AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

PROCEEDINGS BOOK

3rd
INTERNATIONAL CONFERENCE ON
FOOD and AGRICULTURAL ECONOMICS
25-26th April 2019
Alanya, TURKEY

ISBN: 978-605-81058-1-2

Harun Uçak (Ed.)
Alanya Alaaddin Keykubat University

3rd

INTERNATIONAL CONFERENCE ON
FOOD AND AGRICULTURAL ECONOMICS

PROCEEDINGS BOOK

(Full Texts-Abstracts-Posters)

25 -26th April 2019

Alanya Alaaddin Keykubat University, Turkey

ISBN
978-605-81058-1-2

HonoraryPresident of Conference

Prof. Dr. Ahmet Pınarbaşı, Alanya Alaaddin Keykubat University, Turkey

Chairman

Harun Uçak (PhD), Alanya Alaaddin Keykubat University, Turkey,

ScientificCommittee

Anar Hatamov, Azerbaijan State Agricultural University, Azerbaijan
Andrea Holešinská (PhD), Masaryk University, CzechRepublic
Armando Maria Corsi (PhD), University of South Australia, Australia
Astrida Miceikienė (PhD), Aleksandras Stulginskis University, Lithuania
Erdoğan Güneş (PhD), Ankara University, Turkey
Ewa Stawicka (PhD), WarsawUniversity of Life Sciences, Poland
Fabio Gaetano Santeramo (PhD), University of Foggia, Italy
Fazıl Akın Olgun (PhD), Ege University, Turkey
Feng Wu (PhD), University of Florida, USA
Jaime de Pablo Valenciano (PhD), University of Almeria, Spain
Janina Sawicka (PhD), Warsaw University of Life Sciences, Poland
Jingbo Cui(PhD), Wuhan University, China
Juan Francisco Rosas (PhD), Universidad ORT Uruguay, Uruguay
Juan UribeToril (PhD), University of Almeria, Spain
Hrabrin Bachev (PhD), Institute of Agricultural Economics, Sofia, Bulgaria
Mahir Fisunoğlu (PhD), Çukurova University, Turkey
Maria Parlinska (PhD), Warsaw University of Life Sciences, Poland
Marta Domagalska-Gredys (PhD), AgricultureUniversity of Cracow, Poland
Martin Grancay (PhD), Slovak University of Technology in Bratislava, Slovakia
MaurizioCanavari (PhD), University of Bologna, Italy
Muhsin Kar (PhD), Yıldırım Beyazıt University, Turkey
Nejat Erk (PhD), UMUC EuropeanDivisionProfessor, Turkey
Özgür Bor (PhD), Atılım University, Turkey
Tomáš Dudáš (PhD), Pan-European University, Slovakia

CONTENTS

Exploring the Dynamic Correlation between the Future Wheat Markets and Egyptian Spot Prices 1
Osama Ahmed and Walid Sallam

Possibilities of Improving Organic Farming in Turkey 18
İsmet Boz and Cevahir Kaynakçı

How Have Things Changed? Value Co-Creation Reinvents Agribusiness – A Multiple B2B Stakeholder Perspective 28
Hesty Nurul Utami, Eleftherios Alamanos and Sharron Kuznesof

Algerian Efforts in Diversifying the Economy: The Agricultural Sector as A Substitute 42
Mostefai Manal

Effects of Fadama III AF Sorghum Production Development Programme on Women and Youths in Niger State, Nigeria 43
Abigail John Jirgi, Tisin Ogundare, Michael Akindele Ojo and Adeoluwa Adewumi

Bayesian Model Combination Schemes: An Example of Modelling Selected Grains Spot Prices 51
Krzysztof Drachal, Justyna Góral and Włodzimierz Rembisz

Tunisians Consumers Preferences Regarding Functional Food 52
Erraach Yamna, Arfa Lamia and El Hammemi Manel

Modeling Alternative Technology Adoption Transformation Scenarios to Achieve Production and Economic Performance Goals in the Uruguayan Beef Cattle Sector 53
Enrique Fernández, Juan Manuel Soares de Lima, Bruno Ferraro and Bruno A. Lanfranco

The Grain-for-Feed Plan: A Supply-Side Reform Case Study in Inner Mongolia Autonomous Region of China 55
Changbai Xiu, Fengying Nie and Yuchun Liu

Trade Diversion among Costa Rica and its Main Pork Meat Partners 56
Víctor Rodríguez Lizano and Mercedes Montero Vega

Competitive Business Strategy of a PublicBreedingInstitute 64
Zvonimir Zdunic

Structural Changes in Global Meat Market 70
Alesia Efremova

Potential Use of Food Waste as a Bioresource: Case Study from Jelgava Region 78
Dina Popluga and Ieva Ločmele

Best Innovative Approach to Minimize Post Harvest Losses Within Food 79
Octavian Barna, Gabriela Iordăchescu, Gabriela Ploscuțanu, Mihaela Eugenia Pricop and Octavian Baston

Effects of Different Subsurface Drip Irrigation Applications on Yield and Quality Parameters of Alfalfa 80
ŞuayipYüzbaşı, Sinan Aras, Süleyman Şen, Şener Özçelik, Ümit Alkan and Mehmet Gündüz

Effect of Drip Irrigation Management on Yield and Water Use Efficiency of Tomato Grown in an Unheated Polyethylene Tunnel-Type Greenhouse 81
Galina Patamanska, Elena Grancharova, GeorgiKostadinov and AntoanetaGigova

A Research on Determination of Farmer's Preference and their Problems in Credit Use 87
Ali Berk and Süleyman Armağan

Effect of Improved Maize Production Technology on the Poverty Status of Rural Farmers in Kaduna State, Nigeria 95
Usman Shaba Mohammed, Cornelius Owoniyi Adebayo and Akuniyi Matthew Durba

Vulnerability of Sugarcane Crop Production to Climate Change in Pakistan: An Empirical Investigation 101
Usman Shakoor, Mudassar Rashid, Muhammad Iftikh-ul-Husnain and Tahir Arif

Consumer Behaviour and Promotional Strategies Differences on the Market of Milk in Turkey and Slovakia 108
Jana Rybanská, DoğukanPolat, ĽudmilaNagyová, Alexandra Andocsová and Andrej Géci

Analysis of Consumption Behaviour and Consumer Profile for Table Eggs: A Pilot Study for Egg Consumers in Turkey 117
Osman İnançGüney and LeventSangün

Breaking Yields in Rice Production: High Yields or High Profits? 125
Bruno Lanfranco, Bruno Ferraro, Enrique Fernández and Juan M. Soares de Lima

Economic Benefits of Standards 127
Caspar von der Crone

Determination of Factors Influencing the Adoption of Returnable Plastic Crates (RPCS) in Reducing Tomato Losses Among Traders in Lagos State, Nigeria 136
Aghadi Crystal Nwabuogo, Mburu John and KalabaMmatlou

The Impact of Helminthes Parasites Infection OnserumProteinles Profile of Catfish ClariesLazera Using Polyacrylamide Gel Electrophoresis 146
Eshraga Dafa Alla Mahmoud and Asma Abdelrahman Ahmed

Managing Post Harvest Losses for Improved Food Security in Nigeria: A Conceptual Review 153
Musa Gambo Kasuwar Kuka

Bread-Baking Traditions Incorporated in a Rural Tourism Product in Latvia 154
Aija Eglite and Dace Kaufmane

Economic Evaluation of Hydroponic Fodder Feeding Technologies 162
Astrida Miceikiene

Storage Life Management of Some Raw Vegetables 163
Barna Octavian, Iordăchescu Gabriela, Baston Octavian, Ploscuțanu Gabriela and Pricop Eugenia Mihaela

Risk Management Problems and Solutions in Rural Tourism in Latvia 164
Dace Kaufmane and AijaEglite

Causal Relationship between Agricultural R&D Spending and Agricultural Output: The Case of Turkey 172
Bekir Pakdemirli

Will Non-Agricultural Employment Promote Farmers' Agricultural Investment: A Study of Tea in China 173
Xiaorong Zhang and Xiangzhi Kong

The Performance of the Agricultural Sector for the Case of Kosovo 175
Anera Alishani

Municipalities Revenue Autonomy in the Baltic Countries 176
Neringa Slavinskaitė and Aušra Liučvaitienė

Human Capital in Poland 184
Janina Sawicka and Maria Parlinska

Public Policies and Organizational Structure for Sustainable Intensification: Synergies between Policy-Making and Scientific Knowledge Generation in Uruguay 185
Nicolás Gutiérrez and Bruno Ferraro

Socio-Economic Analysis of Breeders, Breeders' Associations and Member Relations, a Case Study of Sivas 199
Murat Demirbük and NurayKızılaslan

Demographic Transition in Turkey, Rural Population and Analysing of Demographic Projection of 2080 213
Özlem Sertkaya Doğan

Honey Production and Marketing in Tokat Province 224
Figen Çukur, Nuray Kızılaslan and Halil Kızılaslan

Farm Loan Using, Loan Preferences and Production Structure of Farmers: Case of Manisa Province 235
Onur Terzi and Fazıl Akın Olgun

Economic Analysis of Cassava Processing under Value Chain Development Programme (Vcdp) in Wushishi Local Government Area of Niger State, Nigeria 245
Abigail John Jirgi, Bose Rebecca Edwin, Agatha Itohan Oseghale, Ayodeji Alexander Ajibola Coker, Faith Debaniyu Ibrahim and Ramatu Usman Bako

Credit Fungibility and its Impact on Wheat Productivity in Faisalabad, Pakistan 254
Muhammad Shees-ur-Rehman, Muhammad Khalid Bashir, Muhammad Ashfaq, Ghaffar Ali and Shabbir Ahmad

Factories Influence the Value of Agricultural Real Estate 255
Dorota Koziol–Kaczorek and Agnieszka Parlinska

The Effect of Spirulina Platensis (Gomont) Geitler Extracts on Seed Germinationof Capsicum Annuum L. 256
Füsun Akgül and RızaAkgül

Determination of the Factors Affecting Membership of Breeders' Associations by Structural Equation Modelling 263
Murat Demirbük and NurayKızılaslan

Evaluation of Women Farmers' Perspectives on Women's Entrepreneurship in Besni District of Adiyaman Province 278
Tayfun Çukur, Nuray Kızılaslan and Halil Kızılaslan

The Transformation from MemleketSandiklari as Agricultural Development Project to the Largest Bank of Turkey: The Establishment and Organization Process of Ziraat Bank in Ottoman Period 289
Mehmet Fatih Güner

Oat in Human Nutrition 296
Nilüfer Ergül and Ahmet Görgülü

Agrotourism of a Region Between the Three States 298
Behije Ibrahimi

Effect of Different Subsurface Drip Irrigation Applications on Some Quality Parameters of Tomato 300
Sinan Aras, Şuayip Yüzbaşı, Şener Özçelik, Nuri Candan, Ümit Alkan, Mehmet Gündüz, Perihan Tarı Akap ve Fatih Şen

The Effect of Spirulina Platensis (Gomont) Geitler Extracts on Seed Germination of Lactuca Sativa L. 301
Füsun Akgül and Rıza Akgül

Using Bioplastics in Food Packaging 307
Sinan Uzunlu

The Factors Behind the Emergence of the Private Agricultural Extension in Algeria: The Case of the Citrus Sector 308
Karima Boudedja and Akila Derbal

Can Cooperatives Increase Farmers' Income: A Study of Tea in China 309
Xiaorong Zhang and Xiangzhi Kong

Effects of Conflicts on Food Security and Poverty Status of Irish Potato Farmers in Plateau State, Nigeria 311
Ezekiel SalawuYisa, Ayodeji Alexander AjibolaCoker, Ifeanyi Kingsley Etonihu and AdeoluwaAdewumi

The Implications of Financial Autonomy of the Rural Municipalities in Lithuania: The Situation and Trends 321
Astrida Miceikiene and Laima Skaurone

What Happens to Small Dairy Farmers after a Free Trade Agreement? A Costa Rican Case Study 322
Mercedes Montero-Vega and Víctor Rodriguez-Lizano

The Impact of Farm Workers Strike on Wine Production and Export in South Africa: An Error Correction Model (Ecm) Analysis 323
Lenogang Petronela Ramafoko, Usapfa Luvhengo, Joseph Nembo Lekunze and Sandile Alexandra Mahlangu

Orange Buying and Consumption Habits: A Segmentation of Tunisians Consumers 335
Arfa Lamia and Erraach Yamna

A Panel Data Analysis of Algerian Food Exports: A Gravity Model Approach 336
Mohamed Assad Allah Matallah and Mohamed Amine Benmehaia

Econometric Impact of Agricultural Productivity Shock on Nigeria's Economy 344
Ayodeji Alexander Ajibola Coker and Ahmed Aliyu

Roles, Responsibilities and Competencies Needed by Extension Agents in Extension System 357
Cevahir Kaynakçı and İsmet Boz

Changes in the Level of Education of Farmers in Poland 363
Ewa Stawicka and Beata Żelazko

Estimating Nutrient Elasticity for Turkey 369
Neslihan Dönmezand Hüseyin Taştan

The Impact of Exchange Rate Volatility on Turkey's Livestock Imports 370
Yakup Arı and Yılmaz Toktaş

Analysis of the Preferences of Herders' in Inner Mongolia for Grassland Protection Compensation and Reward Policies Using a Choice Experiment: A Case Study of Ordos 382
Guanghua Qiao and Bao Zhang

Incorporating Collective Entrepreneurship and Capacity Development for Emerging Cooperative Farming Systems: The South African Review 383
Usapfa Luvhengo, Janus Henning and Yonas Barhta

Adoption of Pressurized Irrigation Systems among Maize Producing Farmers in Çarşamba District-Samsun 384
İsmet Boz and Cevahir Kaynakçı

Assuring Quality in the Beef Production Chain 391
Bruno A. Lanfranco, Juan M. Soares de Lima, Marcia del Campo, Gustavo Toyo and Jorge Acosta

Sustainable Livestock Farming in Turkey and Pinarhisar Gene Center Implementation 393
Mesut Doğan

PREFACE

Economics refers to the scientific study that investigates how to supply unlimited human needs with the utilization of scarce resources. Although individual needs have altered throughout most of the human historical process, the only basic and fundamental need that cannot be given up is water and food. Therefore, the agricultural and food industries as the sources of food are strategic sectors have been protected under state regulations. History has demonstrated that the human losses and mortality rate caused by food shortages from time to time are serious, and even some civilizations have ceased to exist because of the lack of agricultural production due to droughts. One of the most important differences between today's and the past lives is that people can now store food for longer periods of time so that food safety can be provided. Therefore, it can be said that particularly developed countries are affected in the slightest degree by food crises. However, almost one billion people in least developed countries face hunger; especially price fluctuations have serious negative impact on these people. The economic problems brought by food consumption as well as food production have become one of the important debates in recent years. Technological change, development and globalization make it possible for people to consume far more various products. The products reach the consumers through the food industry much differently than the agricultural products. Technological development has important influences on the increase of food supply and generates high-calorie food products which are more caloric than human needs. Ultimately, as much as insufficient food consumption, food overconsumption has become one of the major problems of human beings, especially in developed countries, which leads to an increased economic burden due to health related costs. It had been postulated that the least developed countries and the developing countries have a significant cost advantage over developed countries, given the assumption that the agricultural sector in international trade is a labor intensive sector compared to other sectors. Yet, the technological transformation in the agricultural sector has led the agricultural sector to become a more capital intensive sector compared to the past. Today, it is noted that the developed countries have become one of the important exporters of agricultural products in addition to the industrial products.

The 3rd International Conference on Food and Agricultural Economics, which was held on 25-26th April 2019, includes presentations on macro and micro level food and agriculture economics. Accepted submissions came from 4 different continents and 20 countries as Algeria, China, Costa Rica, Croatia, Germany, Kenya, Kosovo, Latvia, Lithuania, Nigeria, Pakistan, Poland, Romania, Slovakia, South Africa, Sudan, Tunisia, Turkey, United Kingdom and Uruguay also showing that the event is of global interest. It is my wish that this conference that allows scientists, practitioners and independent researchers outside universities to present their theoretical, analytical and experimental research will contribute to the scientific literature and policy-makers' decisions, and I would like to express my appreciation to all participants and keynote speakers for their significant contributions. Prof.Dr. Alan Matthews (Trinity College, Ireland) made presentation about "The EU's Common Agricultural Policy after 2020: New direction or more of the same?", Prof.Dr. Deborah FahyBryceson (University of Edinburgh, United Kingdom) made presentation about "Food Security, Smallholder Agriculture &Deagrarianization in Sub-Saharan Africa" and they shared their scientific knowledge with us. Last but not least, I would like to send my gratitude to

Dr. Sezin Zengin Farias Martinez, Saliha Çelik, Egemen Güneş Tükenmez, Nazlı Türker, Muhammet Necati Çelik, Kemal Sür and Bekir Çınar for his valuable assistance and co-operation. I would also like to gratefully acknowledge the generous support from Rector of AlanyaAlaaddinKeykubat University Professor Ahmet Pınarbaşı, and I would like to extend my thanks to the TÜRSAB Regional Executive Board.

Prof.Dr. Harun Uçak Chairman/Editor

EXPLORING THE DYNAMIC CORRELATION BETWEEN THE FUTURE WHEAT MARKETS AND EGYPTIAN SPOT PRICES

Osama Ahmed
Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Department of Agricultural Markets, Germany
Cairo University, Faculty of Agriculture, Agricultural Economics Department, Egypt
Email: naser@ iamo.de

Walid Sallam
Cairo University, Faculty of Agriculture, Agricultural Economics Department, Egypt

Abstract

Egypt is considered a higher wheat importer in the world, and given the reality that futures prices lead spot prices that makes the Egyptian prices vulnerable to future wheat markets. This study assesses the relationship between Egyptian flour prices and future wheat prices associated with Paris (MATIF) and USA (CBOT). Markov switching-vector error correction methods are used to estimate two regimes by splitting the sample by high and low volatility regimes. This study also examines the dynamic conditional correlation using Asymmetric-Dynamic Conditional Correlation with Multivariate Generalized Autoregressive Conditional Heteroscedasticity (DCC-GARCH). Results suggest a high volatility regime observes especially during the extreme market events; in the time of the food crisis 2007/2008 and 2010 as well as after two revaluations in Egypt in 2011 and 2013 and during the economic reforms in 2016, mainly in the range from 0 to 0.4 before crisis, while the fluctuations are higher in the time of food crisis, revolutions and economic reform that in the range from -0.2 to 0.8. This implies that the negative impact of the economic and political crisis on the consumer prices. The results provide evidence of symmetric volatility spillovers from future markets to Egyptian wheat market. Results from impulse response functions indicate that shock by 1% in the future markets will lead to positive shock in the flour spot market in Egypt.
Keywords: Food Prices Volatility, Futures and Spot Prices, Asymmetric Price Transmission, Dependence Analysis, Markov Switching, Vector Eror Correction, DCC- GARCH.

1. Introduction

Egypt is suffering from food insecurity for long time as reason of the scarcity of natural resources, economic instability, political upheaval and the excessive reliance on food imports, that is make Egypt vulnerability to negative price volatility. The prevailing economic situation in Egypt is characterized by high food and energy prices, high unemployment rates, unfair wage structures, and low exchange rate. This economic downturn led to a structural problem in the functions of the Egyptian food market. The GDP growth rates decreased from 5.1% in 2010 to 3.6% in 2017, while inflation measured through the consumer price index grew by 29.8% in 2017, the unemployment rate is consistently high at 12.5% (Central Bank in Egypt, 2017). Rising the unemployment rate worsened the poverty rate that increased from 21.6% in 2009 to 27.8% in 2017, and food insecurity increased from 14% of the Egyptian population in 2009 to 16% (15.9 million people) in 2017 (World Food Program, 2018).

The economic situation became worse after 2016 with the devaluation of the Egyptian pound against the USD over 50% that hit especially strong in country depends significantly on the international market to meet the local food demand, which makes this market vulnerable to food price volatility in international markets. Rising food prices erode the consumer purchasing power and increase the poverty rate.This exacerbated food security problems that hit poor countries especially hard. In 2013, more than 80% of Egyptian population not receiving enough income to cover consumption needs, and more than 65% of this insufficient income was spent on food specially wheat (Egyptian Food Observatory, 2013). Inflation measured through the consumer price index increased

from 9.1% in January, 2015 to 21.9% in December, 2017 (Central Bank in Egypt, 2018), Consumer's in Egypt have used different strategies to cope with increasing the food prices such as consuming cheaper food with low nutrients, reducing food intake, and buying food on credit (Egyptian Food Observatory, 2013). In 2015, the poverty rate increased by 27.8% (26.1 million people); rising poverty worsened food insecurity with undernourishment represented more than 5% of Egyptian population in 2017 (GFSI, 2017).

Egypt is considered a net importer of grain and top importer of wheat in the world; most of the Egyptian wheat is imported from former Soviet Union countries, U.S and France. Wheat is the most relevant grain in terms of Egyptian consumption and the key to household economies in rural areas, since most Egypt farm households are net buyers of wheat beside their own production to partially meet their consumption needs. Hence, the impacts of wheat price spikes on poor households can be relevant. Bread represents the largest food staple for Egypt's population of more than 98 million people. It is also supreme important in the Egyptian diet and that indicate the centrality of the bread to Egyptian life. Egyptians call bread "Aish baladi". Baladi means traditional or authentic in English, but the word "Aish" is the key to understanding the special place of bread in Egyptian heritage that means "life", which is how Egyptians have perceived bread since ancient times. Bread is considered a commodity that Egyptians cannot live without in their daily diet. After the food price crisis in 2007/2008 and the second wave of the food crisis in 2010, the basic food commodities prices, particularly in developing countries, have been increased and negatively affected by global price volatility. These rises in food prices cause to the social unrest and series of revolutions in the Middle East; so-called Arab spring began with Tunisia, Egypt, Syria, Libya, and Yemen (Ciezadlo, 2011; Bellemare, 2015). As in Egypt, after the global food crisis, the food market suffers evident price distortion especially for wheat that significantly affected by the price volatility. On January 25th 2011, a protest was held in Egypt calling for the end of the Mubarak regime and protesting against economic and living conditions as a result of food prices increases.

The concept of the food price volatility is closely related to the food security. According to FAO 2015, the food security pillars are four, they are; food availability, economic and physical access to food, food utilization, and stability over time (vulnerability and shocks). Food price shocks may hit poor countries especially hard and increase the population lives below the poverty line that exacerbate the economic instability and political upheaval. Since Egypt is depend on importing the wheatneeds, that make Egyptian market vulnerable to international wheat shocks and that food security remains an issue of consumer's affordability.Lack of affordability leads to poor access to the food and that can lead to nutritional damage, particularly among children. The study by Robles and Torero (2010) found evidence that after the 2007/2008 food crisis, greater reductions in calorie intake have been showed due to increases of the food prices. The work by Iannotti and Robles (2011) to assess the negative impact on energy intake associated with food price shocks in Latin America. They confirmed that the increases in prices of the basic foods commodities (rice, wheat, and maize) during the period from 2006 -2008 negatively affected the energy intake especially for poorer households. Arndt et al. 2016assess the relationship between increases in foods prices and child nutrition in Mozambique at the period 2008/2009. They find that increases of the food prices lead to decreasing of the nutrition and the prevalence of underweight, particularly among children.Ivanic and Martin (2008) studied the impact of the food crisis and the consumption welfare in the developing countries in Africa, Latin American, and South Asian countries. Research results indicate that increase in the food prices leads to an increase in the poverty and reducing the household welfare. Egyptian wheat prices reflect the information from price discovery occurring in wheat future markets. The article by de Brauw (2011) evidence has found that increases in food prices inflation by 15% in El Salvador resulted in decrease the height-for-age of the children in households.

Several studies have suggested many causes that may be underlying recent price volatility of food.Jacks and Stuermer (2016) conducted study on the drives commodity price booms and busts. They found evidence that the commodity demand shocks transmitted into price variability strongly more than commodity supply shocks. Carter et. al., 2011 investigated the frequency of dramatic commodity booms and busts. Results indicate that the supply and demand shocks that coincided with low inventories that leads to price booms. Roberts and Schlenker (2010) found that 30% of the staple food commodities average price rise was due to excess biofuel demand in 2007/2008.Roberts and Schlenker (2013) analyzed the supply elasticity based on the certainty that the past yield stocks of the

food commodities negatively affected inventory levels and futures prices and implied that 20% of the staple food prices increase as result of using one-third of food commodities used to produce ethanol.

Many empirical analyses have studied the causes of the food price volatility especially in the period of the crisis using different econometrics techniques. Most of these studies found evidence that the energy market strongly leads to volatility in agricultural markets (e.g. Du et al., 2009; Meyers and Meyer, 2008; Balcombe and Rapsomanikis, 2008; Serra et al., 2008; De Gorter and Just, 2008). The study by Hull (1997) assess the linkage between the future and spot prices. The results implied that the future and spot prices moves together in the long-run. There are many studies have studied the relationship between the future and spot prices (e.g.Baklaci and Tutek, 2006; baladi, 2011; Giot, 2003; Garcia and Leuthold, 2004; Hernandez and Torero, 2010). The studies on the causal relation between futures and spot prices found evidence that the relationship between the future and spot prices due to the price discovery in the futures market and flow the information available to the spot prices and indicated that future prices lead the spot price (Brooks et al., 2001; Yang et al., 2001). While other studies found evidence that the spot prices leads the future prices(Kuiper et al. 2002, Mohan and Love 2004). The link between future and spot prices at different levels have been examined by Hernandez and Torero (2010), Baldi et al., (2011), and Sendhil and Ramasundaram (2014).

Few empirical analyses have addressed the volatility impact of the future markets on spot prices using GARCH model (Yilgor and Mebounou, 2016; Baklaci and Tutek, 2006; Bohl and Stephan, 2013; Bozic and Fortenbery, 2015). The work by Busse et al., 2011 studied the emerging linkages between price volatilities in energy and agricultural markets. They assess the price volatility development in food commodities by focusing on the price behavior of rapeseed future prices, crude oil and related agricultural commodity in the period of the food crisis 2006-2008. By using the dynamic Autoregressive Conditional Heteroskedasticity Models (GARCH) models. They found evidence that positive correlation between rapeseed future prices and crude oil during the time of the food crises which continue increased afterwards. Furthermore, the crude oil prices shown higher volatility level than the agricultural commodity prices. Also, the crude oil prices leads to volatility in agricultural markets, which implies that farmers and consumers will continue facing uncertainty of the agricultural prices in the future. The article by Prakash and Gilbert (2011) implied that the magnitude of futures markets traders' positions in agricultural commodity markets has considerably increased, which has raised concerns with respect to increase food price volatility due to various factors such as changes in supply and demand fundamentals, rising expectations, and speculation (Baldi et al., 2011) .

This research article contribute to the literature through assessing the link between futures and spot prices in the wheat market in Egypt, while all the studies focusing on US and EU markets. In addition, we investigates if the future market facilitating the transmission of information to spot market that reduce the market failures and the effectiveness of market performance, we examine as well the whether that the futures market reduces, increases, or stabilizes the spot price volatility, by using two different method; they are: Markov-Switching vector error-correction model and asymmetric DCC-GARCH model.

This paper is organized as follows. In the next section, a brief description of the wheat market in Egypt is offered. In section 2, the methodological approach is described. The fifth section is devoted to the empirical implementation to assess the relationship and the continual volatility correlation between future and spot prices. The last section in this article offers the concluding remarks and policy recomendation.

2. Wheat Industry in Egypt

Bread is considered the mandatory commodity in daily meals for Egyptians. The Egyptian bread is mainly produced by wheat that makes Egypt depend on importing around 12.5 million metric tons (MMT) in 2018 and expected to increase by 0.8% in 2019. According to USDA-FAS (2019) report, indicated that 28 import tenders for 6.64 MMT of wheat in the marketing year 2017/2018 has been issued by The General Authority for Supply Commodities (GASC) compared to 5.85 MMT the last year. Most of the wheat are imported from Russia, Romania, Ukraine and France 5.2 MMT, 1.06 MMT, 355,000 MT, 60,000 MT, respectively. While in the marketing year 2018/2019, GASC increased the wheat purchased by 8% compared to the last year. The largest wheat exporter in Egypt

were Russia, Romania, Ukraine, France, and the United States by 3.9 MMT, 960,000 MT, 480,000 MT, and 300,000 MT, respectively.

Wheat is the first grain in terms of consumption and production in Egypt. Egypt is the largest wheat producer in Africa. Where Egypt, Morocco, Algeria and Tunisia jointly represent 71.5 % of total African wheat production (FAOSTAT, 2017). Wheat is extremely important for African economies, which is devoted 10.4 million hectares to produce 27.2 million tons in 2017, roughly a quarter of the vegetables produced in Africa (FAOSTAT, 2017). In 2018, The Egypt's wheat consumption was 20.1 million metric ton increased by 1.6% compare to the previous year as a result of increasing food, feed and industrial consumption, and forecasted to continue increasing by 1.5% in 2019. This increases in the wheat consumption due to the population growth 2.4 % per annum (USDA-FAS, 2019).The Egyptian government is allocating 4.8 US$ billion for bread and food subsidies program. Bread subsidized system in Egypt is working inefficiently, where allocated five loaves of bread per day for subsidy beneficiaries with only 5 Egyptian piasters per loaf ($0.01) while its actually cost 60 Egyptian piasters ($0.03), this system is allowing bakeries and grocery stores to resell the subsidized bread in the black market that lead to price distortions between the free and subsidized markets and increasing the imported wheat. There is 450 public and private sector mills as well as public-private partnership mills in Egypt. The capacity milling of the public and public-private mills in the range 50,000-55,000 metric tons per day. While the capacity milling of private mills is 20,000 metric tons per day. There are 81 of the public mills and 75 private mills producing 82% high extraction flour for subsidized baladi bread production.Private sector milling 72% extraction flour to sell it to around 20,000 private bakeries and could stop producing this kind of flour to produce 82% extraction flour if they have contract with the government to produce the subsidized baladi bread.

The wheat value chain in Egypt however is still in need of better mechanism to increase the performance and the production efficiency (USDA-FAS, 2019).

3. Methodology

This paper studies the price links that requires knowledge of the joint distribution of the prices considered. Markov-Switching vector error-correction model and asymmetric DCC-GARCH model have been used for this purpose. Many empirical analyses have studied the links between two or more variables using regime shifts approaches and they found evidence that ignoring the structural breaks when using econometric application could lead to biased estimation (Perron, 2006 and Hansen, 2009).Following Balcilar et al. (2015), the MS-VEC time-varying model have been used in this study to asses the links between two pairs of prices: future wheat prices in U.S. – Egyptian flour spot price($CBOT, EGYPT$)future wheat prices in France– Egyptian flour spot price($MATIF, EGYPT$).

The MS-VEC model is widely used to assess the dependence between prices to characterize nonstationary and cointegrated data and inform both of their short and long-run dynamics. The Markove switching (MS) models have been introduced in the literature by Hamilton (1990) as nonlinear time-series models using univariate Markov switching autoregressive model. MS model has been developed and extended to multivariate MS –VAR and MS-VEC models by Krolzig (1997, 1999). There are several studies that have addressed structural breaks using MS-VEC to assess how prices are transmitted (Brümmer et al., 2009; Rezitis et al., 2009; Busse et al., 2012;Ihle and von Cramon-Taubadel, 2008). This paper contributes to the literature by examining the dependence between prices using MS-VEC model to capture the co-integration efficiently with time-varying dynamics thatreflect regime switching. This model has the structure to assess permits asymmetric inference for impulse response function (IRF). Our paper studies the MS-VEC model based on Bayesian Monte Carlo Markov Chain (MCMC) method and estimate the IRF by relying on regime-dependent IRFs (RDIRF) approach.

By focusing on modeling bivariate distributions, let F_{xt} and F_{yt} be the bivariate distribution functions of 2 random variables$(x, y)$with the time series vector X_t and $t \in \{1,2, \dots T\}$ that represent the time period, which could be captured as follows: $X_t = \left[F_{xt}, F_{yt}\right]¢$. And let$\Im_t = \{X_\tau | \tau = \mathrm{t}, \mathrm{t}-1, 1-\mathrm{p}\}$, where p is a nonnegative integer. According to the Balcilar et al. (2015), there exists a probability density function that can be expressed as $f\{X_t|\Im_t, \theta\}F_{xt}$ where θ is

the parameters, and $\theta_0 \in \Theta$ that refers the true value of θ where Θ is the parameter space. The MS-VEC model can be defined as:

$$\Delta X_t = \mu_{s_t} + \sum_{k=1}^{p-1} G_s^{(k)}{}_t \Delta X_{t-1} + \bar{P}_{s_t} X_{t-1} + \varepsilon_t, \qquad t = 1,2,\ldots.,\mathrm{T} \tag{1}$$

Where $S_t \in \{1,2,\ldots,q\}$ and $S_t$is the stochastic variable or regime variable with q states Markov process.P is the order of the MS-VAR model, $\{X_\tau|\tau = \mathrm{t},\mathrm{t}-1,1-\mathrm{p}\}$. $\varepsilon_t$is the error term. The regime variable follows a q states Markov with transition probability matrix can be formalized as follows

$$P = \begin{bmatrix} P_{11} & P_{12} \cdots & P_{1q} \\ \vdots & \vdots & \vdots \\ P_{q1} & P_{q2} \cdots & P_{qq} \end{bmatrix}, \quad \sum_{j=1}^{q} P_{ij} = 1 \; for \; i,j = \{1,2,\ldots.,q\} \tag{2}$$

Where P_{ij} is the probability of the regime j and i at time t and $t-1$, respectively. The feature of this model is that all parameters considered in the analyses depends on the regime variableS_t.

The long-run relationship between the variables can be described as follows:

$$\prod_{s_t} = \alpha_{s_t} \beta^{'}, \tag{3}$$

The $\prod_{s_t}$ is the matrix capture the long-run relationships between the variables expressed in equation (1) that can indicate switching in three different ways: switching the in the regime dependent adjustment weighting matrix ($\boldsymbol{\alpha}$), the long-run independent co-integrating vector ($\beta^{'}$), or both. In this regard, the most advantage of the MS-VEC model described in equations (1) to (3) that the speed at which variables considered are adjusted to the long-run equilibrium varies cross breaks. The macroeconomic time series characterized by the extreme events (crisis time) and crisis-recovery (Balcilar et al., 2015; Durland and McCurdy, 1994; Diebold, et al. 1994; Kim and Yoo, 1995; and Filardo and Gordon, 1998). For this purpose, our analysis relies on two regime models (low and high volatility regimes) that studies the short-term time-varying interactions of the prices considered and assesses response to disequilibrium from this parity.

Our paper contributes to the literature by examining the regime-switching behavior of the price series using MS-VEC dynamic model. A key advantage intrinsic to this model is that it can study the dynamic interactions between two or more variables over the full sample at unknown periods based on the parameter switches in the time series. Also, this model can estimate the probabilistic inferences about the time breaks that could happen during extreme market events (regime occurs) and determine the date of the regime changes. This model could be applied to assess the regime dependence impulse response functions (IRF).

The MS-VEC model can be estimated through two stage estimation processes. The first stage consists of estimating Johansen (1988, 1991) procedure to determine the number of co-integration analyses that allow driving the equilibrium errors $z_t = X_{t-1}\beta^{'}$. The MS-VEC estimated in a second stage either through maximum likelihood (ML), expectation maximization (EM) or Bayesian MCMC parameter estimation based on the Gibbs sampling methods. We use the latter that consist of drawing the regimes given the model parameters and transition probabilities[1]. The IRFs of the MS-VEC model have been used to study how a given shock in one variable could be transmitted to another variable in the model over the time period.

Our analysis relies on regime-dependent IRFs (RDIRF) that can determine the response of the variable to a certain shock over the time variation. The RDIRF function can be expressed as:

$$\theta_{ki,h} = \left(\frac{\P E_t X_{t+h}}{\P u_{k,t}} \middle| s_t = \cdots s_{t+h} = \mathrm{i} \right) \text{ for h} \geq 0 \tag{4}$$

Where $\theta_{ki,h}$ is the k- dimensional response vector which predicts the response of endogenous variables at time $t + h$ after one standard deviation shock and $h = 1,2,\ldots.,H$ is the propagation of the shocks with $k-th$ initial disturbance at time t, conditioned on regime i. $u_{k,t}$ represent the structural shock to the $k-th$ (Balcilar et al., 2015 and Ehrmann et al., 2003).

Following Balcilar et al (2015), we combine the MCMC integration with RDIRF analysis that to study the dynamic response of the shocks occurs during extreme market events or crises-recovery periods and examining the propagation of the prices considered in our analyses in the future by using

[1]For more details, please, follow Balcilar et al.(2015) and Fruehwirth-Schnatter (2006).

the simulations of the artificial histories for the variables[2] after determining the structural shocks through using Gibbs sampler, and then we can obtain the RDIRFS posteriors. The standard deviation confidence bands have been estimated using MCMC integration with Gibbs sampling of 50,000 posteriors with a burn-in of 20,000.

Time-varying and clustering volatility, another common characteristic of time-series, is typically modeled through generalized autoregressive conditional heteroskedasticity (GARCH) models. In this study, we apply Asymmetric- DCC GARCH models.

This analysis uses Asymmetric-Dynamic Conditional Correlation with Multivariate Generalized Autoregressive Conditional Heteroscedasticity (ADCC-GARCH) techniques to characterize the time-varying conditional correlation that allows the parameters to change with changing environment across time. ADCC-GARCH model can be estimated through two stage estimation processes. The first stage consists of estimating marginal models that filter information contained in univariate distributions and allow deriving standardized, independent and identically distributed (i. i. d) residuals from the filtration. The ADCC-GARCH have estimated in a second stage. The maximum likelihood method has been applied on the uniform residuals to estimate ADCC-GARCH. Since the theory of ADCC-GARCH applies on stationary time-series, tests for unit roots are run on our data. Results support the presence of a unit root in all series used in the analysis. Univariate ARMA (p_a, q_a) marginal models capture univariate price patterns with p_a representing the number of autoregressive parameters of the ARMA model; q_a the number of moving average components.

Following Gardebroek and Hernandez (2013), we applied this model:

$$r_{it} = \gamma_0 + \sum_{j=1}^{p} \gamma_j \; r_{it} + \varepsilon_{it}, \tag{5}$$

$$\varepsilon_{it} = \sqrt{H_{it}}.\varphi_i, \text{ with } \varepsilon_{it} \sim N(0, H_t) \; and \; \varphi_i \sim N(0, I) \tag{6}$$

Where r_{it} is the 4 X 1 stochastic vector of price returns for WH, WOP, WWP, and EXCH, γ_0 is a 4 X 1 vector of long –term drifts, γ_j is the 4 X 4 parameters matrices with j= 1,.., p, and ε_{it} is a 4 x 1 vector of ordinary residuals. H_{it} is a N X N corresponding variance covariance matrix and φ_i the standardized residuals. The conditional variance-covariance matrix H_t for the DCC model could be defined as follows:

$$H_t = D_t R_t D_t \tag{7}$$

Where R_t is a time-dependent conditional correlation matrix, $D_t = diag\,(h_{11,t}^{\frac{1}{2}} \ldots\ldots h_{NN,t}^{\frac{1}{2}})$, and $h_{NN,t}$ is a conditional variance GARCH (1,1) that could be specified as: $h_{NN,t} = \omega_i + \alpha_i \; \varepsilon_{i,t-1}^2 + \beta_i h_{ii,t-1}$, $i = 1, \ldots\ldots, 4$. The dynamic conditional variance can be defined as:

$$Q_t = (1 - \alpha - \beta)\bar{Q} + \alpha u_{t-1} \acute{u}_{t-1} + \beta Q_{t-1} \tag{8}$$

Where Q_t is the 4 x 4 symmetric unconditional variance matrix between the series, α and β are the non-negative adjustment parameters and satisfy $\alpha + \beta < 1$, these parameters estimated using autoregressive moving average model (ARMA). $\bar{Q}$ is the 4 x 4 unconditional covariance between the u_t, and $u_{it} = \epsilon_{it} / \sqrt{h_{iiiit}}$

The dynamic conditional correlation can be expressed as:

$$R_t = diag(Q_{ii,t}^{-1/2}) \; Q_t \, diag(Q_{ii,t}^{-1/2}) \tag{9}$$

According to Engle (2002), the DCC model is estimated through maximizing the log-likelihood for the dynamic conditional variance, as follows:

$$L(\alpha, \beta) = -\frac{T}{2}\ln(2\pi) - \frac{1}{2}\sum_{t=1}^{T}(2ln|D_t| + \acute{\varepsilon_t}(D_t D_t)\varepsilon_t) - \frac{1}{2}\sum_{t=1}^{T}(ln|R_t| + \acute{\varepsilon_t}(R_t^{-1}{}_t)\varepsilon_t) \tag{10}$$

To capture the maximization of the dependency changes over the time by maximizing value in the previous equation as shown in the equation below:

$$L(\alpha, \beta) = -\frac{1}{2}\sum_{t=1}^{T}(2.ln|R_t| + \acute{\varepsilon_t}(R_t^{-1}{}_t)\varepsilon_t) \tag{11}$$

The limitation of the symmetric dynamic conditional correlation is found that this approach does not respond to positive and negative price shocks (Cappiello et al., 2006). Most of food price

[2]The artificial histories could be estimated by using the estimated value instead of parameters used in the model, and then we can calculate the variance covariance matrix to obtain the residuals, and finally we can estimate the endogenous variables.

literatures found evidence that price time series may be characterized by asymmetric to reflect the market shocks'. Thus, estimate the DCC-GARCH model ignoring the asymmetric effect could lead to - inaccurate results.

Evidence of asymmetries within the food and energy marketing chain is abundant. These asymmetries tend to be more pronounced as we move to extreme tails of the distribution (i.e., when price increases or declines are larger), which we capture through ADCC proposed by Cappiello et al. (2006) that allows for asymmetric dynamic conditional correlation in any direction and nests symmetry as a special case. The ADCC is an extension of the dynamic conditional variance which can be specified as:

$$Q_t = (1-\alpha-\beta)\bar{Q} - g.\bar{\Psi}_t + \alpha u_{t-1}\acute{u}_{t-1} + \beta Q_{t-1} + g.(\xi_{t-1}\acute{\xi}_{t-1}) \quad (12)$$

Where $\bar{\Psi}_t = E\left[\overline{\xi_{t-1}\acute{\xi}_{t-1}}\right]$ and $\overline{\xi_{t-1}} = (I\,[\overline{u_t} < 0\ ]o\,\overline{u_t})$ with implying the element by element Hadamard product (o), and g - denotes the asymmetric term. Thus, if$g = 0, [\alpha_{ij}] = [\sqrt{\alpha}], [\beta_{ij}] = [\sqrt{\beta}]$ the model tend to be symmetric DCC, while if $[g_{ij}] = [\sqrt{g}], [\alpha_{ij}] = [\sqrt{\alpha}], [\beta_{ij}] = [\sqrt{\beta}]$ the model tend to be ADCC. Then g expressed periods where both series experience negative shocks (bad news) and $[\xi_{t-1}\acute{\xi}_{t-1}] = I_t$.

4. Empirical Analysis

The empirical application aims at examines the relationship between nominal domestic prices of flour in the Egyptian market and future prices associated with Chicago in U.S. (CBOT) and Paris in France (MATIF). CBOT trades a soft red winter wheat while MATIF trading a milling wheat contract. The Egyptian market mainly importing either the soft wheat or milling one, for this purpose we have selected those markets.The analysis is based on monthly prices series and expressed in US dollar per ton and observed fromJanuary 1998 to December 2017, yielding a total of 240 observations. The futures prices are obtained from Agriculture and Horticulture Development Board (AHDB) (https://cereals-data.ahdb.org.uk/archive/), while the Egyptian wheat spot prices are obtained from Central Agency for Public Mobilization and Statistics (CAPMAS) (https://www.capmas.gov.eg/HomePage.aspx). The period of analysis is of interest, as it includes the first and second wave of the food crisis in 2007/2008 and 2010 as well the Egyptian revolutions in 2011 and 2013 and is likely to reflect the impacts of the political and economic instability. Figure 1 shows the developments of the wheat spot price and future prices (CBOT and MATIF). Table 1 present's summary statistics for first differenced logged prices series and illustrate evidence of non-normal price series, characterized by skewness, kurtosis and ARCH effects. Standard unit root testswere carried out and results in table 2 and results indicate that the series are non-stationary and contains unit roots for this reason we have taken the first difference of the price series. The cointegrationJohansen's (1988, 1991) and Stock-Waston (1988) tests are condacted to assess the existence of an equilibrium relationship between the pairs of prices studied. Test results suggest that there is a long-run relationship between spot prices in the Egyptian flour consumer prices, with CBOT and MATIF future markets (see table 4).Results from MS-VEC model, whose specification is chosen through the Akaike's information criterion (AIC) and Bayesian information criterion of Schwarz's (BIC) in VAR, are presented in Table 3. Linear VEC and MS-VEC models with 2 lags are fit to spot and future prices. The MS-VEC model using Baysian Monte Carlo Markov Chain (MCMC) method has been applied with Gibbs sampling by employ 50,000 posterior draws and 20,000 burn-in (follow Balcilar et al. 2015). The long-run average probabilities of low and high-volatility regimes results also presented in table 5 and 6, indicated that the high volatility regimes occurred on 84.2occasions, while the low volatility regimes occurred on 198.6occasions for spot-CBOT pair prices. The Spot-MATIF pairs of prices, high volatility regimes occurred on 61.92occasions, while the low volatility regimes occurred on 194.88 occasions.

The smoothed probabilities of MS-VEC model displayed in Figure 3 and 4 shows high volatility regime between the both pair of prices Spot-CBOT and Spot- MATIF, indicating that high volatility fluctuations have been observed after 2007/2008 food crisis and increases much more after two revaluations in 2011 and 2013, especially between Spot-CBOT prices which shows higher volatility

during this period.This implies that the Egyptian Spot prices strongly affected by the high volatility occurred especially in extreme market events such as food crisis and revaluations.

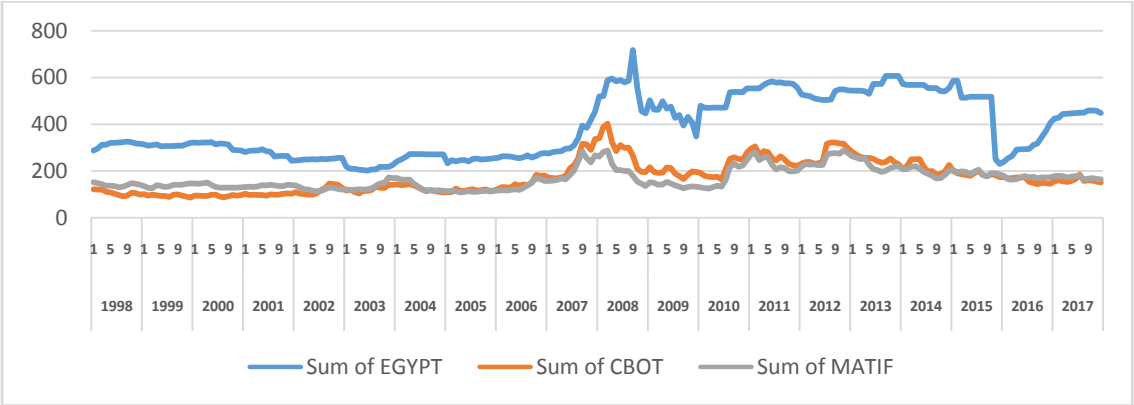


Figure 1.The Developments of the Wheat Spot Price and Future Prices (CBOT and MATIF)

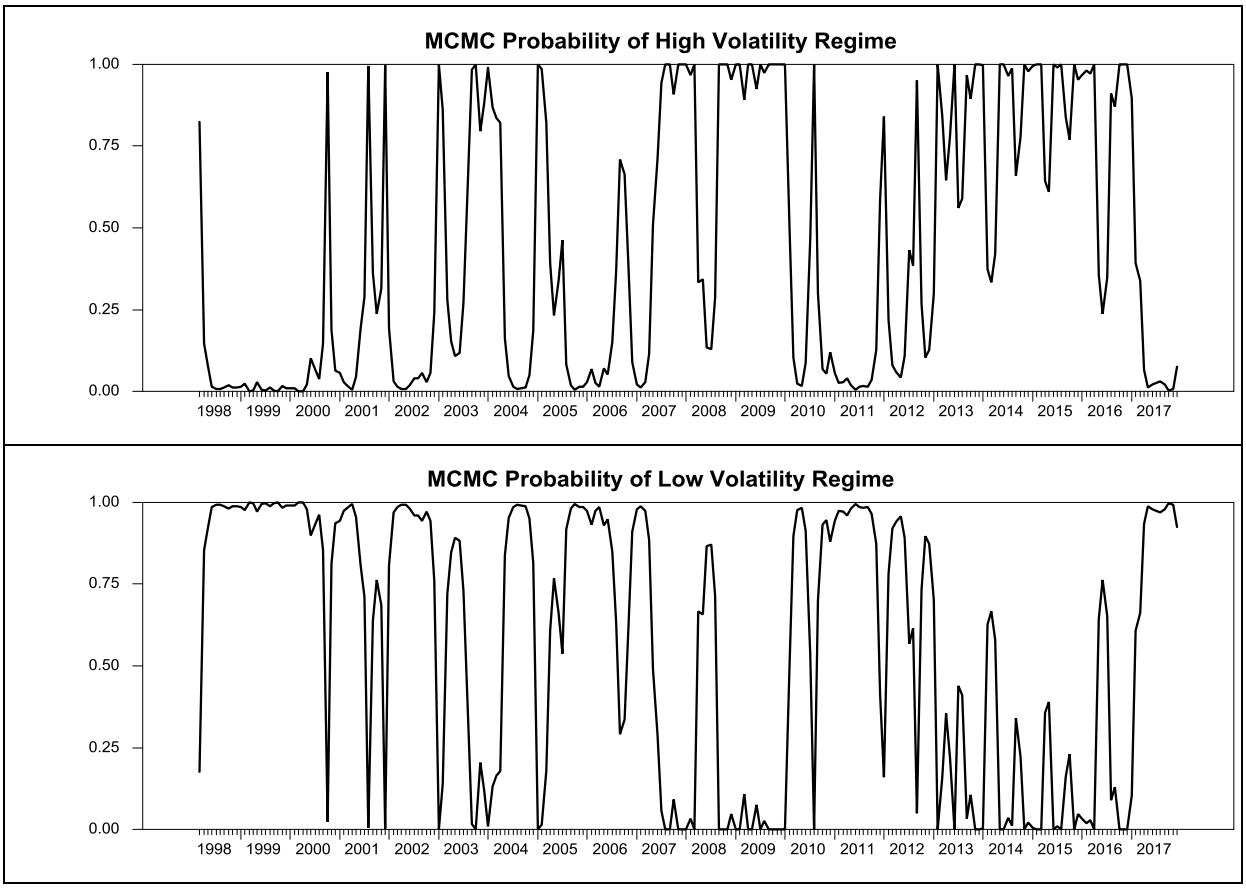


Figure 2. Monte Carlo Markov Chain Smoothed Probability Estimates of High Volatility for $EGYPT - CBOT$.

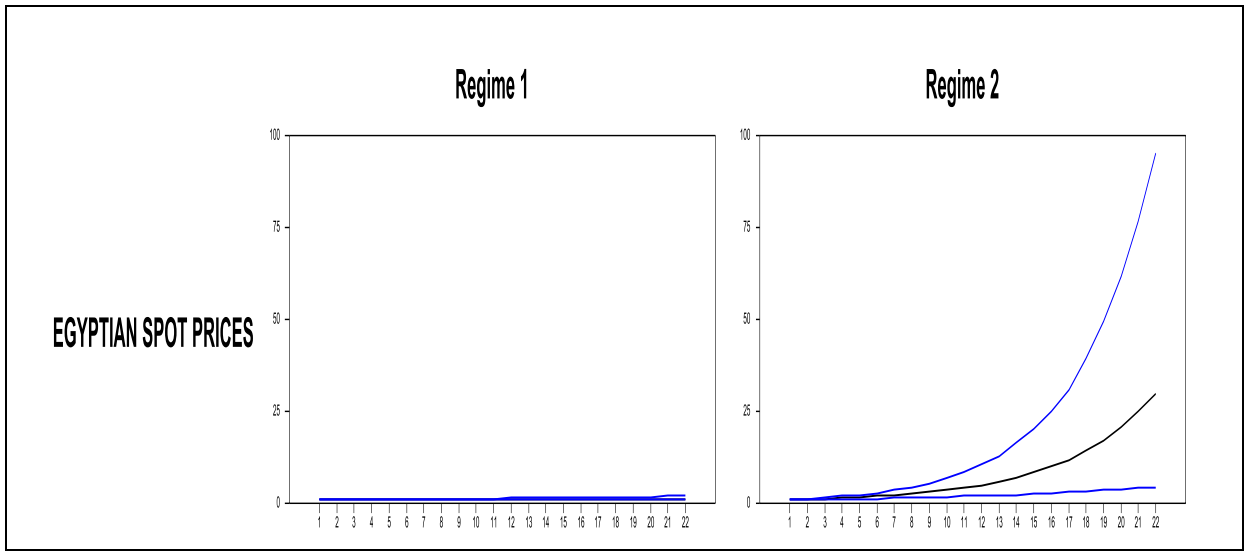


Figure 3. Impulse Responses of CBOT Future Prices to Flour Spot Prices in Egypt in MS-VEC Models *EGYPT - CBOT*.

Table 1. Summary Statistics and Unit Root Test for Log-Differences Egyptian Wheat Prices and Future Prices

	EGYPT	CBOT	MATIF
Mean	0.002	0.001	0.001
Standard error	0.070	0.070	0.058
Skewness	0.480*	0.489*	0.618*
Kutosis (excess)	1.969*	2.907*	3.761*
Anderson-Darling Test	6.122*	2.7498*	3.519*
ARCH LM statistic	3.031*	1.209*	3.233*
Number of observations	240		

Note: *indicates rejection of the null hypothesis at the 5% significance level. The skewness and kurtosis and their significance tests are from Kendall and Stuart (1958). The Anderson-Darling is the well known test for normality. The ARCH LM test of Engel (1982) is conducted using 10 lags**.**

Table 2.Unit Root Tests for Producer, Wholesaler, and Retailer Tomato Price Series

	t-test	Critical values: 1%	Critical values: 5%	Critical values: 10%
Augmented Dickey-Fuller test for unit root				
With intercept				
Egypt	-2.130	-3.460	-2.880	-2.577
CBOT	-1.798	-3.474	-2.880	-2.577
MATIF	-2.146	-3.474	-2.880	-2.577
KPSS				
With trend				
Egypt	0.423**	0.216	0.146	0.119
CBOT	0.560**	0.216	0.146	0.119
MATIF	0.241**	0.216	0.146	0.119

Table 3. VAR and ARMA Order Selection Using Bayesian Information Criterion (BIC)

Lag (P)	1	2	3	4	5	6	7	8
VAR Order Selection								
$EGYPT$,CBOT	19.163	**13.520**	13.592	13.671	13.746	13.820	13.901	13.991
$EGYPT, MATIF$	18.503	**13.170**	13.126	13.192	13.244	13.310	13.359	13.448
ARMA Order Selection								
$EGYPT$	**3.955**	3.977	4.000	4.023	4.043	4.066	4.089	4.104
CBOT	**3.940**	3.941	3.955	3.979	4.002	4.015	4.038	4.058
$MATIF$	**3.453**	3.467	3.573	3.461	3.477	3.491	3.511	3.467

Table 4. Johansen λ_{trace} Test for Cointegration and Cointegration Relationship

	Johansen co-integration tests for (EGYPT, CBOT)						
			Cointegration Vector				
$\boldsymbol{H_0}$	H_a	Eigenvalues	LEGYPT	LCBOT	λ_{max}	λ_{trac}	Trace 95%
$\boldsymbol{r = 0}$	$r > 0$	0.056	-------	-------	13.794	17.059	15.410
$\boldsymbol{r \leq 1}$	$r > 1$	0.013	4.596	-3.976	3.264	3.264	3.840
Johansen co-integration tests for (EGYPT, MATIF)							
			Cointegration Vector				
$\boldsymbol{H_0}$	H_a	Eigenvalues	LEGYPT	LMATIF	λ_{max}	λ_{trac}	Trace 95%
$\boldsymbol{r = 0}$	$r > 0$	0.082	-------	-------	20.321	23.649	15.410
$\boldsymbol{r \leq 1}$	$r > 1$	0.014	-0.038	0.059	3.328	3.328	3.840

Table 5. Result for the MS-VCM Model for Price Pair ($\boldsymbol{EGYPT, CBOT}$)

Variable	$\boldsymbol{EGYPT}$	$\boldsymbol{CBOT}$
$\boldsymbol{C}$	0.002 (0.004)	0.001 (0.004)
$\boldsymbol{\Delta EGYPT_{t-1}}$	0.016 (0.064)	-0.037 (0.065)
$\boldsymbol{\Delta CBOT_{t-1}}$	0.071** (0.025)	0.163** (0.067)
$\boldsymbol{EC_{t-1}}$	-0.054** (0.016)	0.009 (0.017)
Transition probability matrix:		$\begin{bmatrix} 0.874 & 0.125 \\ 0.164 & 0.835 \end{bmatrix}$

Regime properties	**Probability**	**Observations**
Regime 1	**0.791**	189.6
Regime 2	**0.351**	84.2
Ljung-Box Q(5)	**18.250**	**13.262**

Note: ** denotes statistical significance at the 5% level.

The impulse response functions have been conducted of the future prices (1standard deviations) on the spot prices by using Cholsky factor orthogonalization. The regime dependent impulse response method has used for computed the MS-VEC impulse responses that comes from 50,000 posterior draws (Ehrmann et al., 2003; Balcilar et al., 2015). Figure 3 and 5 shows that shock by 1 % in the future markets will leads to a significant positive shock in the Egyptian flour Spot prices.

Table 6. Result for the MS-VCM Model for Price Pair (*EGYPT, MATIF*)

Variable	*EGYPT*	*MATIF*
C	-0.251** (0.048)	0.8297 (0.782)
$\Delta EGYPT_{t-1}$	0.030 (0.064)	-0.020 (0.0512)
$\Delta MATIF_{t-1}$	-0.006 (0.080)	0.367** (0.064)
EC_{t-1}	-0.060** (0.016)	0.028** (0.013)
Transition probability matrix:		$\begin{bmatrix} 0.786 & 0.145 \\ 0.179 & 0.899 \end{bmatrix}$

Regime properties	**Probability**	**Observations**
Regime 1	**0.812**	194.88
Regime 2	**0.258**	61.92
Ljung-Box Q(5)	**20.220**	**10.142**

Note: ** denotes statistical significance at the 5% level.

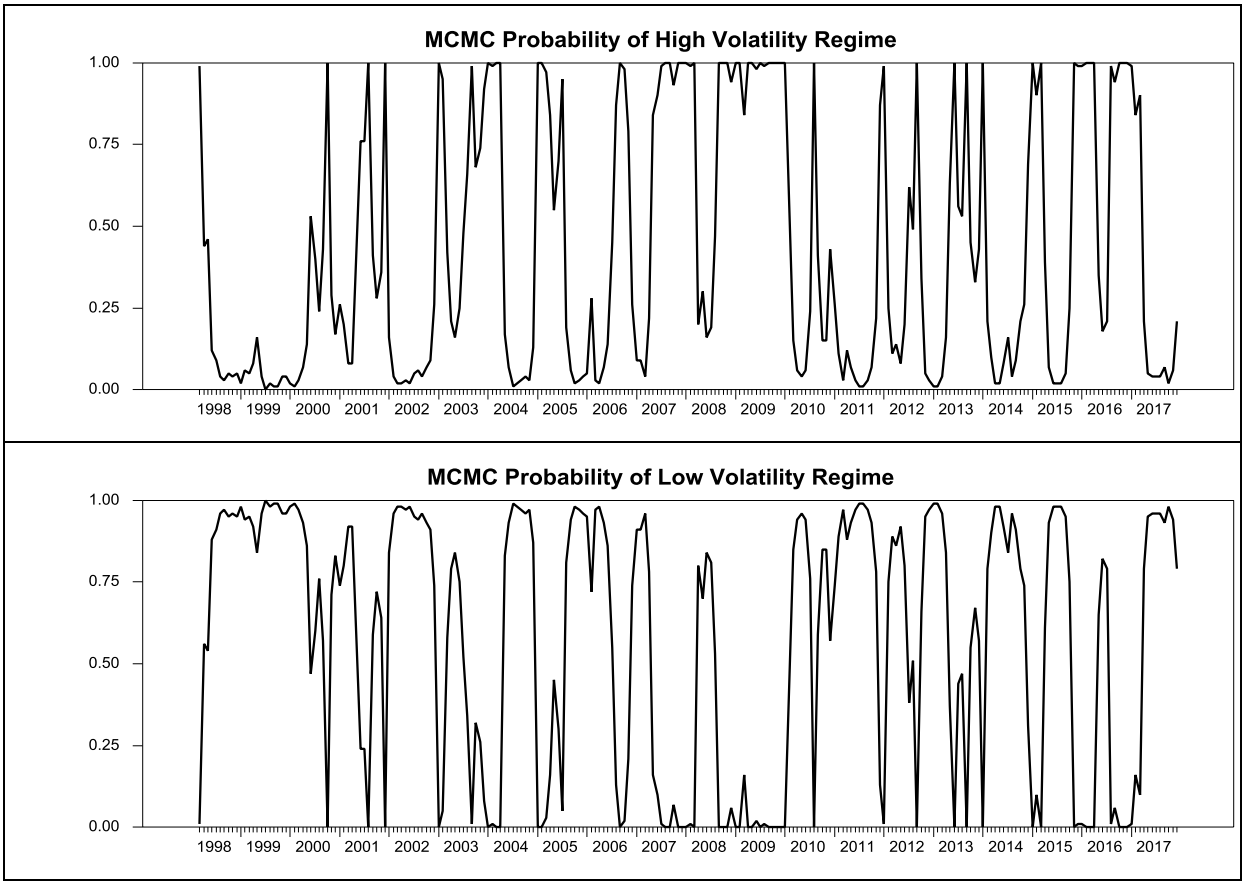


Figure 4. Monte Carlo Markov Chain Smoothed Probability Estimateso High and Low Volatility for *EGYPT, MATIF*

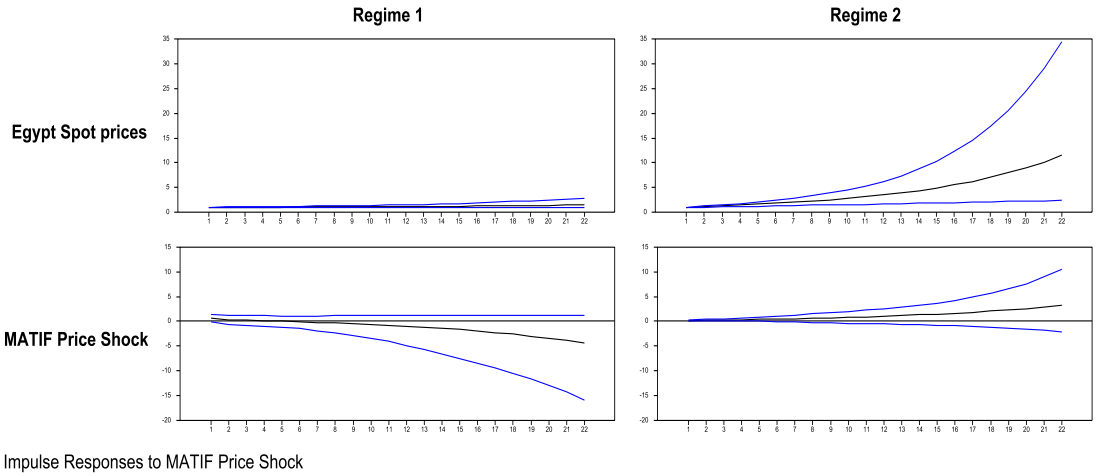


Figure 5. Impulse Responses of MATIF Future Prices to Flour Spot Prices in Egypt in MS-VEC Models *EGYPT, MATIF*.

Table 7. Asymmetric DCC- GARCH Model for CBOT Future Price, MATIF Future Price, Egyptian Flour Spot Prices

Coefficient	***EGYPT*** $(i=1)$	***CBOT*** $(i=2)$	***MATIF*** $(i=3)$
Conditional mean equation			
γ_0	0.002 (0.004)	-0.001 (0.003)	0.001 (0.002)
γ_{1i}	-0.019 (0.099)	-0.053 (0.059)	-0.001 (0.044)
γ_{2i}	0.177** (0.079)	-0.0153 (0.082)	-0.038 (0.059)
γ_{31i}	-0.110 (0.096)	-0.016** (0.040)	0.362** (0.075)
c_i	0.040** (0.001)	0.004 (0.003)	0.009** (0.005)
a_i	0.144 (0.116)	-0.040** (0.019)	0.089** (0.028)
g_i	-0.035 (0.036)	0.186 (0.639)	0.925** (0.028)
d_i	0.156 (0.204)	0.011 (0.056)	-0.110 (0.338)
DCC(A)			0.023** (0.010)
DCC(B)			0.954** (0.219)
Wald joint test for all cross-volatility coefficients			
Chi-sq			98.851
***p*-Value**			0,005
Ljung-Box test for autocorrelation (H_0: no autocorrelation in squared residuals)			
LB (10)	4.857	11.869	10,949	10.637
***p*-value**	0.900	0.293	0,361	0.386
Lagrange multiplier (LM) test for ARCH residuals (H_0: no ARCH effects)			
LM (5)	1,750	1,480	1.060	2.410
***p*-value**	0,882	0,914	0,963	0,790

Note: *(**) denotes statistical significance at the 10% (5%) level.

The asymmetric DCC-GARCH model has been estimated that shows how the levels of volatility interdependence among the pairs of prices considered changes over time. Given that ignoring the asymmetric price volatility transmission could lead to bias estimation, thus we have applied the asymmetric model to study the positive and negative price shocks together. (Table 7). The number of lags (one lag) is chosen through the Akaike's information criterion (AIC) and Bayesian information criterion of Schwarz's (BIC) (see table 3). The first stage of estimating DCC-GARCH consists of estimating marginal models (ARMA) that filter information contained in univariate distributions and allow deriving standardized, independent and identically distributed (*i.i.d.*) residuals from the filtration. We can observe from estimating the mean model across the future (CBOT and MATIF) and Spot markets that the Egyptian flour spot prices positively affected only by CBOT price levels, while the CBOT prices influenced by MATIF price levels. The current price levels of MATIF future market have positively influenced by price levels during the last month.

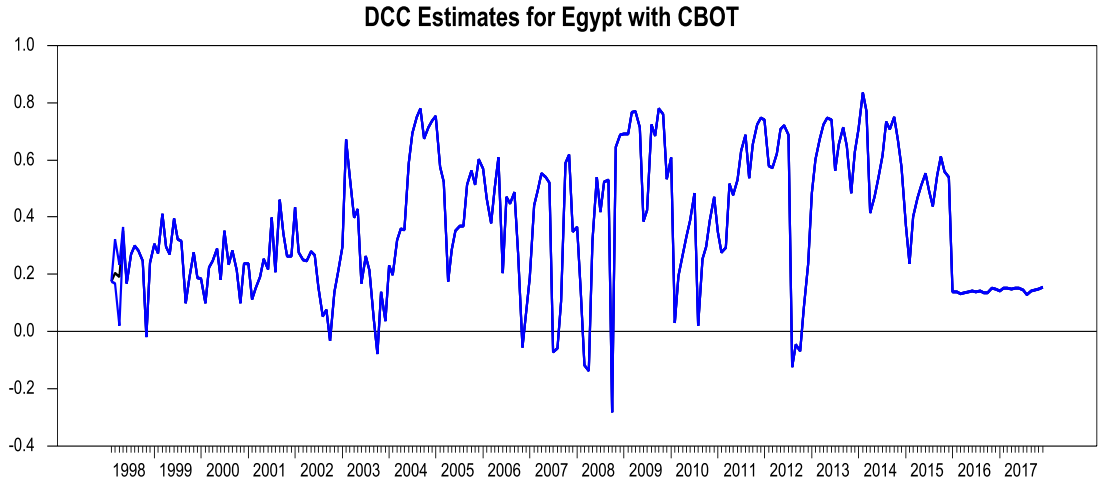


Figure 6. The Dynamic Conditional Correlation Between EGYPT, CBOT.

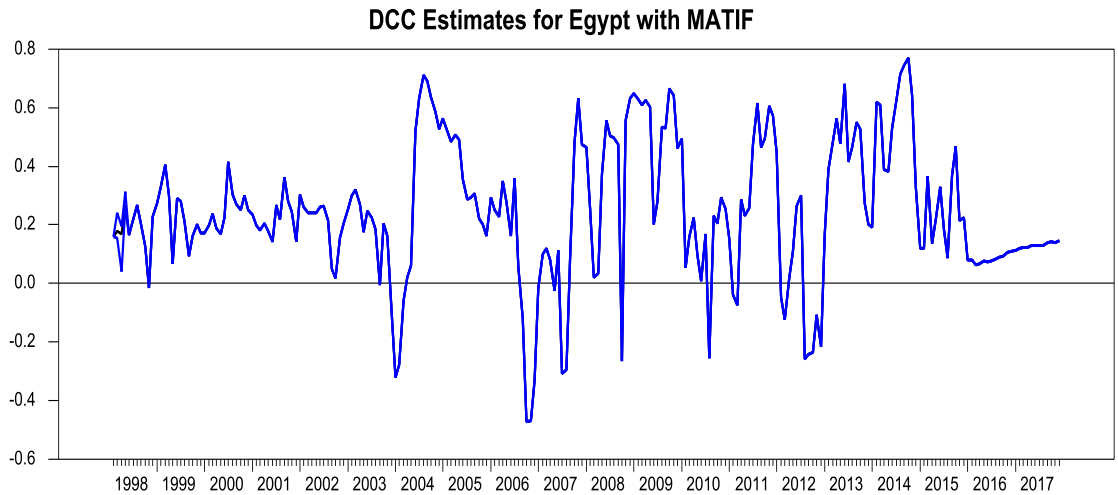


Figure 7. The Dynamic Conditional Correlation Between EGYPT, MATIF.

We now turn to the conditional variance- covariance equation, we found from estimating the Wald test that the adjusted parameter $\alpha + g$ is equal to zero at 1% significant levels, implying that the dynamic conditional correlation between the future-spot prices in the DCC model are a plausible assumption. The Ljung-Box test results presented in tables 7 allow accepting the null of no autocorrelated residuals. The Lagrange-Multiplier (LM) tests (table 7) implemented to test for ARCH residualsprovide evidence that the DCC model are well specified. The Hosking Multivariate portmanteau tests for cross-correlation (multivariate residual autocorrelations) the results also indicate that there is no cross-correlation in squared residuals. The asymmetric dependence has not been found

by which extreme increases or decreases in future prices are likelyto be passed together to flour spot prices in Egypt.

Estimation results from DCC- GARCH are presented in Table 7 and graphed in Figure 6 and 7 for the Spot-CBOT and Spot-MATIF price pair, respectively; indicating thatdynamic conditional correlation from January1998 to December 2004 was relatively low and fluctuated in the range from 0 to 0.4. In the period after 2005, the DCC estimates indicate an important increase in the level of the volatility. The dependence increased dramatically from a small or negativethat reaching values around 0.8 beginning on 2005. Figures (6 and 7) also shows a high dependency with very high fluctuations between future andSpot markets, especially one year effect after the period of the extreme market events, mainly in the range from -2 to 0.8. Such increase in the volatility is likely to be related to the food crisis and economic downturn impacts of the future prices on the Egyptian spot price.

5. Concluding Remarks

Egypt suffers from food insecurity, poverty, and nutritional deficiencies. While food price volatility in developing economies has been widely assessed by previous research, less attention has been paid on less developed countries, mainly due to a lack of price data. Since the food price crisis in 2007/2008, economic research has paid substantial attention to food price behavior, given the significant impacts that it has at the political, economic and social levels. Our work focuses on examining the relationship between flour spot prices in Egyptian market and wheat future prices associated with CBOT in U.S. and MATIF in France.We assess how the information of the price discovery occurred in the future markets affect the volatility of spot prices. The study based on monthly data of CBOT, MATIF, and spot prices in the Egyptian flour market from January 1998 and December 2017. The analysis covers interested period which include the first and second food crisis and two revolutions in Egypt. That shows how the economic and political crisis could affect negatively the consumer prices in developing countries.

The contribution of this paper to the literature is studies price volatility behavior of food staples in less developed countries, thus enlarging a literature that is rather scarce due to data limitations, as results of information flowed from future markets to spot prices. In addition, it does so by using MS-VEC and asymmetric DCC-GARCH models. An attractive feature of MS-VECmodel is that it can estimate the low and high volatility regimes by dividing the sample based on the variance and covariance matrix. While the DCC-GARCH features is that it can assess the dynamics of the volatility across the prices considered.

Results from estimating both models indicate that the high volatility regime more frequently observed especially in the time extreme market events, for instance the 2007/2008 and 2010 food crisis, and the two revaluations 2011 and 2013. The low volatility regime exists after and before the time of the economic and political crisis. Results also show that symmetries affect short-run price dependencies, with the characteristics of these symmetries depending on the markets studied. That implies increases or decreases shocks in future markets affecting together the spot prices in Egypt.

The impulse response functions have been conducted in nonlinear MS-VEC model and indicated that the shock of the future markets by 1% will be transmitted to a positive shock in the Egyptian flour spot market for high volatility regime, while for the low volatility regime implies no significant effect of the future market on the Spot prices.

Policies, such as provision of inputs at subsidized prices, or the promotion of adoption of simple technological and tools in the production of wheat, may imply reduce production costs and then consumption prices. Using new varieties that heat and disease tolerant may increase the productivity, these varieties are already developed by the research institute in Egypt but need to be transferred. Adaption good agricultural practices may also increase the farmers' productivity. Increase the production efficiency of the wheat by train the farmers on the ways of the modern agricultural cultivation that may increase the wheat yields and reduce the dependence on the international market and the fluctuations of these markets. Develop a market information system using online market to increase the competitiveness between all actors along the supply chain that increase the farmers income from producing wheat that makes them accept to grow wheat in the coming seasons.

References

Baklaci, H., Tutek, H. (2008) The Impact Of The Futures Market On Spot Volatility: An Analysis In Turkish Derivatives Markets. Transactions on Modelling and Simulation, Vol.43.

Balcilar, M., Gupta, R., Miller, S. M. (2015) Regime Switching Model of US Crude Oil and Stock Market Prices: 1859 to 2013. Energy economics. doi: 10.1016/j.eneco.2015.01.02

Balcombe, K. & Rapsomanikis, G. (2008) Bayesian estimation and selection of nonlinear vector error correction models: The case of the sugar-ethanol-oil nexus in Brazil, American Journal of Agricultural Economics, 90(3): 658–668.

Baldi, L., Peri, M., Vandone, D. (2011) Spot and Futures Prices of Agricultural Commodities: Fundamentals and Speculation. Working Paper n. 2011-03.

Bellemare, M.F. (2015) Rising food prices, food price volatility, and social unrest. American Journal of Agricultural Economics, 97(1),1–21.

Bohl, M.T. Salm, C.A and Wilflind, B. (2011) "Do Individual Index Futures Investors Destabilize the Underlying Spot Market?" The Journal of Futures Markets,vol. 31, no 1, pp. 81–101.

Bozic, M., T. Fortenbery, T.R. (2015) Price Discovery, Volatility Spillovers and Adequacy of Speculation when Spot Prices are Stationary: The Case of U.S. Dairy Markets. International Association of Agricultural Economists Conference, Milan, Italy.

Brooks C., Rew A.G., and Ritson S. (2001) A trading strategy based on the lead-lag relationship between the spot index and futures contract for the FTSE 100, International Journal of Forecasting, 17: 31-44.

Brummer, B., von Cramon-Taubadel, S., Zorya, S. (2009) The impact of market and policy instability on price transmission between wheat and flour in Ukraine. European Review of Agricultural Economics. 36. 203–230.

Busse, S., Bruemmer, B., & Ihle, R. (2011) Emerging linkages between price volatilities in energy and agricultural markets. In A. Prakash (Ed.), Safeguarding food security in volatile global markets (1st ed., pp. 111–125). Rome, Italy: Food and Agriculture Organization of the United Nations (FAO).

Busse, S., Brummer, B., Ihle, R. (2010) The pattern of integration between fossil fuel and vegetable oil markets: The case of biodiesel in Germany. Selected paper prepared for presentation at the Agricultural and Applied Economics Asociation – AAEA, CAES, WAEA joint annual meeting, Denver, Colorado.

Cappiello, L., Gerard B., Kadareja A., Manganelli S. (2006) "Financial Integration of New EU Member States." ECB Working Paper No. 683.

Carter, A.C., Rausser,C.G., Smith, A. (2011) Commodity Booms and Busts. Annual Review of Resource Economics. Vol. 3:87-118.

Central Bank in Egypt. (2017) Economic research, statistics department. Available at: https://www.cbe.org.eg/en/EconomicResearch/Statistics/Pages/Inflation.aspx (Accessed January 2019).

Ciezadlo, A. (2011) "Let Them Eat Bread", in The New Arab Revolt: What Happened, What It Means, and What Comes Next, New York: Council on Foreign Relations. Available at http://www.foreignaffairs.com/articles/67672/annia-ciezadlo/let-them-eat-bread(Accessed 10 December 2018).

de Brauw, A. (2011) Migration and child development during the food price crisis in El Salvador. Agricultural Economics, Food Policy, 2011, vol. 36, issue 1, 28-40. http://www.sciencedirect.com/science/article/pii/S0306-9192(10)00116-8

De Gorter, H. & Just, D. (2008) The law of unintended consequences how the U.S. biofuel tax credit with a mandate subsidizes oil consumption and has no impact on ethanol consumption, working paper, Department of Applied Economics and Management, Cornell University, Ithaca, New York.

Diebold, F. X., Lee, J.-H., Weinbach, G. C. (1994) Regime switching with time-varying transition probabilities. In C. Hargreaves (ed.) Nonstationary Time Series Analysis and Cointegration, pp. 283–302, Oxford: Oxford University Press.

Du, X., Yu, C. & Hayes, D. (2009) Speculation and volatility spillover in the crude oil and agricultural commodity markets a Bayesian analysis, Working Paper 09-WP 491, Iowa State University.

Durland, J. M., McCurdy, T. H. (1994) Duration-dependent transitions in a Markov model of U.S. GNP growth. Journal of Business and Economic Statistics 12, 279–288.

Egyptian Food Observatory. (2013) Food Monitoring and Evaluation System, published by the Egyptian Cabinet's Information and Decision Support Center (IDSC) and World Food Programme (WFP), Quarterly Bulletin, Issue 14, October-Decmber 2013. Available at http://documents.wfp.org/stellent/groups/public/ documents/ena/wfp263322.pdf (Accessed 25 December 2018).

Ehrmann, M., Ellison, M., Valla, N. (2003) Regime-dependent impulse response functions in a Markov-switching vector autoregression model. Economics Letters 78, 295–299.

Engle, R. (2002) Dynamic Conditional Correlation, Journal of Business & Economic Statistics, 20:3, 339-350. DOI: 10.1198/073500102288618487

FAO. (2015). The state of food insecurity in the world. Food and Agriculture Organization of the United Nations (FAO), Rome.

FAOSTAT. (2017) Food and Agriculture Organization of the United Nations. Dataset. Available at http://faostat3.fao.org/faostat-gateway/go/to/download/Q/*/E(Accessed March 2019).

Filardo, A. J., Gordon, S. F. (1998) Business cycle durations. Journal of Econometrics 85, 99–123.

Fruehwirth-Schnatter, S. (2006) Finite Mixture and Markov Switching Models. Statistics. Springer.

Garcia, P., and Leuthold, R.M. (2004) A selected review of agricultural commodity futures and options markets. European review of agricultural economics, 31: 235-272.

Gardebroek, C., Hernandez, M. (2013) Do energy prices stimulate food price volatility? Examining volatility transmission between US oil, ethanol and corn markets. Energy Economics, vol. 40: 119-129.

Giot, P. (2003) The information content of implied volatility in agricultural commodity markets, Journal of Futures Markets, 23: 441-454.

Global Food Security Index (GFSI). (2017) A report from The Economist Intelligence Unit. Available fromfile:///C:/Users/IAMO/Downloads/EIU%20Global%20Food%20Security%20Index%20-%202017%20Findings%20&%20Methodology.pdf (Accessed 25 December 2018).

Hamilton, J. D. (1990) Analysis of time series subject to changes in regime. Journal of Econometrics 45, 39-70.

Hansen, B.E. (2009) Averaging estimators for regression with a possible structural break. Econometric Theory 25, 1498-1514.

Hernandez, M., and Torero, M. (2010) Examining the Dynamic Relationship between spot and future prices of agricultural commodities, International Food Policy Research Institute, Discussion Paper 00988.

Hull, J.C. (1997) Options, futures and other derivatives. Prentice Hall, New York.

Iannotti, L., Robles, M. (2011) Negative Impact on Calorie Intake Associated with the 2006–08 Food Price Crisis in Latin America. Food and Nutrition Bulletin. Food and Nutrition Bulletin, vol. 32, no. 2. https://doi.org/10.1177/156482651103200205

Ihle, R., v. Cramon-Taubadel, S. (2008) A Comparison of Threshold Cointegration and Markov Switching Vector Error Correction Models in Price Transmission Analysis. Proceedings of the NCCC-134 Conference on Applied Commodity Price Analysis, Forecasting and Market Risk Management. St. Louis, MO. http://www.farmdoc.uiuc.edu/nccc134. Last accessed in 15/06/2012.

Ivanic, M., Martin, W. (2008) Implications of higher global food prices for poverty in low- income countries. Agricultural Economics, Vo. 39,1: 405-416. https://doi.org/10.1111/j.1574-0862.2008.00347.x

Jacks, D., Stuermer, M. (2016) What Drives Commodity Price Booms and Busts?. Working paper, Federal Reserve Bank of Dallas Research Department.

Johansen, S. (1988) Statistical analysis of cointegration vectors. Journal of Economic Dynamics and Control 12, 231–254.

Johansen, S. (1991) Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models. Econometrica 59, 1551–1580.

Kim, C. J., Nelson, C. R. (1998) Business cycle turning points, a new coincident index, and tests of duration dependence based on a dynamic factor model with regime switching. Review of Economics and Statistics 80, 188–201.

Krolzig, H.-M. (1997) Markov Switching Vector Autoregressions Modelling: Statistical Inference and Application to Business Cycle Analysis. Berlin: Springer.

Krolzig, H.-M. (1999) Statistical analysis of cointegrated VAR processes with Markovian regime shifts. Working Paper # 1113, Computing in Economics and Finance 1999, Society for Computational Economics.

Kuiper W.E., Pennnings, J.M.E., and Meulenberg, M.T.G. (2002) Identification by full adjustment: evidence from the relationship between futures and spots prices, European Review of Agricultural Economics, 29: 67-84.

Meyers, W. & Meyer, S. (2008) Causes and implications of the food price surge, FAPRIMU Report 1208, FAPRI, University of Missouri.

Mohan, S., and Love, J. (2004) Coffee futures: role in reducing coffee producers' price risk, Journal of International Development, 16: 983-1002.

Perron, P. (2006) Dealing with structural breaks. In Palgrave Handbook of Econometrics, Vol. 1: Econometric Theory, ed. K. Patterson and T.C. Mills. Basingstoke: Palgrave Macmillan.

Prakash, A., and Gilbert, L.C. (2011) Rising vulnerability in global food system: beyond market fundamentals. In: A. Prakash (ed.), Safeguarding Food Security in Volatile Global Markets. Rome: FAO, 111–125.

Rezitis, A., Pachis, D. (2013) Investigating the Price Transmission Mechanism of the Greek Fresh Tomato Market with a Markov Switching Vector Error Correction model . Agricultural Economic Review. Vol 14, No 2.

Roberts, M., and Schlenker, W. (2010) Identifying supply and demand elasticities of agricultural commodities: implications for the US ethanol mandate, Working Paper No. 15,921, National Bureau of Economic Research.

Robles, L., and Torero, M. (2010) Understanding the Impact of High Food Prices in Latin America, Economía Journal, Volume 10 Number 2, (Spring 2010), 117-164.

Schlenker, W., Roberts, M.J. (2013) Identifying Supply and Demand Elasticities of Agricultural Commodities: Implications for the US Ethanol Mandate. American Economic Review. Vol. 103, N0. 6, 2265-95.

Sendhil, R., and Ramasundaram, P. (2014) Performance and Relevance of Wheat Futures Market in India – An Exploratory Analysis. Selected Paper Prepared for Presentation at the Agricultural & Applied Economics Association's 2014 AAEA Annual Meeting, Minneapolis, MN.

Serra, T., D, Z., Gil, J. & Goodwin, B. (2008) Nonlinearities in the US maize-ethanol-oil price system, in Selected Paper prepared for presentation at the American Agricultural Economics Association Annual Meeting Orlando, Florida.

USDA Foreign Agriculture Service (USDA-FAS). (2019) Grain and Feed Annual 2019. Available at: https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Grain%20and%20Feed%20Annual_Cairo_Egypt_3-14-2019.pdf (Accessed March 2019).

World Food Programme. (2012) Egypt Country Brief March 2019. Available from https://docs.wfp.org/api/documents/WFP-0000104476/download/?_ga=2.143595765.1930084015.1555960405-859843503.1555960405(Accessed 25 December 2018).

Yang, J., Bessler, D.A., and Leatham, D.J. (2001) Asset storability and price discovery in commodity futures markets: a new look. Journal of futures markets, 21: 279-300.

Yilgor, A.G. ,Mebounou, C.L. (2016) The Effect of Future Contract on The Stock Market: An Application On Istanbul Stoch Exchange. Journal of Business, Economics and Finance (JBEF), Vol. 5, 3. DOI: 10.17261/Pressacademia.2016321974.

POSSIBILITIES OF IMPROVING ORGANIC FARMING IN TURKEY

İsmet Boz
Ondokuz Mayis University, Department of Agricultural Economics, Turkey
E-mail: ismet.boz@ omu.edu.tr

Cevahir Kaynakçı
Ondokuz Mayis University, Department of Agricultural Economics, Turkey

Abstract

Although there is no universally accepted definition of organic farming, most of the scientists focus on an economic, social, and environmentally sustainable agricultural production system that prohibits chemical fertilizers, pesticides, growth regulators, and livestock feed additives. Organic farming in a region must provide a sustainable livelihood for farmers, clean environment for all living organisms, and healthy food items at reasonable prices for consumers.

The overall purpose of this studyis to examine the current state and potential developments of organic agriculture in Turkey. The paper first reviews the principles of organic agriculture, then gives information about the legislative process and developments of organic agriculture in Turkey. Specific objectives are to examine the legal structure, organic production, marketing of organic products, and strategies to develop organic agriculture in Turkey.

Qualitative research methods were applied to accomplish the objectives of this study. For this reason, journal articles, books, websites, state statistics, and official reports were used for data collection. The basic outline of the paper organized considering the overall purpose and specific objectives of the study.

Keywords: Organic Farming, Organic Agriculture, Conventional Agriculture, Organic Products

1. Introduction

Organic farming is a procedure of growing agricultural products without using any chemicals that are harmful to health and nature; instead, substances that are approved for compliance with organic regulations, green fertilization, alternation, and biological control methods are applied. All production and sales stages of organic products are controlled and certified by accredited inspection and certification bodies. Producers are given proper training and extension services from input provision to final marketing stages. In this way, organic products with high nutritional value and reliability are made available to customers. All stages of organic products should be inspected and documented. No uncertified products can be produced and sold under the name of organic. Control and certificationis one of the basic principles of organic farming and ensures that the products grown are produced, processed, and packaged according to organic standards specified in organic laws and regulations.

One of the most commonly used definitions of organic agriculture was made by the International Federation of Organic Agriculture Movement (IFOAM) in 1985, which states that "Organic Agriculture is a production system that sustains the health of soils, ecosystems, and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation, and science to benefit the shared environment and promote fair relationships and good quality of life for all involved." (IFOAM, 2019). Organic agriculture is based on four basic principles which were also defined by IFOAM as follows:

Principle of Health: Organic farming should protect and improve the health of the soil, plants, animals, humans and the entire planet as a unified whole. According to this principle, the health of individuals and communities cannot be separated from the health of ecosystems. Healthy products are grown in healthy soils, and people and animals consuming these products live a healthier life.

Principle of Ecology: Organic farming should be based on living ecological systems and cycles, to work with them, to work on them and to be sustainable. This principle connects the origin of organic agriculture to existing ecological systems. Accordingly, production should be based on ecological processes and recycling. Nutrition and well-being are provided by the ecology of a specific production environment. This ecology is the living land for vegetative production, the farm ecosystem for animals, and the aquatic environment for fish and other living things in the sea.

Principle of Fairness: It should establish fair relations with organic agriculture, common environment, and living opportunities. Justice is characterized by equality, respect, and fairness in the management of the shared world both in interpersonal relations and in the relationships of people with other living things.

Principle of Care: Organic agriculture should be managed cautiously and responsibly to preserve the health and well-being of current and future generations and the environment. Organic agriculture is a vibrant and dynamic system that responds to internal and external demands and conditions. Organic farming practitioners can increase efficiency and efficiency in production, but not increase the risk of compromising health and well-being. As a result, it is necessary to evaluate new technologies for organic farming and to review existing methods. Care should be taken when considering the incomplete ecosystem and agricultural understanding.

The primary purpose of this study is to examine organic agriculture regarding production and marketing and to develop strategies to improve organic farming by utilizing agricultural resources in Turkey. It is aimed by this study to provide useful information for farmers, farmers organizations, agriculturists, extension practitioners, and scientists.

2. Materials and Methods

Basic material used for this study was obtained from secondary sources such as state statistics, official reports, and earlier published work. The study gives information about organic agriculture and its principles in the introduction section. It continues by an examination of organic agriculture in Turkey giving updated information on organic agriculture such as number of organic farms, the area under organic production, number of commodities produced organically, total organic output, and exports of organic products. A set of strategies to strengthen organic farming are discussed in the finding section. The study concludes with some recommendations to utilize agricultural resources and improve organic agriculture in Turkey.

3. Findings

3.1. Legislation Process of Organic Agriculture

Organic agriculture in Turkey has been organized by different legislation which can be divided into two main periods as before and after the organic law of 2004.

Prior to Organic Law of 2004:There were no national legal regulations in this period. Organic agriculture activities in this period started with the demand of Western European companies and carried out in accordance with the legislation of the importer countries. The European Council issued the Council Regulation (No. 2092/91) in 1991 and brought obligation to the countries exporting organic products to the European Community (EC) to publish their national legislation.The first official organic agricultural movement in Turkey started in 1992, with the establishment of the Association of Ecological Agriculture (ETO). The regulation entitled “Production of Plant and Animal Agricultural Products by Ecological Methods” was issued on December 18, 1994.

The regulation that Production of Plant and Animal Products by Ecological Methods (No. 22145) was issued on December 24, 1994. With this regulation, organic agricultural activities in Turkey started to be carried out, for the first time, under the control and established rules of the Ministry of Agriculture and Rural Affairs (MARA). To comply with changes in the EU legislation, amendments to this regulation were required, and a new regulation entitled “Principles and Implementation of Organic Agriculture (No. 24812) was issued on July 11, 2002. The rules and regulations of organic

animal production and cultural fisheries were also included in this regulation (Boz et al., 2011; Durak Kılıçaslan, 2015).

After the Organic Law of 2004:Themost effective legislation on organic agriculture in Turkey was made by passing the Law of Organic Agriculture (No. 5262) issued on December 3, 2004. The law sets the rules for the production, consumption, and inspection of organic products. Itstrengthened the legal amendments made in the previous organic agriculture regulations. Besides, the duties and responsibilities of the parties involved in organic processes and penalties for not obeying the law and regulations were determined. Based on the organic law, the regulation entitled "Principles and Implementation of Organic Agriculture" (No.25841) was entered into force on June 10, 2005.This regulation was issued to take part in the list of countries who export organic products to the EUand was prepared considering the Council Regulation (No. 2092/91). The export and marketing of organic agricultural products in the desired varieties and quantities in foreign markets was made possible by this regulation. To ensure that internal amendments to the EU legislation are made, the Regulation on the Principles and Implementation of Organic Agriculture (No.26322) was issued on October 10, 2006) (Durak Kılıçaslan, 2015).

In order to comply with new EU legislation, the regulation entitled "Principles and Implementation of Organic Agriculture (No. 27676) was issued on August 18, 2010. Amendments were made in this regulation on October 6, 2011 (No. 28076), August 14, 2012 (No. 28384), May 24, 2013 (No. 28656),February 15, 2014 (No. 28914), July 22, 2015 (No. 29422), and January 10, 2018 (30297).

3.2. Organic Agriculture in Turkey

In terms of climate, soil, water resources, labor, and product diversity Turkey has favorable conditions for organic agriculture. In every region of the country, there are some products which can be grown organically within the present agricultural systems. The most produced organic commodities in Tukey include pistachios, pears, sunflowers, almonds, green peppers, wheat, walnuts, tea, rice, strawberry, tomatoes, apples, hazelnuts, carrots, figs, watermelon, melon, apricots, chestnuts, cherry, lemon, mandarin, lentil, maize, pomegranate, chickpea, cottonseeds, potatoes, orange, onion, soybean, grape, sour cherry, oat, and olives.

Table 1. Organic Agriculture in Turkey

Year	Number of Organic Farms	Number of Products	Organically Certified Area/Hectare	Total Production/Tons
2005	14401	205	203811	421934
2008	14926	247	166883	530224
2011	42460	225	614618	1659543
2014	71472	208	842216	1642235
2015	69967	197	515268	1829291
2016	67867	238	523777	2473600
2017	75067	214	543033	2407600

Source: http://tarimsalistatistik.com/tr-TR/Sayfa/alan-ve-uretim-miktari-area-andamountofproduction

Figures related to the number of organic farms, the number of organic products, organically certifies area, and total organic production is presented in Table 1. It can be followed by the table that organic agriculture has an increasing trend regarding all these four aspects. For example, the number of organic farms was 14401 in 2005 and increased to 75067 in 2017. Similar growing trends can be observed in organically certified areas and total organic production. However, diversity of organic products did not have the same increasing trend in the same period which was 205 products in 2005 and reached to only 214 products in 2017.

Table 2. The Most Exported Organic Commodities in 2017

Product	Amount (Tons)	Value ($)	%(Ton)	%($)
Maize	14.902,5	56.108.024,5	24,2	26,1
Figs and fig products	7.098,7	43.581.055,1	11.5	20,2
Fruits and fruit products	12.742,9	32.340.145,1	20,7	15,0
Hazelnuts and hazelnut products	3.857,6	31.941.924,4	6,3	14,8
Grapes and grape products	9.595,6	22.965.367,5	15,6	10,7
Apricots and apricot products	3.078,4	14,571,024,7	5,0	6,8
Vegetables and vegetable products	7.939,0	4.953.971,1	12,9	2,3
Spices	253,7	4.769.184,1	0,4	2,2
Lentils and lentil products	562,2	1.208.576,6	0,9	0,6
Forestry products	63,8	857.712,5	0,1	0,4
Pistachios	33,4	829.797,8	0,1	0,4
Wheat and wheat products	1.193,1	438.088,0	1,9	0,2
Milk and dairy products	150,0	124.412,4	0,2	0,1
Total	61.473,8	214.689.284,7	99,7	99,7
GENERAL TOTAL (Including other crops not in the list)	61.689,3	215.288.185,8	100,0	100,0

Source: https://www.tarimorman.gov.tr/Konular/Bitkisel-Uretim/Organik-Tarim/Istatistikler

Table 3. The Most Exported Countries in 2017

Country	Amount (Tons)	Value ($)	%Tons	%$
England	22.593,44	62.915.945,67	36,62	29,22
USA	7.271,73	31.369.690,33	11,79	14,57
Germany	7.976,45	28.259.705,55	12,93	13,13
The Netherlands	6.872,48	25.073.960,26	11,14	11,65
France	5.773,81	21,809.399,52	9,36	10,13
Switzerland	2.811.95	11.356.171,02	4,56	5,27
Italy	2.397,83	11.051.690,62	3,89	5,13
Canada	1.019,24	3.516.049.60	1,65	1,63
Sweden	958,02	3.238.918,82	1,55	1,50
Austria	664,04	3.087.092,11	1,08	1,43
Srilanka	7,24	2.102.058,41	0,01	0,98
Australia	423,27	1.717.205,80	0,69	0,80
Japan	383,66	1.465,627,46	0,62	0,68
Belgium	381,22	1.424.310,10	0,62	0,66
Total	59.543,38	208.387.843,3	96,51	96,79
Others	2.154,92	6.900.351,5	3,49	3,21
GENERAL TOTAL	61.689,3	215.288.185,8	100,0	100,0

Source: https://www.tarimorman.gov.tr/Konular/Bitkisel-Uretim/Organik-Tarim/Istatistikler

Expanding exports potential is one of the key factors influencing the production of organic products. Exports provide a continuously increasing demand at higher prices and stimulate domestic farmers to convert their conventional production to organic. Since organic agriculture in Turkey started as exports oriented, different companies from Europe sign contracts with farmers in Turkey and provide a constant demand which also positively affect the income and wellbeing of farmers. Table 2 shows the most exported commodities in 2017. Organic maize takes the first place in tons and dollars as it makes almost one-fourth of the total export value. This was followed by figs, fruits, hazelnuts, and grapes. As of 2017, the amount of organic product exports reached to 61.6 thousand tons and the value of exports to $215 million.

Organic products are exported to many different countries around the world. According to Table 3, England takes the first place of importing organic commodities from Turkey, and it is followed by the

USA, Germany, the Netherlands, France, and Switzerland, respectively. Although most of the exports are made to European countries, the United States, Canada, and Japan have also remarkable potential for importing organic commodities from Turkey.

3.3. Strategies for Improving Organic Farming

3.3.1 Eliminating the Belief that Organic Farming Reduces Yield

Almost in every segment of the society including intellectuals and scientist, there is a common belief that organic farming reduces yield and cannot provide an adequate amount of yield to sustain the increasing world population.Scientific studies conducted on this issue revealed interesting results: De Ponti et al. (2012) analyzed 362 data sets (conventional and organic) collected from 43 countries and compared the yields of 67 commodities produced both organic and conventional It was found that the yield in organic production was 80% of the conventional output. The yield range in organic products was also quite high. The relative yields were higher than 80% in soybeans, some other pulses, rice, and corn; however, lower than 80% in wheat, barley, and potatoes. The relative yields of organic production of most countries were quite close to the overall average of 80%. However, Asian and Central European countries relatively showed higher yield than the average while the Northern European countries had lower yields than the mean value of 80%. In countries such as Denmark and the Netherlands where inputs are intensively used in conventional agriculture, the difference between organic agriculture and conventional agriculture is more. A significant result from the study is that as yield level in conventional agriculture increases the difference in yield with organic agriculture is also goes up.

Another meta-data analysis (Ponisio et al., 2015) compared organic and conventional yields (115 studies containing more than 1000 observations) and found that organic yields are only 19.2% lower than conventional yields. Crop types and management practices played an important role to cover the yield gap between conventional and organic production. The study found no significant differences in yields for leguminous versus non-leguminous crops, perennials versus annuals or developed versus developing countries. The significant result of the research was that two agricultural diversification practices, multi-cropping, and crop rotations, substantially reduce the yield gap when these methods are applied in organic systems.

Studies conducted in Turkey also gave interesting results. For example, Bayramoğlu and Gündoğmuş (2008) compared conventional and organic raisin farmers regarding cost efficiency and technical efficiency. The coefficients were determined to be 0.712 and 0.862 for organic households, while 0.844 and 0.903 for the conventional group. According to the coefficients calculated for individual and different returns to scale, it can be stated that conventional households are on average more efficient relative to their technology.Considering the long-term benefits of organic agriculture, it can be noted that the efficiency gaps are small and can be eliminated by proper managerial practices, and price policies.

There are some studies in Turkey favoring organic agriculture. For example, Engindeniz (2006) found that organic lettuce production is an economically viable alternative for growers, although materials and total costs are higher for the organic farming system compared to conventional farming. Organic farming costs are expected to decrease as sales continue to increase and these systems become more productive. Another favoring study (Demiryürek and Ceyhan 2008) found that organic hazelnut producers were organic hazelnut producers had lower costs of production and higher income as compared with conventional producers. The study recommended governmental support and strengthening extension services to promote organic hazelnut farming in the region.

In general, scientific studies conducted worldwide show some yield gaps between organic and conventional production. However, these gaps are not too large and can be closed by crop diversification and proper management practices.To increase efficiency in organic farms, factors influencing production costs and selling prices should be regulated by the government.

3.3.2. Developing Long Term Value Chain for Organic Products

A long-term value chain makes organic production process operate properly. It includes all stakeholders who take part in the production, processing, trading, and selling of a specific product (Figure 1). It is called a value chain because it is only as strong as the weakest link, once this link breaks the whole chain become ineffective and loses its total value. The generic value chain presented in Figure 1 can be adapted to organic farming. Since productions begin with input provision, organic seeds, seedlings, fertilizers, irrigation equipment, and pests control methods are needed for cultivating farm products organically. Organic fields should be secured from chemical fertilizers and pesticide passages from neighboring conventional agricultural fields. All the cultural practices required for the healthy growth of organic products must be fulfilled in a timely and complete manner.

Growing healthy organic products is not sufficient for a perfectly functioning value chain. The post-harvest operations including collecting, grading, storage, packaging, and transportation are also very important. All these activities should be maintained with the same care in order to minimize product losses, and not to deteriorate the organic feature of the products.For example, organic containers should be used in harvest; workers should wear gloves; and harvesters must be cleaned from all residues. Plastic and metal containers cannot be used for packaging organic products. Instead, paper, cardboard, basket, and cloth bag should be used as packaging material according to the principles of organic agriculture. Storage facilities should be separate from conventional products. Adequate measures should be taken to prevent product mix when the storage facilities are limited. No chemical materials can be used during storage.

Organic products cannot be processed in the same place at the same time with conventional products. Chemical additives and irradiation cannot be used during processing. Only permitted additives may be used. The product cannot be genetically modified during processing. The provisions of the Turkish Food Codex Regulation are applied during the processing. Accelerating the germination and development process of organic products by using chemical substances, and cleaning with unauthorized chemicals is prohibited.

Warehouse structure and transport conditions of organic products are determined by the control body. According to the rulesorganic products cannot be kept on the motorways. Double protected containers to prevent products from being affected by fuel waste during transport must be used, and the container must be labeled. Transporters of organic products must have a certificate of internal circulation. In the marketing process, organic products must be sold separately from other products. They must be sold in strictly packages. Products to be sent abroad or to be brought from other countries must be under the control of the inspection body.

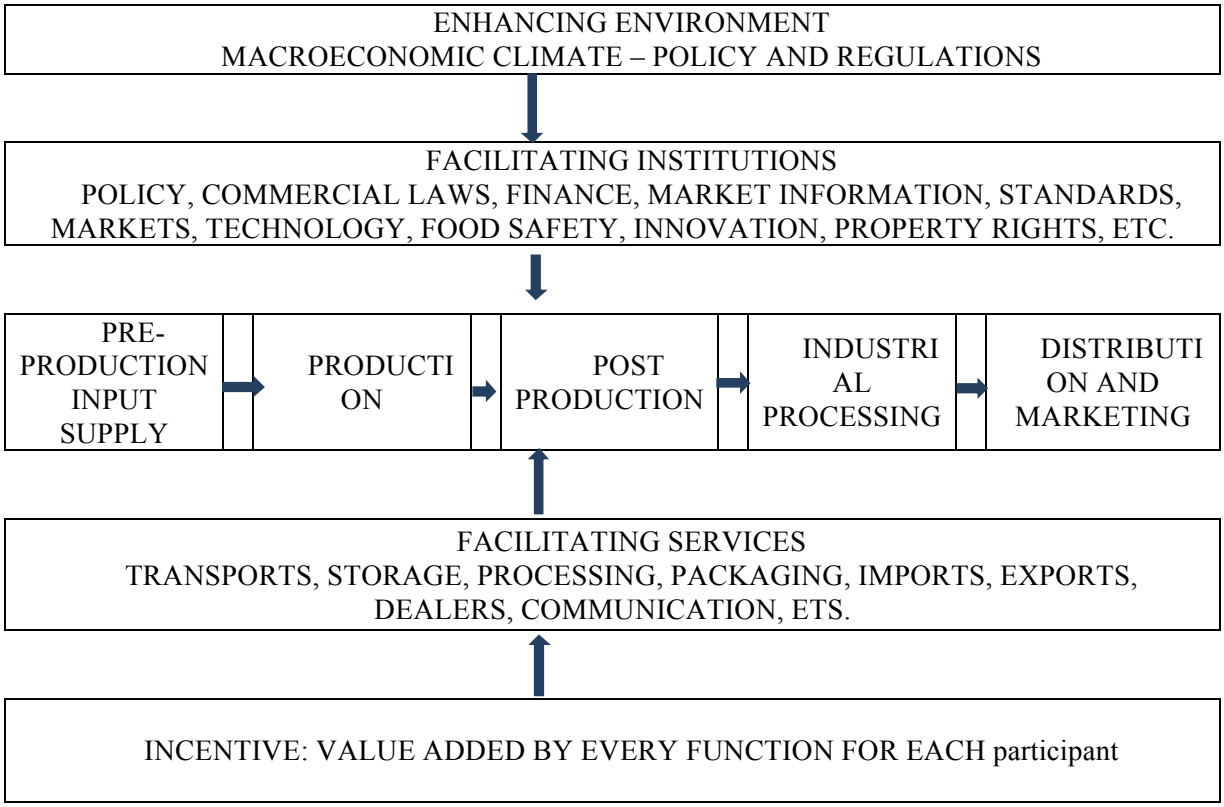
All these processesadd value to organic products and make contributions to each stakeholder involved in every stage of this process. In order to reach the final consumers, every commodity needs to be delivered appropriately and marketed. The smoother the consumers have access to products the more they purchase and consume. Therefore, marketing channels are essential to reach all consumers, especially the hard to reach. These processes also increase the value of the products and make contributions to the stakeholders involved in every single stage (Aksoy et al., 2018).

Facilitating institutions are needed for a well operating value chain, particularly to develop and implement organic farming policies and enforce commercial laws and regulations. Institutions should be appropriately involved in finance, market information, standards, markets, technology, food safety, innovation, and property rights. On the other hand, facilitating services such as transports, storage, processıng, packaging, imports, exports, dealers, communicators, etc. are needed. Moreover, incentives for individuals who add value to products in different stages consists of a significant part of the value chain (Aksoy et al., 2018).

This value chain can be applied in organic agriculture in Turkey. However, in order to use this chain, first of all, organic agriculture should be focused on favorable farm commodities of each of the seven regions of Turkey. For example, the Eastern Black Sea Region is convenient for tea and hazelnuts while the Western Black Sea Region for hemp. The central and eastern Anatolian regions are famous with cereals, particularly wheat, barley, oat, and rye. Apricots have a remarkable advantage in Malatya and neighboring provinces. The southeastern Anatolian Region has suitable climate and soil conditions for growing cotton, pistachios, lentil, and watermelon while the Mediterranean Region has favorable conditions for growing bananas, maize, peanuts, soybeans,

citruses, rose, and all kinds of greenhouse vegetables. The Aegean Region produces very famous olives, grapes, poppy, tabaco, and figs; and finally, the Marmara Region produces linen, olives, rice, and sunflower.

Organic agriculture should be first focused on these products. Initially, certain production areas and farmers should be identified. The Ministry of Agriculture and Forestry must bring together all stakeholders including farmers' organizations, control and certification bodies, universities, consumers' associations, and the media. Once farmers start to produce the most important commodity organically and earn an adequate income, they may increase the diversity with other products. Mainly, the Eastern and the Central Anatolian regions can be focused on organic grains, fodders, and livestock. This may provide a completely organic agricultural farming system in the predetermined areas.



Source: United Nations Industrial Development Organization (2009)

Figure 1. A Generic Value Chain

3.3.3 Increasing Organic Product Sales in Mainstream Retailers

Organic agriculture should be considered as a socioeconomic system in which family farms, workers, and rural people are involved. In order to make a sustainable living in a rural areathese people should earn enough income from the sales of their organic products. As the yield is expected to decrease by around 20% (results of earlier studies), this gap should be compensated by additional price raise for organic commodities or governmental subsidies. Once farmers face constant demand for their organic products at reasonable prices, they will be able to earn enough income part of which they can use for future farm investments and developments. Individually small organic farmers face many difficulties in accessing markets and reaching the final consumers. Mainstream retailers may play an essential role in making organic food available to consumers. They have stories in every neighborhood, want to grow even further, try to share collective responsibility, and want to increase their profit in every market by selling valuable goods.

On the other hand, the global trends regarding food and nutrition force consumers to be more educated, concern about lifelong health, and pay attention to sustainability. For these reasons, consumers prefer more delicious food like fresh fruits and vegetables, organic bread and cereals, and

organic beverages; and healthier food containing fewer calories, less meat, less processed, and no chemicals. Also, consumers concern about environmental ethics including animal welfare, fair trade, less CO2 production, and local food.

Although every income segment of the society is precious and deserve to consume organic food, some higher-income consumers are willing to pay higher prices for organic products but cannot reach these products because of unavailability. Mainstream retailers may play an important role to reach organic products to customers in every neighborhood. They can contribute to creating a constant demand for organic products which will strengthen the other links of the value chain such as producers, processors, and distributors.

3.3.4 Increasing the Sales of Organic Products through Local Organic Bazaars

Local organic bazaars are one of the most effective ways of selling organic products. They are constructed in urban and suburban areas where consumers are available in certain days of the week and producers can have easy access to the market bringing their organic products and selling to consumers. Since there are no mediators in this kind of marketing, the gaps between production costs and selling prices get smaller and larger part of rates paid by customers to go directly to producers. This also gives producers to take the initiative for discounts in the case of demand shortages.

The benefits of local organic bazaars include the following (Ekolojikpazar.org, 2017; Ayan et al., 2017; Boz and Rasulov, 2018):

(a) Consumers receive reliable information, directly or most shortly, about the products, not just the products but other related attributes as well.

(b) Opens the road for the fair trade.

(c) Assures without any documents and certificates.

(d) Allows cultural exchange, protects local culture and makes local differences worldwide.

(e) Makes it possible for consumers to buy the products according to their regions and religious belief.

(f) Protects biodiversity and ensures that local species, varieties, and tastes get an opportunity in the local markets.

(g) Adds social, cultural, and ecological values to the commercial values (such as taste and durability) of agricultural products.

(h) Disseminates information between producers and consumers.

(i) Makes it possible for producers to arrange their production considering the demand of consumers.

(j) Makes it possible for consumers to shop by touching, selecting, and even tasting the products.

(k) Allows consumers to access fresh products.

(l) Provides opportunities to small producers who are unable to meet the large demand to enter the market.

Organic bazaars have remarkable potential in Turkey. The first one was established with the cooperation of the Buğday Association and Şişli Municipality in 2006. As of 2018, the number of organic bazaars in Turkey reached 18. By the law on the regulation of trade of vegetables and fruits, and other goods with sufficient supply and demand (2010), and the regulation of marketplaces(2012), municipalities could open markets where only organic products were sold. Becausethere are many issues that differentiate organic markets from other local markets, separate legislation for organic markets is required(Ekolojikpazar.org., 2018).

Starting with 25 producers and 45 stands in 2006, the Şişli Organic Bazaar reached to 80 producers with 340 stands in 2018. Sales of fresh vegetables and fruits in the same period changed from 3-5 tons to 15 tons per week. Except providing organic products to its retail customers, the bazaar offers product supply channel to more than 30 shops, e-commerce sites, and other organic markets. To date, thanks to 100% Ecological Markets and other organic markets, nearly 600 organic fresh vegetables and fruit producers have met the customers (Ekolojikpazar.org., 2018).

As of 2019 there are 18 organic markets, six of which are 100% ecological market and two of them are seasonal. These are İzmit, Kayseri Kocasinan (seasonal), Şişli, Kartal, Bakırköy, and Beylikdüzü 100% Ecological Markets, Bursa Nilüfer, İzmir Bostanlı and Balçova, Eskişehir Tepebaşı, Burhaniye (seasonal), Ankara Ayrancı and Çayyolu, Adana Çukurova, Konya Meram, Eyüp, K.Çekmece, and

Kadikoy organic bazaars. It is also possible to reach organic herbal products from the organic bazaar established in Sürmeli Village Samsun.

4. Conclusions and Recommendations

In order to improve organic agriculture in Turkey multidimensional goals should be set and long-term policies implemented accordingly. Production, processing, marketing, consumption, exports, and legislation work should be carried out simultaneously. Instead of supply-driven production, demand driven production should be preferred due to ensuring the sales of organically produced commodities at reasonable prices.

Although the total area under organic production, the number of organic farmers and commodities, and amount of the organic output have increasing trends in Turkey, considering the agricultural potential of the whole country, the present figures aren't satisfactory. Therefore, agricultural extension programs are needed to raise awareness among farmers in every region, particularly for favorable crops. Farmers should be convinced with an environmentally friendly, socially acceptable and economically viable production system. Cooperating with farmers' organizations the Ministry of Agriculture and Forestry must take the initiative to identify priority regions, priority crops, and farmers who agree to produce organic crops. Subsidies should be provided to compensate income loses, particularly in the earlier years of the converting process.

Although there are certification and control bodies, and the government provide subsidies for organic agriculture, because of small and separated farms, it is challenging to organize farmers and apply joint certification campaigns. This situation also lowers farmers power on influencing input and output prices, increasing the dependence on market forces. For this reason, organic agriculture programs should be implemented through farmers organizations.

Consumer research should be given priority. The population of Turkey has reached 82 million in 2019, but still, the improvements in organic agriculture are highly depended on exports. Domestic consumption should not be ignored. There are millions of people who are willing to pay higher prices for organic products, but they don't consume them because of unavailability. Mainstream retailers and local organic bazaars may play an important role to fill this gap. Besides, the internet should also be used to market organic products. In order to use this method, sellers and consumers should have access to the internet, and proper capabilities to utilize this method.

New storage and processing facilities should be established to increase the value of organic products. The facilities where organic products are stored and processed must have adequate qualifications. The storage facilities should be safe from chemical ingredients and materials. Licensed storage facilities should be encouraged. Once these facilities receive enough organic products to store, storage cost per unit of the product may go down.

References

Aksoy, U., Boz, İ., Eynalov, H., Gulliev Y. (2018). Organic Agriculture. in Azerbaijan, Current status and potentials for future development. Food and Agriculture Organization of the United Nations Baku 2018.

Ayan AK, Boz I, Kaynakci C and Aytac S (2017): Consumers' perception of organic food items: A case study of Sisli And Kartal organic bazaars of Istanbul. International Journal of Agriculture and Environmental Research. 3(5); 3635-3643.

Ayan AK, Boz I, Kaynakci C and Aytac S (2017): Suppliers of organic food: evidence from Sisli and Kartal Ecological Bazaars of Istanbul. International Journal of Scientific Research and Management (IJSRM) 5, 5553-5559.

Ekolojikpazar.org (2017): 100% ekolojik pazar. Retrieved (May 12, 2017) from: http://ekolojikpazar.org/hakkinda/neden/

Bayramoglu, Z., Gundogmus, E. (2008). Cost efficiency on organic farming: a comparison between organic and conventional raisin-producing households in Turkey. Spanish Journal of Agricultural Research, (1), 3-11.

Boz, I, Aksoy, U., Özçatalbaş, O. (2011). Enhancing Organic Farming in Turkey (UTF/TUR/052), Workshops and Training Programs. Food and Agriculture Organization of the United Nations and the Ministry of Food Agriculture and Livestock.

Boz, I., Rasulov, A. (2018). The effects of local bazaars on marketing of organic products: the cases of Turkey and Uzbekistan. Development of Organic Agriculture in Central Asia. Proceedings of the International Conference held during 22-24 August 2017 in Tashkent & Samarkand, Uzbekistan, p.245-155.

Demiryurek, K., & Ceyhan, V. (2008). Economics of organic and conventional hazelnut production in the Terme district of Samsun, Turkey. Renewable Agriculture and Food Systems, 23(3), 217-227.

De Ponti, T., Rijk, B., & Van Ittersum, M. K. (2012). The crop yield gap between organic and conventional agriculture. Agricultural systems, 108, 1-9.

Durak Kılıçaslan, N. S. (2915). Türkiye ve AB'de Organik Tarim Mevzuati, Uygulamalari Ve Değerlendirilmesi. AB Uzmanlık Tezi. T.C. Gıda Tarım ve Hayvancılık Bakanlığı, Ankara.

Engindeniz, S., & Tuzel, Y. (2006). Economic analysis of organic greenhouse lettuce production in Turkey. Scientia Agricola, 63(3), 285-290.

Ministry of Agriculture and Forestry (MAF), 2019. Organik Tarım İstatistikleri. https://www.tarimorman.gov.tr/Konular/Bitkisel-Uretim/Organik-Tarim/Istatistikler

Ponisio, L. C., M'Gonigle, L. K., Mace, K. C., Palomino, J., de Valpine, P., & Kremen, C. (2015). Diversification practices reduce organic to conventional yield gap. Proceedings of the Royal Society B: Biological Sciences, 282(1799), 20141396.

United Nations Industrial Development Organization (2009). Agro-value Chain Analysis and Development The UNIDO Approach A Staff Working Paper

HOW HAVE THINGS CHANGED? VALUE CO-CREATION REINVENTS AGRIBUSINESS – A MULTIPLE B2B STAKEHOLDER PERSPECTIVE

Hesty Nurul Utami
Newcastle University, Newcastle University Business School, UK
Email: h.n.utami2@ newcastle.ac.uk

Eleftherios Alamanos
Newcastle University, Newcastle University Business School, UK

Sharron Kuznesof
Newcastle University, School of Natural and Environmental Sciences, UK

Abstract

Value co-creation (VCC) has served as a facilitator for business innovation by considering the benefits of the relationships between the involved actors. The previous research on VCC has signified an essential impact for both customers and organisations through the negotiated exchange process, which is associated with the service-dominant logic. However, there is limited empirical research that has conceptualised the VCC process. Therefore, this study aims to address this gap by exploring the co-creation process within a value chain. The focus of the study is vegetable marketing in Indonesia. Horticulture business in Indonesia represents a significant contribution to the national economy. The transformation of agri-food supply chains from a traditional product-focussed towards a modern, service-based approach makes them a suitable empirical focus to explore value co-creation. In-depth interviews with multiple agribusiness actors (n=20) within vegetable supply chains of various complexity were undertaken in the West Java Province. An inductive, interpretive analysis shows that VCC can be defined as a result of an iterative process with proactive, inclusive, and collaborative action by involving all actors in the business ecosystem to actively engaged in exploring, exchanging resources and tracking new ideas to satisfy customer needs. The objective of co-creation in a B2B context is to develop an extensive business network, to enhance knowledge and achieve competitive advantage. Multiple stakeholders formed a networkof small businesses to propose a solutionby aligning and synchronisingthe market participants, not only supplier or retailer with the consumer, but also producers such as farmer or farmer groups. The resultshighlight the importance of actors' willingness to engage in collaboration, mutual understanding, mutual benefits, and thedevelopment of the agriculture community. Four factors are the potential contributors to the VCC process facilitated by inclusive business initiatives. Adopting co-creation initiatives requires the involved parties to realise that the activities offer mutual benefits to all collaborators. The mutual understanding among the involved actors can represent a new idea and develop close relationships on addressing market challenges while the development of the agricultural community to an inclusive agribusiness model is part of the initiative to strengthen businesses.Also, the realisation of co-creation outcomeshassignificant impacts on generating new demand, enhancingthe consumer experience, changing consumer behaviour and improving competitive advantages.A holistic conceptual modelintegrates value co-creation and inclusive business toassess the co-creation potential.The paper also discusses the potential theoretical and practical implications.

Keywords: Co-creation Process, Co-creation Impact, Inclusive Agribusiness, Agri-Food Marketing, Competitive Advantage

1. Introduction

The agri-food supply chain development has become an interesting phenomenon including recent changesin the agribusiness sector. Innovation has been implemented in various stages of agricultural production (Nicolosi & Ruivenkamp, 2013), supply chain (Devaux et al., 2009; Manning, 2015) or marketing(Lee et al., 2015)leading to a more sustainable economic growth (Adenle et al., 2017). The

changes in food retailing over the last decades introduced new types of the supply chain, modern agribusiness marketing and consumer demand (e.g. consumer's diets and lifestyle). One of the primaryexamplesis the fresh produce marketing and supply chainin the Asian, African or the western markets. Agri-food firms have recognised the needs for innovation to marketing agricultural products such as fresh produce to meet consumer demand and improve competitiveness(De Koningetal., 2016; Vyt et al., 2017). The dynamic market situation is more demanding than ever. The significance of consumers role and participation into the agri-food business process (Hunt et al., 2012; Xie et al., 2008) requiresnew and capabilities of the agribusiness actors along the chain to satisfy consumer demand.

Even thoughthe VCC concept has been recognised as a central element in business studies, there is a scarcity of research thatfocuses on the exploration of inclusive VCC in the agri-food sector in general and in the context ofvegetable marketingin particular. The study aims to investigate theVCC development within the multiple agribusiness actors in a value chain. The objective of the study is to identify the potentials of inclusive co-creation development in vegetable marketing and its impact oncompetitiveadvantage.

2. Literature Review

2.1 Value co-creation

The concept of VCCfocuses on how to create reciprocal benefits among business partners with the emphasis being on service-dominant logic and on involving actors in the co-creationprocess(Eggert et al., 2018; Grönroos & Helle, 2010).However, along with extensive study development on understanding the co-created value, the term value has showncomplexitywith a lack of consensus. VCCexistsas a rigorous, robust and competing forconceptualisation with blurry definition (Grönroos & Voima, 2013; Gummerus, 2013; Sánchez-Fernández & Ángeles Iniesta-Bonillo, 2007). It is because the valueis determinedbased on the context and the access of the value creator to the market and resources such as knowledge and skills (Bettencourt et al., 2014).

The term of value continues to develop through the concept of value creation and co-creation, although each conceptconceives different meaning by considering business actors or customer relationships and interactions (Lambert & Enz, 2012). The idea has shifted from creating value for the customer into co-create value with the customer as the on-going relationship result between customer and intermediaries (Grönroos, 2011). This change has also been influenced by the evolution of the marketing logic from goods-dominant logic underlying value-in-exchange into service-dominant logic that focuses on co-creating value through resource integration between customer and companies (Grönroos & Ravald, 2011; Vargo & Lusch, 2004).The focus on the customer has foreshadowed the essential step of involving customers into the company's business process to become more competitiveand maximise customer lifetime value (Martinez, 2014; Payne & Frow, 2005).

2.2 Value co-creation in Agribusiness

While several definitions of value have been discussed in the literature(Insch, 2008; Manning, 2015), value in agribusiness still refers to value creation or value added based on the creation of tangible economic outputs from firms' initiatives to change the raw materials of the agricultural product, into specificstandardised products that is more considered in the marketplace (Anderson, 1995; Insch, 2008). Although, the use term of value has extended based on consumption perspective by incorporating intangible values to tangible ones that offer as value proposition benefits from product consumption (Insch, 2008; Zeithaml, 1988). The development of the concept has viewed value as a multidimensional construct by including more dimensions, such as psychological, hedonic and emotional attributes that are also relevant to agribusiness to date (Hollebeek & Brodie, 2009; Lin & Huang, 2012). The customer-centric perspective has been consideredin food and agribusiness studies by moving toward providing non-monetary value for consumers based on the behaviour change (Gow et al., 2003; Hunt et al., 2012). Customer orientation has been considered as an essential part for the success of value creation in agribusiness to achieve long-run relationships and profitability (Gow et al., 2003; Tardivo et al., 2017). The shift on business and marketing orientation in food and

agribusiness by focusing on the customer has also highlighted the importance of involving customers into the value creation process (Hollebeek & Brodie, 2009; Hunt et al., 2012). Agribusiness sector has considered the innovation idea through a complementary, collaborative and coordinative concept by focusing on consumer-centred that turning value creation intovalue co-creation(Bitzer & Bijman, 2015; Dagevos & Ophem, 2013; Xie et al., 2008).

The importance of VCC in the agribusiness context has grasped the importance of developing relationships between farmers that consider as the target of innovation and other agribusiness actors (Bitzer & Bijman, 2015). Technology development presents its effects that contribute to the co-creation process on accelerating co-creation ideas(Leroux et al., 2001). However, due to the complexity of products, agriculture market, and high physical connectedness nature of agribusiness transaction (Arato et al., 2017; Leroux et al., 2001), the value creation/co-creation should offer solutions to the existing problems via collaboration that involve the chain actors (Cui & Wu, 2016; Kottila & Rönni, 2008).

In the case of fresh produce that traditionallyhas been traded as commodities anddelivered through the conventional supply chain has now begun to transformby following the modern marketing channels(Bijman & Hendrikse, 2003; Slamet & Nakayasu, 2016; Utami et al., 2016). The modern market channelfollows a different supply chain and marketing on selling fresh produce by shortening the chain and cutting the number ofintermediaries(Blandon et al., 2009; Lee et al., 2015).The changes represent a global phenomenon on explaining food-retail development (e.g. supermarket and e-commerce) that changes customer behaviour towardsfood(Lee et al., 2015; Lu & Reardon, 2018). Modern food retailers developed new business modelsinvolving fewerintermediaries and provide fresh produce with better quality standard and more benefit for both agribusiness actors and consumers(Kähkönen, 2012; Vyt et al., 2017). Previous studies highlight the significance of creating more value in agribusiness (Insch, 2008; Manning, 2015).Given that littleis known regarding how VCC evolution has been applied throughout the modern agri-food supply chain and marketing channelsand the drivers, events, impact and the form of value creation transformation,the first research question for this study is:

RQ1: How is the value co-creation process defined in agribusiness context?

2.3 Inclusive Agribusiness for Development

The concept of inclusive businesshighlights business partnerships commercialisation conducted between large agribusiness corporationsand low-income communities or small-scale agribusiness firms or smallholder farmers aiming to support agricultural transformation and rural development (Chamberlain & Anseeuw, 2018). The term inclusive growth for agribusiness describes the process of linking farmers to get involved in an inclusive chain. Developing inclusive business is closely related to empowering actors that have been ignored in the value chain, such as smallholder farmers and small-scale agribusiness actors Inclusive agribusiness provides a perspective on reinforcement for creating a viable inclusive business model, activities or initiatives aligningthe small-scale business or rural communities within the agri-food market system (Woodhill, 2016).However, it is a challenge to integrate smallholder farmers or traditional wholesaler in modern agri-food chains (Mungandi et al., 2012), especially encountered by agribusiness sector that dominated by small-scale business with complex supply and market chain(Candelo et al., 2018). There is a gap left between the smallholder farmers and the retail markets that exist in the food marketing system.

Agriculture structures based on the inclusive agribusiness concept can be seen from the perspective of the system complexity shown by the involvement of multi-actors that collaborate to eliminate the constraints for the farmers. It is necessary to bridge the gaps between the market constraints and opportunities and develop trust and relations along the chain to enable the success of such structures(Steen & Maijers, 2014).The examination to strengthening the inclusive agribusiness in complex interventions has been identified, such as throughco-innovation(Bitzer & Bijman, 2015), B2B rural community development (Steen & Maijers, 2014), agribusiness development and transformation (Chamberlain & Anseeuw, 2018). However, there are relatively few studies focusing on the interventions that successfully promote inclusive agribusiness and simultaneously enableVCCdevelopment. Hence,the second research question for this study is:

RQ2: How is co-creation potentials with inclusive agribusiness development contributes topromoting competitiveness?

3. Methodology

The datawere collected viain-depth interviewsthat explored the understanding of VCC potential in the context of inclusiveagribusiness and specifically vegetable marketing in West-Java Province in Indonesia. The focus is on agribusiness actors along the supply chain that consists of farmer producer, trader (e.g. cooperative company, supplier company, local wholesaler, supplier-based e-commerce) and retailer both traditional (e.g. wet market retailer, street vendor) and modern (e.g. supermarket, e-commerce retailer).The location was chosen due to the prevalence of West-Java as one of the highest vegetable production centres in Indonesia. Data from the last five years from Statistics Indonesia showed that around 70 percent of horticulture production from West-Java including fresh vegetables was supplied nationally. West-Java demonstrates as the potentialarea for horticulture business in Indonesia.

Some20 interviewswerecarried outwith various agribusiness actors along the supply chain to receive more comprehensive information that facilitates the examination of the business actor perspective across the agri-food chain (see table 1).Purposive sampling was applied for the study to select the respondents(Etikan et al., 2016). Semi-structured interviews were chosen for the data collection method. The face-to-face interviewswere applied to get higher participation in the data collection completion rate and get more in-depth information on the observed phenomenon.

Table 1. Interviewees' Profile

No	Type of interviewee	Age group (years)	Role in the business/company
1	E-commerce supplier & retailer	20 – 24	CEO
2	Producer & trader	50 – 54	Farmer & traditional trader
3	Producer & e-commerce retailer	45 – 49	Farmer & modern retailer
4	E-commerce supplier & retailer	30 – 34	CFO
5	Trader	35 – 39	Head of a co-operative company
6	E-commerce retailer	30 – 34	Founder
7	Trader	50 – 54	Head of general affairs-supplier company
8	E-commerce supplier	25 – 29	Co-founder
9	Trader	45 – 49	Local wholesaler
10	Producer & trader	50 – 54	Founder of a co-operative company
11	E-commerce supplier & retailer	35 – 39	Buyer specialist
12	Producer	55 – 59	Individual farmer
13	E-commerce retailer	30 – 34	Operational manager
14	Modern retailer	20 – 24	Department manager of supermarket
15	Modern retailer	30 – 34	Store manager of supermarket
16	E-commerce supplier & retailer	35 – 39	Founder
17	Producer & trader	50 – 54	Head of the farmer group
18	Producer & trader	30 – 34	Head of the farmers union
19	Traditional retailer	50 – 54	Traditional wet market retailer
20	Traditional retailer	45 – 49	Street vendor

NVivo 12 facilitated the coding of the text created by transcribing the recorded interviews. Thematic analysis was employed to identify, analyse, interpret and report the themes derivedfrom the dataset (Braun & Clarke, 2006). The data analysis was based on the six steps of thematic analysis propose by Braun and Clarke (2006), namely, (1) data familiarising, (2) generating codes, (3) theme discoveries, (4) theme reviews, (5) defining the theme's name and (6) reporting the results. The advantage of thematic analysis is related to the flexibility in the exploration of specific theoretical ideas (Braun & Clarke, 2013; Maguire & Delahunt, 2017).

4. Findings

4.1 Defining Value co-creation in Agribusiness

The data analysis identifies the meaning of co-creating value for fresh produce based on food retail evolution, such as the existence of the online retail channels as a new type of modern market in the marketplace either in the form of B2B or B2C. The agri-food marketing has shifted from traditional market such as wet market or street vendors towards the supermarket and now to e-commerce. The changes also followed by the shift ofbusiness orientation from product-centric to customer-centric.For example:

"As a businesswoman, I make the business different by merely not only selling products, but I deliver the product with the full package. Small things in real life that I transform into the business as services. I need to make the business distinction because mine is not a trillions-business project. It is only a small business."

Beginning with formulating the meaning of VCC in agribusiness context can be synthesised as a result of an iterative process with proactive, inclusive, and collaborative orientation by involving all actors in the business ecosystem to actively engaged in exploring, exchanging resources and tracking new idea to complete customer needs by offering customer solution. Multiple stakeholders with small-business scale joint together to propose a solutionfor customer demandby synchronising the new agribusiness avenue amongst value collaborator. Collaboration is not onlyoccurring between supplier or retailer with the consumer, but also the involvement of producers such as farmer or farmer group as the critical part in the agri-food supply chain.

4.2 The Role of Inclusive Agribusiness for co-creation

The result from the data analysis indicates the downstream agribusiness actors such as the new player in the market chain of e-commerce on activating their active role in bridging between the business interest of the upstream agribusiness actors (e.g. smallholder farmer and local wholesaler) and the interest of the consumer to achieve mutual goals. A collaborative network between the agribusiness actors to apply a new agri-food business model to supply modern retailers with a short supply chainhas enabled the facilitation on delivering the benefits and impacts of co-creation. During the supply chain transformation, crucial information regarding the implementation of inclusiveness is strongly attached as the concept mediating co-creation development. Inclusive agribusiness initiatives arebridging the necessities of co-creation enabling in agribusiness with inclusiveness concept, which is shown by the domination of small-scale business along the supply chain. For example:

"To be fair, as a society, we need to take each other and be inclusive as a group to be more advanced in the business […]. What I am doing now is try to change the farmer's mindset to guide them in an inclusive group and cooperate."

The participants express the optimistic of inclusive business initiatives can get faster the adjustment of local agribusiness toward modern customer orientation. It is because most of the fresh vegetable from the production centres located in the rural area are sold to the cities or for the urban market. Although the changes made by the agribusiness actors in the upstream subsystem such as smallholder farmer, farmer group, farmers union along with the local wholesaler integration is conducted for a higher purpose that aiming for rural social change, it is supported by the establishment of social enterprises to promotesociety and creating more young agribusiness entrepreneurs coming from rural areas. As one interviewee share the experience:

"The farmer partners or the students that we have now mostly come from villages and their parents are primarily farmers. We can persuade them to support both their children as well as increase their earning."

The agribusiness transformation from the conventional to modern agribusiness concept require supporting components to assist the changes and make it a success. However, due to the limitation of agribusiness with small-scale business domination such as happened in Indonesia, the business actors realised that they need to collaborate and cooperate with other business parties both the upstream and downstream agribusiness actors in the chain to satisfy market requirements. The business model that relies on social movement to empower the small businesses either smallholder farmers or

intermediaries. Thus, in a broader context of B2B co-creation, the resource capacity development through the extensive business network, advocacy and knowledge enhancement have enabled the development of co-creation to achieve competitive strength.

4.2.1 Advocacy

Advocacy considers as an essential component for inclusive agribusiness initiative promotion to support the local agriculture business transformation. Giving advocacy to rural communities with agriculture-based such as smallholder farmer and local wholesaler can encourage the business actors to will involves making changes toward modern agriculture and improve local agricultural products. Such advocacy is crucial due to business resources limitation obtain by the rural business actors and advocacy can support empowerment and capacity development. For example:

"[…] we can accommodate more smallholder farmers to join with the company and facilitate their needs to supply the product to the modern market. The branch offices will be used as the information point for the smallholder farmers to facilitate their business by collaborating with the company as the supplier."

4.2.2 Knowledge Sharing

Empowering smallholder farmers and rural intermediaries such as local wholesalers are also involving knowledge sharing to transfer the new knowledge and skills to improvebusiness practices that indicate readiness to serve the modern market either supermarket, export market and e-commerce. Knowledge sharing will synchronise the business mission and vision amongst the collaborators of using the short supply chain. The aim for upgrading farmers and local wholesaler capabilities is to deliver and improve business practice and understand the professional business process for accessing modern market both benefits and risks. Although, deliver new knowledge and at once educating farmers is challenging, especially on approaching the business actors who have long experience with conventional agriculture system that focuses only on product and sales without considering market requirements. One interviewee gives notes concerning knowledge sharing for knowledge improvement:

"Our company gave support to find the potential farming land, and we gave assistantship for the farmer applying the production method procedure to ensure they can produce the required product specification […]. The partnership concept offers mutual benefits for all the involved parties as well as we can provide inclusive development in agriculture."

4.2.3 Network Function

The analysis also shows the needs of network function to enables facilitates the resource sharing to integrates the possible beneficial resources both intangible and intangible resources that can offer benefits to the involved parties in the partnership. Networking can connect the parties that have the same interests that following up through cooperation and partnerships that enable resource exchange. It is one of the evidence on co-creation development process has been implementing in agribusiness context with inclusiveness. By activating the network,the function is also beneficial to widen business relations and cover each business party limitation through collective action ensuring market demand fulfilment related to product quality, quantity and continuity. While service is also now occurredas the necessity to be concerned in each part of the business process to satisfy consumer demand.As one interviewee stated the importance of networking:

"There are several stakeholders that important for the company besides farmers, local trader as a supplier and the customer; they are the fertiliser companies, seed companies, government, and another stakeholder namely the NGO."

The analysis illustrates that agribusiness actors begin to realise and acknowledge using business networks as a reliable key for value creation by involving other business parties in the supply chain to grow together and achieve mutual goals. Optimising network function enables resource integration amongst the collaborator that facilitated by technology application and knowledge-skills enhancement customised for each business actor needs. Integrated partnership through networks can contribute to

synchronise and align the agribusiness production system and agribusiness marketing activities, which is suitable for bridging inclusive agribusiness situation. Networking via physical interaction (e.g. filed visit, farmer training, rural community engagement) or virtual interaction (e.g. website, social media, mobile apps)follow up with collaboration and cooperation between an actor in the network can widen business relations or attract new consumers. As a result, the networks can facilitate strengthening relationships and open broader opportunities for more potentials for improving competitiveness.

4.3 Realising Value co-creation Potential for Agribusiness

The analysis indicates that agribusiness actors involve for vegetable production and marketing has consideredco-creation is enabling local agribusiness support, which is identified by the supply chain transformation to short supply chain replacing the fragmented conventional-long supply chain. Although to implement the scenario, the upstream business actors such as smallholder farmers and local wholesaler should gather in farmer group or farmers union or cooperative company,and they need to have a better understanding on differentiating market requirement when accessing modern retails such as supermarket and e-commerce. For example, the changes on production plan, post-harvest handling, supply chain strategy and marketing channels. It means that the agribusiness actors realised the opportunities as well as the challenges they need to address. The farmers need to have the willingness to agree to renew the business process to accomplish the changes propose more meaningful insights for business competitiveness and sustainability. One of the interviewees who is a farmer and also trader mentioned about this issue:

"The most suitable concept is by integrating the farm field that functioning for the production and trading as the marketing tool and the two activities should be aligned and synchrony. It means that in a business culture that consists of smallholders, it is necessary to develop an integrated partnership[…].When I started to access the modern market is because it gives business certainty regarding price, quality and quantity. It is different from the traditional market that giving uncertainty situation to the farmer producers."

The transformation has changed the marketing orientation toward customer-centric that leads to value creation on adjusting consumer lifestyle changes related to food shopping changes and food consumption changes. The upstream agribusiness actors (e.g. farmers/farmer group/farmers union) begin to realise the importance of involving business partners into the business process to support the capability of fulfilling consumer demand and anticipating dynamic market situation. For example, by considering the commodity value by selecting high-value commodities to be planted, improve quality, adding product attributes, providing more product variety, and adding service into the business process to satisfy either business customer or end-consumer. While the modern channels try to approach end-consumer by proposing more food consumption values to attract consumers and select the online channel for fresh produce shopping, such as price fairness, better product-services, deliver new knowledge related to foodand cooking, entertainment, new shopping ambience and simplicity.

The analysis presents four essential components in understanding the co-creationdevelopment opportunities forinclusive agribusiness. The components are willingness to collaborate, mutual understanding, mutual benefits and agriculture community development.

4.3.1 Willingness to Collaborate

The ideal condition to initiateco-creation development requires the willingness of the involved parties to work together and join the collaboration. Each value collaborator, especially among the involved business actors,needs to have the same objectives in the collaboration by synchronising the perspective and vision. Willingness to collaborate become crucial in co-creation development to show the business partners such as farmers or local wholesaler realising the benefits for making the changes and improve their business orientation in the broader market. Thus, facilitation through partnership or cooperation in linking the farmers and local wholesaler to modern market present an essential role in the supply chain transition, where the participants share their opinions concerning the importance of collaboration:

"The collaboration between our company and the farmers will also become our distinction with the competitors. Other retailers maybe only concern on their own business and sell what the supplier offer them without thinking about the farmer's welfare. Meanwhile, we willing to also empower the farmers business and make an improvement to their farming business."

Collaboration within B2B also plays a crucial part in the co-creation process for empowering the business actors in the upstream subsystem thru knowledge improvement. Empowerment and education become the agenda for the intermediaries who willing to work together and collaborate with the farmer producers and local trader as well as encouraging young people in rural areas to support local products. The goal is to share the insight of business in agriculture that can offer tremendous opportunities beyond only about buying and selling with conventional marketing concept.The business and marketing orientation begin to focus on both product and service orientation. Networking and persuasion mostly initiate by the downstream marketing actors (e.g. cooperative company, supplier company, e-commerce) to the upstream business actors (e.g. smallholder farmer, local wholesaler) on designing the collaborative action that followed by exposing creative and innovative ideas from both parties. A success and beneficial of co-creation result can ensure simultaneous development in the business. Hence, collaborative orientation in inclusive agribusiness has started to acknowledge as a competitive strength by agribusiness actors along the chain.

4.3.2 Mutual Understanding

Mutual understanding refers to reciprocal interaction between value collaborator during the co-creation process by presenting new ideas for creating unique value on selling fresh produce via modern market channels. It also refers to comprehend the risks and benefits of the cooperation conducting by the involved parties before making further collaborative actions. By having a mutual understanding, each party will synchronise perceptions towards business vision and mission and develop strong bonding business and emotional relationships to co-produce unique value deliver to the targeted market. The intermediaries appointed as a modernmarket such as B2B and B2C e-commerce who collaborate with the farmer or local wholesaler with community-based (e.g. farmer group, farmers union, cooperative company) attempt to provide capacity development to make the upstream business partner understand the mechanism of modern market channels that entirely different from the conventional market channels. As one interviewee comment:

"Mutual understanding is needed to develop agreement between buyer and producer to avoid the gap of supply and demand side. The buyer needs to understand that to fulfil buyers needs and wants also require the knowledge of farming production and deliver the knowledge to the end-user."

On the other hand, the farmers or local wholesalers also give insights on how the agriculture production conducted that involved not only the social and economic perspective of the ruralcondition but also showing that rural agriculture is strongly influenced by culture situations. It becomes the differentiation between agricultural practices in a particular location with other locations. Developing dialogue and reciprocal interaction provides better mutual understanding among the parties that enables further co-creation development in various kinds of way, either for production activities, supply chain or marketing.

4.3.3 Mutual Benefits

Realising the co-creation development requires the relevance of benefits that offer from the collaboration or cooperation. The analysis illustrates that mutual benefits become essential to actualise collaboration. Otherwise, it will work worth nothing. Although, recognising the benefits that will obtain by each party is challenging specially to convince the farmers or local wholesalers who have long experience conducting agriculture activities with conventional ways. Hence, proposing something new for farmers or local wholesaler needs common rationale regarding the benefits received by the actors. In a broader scope, the analysis also indicates that collaboration conducted thru community-based activities either with business partners or consumers also proposing social benefits in co-creation development and appointed the company as a social enterprise. It shows that agribusiness companies, although it is only a SMEs scale has had a concern on social impacts proposed via co-

creation with society. One participant shares an opinion concerning mutual benefits as the co-collaboration effect:

"I offer a higher price rather than the traditional market. I want the business benefiting both for me and for the farmers. Hence, I open with the farmers about the profit margin they willing to have."

4.3.4 Agriculture Community Development

The analysis reveals a finding related to agriculture community development for enabling co-creation in agribusiness in particular for B2B co-creation process. Agriculture community refers to various forms, such as farmers union or farmer group, co-operative company, education community with agriculture-based for school-age people, and young farmer community that support local agricultural. The role of community in agribusiness co-creation development is to enable higher participation and engagement within the community members that bond with a sense of belongings. Community development also plays an essential part in inclusive agribusiness to implement collaborative actions and to strengthen the business strength via institution reinforcement that focuses on improving human resource in rural agriculture. The condition gives a sign that the upstream agribusiness actors, although it is based in rural areas have considered the importance of having a knowledgeable and skilful human resource, while it is also referring as intangible capital for co-creation process requirements. Establishing the agriculture community also contributes to supporting local agriculture competitiveness that implemented via fair trade concept to share fair profit and benefits for farmers that usually disadvantages by the conventional marketing system. Gather in a community has open broader opportunities for business networking, improve product quality and service and open market opportunities for smallholder farmer or local wholesalers to collaborate and link with the modern intermediaries such as supplier companies, supermarket or e-commerce. The importance of agriculture community development indicates for the participants mentioned value creation, for example:

"All of the activities that we prepare now for the farmer's unity as well as the plan for the organisation future is solely to reach the organisation vision that builds since first. The concepts are to enable the farmers to be independent in doing agriculture business and to be innovative."

4.4 Value co-creation Impacts for Agribusiness Marketing

The next significant result from the analysis is regarding the co-creation impacts for agribusiness development such as agri-food marketing. The result reveals an indication that creating value has been considered essential and become business objective for the agribusiness actors along the supply chain, especially those who apply short supply chain for modern market orientation. The business actors have recognised that today's customers are not seeing food as daily needs, but also consider how the foodstuff is produced and also perceived food shoppingas lifestyle and social activities. The understanding towards consumer situation change and how social interaction has changed through technology adoption such as the use of internet and social media is the reason for involving customer to participate in co-creating values actively. The objective is not only to satisfy customer needs but also to provide customer above the expectation. The analysis-synthesis the impacts of co-creation for agribusiness marketing especially for end-consumer is regarding generating new ideas for business and marketing improvement, creating consumer experience, providing customer satisfaction, word-of-mouth through direct interaction or electronic, and building repeat buying by ensuring the modern market channels offer the customer with more benefits compared to other types of channels. For example:

"I think this [customer gathering] can consider as making collaboration with the customer by involving them in creating a new idea for the store business development. Thus, we able to make future improvements and changes will base on customer needs and demand."

4.5 The Proposed Value co-creation Potential for Agribusiness

Based on the overall analysis, the potential co-creation development in agribusiness context with Indonesia as the case for the emerging country has shown the transformation of how to conduct agribusiness with modern marketing approach. In this particular context, the vegetable supply chain transformation towards a short supply chain has open to co-creation development. Although, there are circumstances need to be fulfilled to actualise the concept: (1) willing to involve in the collaboration or cooperation; (2) mutual understanding among the value collaborator; (3) mutual benefits to attract the involved parties activate their participation; (4) developing agriculture communities to enable fostering the agribusiness transformation that dominated with small-scale business. In the propose co-creation development framework for an agriculture sector that dominated by small-scalebusiness, inclusive agribusiness initiatives reveal as the facilitator or mediator for realising short supply chain that more benefited for both the agribusiness actors and the consumers (see figure 1). The benefits of VCC can give various impacts that can improve agribusiness competitive strengths.

The findings also show that co-creation is enabled to occur both in the B2B or B2C agribusiness context. About the B2B co-creation, the involved actors can occur between (1) farmer/farmer group/farmers union as producer and the modern intermediaries and (2) trader/supplier and the e-commerce. On the other hand, B2C co-creation occurs between the e-commerce retailer and the end-consumer. During the co-creation process, proactive and creative participation is required to co-create beneficial values for each party (see figure 1). The B2B co-creation is developed to satisfy consumer demand. Meanwhile, the modern retailer such as e-commerce will deliver a value proposition that can attract the consumer to co-create the values during the buying to the consumption process. Hence, both B2B and B2C co-creation development in agribusiness shown as an iterative process that supported by relational marketing. Collaboration sphere reveals as the result of the synchronisation of both B2B and B2C co-creation process that anticipating different things.

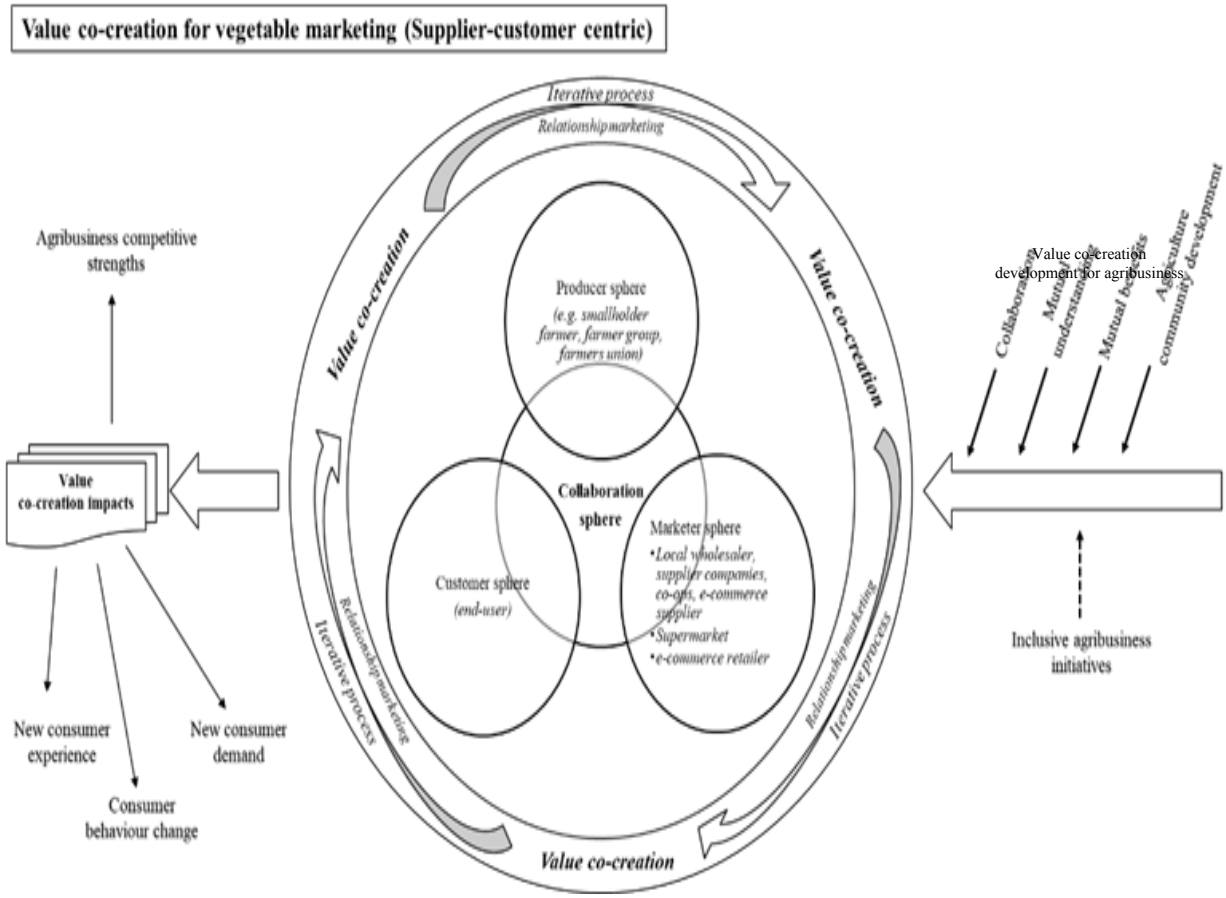


Figure 1. Inclusive Value co-creation Development for Agribusiness Context

5. Discussion

Building upon the research on VCC and link to the literature on agribusiness and inclusive initiatives, the study elaborates the opportunity of co-creation development for inclusive agribusiness and highlights the importance of identifying the value potentials elements on realising the co-creation.Co-creation in the context of inclusive agribusiness involves the facilitation of three primary factors, labelled, advocacy, knowledge improvement and network activation which facilitate thequality improvement in agriculture and support chain development. Four essentials drivers of co-creation have been identified, labelled, willingness-to-collaborate, mutual understanding, mutual benefit and agriculture community development.

The findings have several theoretical implications.The retail food channels havechanged the marketing approach from product-based to customer orientation.Co-creation occurs in the vegetable business and marketing also related to the essentials of supporting local agriculture to be more resilient in the marketplace. This finding correspondstoprevious research (Anderson, 1995), stating that recognising the emergence of co-creation has been discussed not only within a B2Ccontext but also within B2B collaborative relationships. The study also reveals the co-creation elements that support the understanding behind the process of VCC in a B2B relationship context regarding collaboration and mutual benefit among the involved parties in the co-creation. Past research has also highlighted these two elements as part of the co-creation success factors. Each of the involved actors in the co-creation aims to receive mutual value creation and mutual benefits from sharing the acquiredresults among the value collaborators (Gummerus, 2013). The studies on co-creation have shown that it is typical to assume that the involved parties are benefited from the activities (Gummesson & Mele, 2010) that is exercising through a collaboration(Aarikka-Stenroos & Jaakkola, 2012; Vargo & Lusch, 2008).While the other two elements of mutual understanding become one of the propositions on promoting co-creation (Gupta et al., 2017) and community-based can generate for proposing the idea generation for value creation in agribusiness (Lawson et al., 2008).

The study also has a second contribution that refers to the rising importance of VCC as the focus in agribusiness studies has shown as the movement of food and agribusiness orientation, which is in line with the results from the previous studies(Handayati et al., 2015; Vellema & Van Wijk, 2015). The finding regarding collaborative behaviour in agribusiness with inclusive development is also relevant to the nature of multi-stakeholder involvement in agriculture on developing broader networking for business sustainability. The shifting of agri-food business perspective from conventional value chain to network perspective presents the essential evidence of developing value in a more comprehensiveview, with collaboration frame and multi-stakeholder involvement (Kähkönen, 2012; Vellema et al., 2015). Collaboration for inclusive development has alsobeen discussed by previous studies sheddinglight on inclusive co-creation for agribusiness. Collaboration can develop smallholder capabilities and competencies by possibly improving their access to lower cost transactions, improve quality, services and competitiveness (Ha et al., 2015). The success of inclusive agribusiness for agriculture development is subsequently capable of transferring the value addition that shared to the beneficiaries (Chamberlain & Anseeuw, 2018).

Finally, the paper proposes the impact of co-creation on food retailing facilitated by the short supply chain (e.g. B2B and B2C e-commerce) that elaborates the iterative process of co-creation as a set of relational business relationships with among the involved actors within the network and business ecosystem. The relationship among the actors refers to an iterative process when the actors are linked through a reciprocal process of active communication and/or active participation (Ranjan & Read, 2016). The exploration of co-creation impacts also reveal the possibility for empowerment (Devaux et al., 2009) and improving agribusiness competitive strengths (Martinez, 2014).

6. Conclusion

The retail food channels have changed the marketing approach from product-based to customer orientation. The findings highlight the global business transformation which has affected the agribusiness marketplace in emerging economies such as Indonesia. The agribusiness actors along the supply chain begin to understand the importance of creating value for businesses and customers as a response to market challenges, situations and competition. The study also highlights the need for a

new marketing channel in the vegetable supply chain facilitated by e-commerce companies, either suppliers or retailers. By understanding the market and marketing changes, the B2B actors along the supply chain can recognise how to exert changes to modern agri-food chains by enhancing capabilities (e.g. knowledge, skills), conducted collective participation and activate networking. VCC in a collaborative environment can offer a 'win-win' proposition for turning the vulnerable and low-power stakeholders into the resilient (Candelo et al., 2018). This result advances the presumption based on the improvement of company's orientation of perceiving profit and customer as the primary focus in the business. The VCC conception proposes broader experiences for all the stakeholders during the collaborative process by delivering fruitful results (Agrawal et al., 2015) and uncover the new source of competitiveness (Martinez, 2014; Prahalad & Ramaswamy, 2004).

References

Aarikka-Stenroos, L., & Jaakkola, E. (2012). Value co-creation in knowledge intensive business services: A dyadic perspective on the joint problem solving process. *Industrial Marketing Management41*: 15–26.

Adenle, A. A., Manning, L., & Azadi, H. (2017). Agribusiness innovation: A pathway to sustainable economic growth in Africa. *Trends in Food Science and Technology59*: 88–104.

Agrawal, A. K., Kaushik, A. K., & Rahman, Z. (2015). ScienceDirect Co-creation of social value through integration of stakeholders. *Procedia -Social and Behavioral Sciences189*: 442–448.

Anderson, J. C. (1995). Relationships in Business Markets: Exchange Episodes, Value Creation, and Their Empirical Assessment. *Journal of the Academy of Marketing Science23*: 346–350.

Arato, M., Speelman, S., Dessein, J., & Van Huylenbroeck. (2017). Assessment of socio-economic configuration of value chains: a proposed analysis framework to facilitate integration of small rural producers with global agribusiness. *International Food and Agribusiness Management Review20*: 25–43.

Bettencourt, L. A., Lusch, R. F., & Vargo, S. L. (2014). A service lens on value creation: marketing's role in achieving strategic advantage. *University of California, Berkeley57*: 44–66.

Bijman, J., & Hendrikse, G. (2003). Co-operatives in chains : institutional restructuring in the Dutch fruit and. *Chain and Network Sience*, 95–107.

Bitzer, V., & Bijman, J. (2015). From innovation to co-innovation ? An exploration of African agrifood chains. *British Food Journal117*: 2182–2199.

Blandon, J., Henson, S., & Cranfield, J. (2009). Small-scale farmer particpation in new agri-food supply chains: Case of the supermarket supply chain for fruit and vegetables in Honduras. *Journal of International Development21*: 971–984.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology3*: 77–101.

Braun, V., & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners*. (M. Carmichael, Ed.), *SAGE Publications Ltd*. London.

Candelo, E., Casalegno, C., Civera, C., & Mosca, F. (2018). Turning farmers into business partners through value co-creation projects. Insights from the coffee supply chain. *Sustainability10*: 15–17.

Chamberlain, W. O., & Anseeuw, W. (2018). Inclusive Businesses and Land Reform.*Land18*: 1–17.

Cui, A. S., & Wu, F. (2016). Utilizing customer knowledge in innovation: antecedents and impact of customer involvement on new product performance. *Journal of the Academy of Marketing Science44*: 516–538.

Dagevos, H., & Ophem, J. van. (2013). Food consumption value. *British Food Journal115*: 1473–1486.

De Koning, J., Crul, M., Van Engelen, J., Wever, R., & Brezet, J. (2016). Mental innovation space of Vietnamese agro-food firms. *British Food Journal118*: 1516–1532.

Devaux, A., Horton, D., Velasco, C., Thiele, G., López, G., Bernet, T., … Ordinola, M. (2009). Collective action for market chain innovation in the Andes. *Food Policy34*: 31–38.

Eggert, A., Ulaga, W., Frow, P., & Payne, A. (2018). Conceptualizing and communicating value in business markets: From value in exchange to value in use. *Industrial Marketing Management69*: 80–90.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of Convenience Sampling and

Purposive Sampling. *American Journal of Theoretical and Applied Statistics5*: 1–4.
Gow, H. R., Oliver, L. D., & Gow, N. G. (2003). value co-creation in farmer-driven marketing channel. *Journal of Food Distribution Channel34*: 86–91.
Grönroos, C. (2011). Value co-creation in service logic: A critical analysis. *Marketing Theory11*: 279–301.
Grönroos, C., & Helle, P. (2010). Adopting a service logic in manufacturing: Conceptual foundation and metrics for mutual value creation. *Journal of Service Management Journal of Service Management21*: 564–590.
Grönroos, C., & Ravald, A. (2011). Service as business logic: implications for value creation and marketing. *Journal of Service Management22*: 5–22.
Grönroos, C., & Voima, P. (2013). Critical service logic: Making sense of value creation and co-creation. *Journal of the Academy of Marketing Science41*: 133–150.
Gummerus, J. (2013). Value creation processes and value outcomes in marketing theory: Strangers or siblings? *Marketing Theory13*: 19–46.
Gummesson, E., & Mele, C. (2010). Marketing as Value Co-creation Through Network Interaction and Resource Integration. *J Bus Mark Manag4*: 181–198.
Gupta, S., Polonsky, M., & Lazaravic, V. (2017). Journal of Strategic Marketing Collaborative orientation to advance value co-creation in buyer-seller relationships Collaborative orientation to advance value co-creation in buyer-seller relationships. *Journal of Strategic Marketing27*: 191–209.
Ha, T. M., Bosch, O. J. H., & Nguyen, N. C. (2015). Necessary and Sufficient Conditions for Agribusiness Success of Small-scale Farming Systems in Northern Vietnam. *Business and Management Studies1*: 36–44.
Handayati, Y., Simatupang, T. M., & Perdana, T. (2015). Value Co-creation in Agri-chains Network: An Agent-Based Simulation. *Procedia Manufacturing4*: 419–428.
Hollebeek, L. D., & Brodie, R. J. (2009). Wine service marketing , value co-creation and involvement : research issues. *International Journal of Wine Business Research21*: 339–353.
Hunt, D. M., Geiger-Oneto, S., & Varca, P. E. (2012). Satisfaction in the context of customer co-production: A behavioral involvement perspective. *Journal of Consumer Behaviour11*: 347–356.
Insch, A. (2008). Triggers and processes of value creation in Australia's chicken meat industry. *British Food Journal110*: 26–41.
Kähkönen, A.-K. (2012). Value net – a new business model for the food industry? *British Food Journal114*: 681–701.
Kottila, M., & Rönni, P. (2008). Collaboration and trust in two organic food chains. *British Food Journal110*: 376–394.
Lambert, D. M., & Enz, M. G. (2012). Managing and measuring value co-creation in business-to-business relationships. *Journal of Marketing Management28*: 1588–1625.
Lawson, R., Guthrie, J., Cameron, A., & Chr Fischer, W. (2008). Creating value through cooperation An investigation of farmers' markets in New Zealand. *British Food Journal110*: 11–25.
Lee, A. R., & Kim, K. K. (2018). Customer benefits and value co-creation activities in corporate social networking services. *Behaviour and Information Technology37*: 675–692.
Lee, D., Jeong, H., Cho, J., Jeong, J., & Moon, J. (2015). Grocery Shopping via T-Commerce in Korea: New Shopping Channel Adoption Behavior Based on Prior E-Commerce Experience. *International Food and Agribusiness Management Review18*: 1–16.
Leroux, N., Wortman, M. S., & Mathias, E. D. (2001). Dominant factors impacting the development of business-to-business (B2B) e-commerce in agriculture. *International Food and Agribusiness Management Review4*: 205–218.
Liang Lu, & Thomas Reardon. (2018). An Economic Model of the Evolution of Food Retail and Supply Chains from Traditional Shops to Supermarkets to E-Commerce. *American Journal of Agricultural Economics100*: 1320–1335.
Lin, P.-C., & Huang, Y.-H. (2012). The influence factors on choice behavior regarding green products based on the theory of consumption values. *Journal of Cleaner Production22*: 11–18.
Lindgreen, A., & Wynstra, F. (2005). Value in business markets: What do we know? Where are we going? *Industrial Marketing Management34*: 732–748.
Maguire, M., & Delahunt, B. (2017). Doing a Thematic Analysis: A Practical, Step-by-Step Guide for

Learning and Teaching Scholars. *All Ireland Journal of Teaching and Learning in Higher Education8*: 3351–3359.
Manning, L. (2015). Determining value in the food supply chain. *British Food Journal117*: 2649–2663.
Martinez, M. G. (2014). Co-creation of Value by Open Innovation : Unlocking New Sources of Competitive Advantage. *Agribusiness An International Journal30*: 132–147.
Mungandi, S., Conforte, D., & Shadbolt, N. M. (2012). Integration of Smallholders in Modern Agri-food Chains: Lessons from the KASCOL Model in Zambia. *Agribusiness Management Review15*: 155–176.
Nicolosi, G., & Ruivenkamp, G. (2013). Re-skilling the Social Practices : Open Source and Life – Towards a Commons-Based Peer Production in Agro-biotechnology ? *Science Engineering Ethics19*: 1181–1200.
Payne, A., & Frow, P. (2005). A Strategic Framework for Customer Relationship Management. *Source Journal of Marketing69*: 167–176.
Prahalad, C. K., & Ramaswamy, V. (2004). Co-creation experiences: the next practice in value creation. *Journal of Interactive Marketing18*: 5–14.
Ranjan, K. R., & Read, S. (2016). Value co-creation: concept and measurement. *Journal of the Academy of Marketing Science44*: 290–315.
Sánchez-Fernández, R., & Ángeles Iniesta-Bonillo, M. (2007). The concept of perceived value: a systematic review of the research. *Marketing Theory7*: 427–451.
Slamet, A. S., & Nakayasu, A. (2016). Consumers' Choice for Vegetable Market Channels in Indonesia. *2nd International Conference of Agro-Industry3*: 167–172.
Steen, M., & Maijers, W. (2014). Inclusiveness of the Small-Holder Farmer Key Success Factors for Ethiopian Agribusiness Development. *International Food and Agribusiness Management Review17*: 83–88.
Tardivo, G., Thrassou, A., Viassone, M., & Serravalle, F. (2017). Value co-creation in the beverage and food industry. *British Food Journal119*: 2359–2372.
Utami, H. N., Sadeli, A. H., & Perdana, T. (2016). Customer value creation of fresh tomatoes through branding and packaging as customer perceived quality. *J. ISSAAS22*: 123–136.
Vargo, S. L., & Lusch, R. F. (2004). Evolving to a New Dominant Logic for Marketing.*Journal of Marketing 68*: 1-17.
Vargo, S. L., & Lusch, R. F. (2008). From goods to service(s): Divergences and convergences of logics. *Industrial Marketing Management37*: 254–259.
Vellema, S., Wijk, J. Van, & Van Wijk, J. (2015). Partnerships intervening in global food chains : the emergence of co-creation in standard-setting and certi fi cation. *Journal of Cleaner Production107:* 105–113.
Vyt, D., Jara, M., & Cliquet, G. (2017). Journal of Retailing and Consumer Services Grocery pickup creation of value : Customers' benefits vs spatial dimension. *Journal of Retailing and Consumer Services39*: 145–153.
Woodhill, J. (2016). *Inclusive Agribusiness: the State of Play*. Bonn.
Xie, C., Bagozzi, R. P., & Troye, S. V. (2008). Trying to prosume: Toward a theory of consumers as co-creators of value. *Journal of the Academy of Marketing Science36*: 109–122.
Zeithaml, V. A. (1988). Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence. *Journal of Marketing52*: 2–22.

ALGERIAN EFFORTS IN DIVERSIFYING THE ECONOMY: THE AGRICULTURAL SECTOR AS A SUBSTITUTE

Mostefai Manal
University of Abou Bekr Belkaïd, Faculty of Economics and Management, Algeria
Email: mmostefai93@ gmail.com

Abstract

The objective of this work is to assess policies that have been adopted pertaining to Algerian agricultural, this study showed that Algeria as one of the African nations that belong to the organization of petroleum exporting countries, a large amount of its economy is dependent on oil, natural gas, and industrial manufacturing, which account for more than 95% of the Algerian exports, and since oil prices started falling dramatically in 2014 Algeria's longstanding need to diversify its economy away from hydrocarbons has gained fresh urgency.

Over the years of independence, successive governments initiated different action plans to boost agricultural production and reduce reliance on imports in order to achieve the security of food supplies. Meanwhile, Currently, agriculture accounts for approximately 13% of the Algerian GDP and employs 24% of the workforce, the recent surge in agricultural activity is a big step forward for Algeria, which saw farmers uprooted from their land mainly during 1957-61 french colonizers attempted to isolate independence fighters from the population in the countryside. After achieving independence, authorities seized most of the country's farmland and embraced a soviet-socialist management style in the agricultural sector, in the early 1980s, Algeria tried to remedy the failures of the command economy by turning most of its land over the private sector. However, in 1992 the civil strife between the army and radical Islamists caused a mass exodus from Algeria's rural to urban areas, devastating the agricultural industry. However, the sector's productivity has witnessed a relative improvement in recent years due to the Agriculture Development Plan(the National Agricultural Development Program (PNDA)) implemented in 2000 by the Ministry of Agriculture to boost agriculture development and production. In line with this program; the agricultural development strategy was re-oriented in August 2008 (the National Agricultural and Rural Development Program (PNDAR)) to reflect new policy priorities in several areas including intensification of agricultural production, revitalization of natural resources and improved consumption of water resources as well as food safety initiatives. Despite the Agriculture Development Plans and the government aids, Algeria is still unable to feed its growing population by being one of the world's largest importers of wheat at a cost of $1.7 billion in 2017, where analysts say providing aids is not sufficient to meet the government's goal of increasing agriculture's share of economic output from 13 percent now, as long as youths are losing interest in the land and looking elsewhere for jobs.

Keywords: Diversify the Economy, Algeria, Hydrocarbon Sector, Agricultural Sector, Agricultural Policies.

EFFECTS OF *FADAMA* III AF SORGHUM PRODUCTION DEVELOPMENT PROGRAMME ON WOMEN AND YOUTHS IN NIGER STATE, NIGERIA

Abigail John Jirgi
Federal University of Technology, Department of Agricultural Economics and Farm Management, Nigeria, Email: jirgi.abigail97@ gmail.com

Tisin Ogundare
Federal University of Technology, Department of Agricultural Economics and Farm Management, Nigeria

Michael Akindele Ojo
Federal University of Technology, Department of Agricultural Economics and Farm Management, Nigeria

Adeoluwa Adewumi
Federal University of Technology, Department of Agricultural Economics and Farm Management, Nigeria

Abstract

This study was conducted in Niger state Nigeria to determine the effect of Fadama III AF development programme on women and youth sorghum farmers. A Multi-stage sampling technique was adopted for the sampling procedure. Two local government areas were selected and four villages were randomly selected from both local governments. A total of 78 respondents which included women and youths were selected from the villages which brought the total of the respondents to be 156. Structured questionnaire was used to elicit information from the respondents. The data collected were analyzed through the use of descriptive and inferential statistics such as frequency, percentage, mean, propensity score matching analyzed the effect of Fadama III AF programme on the income, labor, output and area of land cultivated. The ordinary least square regression model was used to analyse the determinants of the income of the beneficiaries and non-beneficiaries. The study revealed that the average income, output and labour used of the beneficiaries increased after the participation of the development program depicting a positive impact on the beneficiaries. The study revealed that the mean age of the beneficiaries and non- beneficiaries were 34years and 37years respectively. The majority of the beneficiaries were females 62.80% and males 37.20% for the non- beneficiaries. The OLS estimates indicated that quantity of seeds at 1%, labour at 5%, farming experience at 5%, number of adopted technologies at 10% and transportation at 1% level of significance respectively were the determinants of income for the beneficiaries while price of sorghum at 1%, farm size at 1% and farming experience at 10% level of significance respectively were the determinants of income for the non- beneficiaries. Therefore it was recommended that the Federal Government, ADP's, non-governmental agency and financing institutions (World Bank) ensure the continuation of the programme and extension to the non-beneficiaries in order to improve the standard of living in the rural area.

Keywords: Fadama III AF, Programme, Sorghum, Women, Youths, Farmers

1. Introduction

Nigeriais the largest sorghum producer in West Africa accounting for about 71% of the total regional sorghum output(Ogbonna, 2011). Food and Agriculture Organization (FAOSTAT) (2012) Nigeria reported that Nigeria is the third largest worldproducer after the United States and India. However, 90% of sorghum produced by some countries of the world such as the United States and India is given toanimal feed, making Nigeria the world leading country for food grain sorghum production. Sorghum represents 1.6% of the global GDP in 2006 and 5.4% of the agricultural GDP,

making it the 6th most important product after cassava, yams, rice, maize and fruits (International Food Policy Research Institute (IFPRI), 2010).

In Nigeria, sorghum is the third cereal in the aspect of production after maize and millet (FAOSTAT, 2012), with more than 4.5 million tons harvested in 2010 representing 25% of the total cereal production (FAOSTAT, 2012). In almost all the North of the country, it is the primary food crop. Themajority of domestic production is used for householdconsumption and fodder. Indeed, producers first use their sorghum to meet household needs, only a small proportion being traded,mostly on the local market (Zalkuwi *et al.,*2015). Sorghum is primarily eaten inthe form of flour or paste. It has a high caloric and nutritional valueand is therefore recommended for infants, pregnant and lactating mothers, the elderly and the convalescents (Ogbonna, 2011).

*Fadama*is a Hausa word which implies low-lying and flood plain areas underlined by shallow aquifers and found along Nigeria's river system.*Fadama*III project is a tripartite funded intervention by the World Bank, Federal Government of Nigeria and the participating States.The Federal Government of Nigeria had received additional International Development Association (IDA) credit of USD200 million on June 28, 2013, to scale up impacts on the ground and strengthen the development effectiveness of the well performing Third National *Fadama* Development Project (*Fadama* III) by aligning it more closely with the new Agricultural Transformation Agenda (ATA).Additional Financingbecame disbursement effectiveness by (February 11, 2014)and hascommenced operations upon the approval of the eighteen month procurement plan by the World Bank and the annual work plan and budget in April 2014.

Inspite of many years of agricultural development efforts by past successive governments in Nigeria and international donor agencies and in spite of Millions of dollars committed into such development efforts, agricultural sector appears to have remained undeveloped (Nwaobiala, 2013).This may be as a result of neglect of evaluation on the effectiveness of the programmes on the beneficiaries.There are scanty studies on the impact of *Fadama* III project on farmers' income (Ominikari *et al.,* 2017).There is no evidence of research efforts to measure the impact of *Fadama* III AF on the farmers in Niger State particularly the sorghum farmers. Also, the researchers have in the past commonly used the Heckman's difference - in difference methodology, t-test and chow-test to measure the effect and impact of *Fadama* on the output and income of beneficiaries.The propensity score matching (PSM) method have been rarely used by researchers to measure impact of *Fadama* on the beneficiaries. This study therefore aimed at gauging the effect of *Fadama* III AF sorghum production development on women and youth in Niger State, Nigeriausing the PSM approach. The outcome of the study will be a worthy document and provide important feedback that will help relevant stakeholders and government agencies in Nigeria to re-appraise their strategies as well as guide future policy makers towards a more practical and effective approach to development among women and youths. It will also provide basis for further research into the concept of using a more realistic and efficient approach to gauge the impact of the empowerment programmes among women and youths.

2. Methodology

The study was conducted in Niger State, Nigeria. It was created April, 1976. The capital of the State is Minna which is located between Longitude 3°30'E and7°20'E and Latitude 8°22'N.This area was chosen because of its participation in the National *Fadama*III AFdevelopment project.

A multistage random sampling technique was adopted in selecting the respondents for this study. The First stage was a purposive selection of two Local Government Areas that has been involved in the empowerment program which is among the highest numbers of *Fadama* III AF women and youth empowerment beneficiaries. The Local Governments were Bosso and Katcha Local Government Areas. The second stage involved the selection of four villages each from the two selected Local Government Areas. A sample size of 50% of the total sample frame of 156 beneficiaries from the eight selected villages which is 78 respondents was used. This sampling process described above was used to determine the sample size of the Non-beneficiaries.

Primary data used for this study were collected using structured questionnaire and interview schedules that were administered by the researcher with the assistance of trained Enumerators. Data

were analyzed using descriptive statistics such as mean and frequency; propensity score matching method and ordinary least square (OLS) regression model.

2.1 Propensity Score Matching (PSM) Method

The PSM method was used to determine the effect of *fadama* III AF on the income (₦), labour (man-days), output (kg) and the area of land cultivated (ha) of the women and youth sorghum farmers. The effect of treatment on the beneficiarieswas estimated by computing the differences across both groups (beneficiaries and non- beneficiaries). If a project outcome indicator is farmers income, for instance, the average effect of the programme on the beneficiaries is referred to as average treatment effect on the treated (ATE) and is defined as the difference between the expected income earned by programme beneficiaries while participating in the programme and the expected income they would have received if they had not participated in the programme.

$ATE = \frac{1}{N_1}(Y_1 - Y_0)$

Where;

ATE =Average of treatment effect on the beneficiaries.

N_1 = Number of matches (from regression model)

Y_1 = Average annual income (₦), labour (man days), output (kg)and the area of land cultivated (ha) of beneficiaries

Y_0 = Average annual income (₦), labour (man days), output (kg) and the area of land cultivated (ha) of non-beneficiaries

The model is specified as:

$$Yi = \begin{cases} y_i^* If\, y_i > 0 \\ 0 If\, y_i^* \leq 0 \end{cases}$$

$y_i^* = \beta_0 + X\beta_1 + \mu_i, \mu/X \approx N(0, \delta^2)$

$y_i^* = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + ... + \beta_{10} X_{10} + \mu_i .....$

Where,

Y_1 = dependent variable (propensity scoring index)

β = vector of unknown coefficients

X_1 = Age (years)

X_2 = Sex (1 if male, 0 if otherwise),

X_3 = Marital status

X_4 = Education (years)

X_5 = Farming experience (years)

X_6 = Involvement in farming

X_7 =Farm size (Ha)

X_8 =Quantity of sorghum harvested (Kg)

X_9 =Fertilizer (Kg)

X_{10} = Farm distance (km)

$\beta_1 - \beta_{10}$ = Coefficients of variables

β_0 = Constant

μ = Error term.

2.2 Ordinary Least Square (OLS) Regression Model

The OLS regression model is specified in implicit and explicit form thus;

Implicit form:

$Y=f(X_1,X_2.....X_{11})$

The explicit forms of the regression equation fitted to the data were specified as follows:

Linear:
$Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\beta_6X_6+\beta_7X_7+\beta_8X_8+\beta_9X_9+\ldots+\beta_{11}X_{11}+\mu$
Double-log:
$\ln Y =\ln\beta_0+\beta_1\ln X_1+\beta_2\ln X_2+\beta_3\ln X_3+\beta_4\ln X_4+\beta_5\ln X_4+\beta_5\ln X_5+\beta_6\ln X_6+\ldots+\beta_{11}\ln X_{11+}\mu$
Exponential:
$\ln Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\beta_6X_6+\beta_7X_7+\beta_8X_8+\beta_9X_9+\ldots+\beta_{11}X_{11}+\mu$
Semi- log:
$Y=\ln\beta_0+\beta_1\ln X_1+\beta_2\ln X_2+\beta_3\ln X_3+\beta_4\ln X_4+\beta_5\ln X_4+\beta_5\ln X_5+\beta_6\ln X_6+\ldots+\beta_{11}\ln X_{11+}\mu$ Where;
Y = Income per production cycle (₦)
X_1 = population density of the plant ($kg/m^{2)}$
X_2 = Quantity of seed used (Kg)
X_3 = Labor (man days)
X_4 = Capital input (depreciation in naira)
X_5 = Farm size (ha)
X_6 = Experience in sorghum farming (years)
X_7 = Adopted technology (number of technologies adopted)
X_8 = Level of education (number of years spent in formal schooling)
X_9 = Price of sorghum per bag (₦)
X_{10} =Transportation cost (₦)
X_{11}= Amount of credit received in (₦)
$\beta_1-\beta_{11}$= Coefficients of variables
β_0 = Constant
μ = Error term.

3. Results and Discussion

3.1 Socio-Economics Statistics of the Respondents

The distribution of the respondents according to their socio-economic characteristics is presented in Table 1. It showed that the mean age of the Sorghum farmers that benefited from the empowerment program was to be 37.35 and that of the non-beneficiaries was 34.18. It was also observed that majority (52.60% and 38.50%) of the sorghum farmers were between the ranges of 31-40 years and the predominant age bracket belong to the productive and economically active age group which portends better future for production in agriculture.This agreesthat there's a significant relationship between farmers age and efficiency in agricultural production where younger farmers have the tendency to operate more efficiently than older farmers.37.20% of the beneficiary respondents were males while that female is 62.80%,The males for the non- beneficiaries were 84.60% and the females were 15.40%.The majority of the respondents for the beneficiaries were single constituting 50% while 48.70% were married and 1.30% were separated. 85.90% were married while 12.80% were single and 1.30% were separated for the non- beneficiaries.The mean of the farm size of the beneficiaries is 1.48 with the range of 0.51 – 1.00 (ha) and 1.28 with the range of 1.51 – 2.00 (ha) for the non-beneficiaries.

3.2 The Effect of *Fadama* III AF on the Income, Output, Labour and Area of Land Cultivated Respondents

Table 2 showed that the beneficiaries earned extra average income of ₦349,185.90 more than the non- beneficiaries and this implies that the *Fadama* III AF had a positive effect on the beneficiaries of the empowerment programme. As expected the difference is statistically significant at 1% level given the large and significant level of the project on productive assets of the beneficiaries. Furthermore, the result revealed that the output of the beneficiaries increased with 520.83kg more than the non-beneficiaries which implies a positive effect on the beneficiaries statistically significant at 1% level. This is similar to the findings of Ogbonna and Nwaobiala (2014) who reported that *Fadama* III had positive impact on the output and income of rural women farmers in Gombe State, Nigeria.

Table 1. Socio-Economic Characteristics of the Sorghum Farmers

Variables	Beneficiaries		Non-beneficiaries		Pooled	
	Frequency	**Percentage**	**Frequency**	**Percentage**	**Total**	**Percentage**
Age(years)						
21-30 years	17	21.8	3	3.8	-20	25.60
31-40 years	41	52.6	30	38.5	71	91.10
41-50 years	16	20.5	27	34.6	43	55.10
51-60 years	3	3.8	18	23.1	21	24.80
Greater than 60 years	1	1.3	-	-	1	1.30
Total	78	100	78	100	156	100.00
Mean	37.35		34.18			35.76
Sex of Respondents						
Female	49	62.8	12	15.4	61	39.10
Male	29	37.2	66	84.6	95	60.90
Total	78	100	78	100	156	100.00
Marital status						
Single	39	50	10	12.8	49	31.41
Married	38	48.7	67	85.9	105	67.31
Separated	1	1.3	1	1.3	2	1.28
Total	78	100	78	100	156	100.00
Farm size						
0.01-0.50	3	3.8	15	19.2	18	11.54
0.51-1.00	37	47.4	13	16.7	50	32.05
1.00-1.50	16	20.5	8	10.3	24	15.38
1.51-2.00	14	17.9	31	39.7	45	28.85
2.01-2.50	5	6.4	11	14.7	16	10.26
Greater than 2.50	3	3.8	-	-	3	1.92
Mean	1.28		1.48		1.38	
Total	78	100	78	100	156	100.00

Source: Field survey, 2018

Table 2. Estimated Effect of *Fadama* III AF on the Income, Output, Labour and Area of Land Cultivated Respondents (Nearest Neighbor Matching as the Lead Method)

Matching method	Outcome indicator	ATT	t-value
Nearest neighbor matching	Income	349,185.90	5.279***
	Area of land cultivated (ha)	-0.76	1.194
	Labor used (man days)	-152.25	2.605***
	Output	520.84	6.097***
Radius matching	Income	357,032.50	7.95***
	Area of land cultivated (ha)	-0.59	0.981
	Labor used (man days)	-143.66	4.258***
	Output	570.72	5.856***
Kernel matching	Income	353,919.50	9.861***
	Area of land cultivated (ha)	-0.72	2.462**
	Labor used (man days)	-150.55	2.659***
	Output	527.80	4.801***
Stratification method	Income	352,352.10	16.490***
	Area of land cultivated (ha)	-0.128	0.280
	Labor used (man days)	-110.563	5.364***
	Output	610.51	8.474***

Source: Field survey, 2018

Note:*Significant at 10% probability level, ** Significant at 5% level, *** Significant at 1% level.

The labour used in (man days) increased by 152.248 more than the non-beneficiaries also signifying positive effect on the beneficiaries of the program and was statistically significant at 1% level. Contrarily, it was found that the difference in the area of land cultivated by the beneficiaries and non-beneficiaries was not significant.

3.3 The Determinants of Income of *Fadama* II AF Beneficiaries and non-beneficiaries in Sorghum Production in Niger State

The OLS regression estimates of the determinants of income of *Fadama* II AF beneficiaries in sorghum production in Niger State are presented Table 3. The exponential functional form was chosen as the lead equation based on the number of significant variables. The result revealed that the F-value of 13.13 was statistically significant at 1% level of probability. This implies that the whole model was significant, that is, there was a significant relationship between the dependent variable and the independent variables included in the model.

Table 3. Determinants of the Income of the Beneficiaries in Sorghum Production (Exponential as the Lead Function)

Variables	Linear Coefficients	Exponential Coefficients	Double log Coefficients	Semi-Log Coefficients
Constant	555009.60 (2.04**)	13.32 (28.***)	0.14 (0.03)	-7542335 (-2.64**)
Seed (kg)	15737.49 (4.95***)	0.03 (5.16***)	0.01 (0.12)	13354.01 (0.35)
Labour (man-day)	704.82 (2.12**)	-0.01 (-2.40**)	0.11 (1.57)	67062.12 (1.47)
Capital input (₦)	-1.60 (-0.43)	-4.68 (-0.75)	-0.03 (-0.33)	-10013.56 (-0.21)
Farm size (ha)	50446.97 (1.96*)	0.06 (1.41)	0.28 (4.65***)	166509 (4.50***)
Farming experience (years)	-3833.51 (-1.46)	0.01 (2.14**)	-0.02 (-0.69)	-4790.53 (-0.24)
Adopted Technology (number)	-7198.30 (-1.49)	0.02 (1.89*)	-0.02 (-0.36)	-6128.95 (-0.18)
Education (years spent in school)	-211.01 (-0.15)	0.01 (0.06)	-0.01 (-0.05)	-150.72 (-0.06)
Price of sorghum (₦)	19.76 (0.92)	0.01 (1.08)	1.35 (0.01)	830344.6 (2.65**)
Transportation (₦)	54.00 (2.38**)	0.01 (2.68***)	0.01 (2.94***)	6027.54 (2.04**)
Credit (₦)	0.17 (0.41)	3.08 (0.44)	-0.00 (-0.11)	-490.44 (-0.16)
R^2	0.6693	0.6621	0.4800	0.4600
R^2 Adjusted	0.6199	0.6117	0.4024	0.3794
F Value	13.56***	13.13***	6.18***	5.71***

Source: Field survey, 2018

Note: values in parenthesis are t-values.*Significant at 10% probability level, ** Significant at 5% level, *** Significant at 1% level.

It also shows that the coefficient of multiple determination (R-squared) was 0.6621. This implies that 66.21% variation in the income of the sorghumfarmerswas explained by the explanatory variables included in the model, while the remaining 33.79% not explained is as a result of variables not included in the model as well as factors beyond the farmers' control. The estimated coefficients of seed (0.03), farming experience (0.01), number of adopted technologies (0.02) and transportation cost (0.01) were positive and statistically significant at 1%, 5%, 10% and 1% level of probability

respectively. This implies that for a unit increase in each of these variables holding other variables constant will lead to increase in the income of the beneficiary sorghumfarmers by 3.00%, 1.00%, 3.00 and 1.00% for seed, farming experience, number of adopted technologies and transportation cost respectively. Conversely, the estimated coefficients of labour (-0.01) was negative and statistically significant at5% level of probability indicating that a unit increase in the use of labour holding other variables constant will lead to decrease in income of the beneficiary sorghumfarmers by 1.00%. Summarily, seed, labour, farming experience, number of adopted technologies and transportation were the significant determinants of income of *Fadama* II AF beneficiaries in sorghum production in Niger State.

Table 4. Determinants of the Income of the Non-Beneficiaries in Sorghum Production (Double-Log as the Lead Equation)

Variables	Linear Coefficients	Exponential Coefficients	Double log Coefficients	Semi-Log Coefficients
Constant	-284867.5 (-4.02***)	8.92 (20.35***)	-3.57 (-0.90)	-2494673 (-0.74)
Seed (kg)	-728.84 (-0.22)	-0.01 (-0.02)	-0.08 (-0.95)	-11056.12 (-0.74)
Labour (man-day)	-107.16 (-1.55)	-0.01 (-0.08)	-0.02 (-0.36)	-11046.39 (-1.12)
Capital input (₦)	-0.13 (-0.14)	-6.13 (-1.08)	-0.01 (-0.02)	9171.16 (0.64)
Farm size (ha)	111227.8 (6.52***)	0.70 (6.59***)	0.93 (7.40***)	139176.3 (6.42***)
Farming experience (years)	646.44 (0.83)	0.01 (1.68*)	0.15 (1.79*)	11161.06 (0.78)
Adopted Technology (number)	-1150.54 (-0.59)	0.01 (0.20)	0.01 (0.36)	-1141.84 (-1.01)
Education (years spent in school)	-582.46 (-0.66)	-0.01 (-0.54)	-0.01 (-0.27)	-357.19 (-0.30)
Price of sorghum (₦)	32.33 (5.06***)	0.01 (5.52***)	0.07 (3.99***)	28580.89 (3.86***)
Transportation (₦)	-2.46 (-0.22)	0.01 (-0.22)	-0.01 (-1.60)	-1064.69 (-1.34)
R^2	0.76	0.78	0.78	0.74
R^2 Adjusted	0.73	0.75	0.76	0.71
F Value	24.57	26.56	27.59	21.80

Source: Field survey, 2018

Note: values in parenthesis are t-values.*Significant at 10% probability level, ** Significant at 5% level, *** Significant at 1% level.

For the *Fadama* II AF non-beneficiaries in sorghum production in Niger State, the OLS regression estimates of the determinants of income are presented in Table 4. The double-log functional form was chosen as the lead equation based on the F-value, R-squared value and the number of significant variables. The result revealed that the F-value of 27.59 was statistically significant at 1% level of probability. This implies that the whole model was significant, that is, there was a significant relationship between the dependent variable and the independent variables included in the model. The estimated the coefficient of multiple determination (R-squared) was 0.78 which implies that 78% variation in the income of the sorghumfarmers was explained by the explanatory variables included in the model, while the remaining 22% not explained is as a result of variables not included in the model as well as factors beyond the farmers' control. Since the double-log function was the chosen equation, the estimated coefficients are the direct elasticities of the variables. The estimated elasticities of farm size (0.93), farming experience (0.15) and price of sorghum (0.07) were positive and statistically significant at 1%, 10% and 1% level of probability respectively. This implies that for 1% increase in

each of these variables holding other variables constant will lead to increase in the income of the non-beneficiary sorghumfarmers by 93.00%, 15.00% and 7.00% for farm size, farming experience and price of sorghum respectively. In essence, farm size, farming experience and price of sorghum were the significant determinants of income of *Fadama* II AF non-beneficiaries in sorghum production in Niger State.

4. Conclusion and Recommendations

4.1 Conclusion

Considering the empirical results obtained from this study, it can be concluded that *Fadama* III AF had a positive impact on the lives of the beneficiaries with the implications that income, output and labour used had a positive impact on the beneficiaries. Quantity of seeds, labour, farming experience, number of adopted technologies and transportation were the determinants of income for the beneficiaries while price of sorghum, farm size and farming experience were the determinants of income for the non- beneficiaries.

4.2 Recommendations

Based on the results of the study, the following recommendations were hereby proffered:

i. The *Fadama* III AF had a positive impact in the lives of the beneficiaries increasing their income and output. Therefore, the Federal Government, ADP, non-governmental agencies and financing institutions (World Bank) should ensure the continuation of the programme and extension to the non-beneficiaries in order to improve the standard of living in the rural area.

ii. The Federal Government and non-governmental agencies in collaboration with the farmers' cooperative societies should formulate policies and programmes that will encourage youths' participation in sorghum production in the rural areas.

iii. The Ministry of agriculture, non-governmental agencies, research institute and financial institutions (CBN) should enhance access to credit, infrastructure facilities such as storage facilities to preserve the farm produce and also provide of drought resistance seed.

References

FAOSTAT (2012). Food and Agricultural organization of the United Nation website. Retrieved 16 August, 2016 from: http://faostat3.fao.org/browse/Q/QC/E

International Food Policy Research Institute (IFPRI), (2010). A 2006 Social Accounting Matrix for Nigeria: Methodology and Results, Nigeria Strategy Support Program.

Nwaobiala, C.U. & Nottidge, D.O. (2013).Effect of Climatic Variables on Cassava Farmers' Production in Abia State, Nigeria. *Nigerian Journal of Agriculture, Food and Environment. 9(4):57-62.*

Ogbonna, M. O. & Nwaobiala, C. U. (2014). Effect of Fadama III Project on Rural Farm Women Production in Gombe State, Nigeria. *Nigerian Journal of Agriculture, Food and Environment,* 10(1):13-18.

Ogbonna, M. O. (2011). Current Developments in Malting and Brewing Trials with Sorghum in Nigeria: A review.*Journal of the Institute of. Brewing, 117, 394–400.*

Ominikari, A.G., Kuforiji, O.A. & Eshiet A.A. (2017). Assessment of the Benefits of National Fadama III Agricultural Project among Participants through her Activities (Indicators) in Bayelsa State. *International Journal of Environment, Agriculture and Biotechnology,* 2(4):2149-2155

Zalkuwi, J., Singh, B. M., Singh, O. P. & Tribhuvan, S. U. P. (2015)**.** Possibility of Improvement in Sorghum Production: A Comparative Study of Technical Efficiency in India and Nigeria. *International Journal of Advances in Agricultural Science and Technology,* 2(10):1-12.

BAYESIAN MODEL COMBINATION SCHEMES: AN EXAMPLE OF MODELLING SELECTED GRAINS SPOT PRICES

Krzysztof Drachal
University of Warsaw, Faculty of Economic Sciences, Poland, Email: kdrachal@ wne.uw.edu.pl

Justyna Góral
Institute of Agricultural and Food Economics - National Research Institute, Poland

Włodzimierz Rembisz
University of Economics and Human Sciences in Warsaw, Management and Finance Department, Poland

Abstract

Certain researches identified that both the drivers of agricultural prices, and the strength of these drivers impact on agricultural prices is varying in time (Li et al., 2017). In other words, for the different time periods, different variables are playing the major role as the drivers of the commodities prices. This leads to the fact that "the best" econometric model explaining a given commodity price changes with time. Quite a novel example of an econometric method including such features is Dynamic Model Averaging proposed by Raftery et al. (2010). However, this method can be easily adapted from model averaging technique to model selection one. Moreover, Barbieri and Berger (2004) argued that common procedure to select the model with the highest posterior probability is not always optimal; and, therefore, they proposed Median Probability Model. This research focuses on wheat, corn and soybean spot monthly prices since 1976. Following the literature, fundamental factors, financial factors and general macroeconomic factors were used as explanatory variables (Chen et al., 2012; Fernandez-Diaz and Morley, 2019; Nazlioglu and Soytas, 2012). The novel Bayesian methods applied herein were compared in a sense of forecast accuracy with some benchmark models. Secondly, the obtained results were used to describe time-varying patterns of how different variables impact grain prices during different time periods.
Keywords: Agricultural Prices, Forecasting, Grains Prices, Model Averaging, Model Uncertainty.

Acknowledgement

(K.D.) Research funded by the Polish National Science Centre grant under the contract number DEC-2015/19/N/HS4/00205.

TUNISIANS CONSUMERS PREFERENCES REGARDING FUNCTIONAL FOOD

Erraach Yamna
National Agronomic Institute of Tunisia INAT, Laboratory of Rural Economy, Tunisia
Email: emna_raach@ yahoo.fr

Arfa Lamia
National Agronomic Institute of Tunisia INAT, Laboratory of Rural Economy, Tunisia

El Hammemi Manel
National Agronomic Institute of Tunisia INAT, Laboratory of Rural Economy, Tunisia

Abstract

Consumers are becoming increasingly concerned about their health and pay more attention to the healthiness of their diet. Functional food represent an emerging sector in markets where consumers are increasingly looking for products with functional ingredients such as probiotics, omegas or vitamins as a means to boost their well-being. In Tunisia Functional foods are relatively news and their consumption is still limited. In this context this paper applied Conjoint Analysis method (CA) to elicit consumer preferences over attributes of functional foods using dietary cookies as functional product of interest.

The application of the Conjoint Analysis has considered four attributes of dietary cookies: the taste (fruits; chocolate; nature), the price in dinar per package of 180g (low: 4,6; medium: 6,3; high: 10,6), energy intake in Kilo calorie / 180g (low: 670; medium: 780; high: 890) and the composition (oat meal; barley flour; wheat flour; corn flour)

The information handled in this research were obtained from a face survey performed to 420 consumers of dietary cookies in Tunisia. The main findings of the present study indicate that consumers express positive attitudes towards the consumption of local dietary cookies. Indeed, results indicate that the composition and the price of dietary cookies are the attributes that most affect consumers´ preferences. Finally the profile of the most preferred dietary ookies by Tunisians consumers was identified.

Keywords: Functional Food, Dietary Cookies, Preference Structure, Conjoint Analysis, Tunisia.

MODELING ALTERNATIVE TECHNOLOGY ADOPTION TRANSFORMATION SCENARIOS TO ACHIEVE PRODUCTION AND ECONOMIC PERFORMANCE GOALS IN THE URUGUAYAN BEEF CATTLE SECTOR

Enrique Fernández
INIA, Applied Economics, Uruguay, E-mail: efernandez@ inia.org.uy

Juan Manuel Soares de Lima
INIA, Applied Economics, Uruguay

Bruno Ferraro
INIA, Applied Economics, Uruguay

Bruno A. Lanfranco
INIA, Applied Economics, Uruguay

Abstract

The Agricultural Transformation Pathways (ATP) for Uruguay and two other selected study cases issued in 2016 in the frame of the UN´s Sustainable Development Solutions Network (SDSN) projectmade relevant advances in setting the desired and feasible goals and development objectives for 2030 (Schwoob et al., 2016). Beef is one of the main agri-food chains included in Uruguay´s first studies given is the country´s main export and production is the largest in terms of land used (12,6 million ha) and farms involved (44780).

Understanding the relationship among the multiple factors driving farmers´ decision making process is crucial for policymakers and experts selecting the best pathway to overcome roadblocks and reach goals. This paper addresses the relationship between farm business orientation, farm size, technological level, production performance and economic return in the beef cattle production sector. The objective is to understand the main constraints to the adoption of technology and the main factors to consider in the design of future assistance programs. Furthermore, different alternative scenarios of change in technology adoption were considered over the actual situation and modeled, evaluating impacts on the country´s average beef production performance indicators, number of cattle slaughtered and beef sector economic return.

Using data from the National Cattle Farm Survey 2016 (1298 farms) (Bervejillo et al, 2018) Uruguay´s cattle farms were classified according to their livestock business main orientation: cow-calf operations (CC, 42%), cow-calf and backgrounding (CCB, 14%), cow-calf and pasture finishing (CCF, 31%) and cattle pasture finishing only (F, 13%). Within these groups “land extension” was used for further classification as “Small”, “Medium” or “Large” scale farm operations (50-500 ha, 501-1250 ha, and >1250 ha).

As a proxy for the intensity of technology use a Technological Index (TI) was developed and calculated for each farm using data of application of specific production practices, farm production efficiency indicators and the extension and type of improved pastures in the farm.

Results show a big proportion of Uruguayan cattle farms in the lower levels of technology use (52%), being larger for CC (62%) and CCB (45%) operations. Farms in the “Improved” technological level although less in number, account for 27% of the cattle land of the country, being the rest of the land almost evenly distributed among the other levels (17 to 19% each).

CC farms, in particular, show a strong relationship between farm size and technological level. Small farms classified mainly in the Basic level, with a decreasing proportion trend in the other levels. Large farms, on the other hand, have an opposite trend, with an increasing proportion of farms as technological level improves.

Further analysis shows a large number of farms with a very low level of technology use, particularly in the cow-calf component of the production process. In most cases, even the most basic

and well-knownpractices, with no implementation incremental cash costs are disregarded. Excess stocking rate (Boné&Perugorría, 2011) and lack of facilities for specific technology implementation are main restrictions affecting reproduction and production performance. Small farmers´ perception of cattle accumulation as a denotation of wealth and also as a secure readily available savings fund is the main cause of the excess stocking rate. Consequences are not only lower production performance but also a higher vulnerability at extreme climatic events.

Different alternative scenarios of change in technology adoption were considered over the actual situation and modeled (Soares de Lima, 2009) and compared to the 2030 ATP´s (SDSN) projected goals for the Uruguayan beef sector. Production and economic performance results for each business orientation, and farm size were country-averaged for each scenario.Change in production practices modeled reached in some cases a 30% increase in productivity and 25% in animals slaughtered per year, driven by improvements in reproduction indicators, pasture quality, and availability, and increased supplementation among others. Farms economic return also showed a positive trend while a decrease in GHG emissions per unit of product was projected as a result of better feeding and consequent shorter age to slaughter.

However, results show that important changes in the level of technology use are needed to achieve a meaningful impact on the country´s average performance indicators for the beef sector. Modeling results show that when seeking higher productivity,efforts should focus on farmers with more than a basic level of technology use. Alternatively, welfare concern and other supports should focus on a relatively large number of small cow-calf operations with a very basic level of technology use and limited impact on the sector´s productivity.

Keywords: Sustainable Intensification, SDSN, Technology Adoption, Livestock Production Modeling.

THE GRAIN-FOR-FEED PLAN: A SUPPLY-SIDE REFORM CASE STUDY IN INNER MONGOLIA AUTONOMOUS REGION OF CHINA

Changbai Xiu
Inner Mongolian Agricultural University and Inner Mongolia University for Nationalities, China
E-mail: xchangbai@ imau.edu.cn

Fengying Nie
Academy of Agricultural Sciences, Department of Agricultural Economics and Center for Overseas Agricultures, China

Yuchun Liu
Inner Mongolian Agricultural University, College of Economics and Management, China

Abstract

Based upon the practices in Inner Mongolia Autonomous Region, this paper presents the setting of the "Grain-for-feed Plan" (hereinafter called the Plan) initiated by the Ministry of Agricultural and Rural Development on behalf of the Central Government of China, exams the willingness, economic returns, social impacts and suggestions for future development of the Plan. It concludes that (i) the Plan is welcomed by both the local government and grassroots people in transiting local agricultural patterns and increasing farmer's income; (ii) this Plan is having and will have an deep and long impacts on shaping future agricultural patterns and agribusinesses and modernizing future agricultural industries and rural societies; (iii) there are problems and challenges that need to be solved in order to smoothly push and implement this Plan; and (iv) policy suggestions including expanding publicity of the Plan, increasing transparency in implementation, equal participation and management of farmers are discussed.

Keywords: Grain-for-feed Plan, Supply-side Reform, Inner Mongolia, Agricultural Structural Changes, Cost-Benefit Analysis

TRADE DIVERSION AMONG COSTA RICA AND ITS MAIN PORK MEAT PARTNERS

Víctor Rodríguez Lizano
University of Costa Rica, Department of Agricultural Economics and Agribusiness, Costa Rica
Email:victorantonio.rodriguez@ ucr.ac.cr

Mercedes Montero Vega
University of Costa Rica, Department of Agricultural Economics and Agribusiness, Costa Rica

Abstract

This paper examines the effect of the free trade agreements signed by Costa Rica on pork trade creation and trade diversion. Pork imports to Costa Rica are explained by three main partners which are: Canada, Chile and USA, which were included in the analysis. In order to analyze the effects of FTAs on trade flows between our selected countries, especially between Chile and Costa Rica, we constructed an import demand function for Costa Rica with monthly data from 2000 to 2017. The import demand function includes pork meat price, the Costa Rican Openness index against Chile, Costa Rican GDP, population and the exchange rate. We introduced a novel methodology to determine the openness index (OI), two dimensions were considered in order to measure the degree of openness of Costa Rica against each of the three main partners. The first dimension refers to tariff level and the second one to quota level.

Results indicate that Costa Rican pork imports from Chile have being increasing, thus, trade creation can be identified as a possible effect of the FTA. On the other hand, we find that as Costa Rica reduces its tariffs to the Chilean market, pork quantity imported from the USA and Canada decreases, especially from the latter. Overall, the results indicate that FTAs have been creating trade, but in the case of the Costa Rica-Chile FTA it also has been diverting trade from Canada.
Keywords: Pork Meat, FTA, Trade Diversion, Costa Rica, Panel Data

1. Introduction

Since the Uruguay Round and after the creation of the World Trade Organization (WTO), multilateral trade systems have strengthened and many Free Trade Agreements (FTAs) have been signed in the last 25 years (Dai, Yotov, & Zylkin, 2014). Costa Rica, started to engage in international trade by signing FTAs; by the year 1998, the Costa Rican import tariff was 6,35% on average, however, since then, it has signed 13 FTAs and in 2016, the average import tariff was 1,8% (SEPSA, 2018a). The abovementioned tariff relief as well as a higher Gross Domestic Product (GDP) per capita have seem to have a direct impact on Costa Rican imports which have increased 67% in las last four years (SEPSA, 2018a).

During the negotiation of all the above-mentioned FTAs, the agricultural sector represented a heat topic, due mainly to the following reasons:

a) Around 13% of the economically active population depends on agriculture, which means there are 290.393 people whose main economic activity is agriculture (INEC, 2018). This puts pressure on the government when it deals with decisions that affect directly or indirectly the wellbeing of all rural workers, which earn 41,7% less than the average income of an urban worker (SEPSA, 2018b).

b) On the other side, there are big cooperatives which supply national and international markets, for example: Dos Pinos (Dairy) and Coopeagropal R.L. (Oil Palm). This kind of *big players* usually ask the government for protection by using high tariffs, quotas, long relief periods and grace periods.

c) Consumers demand lower prices and high variety of products. As a result, the government has to take wise decisions when a FTA is negotiated, since it has to consider different points of view, especially when certain groups demand for especial conditions.

The Costa Rican meat pork supply chain is organized by 3.589 pork breeders, represented by the National Chamber of Pork Producers (MEIC, 2015). The national meat pork production has been increasing not by adding new farms but due to a productivity increase. On the demand side, there are 174 importers and 3.625 retailers, similarly, the average per capita consumption has increased to 15,41 kg per person by the year 2015 (MEIC, 2015). In the case of Costa Rica, the negotiation of the pork meat trade conditions with Chile and the side effects of its tariff relief had caused several manifestation and farmers disappointment.

Nowadays the FTAs signed by Costa Rica in the past years lead to almost no protection to domestic production and three big countries explain almost 100% of all the pork meat imports: Canada, Chile and United States of America. This situation has caused several conflicts between pork breeders and the government.

The main objective of this paper is to understand if the FTA agreements signed by Costa Rica with Chile have indeed created trade or if they have otherwise diverted trade. If trade diversion happens, when a tariff relief occurs for Chile, it leads to less quantity imported to Costa Rica from the others two partners, which means that Costa Rica will be importing pork meat no necessarily from the more efficient partner, which would affect the efficiency of the market and the wellbeing of consumers and producers.

This paper is divided in five sections. The first one explainsthe conditions of quotas, tariff relief, grace periods, entry into force of each FTA and the supply chain description. The second section stresses the main theory related to the effects of FTA. The third section shows the numerical implementation, the variables considered and the specification of the model in order to measure trade diversion. The fourth section express the results and the fifth section considers some conclusions and policy implications.

2. Pork Supply Chain in Costa Ricaand Trade Conditions

The national supply chain scheme is depicted in Figure 1. Imports can be directly targeted to national consumers or to the national deboning industry, since meat is either imported fresh or frozen.

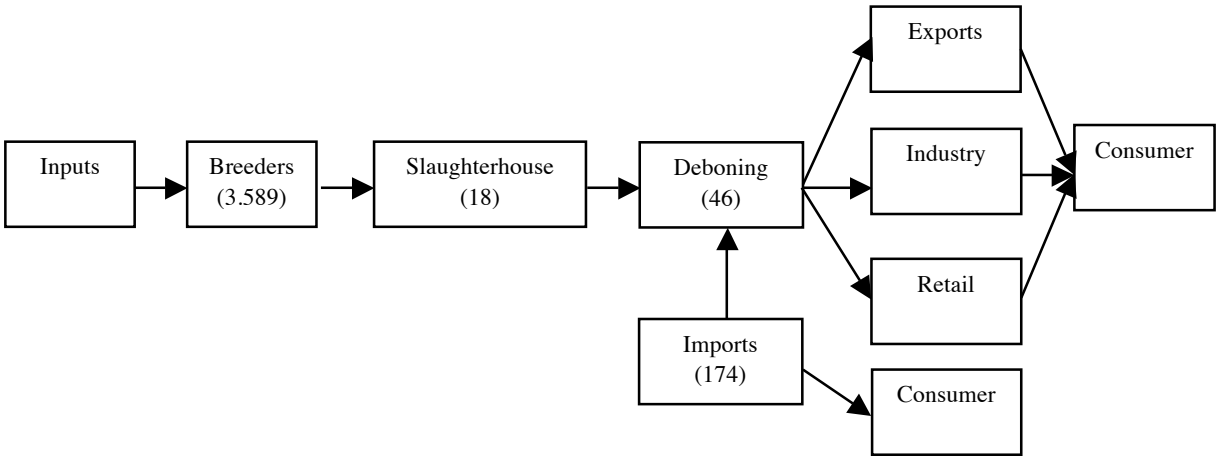


Figure 1. Pork Supply Chain Structure in Costa Rica

As a consequence of FTAs, which conditions are depicted in Table 1, in 2015, Costa Rican pork meat breeders complained due to a 250% import increase which had a direct impact on prices.According to La Nación (2011), from 2010 to 2011, prices reduced in 80% (from 1800 colones to 1000 colones per kilogram of meat). As a result, the National Chamber of Pork Producers has aimed for new niche markets(Rodriguez, 2011), nonetheless, in 2015, it asked the government for safeguard action because of the amount of imports from Chile and USA. For example: in the first four months of 2015, imports were larger than those from 2013.

These circumstances have caused frictions between national breeders and the government. Therefore, the motivation of this paper is to measure the effects of FTAs and their impact on prices by analyzing trade creation or diversion after the Chilean FTA.

Table 1. Fta Conditions Between Costa Rica and Its Main Pork Meat Trade Partners

Country	Tariff Conditions	Quota Conditions
Canada	2001 and before: 46%8 years linear relief from 2002 to 2009 (0%)	525 MT for 2002. Increase 5% each year during 10 years. 46% tariff for Imports that exceeds the quota
Chile	2001 and before: 46%16 year of linear relief from 2002 to 2017 (0%)	No quota limitations
USA	6 years after entry into force at 46% (from 2009 until the end of 2014). From 2015 (included), 9 years of nonlinear tariff relief which ends in 2023 (0%)	15 years of nonlinear increasing changes until reaching an unlimited amount of tones. From 1100 MT in year 1 to 2725 MT in year 14. By the year 15 the quota is totally free up.

3. Theoretical Framework

The analysis of the effects FTAs can be traced back to Viner(1950) who first addressed the concepts of trade creation and trade diversion. Trade creation occurs when a cheaper product replaces a more expensive one because of a reduction in trade barriers. Consequently, trade creation occurs when the volume of goods traded among the members of the FTA increases. By contrast, trade diversion takes place when a cheaper product of the non-member states of the FTA is substituted for a more expensive one produced by the member states as a consequence of the elimination of trade barriers. In order to estimate trade flows, and therefore determine if trade creation or diversion occurred, gravity models have been the most widespread method for cross-country analysis. Therefore, our theoretical framework considers mainly gravity models often related to milestones in specific regions, mainly due to FTAs.

Clausing (2001) analyzed the Canada-USA FTA which had noticeable effects on trade flows between these countries. The model is structured to measure to which extend did the FTA created trade among these countries and to which extent did trade increased as a result of trade diversion. Import demand and supply were specified by price, exchange rates and income for various goods. Goods undergoing the largest tariff liberalizations were the ones whose trade increased the most, as it is expected.

In this sense and in order to address the extent of trade liberalization, further than solely by the direct effect of FTAs, Sandrey, Jensen, & Vink (2011) used a variation of the Global Trade Policy Analysis (GTAP) model. Data from the South African Costumes Union (SACU) and Mercosur`s FTA was used to explore the importance of agricultural production in the both "south" regions and its potential welfare and trade gains. Results show that there are welfare gains to South Africa by GDP increase un 0,12%. These derive from a better use of land, labor and capital of capital employed in the economy; and a small contribution from increased labor employment. However, these gains were affected by the South African terms of trade. The South African agricultural sector did not benefit directly from the FTA but Mercosur did, since imports from this costums union would increase in $422 million dollars. The difference in these results are based on Mercosur´s more developed agricultural sector.

Anderson & Yotov, (2016) implemented a gravity model to address the effects of terms of trade of FTA by using industry-level data on bilateral trade flows in different sectors such as food, textile, wood, paper, chemicals, minerals, metal and machinery industries to analyze partial effects on trade flows. Variables included in this model were: data on bilateral distances, contiguous borders, colonial ties, common language, and elasticity of substitution, tariffs, and the presence of regional free trade agreements. As in Sandrey et al (2011) `s results, large inferred volume effects of FTAs are attributed to non-tariff cost reductions, since they exceed reasonable attribution to tariff changes.

Whether a FTA entails trade creation or trade diversion is not straightforward. For example (Dai, Yotov, & Zylkin, 2014) used a gravity model and analyzed the manufacturing industry of 64 countries, considering 41 trading partners. In this case, results indicate trade diverting effects of FTAs: trade

diversion is stronger for member imports than for exports and stronger still for internal trade. This research also addressed internal trade and suggests trade diversion affected internal trade an additional 21.1% more so than international trade, all else being equal. Models allowing for heterogeneity in trade diversion effects may generate different welfare implications.

Baier & Bergstrand (2007) first addressed the endogeneity of FTA since trade policy is an endogenous variable. Results showed that on average, a FTA induces approximately a 100% increase in bilateral trade between members, relative to non-member countries within ten years. These volume changes exceed the explanatory power of tariff changes and occur due to the reduction in trade costs, reduction of regulatory barriers and enhanced security of bilateral trade which created relationship specific investment.

Admassu (2017) analyzed the trade creation of African countries depending on their regional agreements. This research focuses on intra-African trade and concluded broader and deeper trade blocs are the most effective way to enhance trade and benefits to these countries. This research used a gravity augmented model. Currently, Africa remains a major importer of food and lower-end industrial products from the rest of the world, making most African countries highly dependent on imports from outside Africa. There is significant intra-African trade potential since most African countries are open. The African regional trade flow is very limited (10%) lagging behind the rest of the World´s regional trade agreements. However, this occurs because of the heavy reliance on foreign exchange earnings and tax revenues from foreign trade as well as transport and communication infrastructure, domestic trade and regulatory policies and inefficient border administration.

Based on estimation of the gravity equation,Zolin & Uprasen (2018), analyzed the effects of the economic integration of the European Union (EU) by focusing on trade diversion and trade creation effects of the fifth EU enlargement, considering12 groups of agricultural and food products. Variables included in the analysis were: GDP, population, distance, exchange rate. Results indicate trade creation in 10 product groups (live animals, seafood, cereals, vegetables and fruits, sugars, colonial products, feedstuffs, beverages and tobacco, woody plants, and animal and vegetable materials) including the total agricultural products. Trade creation effects are significantly high in 4 product groups (seafood, woody plants, beverages and tobacco, and animal and vegetable materials). However, trade diversion effects are found in animal and vegetable oils and textile fibers.

Gravity equation models often include Ordinary Least Squares (OLS) or panel data models in which explanatory variables account for GDP, size of the population, distance between countries, common language, common boarder, and dummy variables for the existence or not of FTAs. As it was beforementioned, results are not straightforward and depend not only in the conditions of FTAs, therefore our model intends to measure and analyze the effect of FTA especially addressing if it created trade among partners or if it was otherwise, diverted to other "outside of the FTA" members.

4. Numerical Implementation

In order to analyze the effects of FTAs on trade flows between our selected countries, especially between Chile and Costa Rica, we have constructed import demand functions for Costa Rica with monthly data from 2000 to 2017. These imports being from Chile and from ROW. Both of our import demand functions are specified in equation 1:

$$I_{it} = \beta_1 P_{it} + \beta_2 OI_{it} + \beta_3 GDP_{it} + \beta_4 Pop_{it} + \beta_5 ER_{it} \quad (1)$$

Where:

$P_{it} = pork\ meat\ prices\ in\ dollars$

$OI_{it} = openness\ index\ (proxy\ for\ quotas\ and\ tarrif\ rate\ reduction\ schemes)$

$GDP_{it} = Gross\ Domestic\ Product$

$Pop_{it} = population$

$ER_{it} = exchange\ rate$

To determine the openness index (OI), two dimensions were considered in order to measure the degree of openness of Costa Rica against each of the three main partners. The first dimension refers to tariff level and the second one to quota level.

Before the FTAs, Costa Rica had a 46% tariff for pork meat. Thus, we counted 46% tariff as 0 openness and 0% tariff as 100 openness points. The OI corresponds to a weighted average in which

the tariff score weights 90% of the final openness index. On the other hand, the quota score represents the ratio between the quota admitted by Costa Rica in year i and the production of the Country n in year i. Therefore, the higher the quota admitted, the greater the openness of Costa Rica; it reaches 100 points when the quota is free up; the quota score weights 10% of the final openness index. Following the above-mentioned procedure, an openness index of Costa Rica against each partner was calculated. This is how, three openness indexes were obtained, one for Chile, one for Canada and another one for USA. As the main objective of this paper is to measure trade diversion or creation after the Costa Rica-Chilean FTA got into force, we kept the Chilean openness index and we merged the Canada and USA openness index into one new weighted openness index call Rest of the World (ROW). The ROW index was weighted using the share of each of the two remain countries (Canada and USA) into the Costa Rican pork meat imports. The OI value will be a number between 0 and 1; in which 0 represents the most restrictive scenarios for trade (e.g. low quotas and high tariff) and 1 represents the best scenario for trade (e.g. high quotas or unlimited and 0% tariff).

The openness index for the country n in year i was calculated using the following equation:

$$OI_n^i = 0{,}9\left(1 - \left(\frac{t_n^i}{46}\right)\right) + 0{,}1\left(\frac{Q_n^i}{LS}\right) \quad (2)$$

Where the $\left(1 - \left(\frac{t_n^i}{46}\right)\right)$ factor measures the openness via tariff and the $(\frac{Q_n^i}{LS})$ measures the openness via quota. For the case of the ROW-OI the following equation was used:

$$OI_{ROW}^i = 0{,}47 * OI_{USA}^i + 0{,}53 * OI_{Canada}^i \quad (3)$$

5. Results

In order to specify our model, we conducted the following tests and determined random effects model is preferred to fixed effects models (Hausman = 0,5595). In both cases Panel data in preferred to OLS, since different countries and time periods account for the model´s variability.

Table 2. Tests for Model Selection

	Fixed Effects	**Random Effects**	**Between Fixed and Random Effects**
Test	F-test	Breusch Pagan Lagrange multiplier	Hausman test
Ho	groups have the same intercept	Variance across entities is zero, therefore there are no significant differences	Random-effects model is preferred to Fixed-effects model
Results	0,0345, therefore Fixed-effects model is preferred to OLS model	0,3163. Therefore Random-effects model is preferred to OLS model	0,5595. The Ho is not rejected.

Table 3. Random Effects Panel Data Independent Variable: Costa Rican Pork Meat Imports

Variable	**Coefficiente**	**p-value**
const	13194.2	(0,3927) ***
GDP	6,93E-04	(0,0170) ***
Pop	−9.93742e-05	(0,0412) **
ER	−1.40940	(0,0201) **
OI	1403.87	(6,87e-12) ***
P	−134.432	(0,0871) *

Table 3 presents the econometric results of the import demand function. GDP is a proxy for income, therefore, higher income is expected to increase pork imports, and on the other hand if prices

are higher, then pork imports are expected to decrease. The positive sign for the OI indicates higher imports are expected when tariffs reduce.

According to these results and the Hausman test, we can observe there are differences between the Chilean and the ROW (USA and Canada) import behavior. Thus, two import demand functions were conducted, one for Chile and another for ROW, aimed at identifying the effect of each OI in the Costa Rican demand function.

In order to analyze the specific case of Chile and the effect of the CR-Chile FTA, we conducted an OLS considering GDP, Costa Rican population (Pop), the exchange rate between Chile and US dollars since all payments are done in dollars.

Table 4. OLS Chilean Imports to Costa Rica 2000-2017

Variable	Coefficiente	p-value
const	2713.37	(2.81e-10) ***
OIChile	5852.22	(3.02e-10) ***
PROW	−290.205	(7.54e-05) ***
ERChile	−5.24524	(2.72e-11) ***
CR GDP pp*	−4.14826	(1.16e-05) ***
R^2 = 0,55		

*Costa Rican GDP per capita

The regression results, indicate as tariffs have become lower, imports have increased (OI positive sign), therefore we can assume trade has been created for the Chilean-Costa Rican market; as a result of lower tariffs, Chile has been able to increase their exports to Costa Rica.

Table 5. OLS ROW Imports to Costa Rica 2000-2017

Variable	Coefficient	P-value
Const	−666.768	0.0002 (***)
OI Chile	−1686.35	0.0143 (**)
P ROW	−162.553	0.0588 (*)
CR GDP pp	3.59774	1.53e-05 (***)
R^2 =0,44		

*Costa Rican GDP per capita

Aside from our main focus of analysis which was the OI and trade creation, the model is also aligned with the behavior of a demand function. For example, as prices increase, the import demand decreases which is expected from a demand model. Also, as GDP increases import demand from Chilean pork meat decreases. In this case, Chilean meat is less expensive than Costa Rican meat; at least on a national scale. Pork meat from Chile seems to be perceived as an inferior good compared to the national one since: when Costa Ricans become richer, their import demand decreases.

On the other hand, the ROW`s import demand was estimated in order to evaluate if trade has been diverted as a result of the FTAs.

The parameter estimates of the OI of Chile are negative. This sign suggests the presence of trade diversion in the Costa Rica-Chile FTA. Therefore, as Costa Rica reduces its tariffs to the Chilean market, pork quantity imported from the ROW decreases. These results are aligned with Susanto, Rosson, & Adcock (2007) who analyzed trade creation and trade diversion in the North American FTA. As mentioned before, ROW is composed by the Canadian and USA imports; in this case the quantity imported from USA shows a trend to increase over the analyzed period, however, the Canadian imports decrease. In this case, trade diversion occurred and Chilean imports substitute the Canadian ones. As expected, price and Costa Rica´s per capita GDP (CR GDP pp) show negative and positive parameters respectively.

Since 2006 imports from Canada started to decrease while imports from Chile started to increase which is aligned with trade diversion results indicated in table 4.

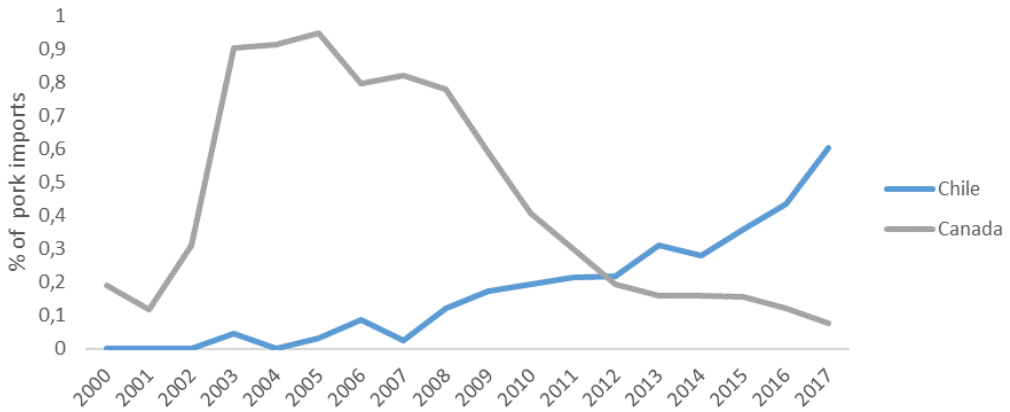


Figure 2. Evolution of Pork Meat Imports to Costa Rica from Chile and Canada

In terms of our methodology, for estimating the degree of trade openness, our OI considers tariff relief as well as quotas, which enables the index to be more flexible against small changes in trade conditions over time. Our estimation of OI was the most significant variable in all models and it provides evidence that supports it is a good proxy for what we have called "degree of openness" between two trade partners. The OI calculated showed to be explain in a good manner the openness of Costa Rica rather than the traditional method to estimate degree of openness ((X+M)/GDP).

6. Conclusion

FTA signed by Costa Rica between 2000 and 2006 created tradesince a notably increase in theoverall amount of pork imports can be observed. Imports fromChile have increased during the last 10 years, however a substitution effect for Canadians imports has being taking place. In this case, the Costa Rica- Chile FTA diverted trade from Canada to Chile.

As a consequence of the FTA and therefore an increase in pork importshas caused Costa Rican domestic prices to decrease which leads Costa Rican pork breeders to face higher degrees of competitiveness. If they cannot adapt to these lower prices, they can end by running out the business.

Is necessary to conduct a welfare analysis in order to show the net effect of the Costa Rica-Chile FTA at least for pork meat. The total tariff relief causes zero revenues for the Government since it no longer received ad-valorem tariffs from importers. Therefore, the welfare net effect depends solely on the leverage betweenconsumer´s surplus (from retail price reduction) andproducer´s surplus (from price reduction). Welfare gains can only be expected if price reductions benefit a higher proportion of the population than those breeders affected by receiving lower prices.

Costa Rica lacks basic price analysis and the pork sector is no exception. During data collection for this research some limitations were faced regarding data gathering. This situation affects not only academia but decision-makers; this research intends to compensate and provide some inputs for decision-makers by determining key variables affecting import demand, as well as an ex-post analysis of trade creation and diversion from the already signed FTAs.

References

Admassu, S. (2017). An empirical analysis of the trade-creation effect of African regional economic communities. *Empirical Economics*. https://doi.org/10.1007/s00181-017-1382-7

Anderson, J. E., & Yotov, Y. V. (2016). Terms of trade and global efficiency effects of free trade agreements, 1990–2002. *Journal of International Economics*, *99*, 279-298. https://doi.org/10.1016/j.jinteco.2015.10.006

Baier, S. L., & Bergstrand, J. H. (2007). Do free trade agreements actually increase members'

international trade? *Journal of International Economics*, *71*(1), 72-95. https://doi.org/10.1016/j.jinteco.2006.02.005

Clausing, K. A. (2001). Trade creation and trade diversion in the Canada - United States Free Trade Agreement. *Canadian Journal of Economics/Revue Canadienne D`Economique*, *34*(3), 677-696. https://doi.org/10.1111/0008-4085.00094

Dai, M., Yotov, Y. V., & Zylkin, T. (2014). On the trade-diversion effects of free trade agreements. *Economics Letters*, *122*(2), 321-325. https://doi.org/10.1016/j.econlet.2013.12.024

La Nación. (2011). Alta importación de cerdo golpea a los porcicultores. Recuperado 27 de febrero de 2019,dehttps://www.nacion.com/archivo/alta-importacion-de-cerdo-golpea-a-los-porcicultores/FW4KKAXKXBC7BPZHAIGJKLLQRQ/story/

Sandrey, R., Jensen, H. G., & Vink, N. (2011). The welfare impact of a free trade agreement between SACU and Mercosur. *Agrekon*, *50*(1), 16-35. https://doi.org/10.1080/03031853.2011.562709

Susanto, D., Rosson, C. P., & Adcock, F. J. (2007). Trade Creation and Trade Diversion in the North American Free Trade Agreement: The Case of the Agricultural Sector. *Journal of Agricultural and Applied Economics*, *39*(01), 121-134. https://doi.org/10.1017/S1074070800022793

Viner, J. (1950). *The customs union issue*. New York: Carnegie Endowment for International Peace.

Zolin, M. B., & Uprasen, U. (2018). Trade creation and diversion: effects of EU enlargement on agricultural and food products and selected Asian countries. *Asia Europe Journal*. https://doi.org/10.1007/s10308-018-0508-7

COMPETITIVE BUSINESS STRATEGY OF A PUBLIC BREEDING INSTITUTE

Zvonimir Zdunić
Osijek Agricultural Institute, Chief Executive Officer, Juzno predgradje 17, 31000 Osijek, Croatia, E-Mail: zvonimir.zdunic@poljinos.hr

Abstract

Due to squeezed public budgets in both developing and developed countries, the governments' policy often include privatization of public plant breeding institutes as a proposed solution to the problem. Since vast of commercial plant cultivars have been developed by conventional breeding techniques, the interest for acquiring such institutions raised over the last several decades. However, not much attention has been paid to developing competitive business strategy within the public Institutes so the customers and society may still benefit from the both its value proposition and public good. At the Osijek Agricultural Institute, Croatia, an early developed focus-and-customer-relationship competitive business strategy has always been a linchpin that could financially and technically underpin plant breeders' education, development of new cultivars and improvement of plant science in the Pannonia region of southeastern Europe. Not less important, this kind of strategy that rely much on personal connection with the customers results better in both - their buying experience and our price positioning in the seed market. It seems that, besides pure transaction, the customers especially appreciate every contact that cannot be found online. Every improvement in this segment of customers' captivity is crucial and therefore of utmost importance for keeping our business strategy competitive, sustainable and enhanced. The example of the Osijek Agricultural Institute that is presented in this paper shows that regardless of being for-profit entity such as a public owned or private research institute, knowledge on choosing and pursuing a proper business strategy is a point of paramount importance, i.e. it is the question of life or death for every kind of market oriented entity.
Keywords: Business, Strategy, Value Proposition, Competitive Advantage, Privatization

1. Introduction

Since 1878, the Osijek Agricultural Institute, Croatia, has been providing research in plant science – from the very first incentives on improving general agricultural practices and early collections of germplasm to the conventional breeding programs aimed to developing non-GMO commercial hybrids and varieties of agricultural plants (maize, wheat, barley, soybean, alfalfa, forage peas, and red clover), supported by the molecular methods such as double haploid and genomic selection. However, long-term debate and misconception about the role of the public plant breeding institutes in the real sector seed industry in southeastern Europe opened certain dilemmas that could be submitted to the following questions: (i) should a public research Institutes practice commercial activities along with scientific ones, (ii) what kind of value proposition, value chain, competitive advantage and competitive business strategy they can perform, and (iii) what about social responsibilities of the Institutes in case of their privatization. This paper deals with this particular agenda that has been on the table for years within the governments and academic community in the region. It includes managerial approach based on Michael E. Porter's foundations and on-the-ground experience in commercial plant breeding and competitive business strategy implementation. It also analyses the importance of having sustainable business strategy that includes a distinctive value proposition along with other strategy's essential elements required for meeting both social and customers' needs as well as retaining Institute's position on the market. Not less important, such comprised scientific and business policy has always helped the Institute for being decisive and as much as possible independent form the general policy makers whose decisions hadn't been always clear and in favor of plant science development.

2. Discussion

2.1. Should a Public Research Institutes Practice Commercial Activities along with Scientific Ones

Public research budgets in developing countries are usually very tight so they do not provide enough money for any sustainable plant breeding program as well as for basic research. In Croatia, for instance, governmental fund for R&D was in range from .74% to .88% of the national GDP vs. 1.77% to 2.04% of the EU GDP for the period 2007-2016 (http://ec.europa.eu/eurostat/). As public budgets are squeezed, research institutes are often being asked to earn more through the sale of their products and services (Tripp and Byerlee, 2000). For the Osijek Agricultural Institute, reinvestment of the profit earned into new cycles of R&D and breeding programs has always been and still is of the utmost importance for its development and sustainability. In such economic environment the overall stability of the Institute relies on combining the following: (i) state budget investment in plant research which never exceed 10% of the total revenue stream, (ii) results of the commercial breeding programs aimed to development of the new commercial cultivars, and finally (iii) results of the seed production and its sales at domestic and foreign market.

Managerial combining of the above listed items and processes actually help development of high performing cultivars and quoting lower than premium seed price for the farmers. Therefore, we may speculate that if there were no Institute, the seed price would rapidly rise at regional market due to reinforcement of the competitors' power. Consequently, societal needs would be probably suffering from the global market players' business policy.

2.2. What Distinctive Value Proposition (VP)

Choosing particular kind of value proposition you will offer your customers is the core of competing to be unique. It is the element of strategy that focuses externally on the customers, at demand side of the business (Magretta, 2012). For the Institute, it is a unique package of seed product along with accompanied extension service aimed to the small and medium size buyers and social benefit. Rural society from which our customers mostly come from and operate in may also benefit form this service through farmers' education on successful crop growing. Improved crop production in such competitive context usually reflects on customers' loyalty by alleviation a potential constraint for expanded use of the Institute's seed products. A distinctive combination of non-GMO seed product, its medium price, personalized relationship with customers and a set of complementary services completes the value proposition for the customers. The VP model of the Institute is shown in Table 1.

Table 1. The Value Proposition Model of the Agricultural Institute Osijek, Croatia

What customers?	**What needs?**
- local farmers	- high yielding cultivars of above average yield stability
- local agricultural enterprises in the country and abroad	- extension service on successful crop growing
- distributors, representatives and direct sales	- plant and soil analysis
What relative price? - acceptable to local farmers (no premium, no discount)	

Various scientific backgrounds of the Institute' staff ensures that, besides the seed product, we can provide a valuable services to our customers as well as free after-sales support such as an extension service, plant lab analyses, field trials statistics, and Field day plot logistic. It means we offer farmer-acceptable seed prices accompanied with convenient services. Alike non-profits, we shift part of our relative value in rural society's favor (analogue to higher price for pure profits). It reflects a part of our social responsibility as a public institution but it also has positive effect to customers' loyalty and our market position as a regional player.

2.3. The Agricultural Institute Osijek Value Chain

The value chain consists of the sequence of internally primary and support activities that an organization performs in order to create a value for customer. Porter (1980) claims that all differences between companies in cost or price derive from the hundreds of activities required to create, produce, sell, and deliver their products or services. The author says that all differentiation is being created right here along with accompanied costs. Therefore, value chain is crucial for understanding competitive advantage. At the Institute, the value chain refers to R&D, conventional breeding, seed production, processing and supplying, marketing and sales, and post-sales service (Table 2). Most of our rivals are not present with R&D and breeding divisions in the region and therefore cannot ensure scientifically based post-sales service to the full extent (Table 2). Following and strictly performing the sequence of those particular activities helps out our strategic positioning on a regional market. By default, small regional farmers are price sensitive and very traditional so they appreciate developing activities being performed at local level. It makes them feel On The Safe Side, Especially In Europe Where The Fear Of Transgenic Plants Is Notably Expressed. Magretta (2012) pointed out that the value chain must be specifically tailored (designed) to deliver a distinctive value proposition to the customers. According to the author, a value proposition that can be effectively delivered without a tailored value chain will not produce a sustainable competitive advantage. These activities are managerially relevant sources of competitive advantage - the things that managers can control. Managing both cost drivers and price drivers of those activities and subactivities may show us what costs could be cut without harming customer value. Strategy is about trying to shape these underlying determinants of profitability (Magretta, 2012).

Table 2. The Two Competing Value Chains

The Value Chain of the Agricultural Institute Osijek				
R&D	Breeding programes	Seed production	Marketing & sales	Post-sales service
The Value Chain for the Most of Rivals				
not in the region	not in the region	Seed production	Marketing & sales	Limited post-sale service

2.4. What Competitive Advantage and Competitive Business Strategy

Competitive advantage refers to an edge that enables a company to earn above industry average profit (Tse, 2018). Competitive advantage lies in the activities that were chosen to perform differently or to perform different activities from rivals (Magretta, 2012). As Porter (1998) argues, competitive advantage arise form the value-creating propositions of a firm or a country. Such propositions may emerge from the firm's (or country's) management of its competitive strategy for competition or its value-creating activities. Kuah et.al. (2013) claim that competitive advantage can also be derived from rare, unique and heterogeneous recourses, which can be translated into capabilities that offer value to both the firm and its customers. Johnson et.al. (2017) stressed out that organizational knowledge is especially important because it may produce competitive advantage. The authors define it as organization-specific, collective intelligence, accumulated through formal system and people's shared experience. It doesn't last forever though, since it can obsolete or get emulated by rivals or new entrants. Therefore, in plant development we consider very specific and narrow based architectural knowledge as the most precious intangible asset of all incumbents. However, competitive advantage is location specific and non-available to the wannabe entrants. To some extent, an informal communication and collaborative practices, even among competitors, should be practiced for promotion of intimate knowledge and collective learning (e.g. exchanging germplasm info or field trials materials). Moreover, it also builds the barrier to get into the industry and therefore contributes to the longer forecast period of competitive advantage. Porter (1985) argues that gaining and sustaining competitive advantage depends on understanding not only a firm's value chain but also how the firm fits in the overall value system (fitting). Although differences in value chain are key source of competitive advantage, it is important to see how chosen activities relate to one another (Magretta, 2012). Each of the independent

choices should enable (reinforce) the value of the other. For example, we believe our basic R&D reinforces plant breeding as our "near market" science; winter countryside meetings with farmers reinforce their decisions on buying our seed products; and extension service impacts social benefit through crop growers' education. It altogether contributes to customers' loyalty and the Institute's reputation. Thus, value or cost of one chosen activity is synergistically affected by the way other activities are performed. The final result of fitting should be strategy enhancement that is characterized by lower costs for institution and higher value for customers. Strategy is about trying to shape these underlying determinants of profitability (Magretta, 2012). Therefore, strategy always means deliberately choosing a different set of activities to deliver a unique mix of value.

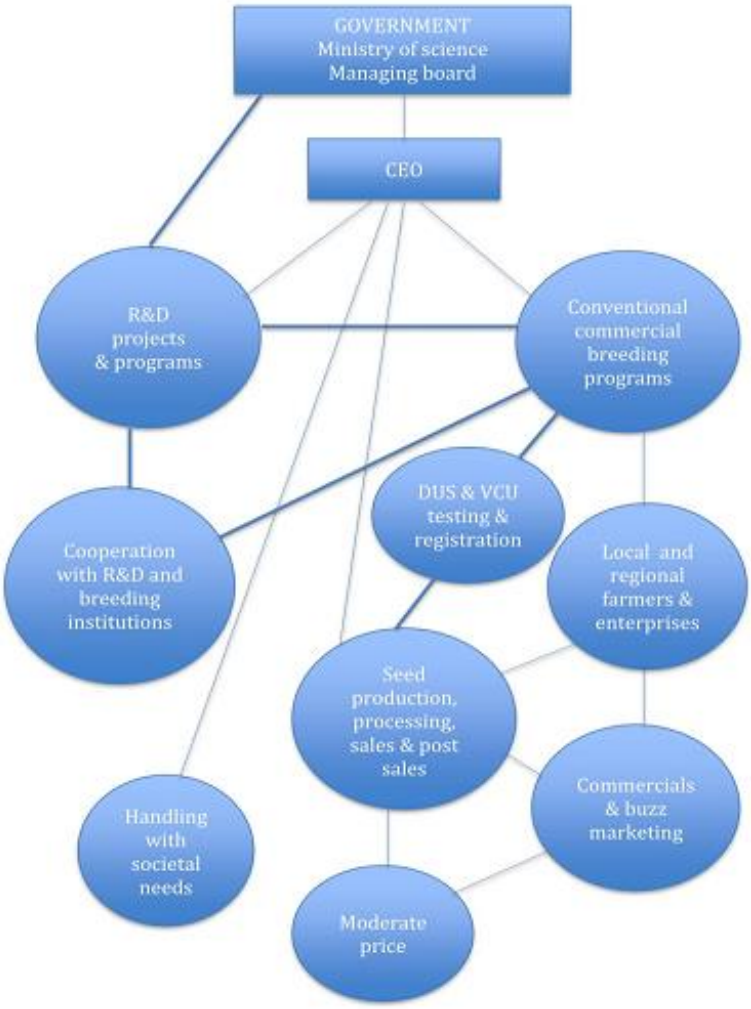


Figure 1. Activity System Map of the Osijek Agricultural Institute

During 140 years of the Institute's continuity, it seems that our customers along with us have contributed significantly to our competitive advantage – actually, we believe they're part of it. We especially value and are proud of the unique relationship with our main distributers and customers. It is a personalized relationship rather than institutional only. Building such relationship is a highly time-consuming process with no shortcuts in its implementation. Carlson (2007) points out that such kind of relationship is characteristic of regional firms and contributes to lowering price and not always expecting normal or industry rates of return on investment. The same author emphasizes this particular relationship as one of the key factors that influence customers' selection of seed products. Greenwald and Kahn (2005) indicated that, besides differentiation and economies of scale, customer captivity represents the most powerful competitive advantage. Authors also pointed out how strategy of being local or an area of focus (concentration) is easier for a firm to get the competitive advantage. Kay (1993) argues that

corporate success derives from competitive advantage that is based on distinctive capabilities, which is most often derived from the unique character of a firm's relationships with its suppliers, customers or employees.

Having into consideration aspects of being public research institution and regional market player as well as limitations in scale so as our concentration on the small to middle size enterprises and customer relationship, it seems that focus type of competitive business strategy is the most appropriate one for the Institute. Applying complementary services such as an extension service to our customers contributes to both creation of the real value for our customers and sets the Institute apart from the rivals (differentiation). Additionally, our customers especially value personal relationship experienced in doing business with the Institute's employees. However, from the standpoint of profitability our rivals probably reach better off, but as a public institution our strategy actually stands at the intersection of public benefit and financial performance. The latter often suffers at the expense of previous because, as explained, we transfer part of our VP into public (social) needs and because profitability itself isn't solely purpose of any public institution. For fully understanding, the complete map of activities of the Osijek Agricultural Institute is shown in Figure 1.

2.5. What About Social Responsibilities of the Institutes in Case of Their Privatization

Fundamentally, knowledge is an "impure" public good, so any research can produce some social benefits that may not be financially profitable to the innovating firm such as nutritional traits and diseases resistance in plants (Thirtle *et.al*., 2001). Contribution to education at universities as well as practical training of plant breeders at the Osijek Institute to acquire hands-on experience is part of our social role. Additionally, our regular donations to charity, sport and art at local community reflect our position as a state-owned public Institute as well. Although some authors suggested flexible strategy for public plant breeding (Tripp and Byerlee, 2000), we believe that only clear, distinct and firmly embodied strategy within an organization would successfully connect organization's profitability and social benefits. Porter (1980) argues that problem is that when you substitute flexibility for strategy, your organization never stands for anything or becomes good at anything. Magretta (2012) points out that flexibility sounds good in theory, but trace it down to the concrete level of the activities you perform and you'll see why flexibility without strategy will guarantee mediocrity-tailoring will be poor, trade-offs inconsistent, fit impossible. Sticking with its strategy allows a company to more fully understand the value it creates and to become really good at it. Tripp and Byerlee (2000), in an era of privatization advocated relinquishing the commercial breeding activities to the private sector or even privatization of the public breeding Institutes. The authors suggest concentration of the public breeding programs to the basic germplasm improvement and leaving to the private sector more applied types of research. Webster (1989) cite the case of privatization of public sector R&D establishments in the United Kingdom that has been forced by the government split "near market" and "basic" research, which again led to dissatisfaction among the staff and a change of direction in both aspects of R&D. Author stresses out his doubts that such policy encourages any greater efficiency. The good thing is, however, that privatization helps institutions to reach some institutional structures on which future innovation in the new technologies will depend. Morris et.al. (2006) point out that public breeding institutes will continue to struggle and have difficult time convincing policy makers that their activities cannot be picked up by private firms. Likewise, on-the-ground experience of the post socialist countries showed that in ownership transformation cases of the plant breeding institutes, they lost their scientific role due to post-privatization problematic staff retention and then a vast of their profit served for private needs only with a very few social responsibilities, if any. It ultimately seems that society of developing countries still benefit much more from the private seed sector indirectly through the public institutions rather than if societal needs purely depend on private firms' business policy.

3. Conclusion

Further development of basic R&D and plant breeding development cycles at the Institute is possible only by inner profit distribution over the Institute's core activities,

Additional customers captivity is an opportunity for the Institute to develop further differentiation from the regional players in the seed industry and keep our competitive advantage sustainable and competitive business strategy focused and enhanced.

Our on-the-ground experience showed that after their privatization in southeast Europe, research institutes lost both their R&D and societal role, and a vast of profit served for private needs only with a very few social concerns.

4. References

Carlson, R. T. (2007). Finding a position for a firm to succeed in the seed industry. A thesis submitted in partial fulfillment of the requirements for the degree Master of Agribusiness. Department of Agricultural Economics, College of Agriculture, Kansas State University, Manhattan, Kansas.

Greenwald, B., Kahn, Judd (2005). All Strategy is Local. Harvard Business Review, September 2005.

Johnson, G., Whittington, R., Scholes, K., Angwin, D., Regnér, P. (2017). Exploring Strategy, Text and cases, Eleventh edition, Pearson Education Limited

Kay, J. (1993). The Structure of Strategy. London business school review. Volume 4, Issue 2, p. 17-37.

Kuah, T. H. A., Esposito, M., Tse, T. (2013). Competitive Advantage Rewired. The European Business Review, July-August, p. 8-11.

Magretta, Joan (2012). Understanding Michael Porter: the essential guide to competition and strategy, Harvard Business Review Press, Boston, Massachusetts.

Morris, M., Edmeades, G., Pehu, Eija (2006). The Global Need for Plant Breeding Capacity: What Roles for the Public and Private Sectors? HortScience, Volume 41(1), p. 30-39.

Porter, E. M. (1980) Competitive Strategy. New York: Free Press.

Porter, E. M. (1985) Competitive Advantage. New York: Free Press.

Porter, E. M. (1998). The Competitive Advantage of Nations. Macmillan Business Press ltd.

Thirtle, C., Heisey, W. P., Srinivasan, C. (2001). Public Sector Plant Breeding In A Privatizing World. ResearchGate, January, p. 1-19.

Tripp, R., Byerlee, D. (2000). Public plant breeding in an era of privatization. National resource perspectives, Number 57, Overseas Development Institute.

Tse, C. M. T. (2018). Corporate Finance, The Basics. Routledge.

Webster, J., A. (1989). Privatisation of public sector research: The case of plant breeding institute. Science and Public Policy, Volume 16, Issue 4, p. 224-232.

POULTRY INDUSTRY: CURRENT STATE AND ROLE IN THE GLOBAL MEAT MARKET

Alesia Efremova
PhD Student, Graduate School of Public Administration (GSPA), Lomonosov Moscow State University, Moscow, Russia, E-mail: alesya-efremova@yandex.ru

Abstract

Within the past decades, we observe the growth of the meat production both in developed and developing countries. World meat production in 2010-2018 increased by 16% from 286 million tons to 331 million tons, according to the data of Food and Agriculture Organization (FAO). During this period, the poultry meat production has demonstrated the most intensive increase – by 24% (pig meat production – by 12%, beef and veal production – by 9%, sheepmeat production – by 13%). Consumption of poultry meat increases regardless of region or their income level. But per capita consumption growth rates will remain higher in developing countries. In many countries, the poultry industry is the only livestock sector that has managed to be successfully adapted to the market economy conditions. The governments of many developed countries strongly supported the industry during this period. The growth of the poultry meat production was ensured not only by the increase in poultry population, but also by the transfer of the industry to an intensive industrial basis. Success of the poultry industry is a fundamentally new and to some extent an unexpected trend in the world agriculture. It can be called a «poultry-farming revolution». The aim of this article is to evaluate the influence of the poultry industry on world food supply. Structural changes in global meat market are analyzed based on recent FAO statistical databases with special attention to geographic concentration or relocation of production and trade across major geographical zones. The findings indicate some possible shifts in export and import structure of meat in near future.
Keywords: Agriculture, Livestock, Poultry Industry, Poultry Meat, Food Supplies, Export, Import

1. Introduction

Rapid growth and technological innovation have led to profound structural changes in the livestock sector, including: a move from smallholder mixed farms towards large-scale specialized industrial production systems; a shift in the geographic locus of demand and supply to the developing world; an increasing emphasis on global sourcing and marketing and changes in production structure. These changes have implications for the ability of the livestock sector to expand production sustainably in ways that promote food security, poverty reduction and public health.

Livestock industry aim at providing population with high-quality food products, which is one of the government's tasks. Poultry industry is able to contribute to meeting population's needs in nutritious and healthy foods at the same time helping to increase food security through the development and strengthening of the industry's production capacity.

Poultry industry is one of the few very specialized branches of agro industrial complex that was created as a complex integrated system providing all processes from poultry reproduction to selling the final products: meat, eggs, etc. The choice of poultry industry development direction takes into consideration international tendencies, scientific achievements and advanced experience. The important factor providing the branch's industrialization is its early maturity and short payback period of investments.

2. Theoretical and Methodological Background

Theoretical and methodological background to the research is works of domestic and foreign academic economists on the most topical issues and trends of the poultry industry development in Russia as well as on key directions of government control of the industry in Russia and countries abroad.

In tackling certain tasks and reasoning the fundamental concepts of the research, abstract logical and graphical methods have been used. Several practical proposals have been elaborated using statistical methods of processing economic data on totality of coverage and SWOT analysis.

3. Results and Discussion

Consumption of meat has increased rapidly in the world over the past decades, particularly from the 1990s onwards. Since the early 1990s, consumption of poultry meat more than tripled, pigmeat consumption has almost doubled (Figure 1). According to OECD forecast, in 2027, the world consumption of meat will be 365.5 million tonnes (+36.1 million tonnes compared with 2018). This has translated into considerable growth in global per capita intake of energy derived from livestock products, but with significant regional differences (OECD-FAO, Agricultural Outlook 2018–2027).

The growing demand for meat has been driven by economic growth, rising per capita incomes and urbanization. In recent decades, the global economy has experienced an expansion, with per capita incomes rising rapidly. Increased incomes strongly positive effect on livestock consumption at lower income levels but a less positive, or even negative, effect at high levels of GDP per capita (FAO. The state of food and agriculture. Livestock in the balance, 2009).

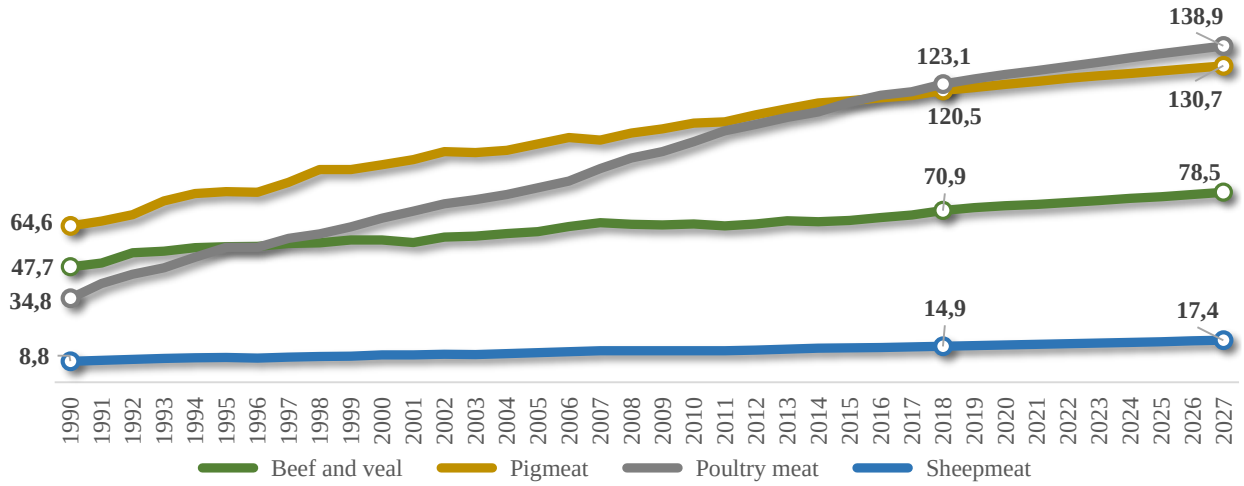
Demographic factors also underlie changing consumption patterns of livestock products. An important factor has been urbanization. The share of total population living in urban areas is larger in the developed countries than in developing countries.

However, urbanization is increasing faster in developing countries than in developed countries. Urbanization alters patterns of food consumption, which may influence demand for livestock products. People in cities typically consume more food away from home and larger amounts of pre-cooked, fast and convenience foods than do people in rural areas. Urbanization influences the position and the shape of consumption functions – the relationship between income and consumption – for food products. Urbanization to have a significant effect on the consumption of animal products, independently of income levels. Another implication of urbanization in many parts of the world is the growing concentration of animals in cities, in close proximity to humans, as people tend to move livestock activities to urban areas.

Social and cultural factors and natural resource endowments can also significantly influence local demand and shape future demand trends. For example, Brazil and Thailand have roughly similar levels of income per capita and urbanization, but livestock product consumption is thrice as high in Brazil as in Thailand. The influence of natural-resource endowments can be seen in the case of Japan, which has considerably lower levels of consumption of livestock products than other countries with comparable income levels but compensates with higher levels of fish consumption.

Natural-resource endowment affects the relative costs of different food commodities. Access to marine resources favours consumption of fish while access to natural resources for livestock production favours consumption of livestock products.

Cultural reasons further influence consumption habits. In South Asia, for example, consumption of meat per capita is lower than income alone would seem to explain.



Source: OECD-FAO Agricultural Outlook 2018-2027

Figure 1. Meat Production in the World, Million Tons of Slaughter Weight

In 2018 global meat consumption amounted to 34.3 kg per capita. Of this meat consumption, poultry sits at 13.84 kilograms per person (40.3%), rising only subtly to 14.7 in 2027 (41,5%).

For many millennia, the leading types of meat in the human diet were beef and lamb. But in a short period of time there happened something which had seemed impossible before. The demand for meat in economically developed countries grows; beef as the main food has given the way to pork and poultry meat (Efremova A. Role of poultry industry in public food supply, 2018). Currently, there is clearly a tendency to replace beef, pork, lamb meat with poultry meat (Table 1).

Table 1. Structure of the World Consumption of Main Types of Meat, KG per Capita

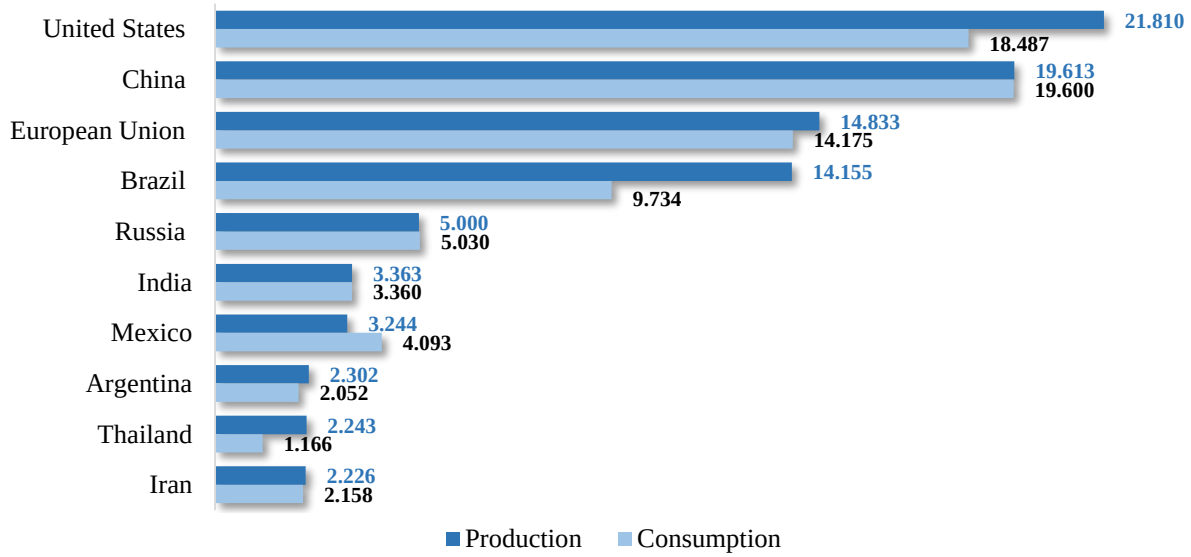
	1990	2000	2010	2016	2017	2018	2019	2027	Share in 2018, %	Share in 2027, %
Meat of all	**23,81**	**29,49**	**32,82**	**34,25**	**34,37**	**34,30**	**34,36**	**35,38**	**100**	**100**
Beef and veal	6,51	6,71	6,58	6,45	6,51	6,5	6,48	6,60	19,0	18,7
Pigmeat	9,83	11,43	12,00	12,28	12,27	12,21	12,23	12,25	35,6	34,6
Poultry meat	5,97	9,73	12,58	13,79	13,86	13,84	13,89	14,69	40,3	41,5
Sheepmeat	1,50	1,62	1,66	1,73	1,73	1,75	1,76	1,84	5,1	5,2

Source: OECD-FAO Agricultural Outlook 2018-2027

Developing regions like the Middle East, North Africa, Latin America and Asia Pacific will account for much growth in per capita meat consumption over the next decade. With many of the countries in the Middle East experiencing positive growth rates over the past decade and rising, this is good for poultry consumption overall. It should be noted the substantial growth in per capita consumption of poultry meat has occurred in East and Southeast Asia. China, in particular, has seen per capita consumption of poultry meat quadruple. Per capita consumption of poultry products in the rest of East and Southeast Asia has also grown significantly, particularly in the Republic of Korea, Malaysia and Viet Nam.

The world production of poultry meat is steadily growing. In 2018, as compared to 2017, poultry meat production has increased by 1,3% and made up 123.1 million tonnes (OECD-FAO, Agricultural Outlook 2018–2027).

As the market sits currently, FAO estimates the majority of poultry meat production comes from the regions of Asia, North and South America, and Europe. In comparing individual countries, the U.S., China, Brazil and Russia remain the leaders in poultry meat production (WATT executive guide to world. Poultry trends. The Statistical Reference for Poultry Executives, 2018). In 2018, it makes about 50% of the world's total poultry production or 60,6 million tonnes. Other notable countries contributing to the world's total poultry production in 2018 are the collective European Union and Mexico (Figure 2).



Source: OECD-FAO Agricultural Outlook 2018-2027

Figure 2. Poultry Meat Production and Consumption Estimates in Select Countries in 2018, Thousand Tons of Slaughter Weight

Peculiarities of the poultry industry, its intensive development and increased demand for poultry products allowed the countries to actively develop the exports. Growth in poultry meat trade has been facilitated by increasing consumption of poultry products. Developments in transportation, such as long-distance cold-chain shipments (refrigerated transport) and large-scale and faster shipments, have made it possible to trade over long distances. This has allowed production to move away from the loci of both consumption and production of feed resources (FAO. The state of food and agriculture. Livestock in the balance, 2009). Increasing trade flows also have implications for the management of animal diseases and a number of food-safety issues.

World trade of poultry meat continues to grow in 2018: export of poultry meat in 2018 amounted to 13.1 million tons which is 3.3% more than in 2017 (OECD-FAO, Agricultural Outlook 2018–2027).

At the global level, poultry meat exports are projected to be 20% higher in 2027 than in the base period. This represents a slowing down of poultry meat trade growth to an annual average rate of 2.0% compared to 3.0% during the previous decade.

Brazil, the world's largest poultry exporter, has supplied 4,4 million tonnes (33.6% of total poultry exports). The significant growth of the poultry meat exports in Brazil is mainly due to the growth of the world's demand for Brazilian meat, especially in connection with avian influenza in a number of countries. The poultry industry in Brazil features low feed prices due to bumper crop of corn and more stable raw material prices. The bumper corn and soybeans crop significantly reduced feed costs in 2018, as corn and soybeans account for more than 70% of the cost price of broilers. All these factors make Brazilian poultry more competitive in the world market (Figure 3).

Currently, the USA is ranked second in the poultry meat exporters' rating. At the same time, in 2015, its share in the poultry meat exports declined due to the loss of the Russian market of 138 thousand tonnes as a result of the prohibitive measures in 2014. Brazil occupied some part of this vacated market.

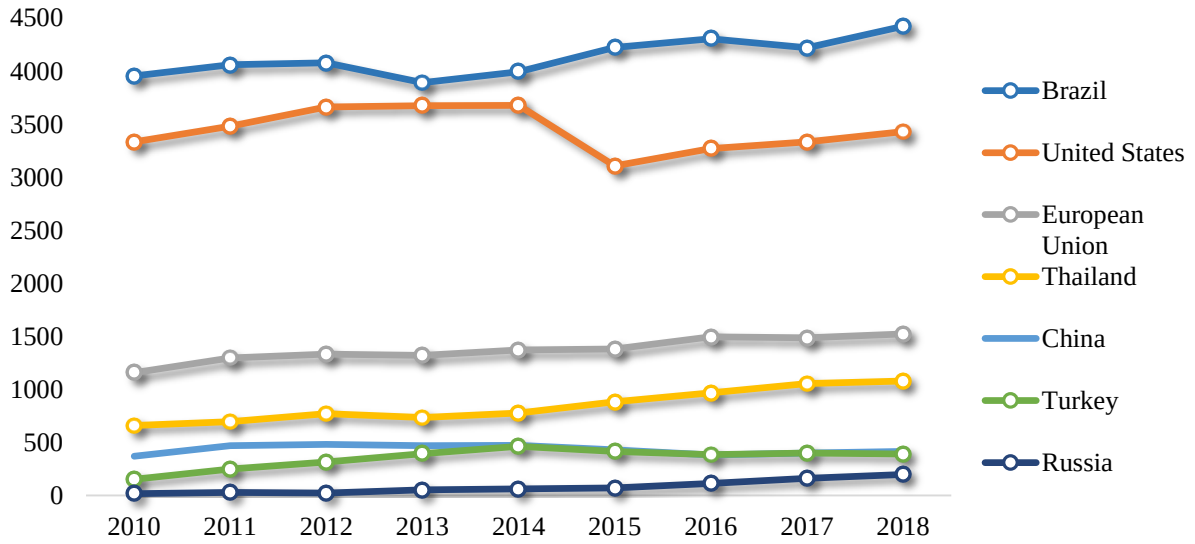
Moreover, the United States lost another two important consumers of American chicken meat – China and South Korea because of the detected strain of avian influenza H5N8.

In total, Brazil and the United States occupy 60% of the world poultry meat market (Figure 3).

Although by 2027 developed countries are expected to account for slightly more than half of global meat exports, their share will decrease steadily relative to the base period. Meat exports will become increasingly concentrated, with Brazil expected to capture more than one third of total trade expansion and the United States more than a quarter. Exports from the European Union, strongly influenced by the exchange rate, will grow at a much slower rate. The European Union has improved its access to Asian markets, but competition from North and South America will prevent it from taking full advantage of this opportunity.

The trade may be affected by the emergence of new players in the market. For example, Thailand is gradually restoring its export opportunities after a significant decline caused by avian influenza.

Russia's share in the export of poultry meat is still insignificant. However, Russia has every opportunity to develop this business line. Russian poultry meat exports in 2018 reached 183 thousand tons, which is 12% more than in 2017 (The Customs Service of Russia, 2019). Compared with 2000, export grew almost 83 times.



Source: OECD-FAO Agricultural Outlook 2018-2027

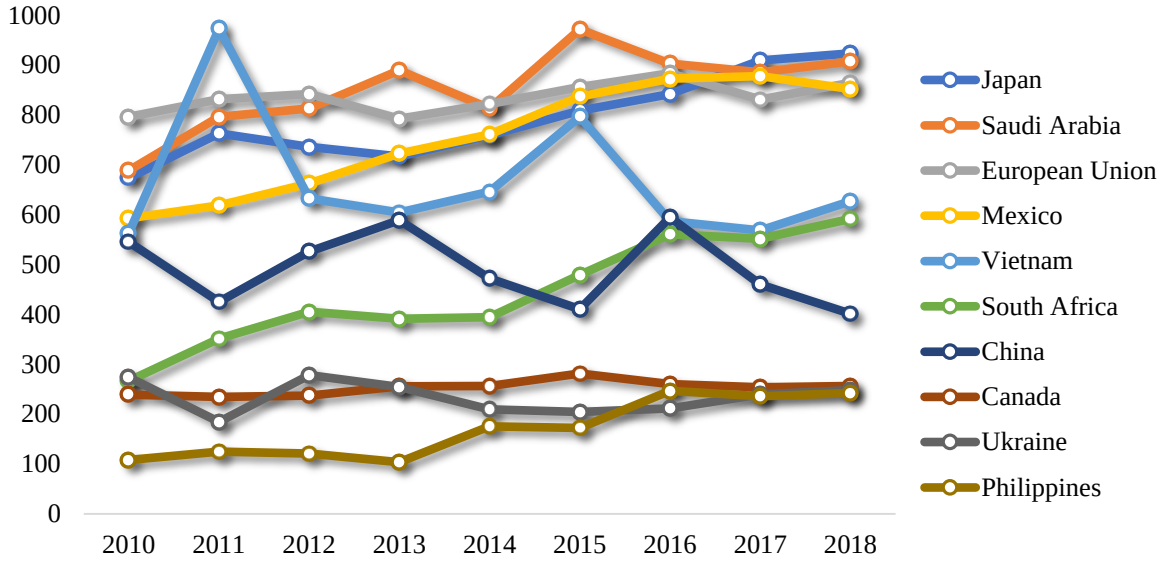
Figure 3. Poultry Meat Exports in Select Countries, Thousand Tons of Slaughter Weight

In 2018, compared to 2017, the import of the poultry meat has increased by 3.4% and amounted to 13 million tons (OECD-FAO, Agricultural Outlook 2018–2027). Top ten world importers of poultry meat account for about 45% of all world poultry meat imports. The share of Japan is 7.1%, Saudi Arabia – 7.0%, the EU – 6.6%, Mexico – 6.5%, Vietnam – 4.8% (Figure 4).

Global poultry meat imports will increase in near future. Asia will account for the greatest share of additional imports, with the greatest increases in the Philippines and Viet Nam, where consumption growth is outpacing domestic production expansion. Meat imports into Asia account for 56% of global trade, and poultry will constitute more than half of this additional import demand (OECD-FAO Agricultural Outlook 2018-2027. Special focus: Middle East and North Africa, 2018).

The potential market is the market of Sub-Saharan Africa. Despite accounting for over 13% of the world population and close to 20% of global agricultural land, Sub-Saharan Africa's share of global agricultural output is relatively low.

Another growing market is the market the Middle East and North Africa. Livestock activities serve as the main source of agricultural value added in the region, with regional production of meat and dairy largely taking place in Iran and Egypt (OECD-FAO Agricultural Outlook 2018-2027. Special focus: Middle East and North Africa, 2018).



Source: OECD-FAO Agricultural Outlook 2018-2027

Figure 4. Poultry Meat Imports in Select Countries, Thousand Tons of Slaughter Weight

The key aspects of the world poultry industry development were the use of the achievements of scientific and technological progress of the 20th century in the field of genetics, nutritional science, veterinary science, technology of stock-keeping, etc.

Technological change is the single most important factor in expanding supply of cheap poultry products. At the same time, it has affected the structure of the sector in many parts of the world.

Technological change refers to developments and innovations in all aspects of poultry production from breeding, feeding and housing to disease control, processing, transportation and marketing.

Technological change in the poultry industry has mostly been the result of private research and development efforts aimed at commercial producers, in contrast with the publicly funded efforts aimed specifically at developing technological innovations that could be applied by smallholders that led to the green revolution in wheat and rice. As a result, technological innovations in the poultry industry have been relatively less widely available and applicable to smallholders. The application of advanced breeding and feeding technology has spurred significant productivity growth, especially in broiler and egg production. Technological advances, and thus productivity growth, have been less pronounced for beef and meat from small ruminants. Genetic advances are much faster in short-cycle animals, such as poultry and pigs, then in species with a longer generation interval, such as cattle. Improvements in feed technology include balanced feeding, precision feeding, optimal addition of amino acids and mineral micronutrients, and development of improved pasture species and animal husbandry systems such as zer-ograzing (FAO. The state of food and agriculture. Livestock in the balance, 2009).

Animal-health improvements, including the increasing use of vaccines and antibiotics, have also contributed to raising productivity. These technologies have spread widely in recent years in a number of developing countries, particularly in industrial production systems close to major consumption centres.

Technological innovations in processing, transportation, distribution and marketing of livestock products have also significantly altered the way food is delivered to consumers (cold chains, longer shelf-life, etc.).

All these different technological advances have contributed to increased production in the commercial poultry industry.

Besides, in many economically developed countries, the government played an important role, it developed and implemented the state policy to support poultry producers, including locating production sites taking into account natural and climatic conditions and social and economic development.

Moreover, some countries (North America, Europe) changed the structure of the land use and crops cultivation in favour of forage crops of intensive type; created large fodder bases with significant investments, material and labour resources (Efremova A. Role of poultry industry in public food supply, 2018).

Many countries still continue to direct huge financial resources to increase the production capacity of feed manufacturers for the industry, install processing equipment and conduct training for workers at farms.

The poultry products can reasonably be called consumer goods, which is confirmed both by retail prices and data on the availability of these products to various strata of population.

Compared to other agricultural branches, such a rapid development of the poultry industry is also ensured by its beneficial peculiarities, as follows:

- the ability to increase the output of production within a few months after investing in it, i.e. the rapid industry payback;
- relatively low retail and consumer prices for poultry meat as compared to pork and beef meat prices. This is due to lower costs of resources;
- healthy properties of poultry meat;
- absence of religious and cultural restrictions among the population in terms of consumption of poultry meat.

4. Conclusions

Agriculture and food industry aim at providing population with high-quality food products, which is one of the government's tasks.

Poultry industry is able to contribute to meeting population's needs in nutritious and healthy foods at the same time helping to increase food security through the development and strengthening of the industry's production capacity. No other livestock industry has applied technological improvements as rapidly or effectively as the poultry industry. Poultry respond well to technological change because of their high reproductive rates and short generation intervals. Moreover, the vertically integrated structure of commercial poultry production has permitted widespread application of new technologies to large numbers of birds, often across thousands of farms.

The choice of poultry industry development direction takes into consideration international tendencies, scientific achievements and advanced experience. The important factor providing the branch's industrialization is its early maturity and short payback period of investments. It is hard to imagine what the current balance of meat, the world market and the quality of nutrition of the world population, in general, could be, if in the past half a century there had not been such an unprecedented growth of the poultry meat and egg production. The development trends of the poultry industry in Russia and abroad pose challenges to the government in terms of changing the industry development course from imports to exports.

References

Efremova A. (2018). Role of poultry industry in public food supply // Proceedings of the 2018 International Scientific Conference 'Economic Sciences for Agribusiness and Rural Economy' No 2. Warsaw. 7–8 June 2018. pp. 29–36.

FAO (2013). Poultry development review. Retrieved from: www.fao.org/docrep/019/i3531e/i3531e.pdf [Accessed 29.03.2019].

FAO (2009). The state of food and agriculture. Livestock in the balance. Retrieved from: http://www.fao.org/3/a-i0680e.pdf [Accessed 20.03.2019].

Hejazi M., Marchant M.A., Zhu J. & Ning X. (2019) The decline of US export competitiveness in the Chinese meat import market // Agribusiness.

Jabir A. & Pappa E. (2015) Global meat market: structural changes across geographical regions // South Asia Research. Vol 35, Issue 2, 2015.

OECD-FAO, Agricultural Outlook 2018–2027 (2019). Retrieved from: https://stats.oecd.org/viewhtml.aspx?QueryId=84948&vh=0000&vf=0&l&il=&lang=en# [Accessed 25.03.2019].

OECD-FAO Agricultural Outlook 2018-2027. Special focus: Middle East and North Africa (2018). Retrieved from: http://www.fao.org/3/i9166en/I9166EN.PDF [Accessed 25.03.2019].

Semin, A.N. (2014). Food security of the Russian Federation under economic sanctions. Journal of Agro-food Policy of Russia, 9 (21), pp. 2-11.

USDA (2017). China. Poultry and Products Annual Report. USDA. 2017 P. 12.

WATT executive guide to world. Poultry trends. The Statistical Reference for Poultry Executives (2018). P. 76.

The Customs Service of Russia (2019). Retrieved from: http://stat.customs.ru/apex/f?p=201:1:7536079720579795::::: [Accessed 20.03.2019].

USDA (2018). Livestock, Dairy, and Poultry Outlook. Retrieved from: https://www.ers.usda.gov/webdocs/publications/89852/ldp-m-290.pdf?v=0 [Accessed 30.03.2019].

POTENTIAL USE OF FOOD WASTE AS A BIORESOURCE: CASE STUDY FROM JELGAVA REGION

Dina Popluga
Latvia University of Life Sciences and Technologies, Faculty of Economics and Social Development, Latvia, E-mail: dina.popluga@ llu.lv

Ieva Ločmele
Latvia University of Life Sciences and Technologies, Faculty of Economics and Social Development, Latvia

Abstract

The increase in population and the development of bioeconomy is the main reason for change in the previous policy on biological resource utilization (European Commission, 2012). Nowadays a great deal of focus has been set on climate change research, decreasing the amount of waste, exploitation of renewable biological resources in the manufacturing and services sectors, thereby adjusting to the climate change, reducing the harm on the environment, decreasing the amount of waste and promoting sustainable development (Owusu, Asumadu-Sarkodie, 2016). However an establishment and consideration of a unified policy regarding the sustainability of waste utilization is needed in order to fulfill the objectives, which are set in Latvia and the rest of the world. The demand regarding sustainable development of waste management have become more significant both in Latvian and international political documents, thereby promoting the development of bioeconomy and sustainable utilization of biological resources. There has been limited research regarding the potential of waste in Latvia due to the fact that the existing research points out that the waste landfills are composed of about 30-50% biological waste (Teibe, 2015). Therefore there are limited possibilities to conduct a broad and comprehensive research on biological waste due to the fact that each household has a different set of habits regarding waste utilization and disposal. Furthermore, there is a necessity for promoting waste disposal and recycling in the public catering sector. Taking in consideration the potential of acquiring biomethane in comparison to the rest of the types of waste, it has not been fully utilized and estimated.This study focuses on surveying employees of the public catering field and food trading enterprises in Jelgava region. Survey was conducted with intention to find out the amount of food waste made by the companies and the types of disposal and further recycling they make use of. Furthermore, a survey was made for household members of the Jelgava district with intention to find out how food waste is used, their opinion regarding food purchasing, exploitation and disposal habits and the possibilities how food waste can be further utilized or recycled. During study it was concluded that food waste is bioresource with high usage potential for sustainable development of Jelgava region.
Keywords: Food Waste, Bioresources, Potential.

BEST INNOVATIVE APPROACH TO MINIMIZE POST HARVEST LOSSES WITHIN FOOD

Octavian Barna
Dunărea de Jos University Galați, Faculty of Food Science and Engineering, Romania

Gabriela Iordăchescu
Dunărea de Jos University Galați, Faculty of Food Science and Engineering, România
Email: gabriela.iordachescu@ ugal.ro

Gabriela Ploscuțanu
Dunărea de Jos University Galați, Faculty of Food Science and Engineering, Romania

Mihaela Eugenia Pricop
Dunărea de Jos University Galați, Faculty of Food Science and Engineering, Romania

Octavian Baston
Dunărea de Jos University Galați, Faculty of Food Science and Engineering, Romania

Abstract

It is expected that total food consumption will especially increase in strong economies due to growing world population and changes in consumption habits. This situation increases the pressure on resources and causes negative effects on the environment and health. Reducing losses in the fresh fruit and vegetable sector also contribute to resource efficiency while creating economic opportunities. In addition, policies aimed at reducing post-harvest losses and assessing food waste developed in countries are also causing new markets for secondary raw materials.

"Innovative Approaches to Minimize Post Harvest Losses within Food Chain "project is supported by the Ministry of the European Union and it is carried out under the coordination of Central Research Institute of Food and Feed Control in Bursa. Project stakeholders are General Directorate of Agricultural Research and Policies (TAGEM), Gaziantep University (GU), Bursa Metropolitan Municipality (AGRICULTURE INC.) and Bursa Commodity Exchange (BTB) from Turkey. Overseas stakeholders of the project are Food Canning National Technology Center (CTC) from Spain, Dunarea De Jos University (UDJ) from Romania and Food Association (IFA) from Austria. The project aims to reduce post-harvest losses and to improve the quality, safety, and marketability of selected horticultural products by developing a training package that meets vocational training needs in the post-harvest sectors (food supply chain).

Seminars, training meetings, conferences related to the project will be organized, technical information will be transferred to the relevant authorities and officials. The seminars and training meetings to be held for this purpose are of great importance, and raising the level of education of the target group in the fresh fruit and vegetable sector will create awareness. In addition, E-Modules to be prepared in the framework of the project will be continuously available to all interested parties.

The report will include post-harvest losses in the fresh fruit and vegetable sector, the current situation regarding the assessment of food waste and the training needs of the sector employees. Also, it reveals the causes of food losses in the post-harvest sectors in Turkey and project partner countries and the vocational training needs of the sector workers to reduce these losses.

Keywords: Fruits, Vegetables, Post-Harvest, Losses, Erasmus+ 2017-1-TR01-KA202-045709

Aknowledgements: Erasmus + Project „Best Innovative Approach to Minimize Post Harvest Losses within Food Chain for VET" [POSTHARVEST] , Project number: 2017-1-TR01-KA202-045709

EFFECTS OF DIFFERENT SUBSURFACE DRIP IRRIGATION APPLICATIONS ON YIELD AND QUALITY PARAMETERS OF ALFALFA

Şuayip Yüzbaşı
International Agricultural Research and Training Center, Turkey
Email: suayip.yuzbasi@ tarimorman.gov.tr

Sinan Aras
International Agricultural Research and Training Center, Turkey

Süleyman Şen
International Agricultural Research and Training Center, Turkey

Şener Özçelik
International Agricultural Research and Training Center, Turkey

Ümit Alkan
International Agricultural Research and Training Center, Turkey

Mehmet Gündüz
International Agricultural Research and Training Center, Turkey

Abstract

Nowadays, the majority of soil and water resources are used for agricultural production. Despite the world population are increasing day by day, water and soil resources are declining due to reasons of various uses. People can meet the needs by conservation of soil and water resources, improvement, development and obtaining more products in unit area by using less water. In order to obtain expected benefits of irrigation, it is essential to selectappropriate irrigation techniques, project planning, installation. Irrigation system should be operated in accordance with the objectives and water requirements should be covered at appropriate irrigation time.Water is one of the most important inputs for alfalfa plant. Insufficient knowledge on soil-plant-water relations, using of inappropriate agriculture techniques and inadequate production environment affect alfalfa production quality and amount negatively. Water requirements of plants vary according to growing season and region therefore irrigation planning is crucial. Depending on the amount of water applied during the growing season may cause decline in yield and quality. In this study,evapotranspiration, irrigation water requirement and water use efficiency of alfalfa irrigated by subsurface drip irrigation has been determined in Menemen Plain. Irrigation applications has been applied the completion of the missing moisture to field capacity depth of 0-60cm.With this study, alfalfa plant which has importance for animal nutrition, and effects of the method has been determined on the yield and quality. Furthermore, the main objectives of the project are increased profitability and saving water by subsurface drip irrigation and sustainable alfalfa production.
Keywords: Subsurface Drip Irrigation, Alfalfa, Soil.

EFFECT OF DRIP IRRIGATION MANAGEMENT ON YIELD AND WATER USE EFFICIENCY OF TOMATO GROWN IN AN UNHEATED POLYETHYLENE TUNNEL-TYPE GREENHOUSE

Galina Patamanska
Institute of Soil Science, Agrotechnologies and Plant Protection, Bulgaria
Email: patamanska_g@ yahoo.com

Elena Grancharova
Institute of Soil Science, Agrotechnologies and Plant Protection, Bulgaria

Georgi Kostadinov
Institute of Soil Science, Agrotechnologies and Plant Protection, Bulgaria

Antoaneta Gigova
Institute of Soil Science, Agrotechnologies and Plant Protection, Bulgaria

Abstract

This study aims at investigating the impact of the irrigationmanagementfor tomato (Solanumlycopersicum 'Big Beef') grown under drip irrigation with mulch in an unheated polyethylene tunnel-type greenhouse.The experiment was carried out in the Chelopechene experimental field of the Institute of soil science, agrotechnologies and plant protection in town of Sofia, Bulgaria in 2018.Four different levels of irrigation have been served as treatment: T1 - full irrigation with application rate 100% of water requirements , T2 and T3 treatments – irrigationwith application rate 60% and 80% of the crop water requirements during the cluster fruit growing and cluster fruit ripening s and T4 - irrigation with 100% pan evaporation-based application rate.The total yield, yield per plant and irrigation water use efficiency (IWUE)were determined by treatments. The experimental results showed thatthe amount of water supplied for irrigation influencedfruit production of tomato grown in an unheated greenhouse.The highest tomato yield was obtained from the T1 and T4 treatments,89.205 t ha^{-1}. и 88.11 t ha^{-1}respectively. Reducing the irrigation application rate of 20% to 40% results in lower yield in T3 treatment by 10.5% and T2 treatment by 22% compared to the yield under full irrigation.The highest irrigation water use efficiency value of 27.03 kgm^{-3} was obtained for T2treatment the lowest irrigation level with. IWUE decreased in the other treatments as the amount of water applied for irrigation was larger.An economic analysis of the results was carried out.

Keywords: Tomato, Drip Irrigation Management, Yield, Unheated Greenhouse.

1. Introduction

In Bulgaria there is an increasing interest in greenhouse vegetables cultivation. The total greenhouse area for the country is within the 1000 ha which 0.4% of total area for growing vegetables is. Due to the high intensity, greenhouse production provides 15-17% of all vegetables produced in the country. The share of greenhouse tomatoes is almost 50% of the total produced in the country. An advantage of greenhouse cultivation is significantly higher yields than field production, as it greatly reduces the impact of unfavorable climatic conditions.Higher yields lead to higher profits, which determines higher profitability and economic importance of greenhouse vegetable production.

Obtaining high yields of greenhouse vegetables is related to the implementation of properirrigation management - the water should be applied in sufficient amount and timely(Sezenetal., 2010). The technical aspect of good irrigation management is the application of more efficient methods of irrigation.Recently, drip irrigation is widely applied in greenhouses. This method allows a supply of water required for irrigation of the plants directly in the active layer of the soil without surface- and

deep-water losses and minimum losses from evaporation and filtration. Coupled with the application fertilizers during the vegetation period of the plants, this method of irrigation leads to high yields.

An important water management activity related to water useefficiency is to plan irrigation properly. Excessive irrigation reduces yields while inadequate irrigation leads to water stress from and reduces production. (Locascio and Smajstrla, 1996). For this purpose, it is necessary to know the actual water requirements of the crops.

The most common used methodto determine the crop water requirements is by assessing evapotranspiration in preceding period. The assessment can be doneby different methods. Frequently used method for low technology greenhouses is through the measurement of free evaporation of waterusing a pan class A.

This study aims at investigating the impact of the irrigation management for tomato (Solanumlycopersicum 'Big Beef') cultivated under drip irrigation with mulch in an unheated polyethylene tunnel-type greenhouse.The research focuses on determination the actual water requirements of tomatoes on the different stages of their growth, so that to irrigate in needed quantities and timely which leads to increase yield and improve the water use efficiency.

2. Material and Methods

The experiment was conducted in unheated polyethylene tunnel-type greenhouse with dimensions of 7.9 x 53 m and a total area of 420 m^2inChelopechene experimental field of the Institute of Soil Science, Agrotechnologies and Plant protection in town of Sofia, Bulgariain 2018. The experimental field is a part of the Sofia Field, located at 550 m above sea level. This area hascontinental climate characterized by cold winter.The soil type of the the experimental site is Chromic Luvisol which can be defined as moderate to strong water-permeable with an average filtration capacity.

An one-factor experiment was conducted with an experimental factor – irrigation. Four different levels of irrigation have been served as treatment: T1 - full irrigation with application rate 100% of water requirements, T2 and T3 treatments – irrigation with application rate 60% and 80% of the crop water requirements during the cluster fruit growing and cluster fruit ripenings,T4 - irrigation with 100% pan evaporation-based application rate.The experimental treatments were arranged according to the method with long plots. Each plot has a surface of 48 m^2 and consisted of twin rowsof tomato (Figure 1) .

Irrigation was performed with drip irrigation system, comprising a command unit and two batteries consisting eight laterals situated next to the each row of tomato. The laterals were simple 1.5 l h^{-1} dripper lines with a 60 cm emitters spacing operated at an operating pressure of 1 atm. The volume of water supplied to the batteries was controlled by water meters mounted on the main pipelines.Mulching was usedto further reducing the evaporation. Black polyethylene mulch (UV 15 mic/1.20 m) was used.

Figure 1. Experimental Site

The irrigation time was determined by monitoring the soil moisture dynamics for the active soil layer to the depth 40 cm for T1treatment. The soil samples were taken in triplicates at 10 cm increments and were processed by a weight-thermostatic method. Water applications were performed in case of lowering the soil moisture below the optimum, which for the this experiment was accepted 90% FC.The application rate was calculated using the formula (Dzhuninski, 1980):

$$m = 10H\alpha(\beta_{FC} - \beta_C)k \quad (1)$$

where: m is application rate (mm), H is the root zone depth (m), α is bulk density of the soil (g/cm^3); β_{FC} is the gravimetric field capacity (%), β_C is the current gravimetric soil moisture (%) and k is a factor representing the ratio between the area wetted from the drip irrigation system and the planted area of the greenhouse. In this experiment it was assumed equal to 0.67.

The amount of irrigation water applied in T4treatment was determined by Class A panevaporation using the equation given below(Doorenbos and Pruitt, 1977):

$I_r = A\ E_{pan} k_c\ k_{pan} k$ (2)

where:I_r is irrigation water amount (m^3), A is the plot area (m^2), E_{pan} is cumulative pan evaporation for irrigation interval (mm x 10^{-3}), k_{pan} is pan coefficient and k_c is crop coefficient.

The pan coefficient was calculated using the formula (Allen et al., 1998):

$K_{pan}=0.61 + 0.00341RH - 0.000162u_2RH - 0.00000959u_2F + 0.00327u_2 \ln(F) -$

$- 0.00289u_2 \ln(86.4u_2) - 0.0106 \ln(86.4u_2) \ln(F) + 0.00063 \ln(86.4u_2) (\ln(F))^2$ (3)

where: RH is relative humidity (%), F is the buffer zone (m), u_2 is wind speed at 2 m height(m s^{-1}).

The values of the crop coefficient for the various stages of the tomato development were selected according to literary data.

Evapotranspiration of tomato (mm day^{-1})for each day of the vegetation period wascalculated by the formula:

$ET = k_c k_{pan} E_{pan}$ (4)

Temperature and humidity inside the greenhouse were measured with temperature-humidity data logger.The average temperature and relative humidity in ten-day periodweregraphically represented inFigure 2.Evaporation was measured daily at 8 am using standard class A pan placed in the middle of the greenhouse.

The irrigations was performed with 100 % application rate estimated according formula (1) for T1 treatmentand formula (2) for T4treatment during the initial stages of crop development.Irrigationsbased on water deficit were performed for T2 and T3treatments in fruit stage of tomato.The irrigationscontinued until two weeks before the final harvest.

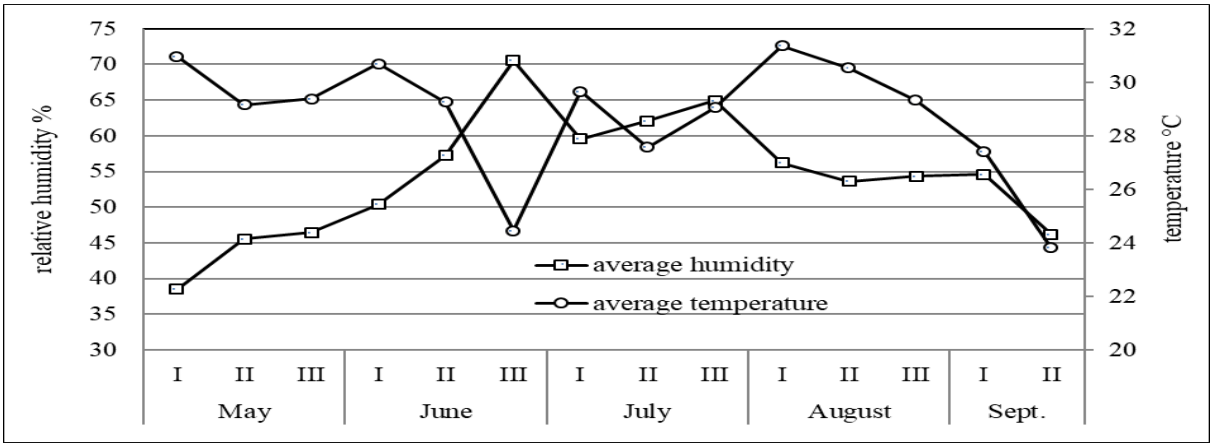


Figure 2. Average Temperature and Relative Humidity Inside the Greenhouse in Ten-Day Period

The subject of this study was tomato variety Solanum lycopersicum “Big Beef”.The tomato seeds were sown on March 9, 2018 in trays with peat. After the first watering, the trays were covered with polyethylene and kept at a temperature of 25-28° C. After seed germination, the temperature was maintained during the day at 18 - 20°C, and at night - by 3 - 4° C lower. Picking seedlings was done 21 days after germination of the seed in the crossing phase.Young tomato plants were transplanted in the greenhouse on April 26into a twin row system. The planting scheme was 1.10 + 0.50/0.60 m. The experimental plots were composed of two24.0 m rows of plants, giving a total area of 48.0 m^2. Pre-planting fertilization was performed in all the experimental plots, the same day before plantingof the tomato plants.

Tomatoes were hand harvested at ripening on July 10 through 2 October. The yield of the five marked typical plants for each plot was used for determining the average yield per plant by treatments.

Irrigation water use efficiency was defined as (Sinclair et al., 1984):

$IWUE = Y/W$ (5)

where: IWUE is irrigation water use efficiency (kgm^{-3}), Y is total yield (kgha^{-1}) and W is consumed water volume for irrigation ($m^3 ha^{-1}$).

An economic analysis was carried outbased on investment, operation and production costs. The net income for each treatment was computed by subtracting all the production costs from gross incomes. All calculations were done based on a unit area of 1 ha and for marketable yield obtained.

3. Results

Based on collected daily data on the greenhouse microclimate and evaporation over the vegetation period the daily evapotranspiration of tomato was determined (Figure3). From Figure 3 it can be seen that the daily values of ET fluctuate from 1.22 mm to 17.49 mm to the beginning of the fruit stage (10.07.2018). During the fruit stage, the evapotranspiration of tomato was increasing and after harvesting it decreased.The higher rates of evapotranspiration occured in the end ofAugust, after which it decreased until the end of the growing season. The mean value of tomato evapotranspiration was 5.14 mm day^{-1}. The seasonal evapotranspiration was640.81 mm.

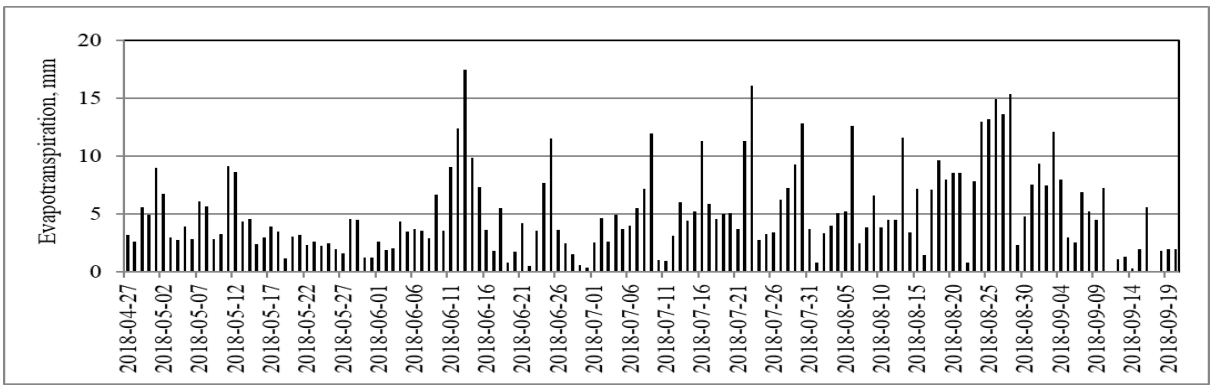


Figure 3. Daily Evapotranspiration

Throughout the growing season, total 34 sequential irrigations with an interval of 3 to 7 days were applied to meet tomato water requirements. The totalirrigaion water amountsapplied for each treatment are given in Table 1.

The vegetation period of tomato was 158days, with ten harvests being carriedout. To assess the impact of irrigation at different irrigation level the total yield, yield per plant and irrigation water use efficiency were determined by treatments. The results are given in Table 1 andgraphically represented in Figure 4.

The experimental results showed that the amount of water applied for irrigation influenced fruit production of tomato grown in an unheated greenhouse. The highest tomato yields of 89.205 t ha^{-1} and88.11 tha^{-1} were obtained from the T1 and T4 treatments. Reducing the application rate of 20% to 40% resulted in lower yields in T3treatment by 10.5% and T2 treatment by 22% compared to the yield under full irrigation.The results show that tomatoes used better the smaller water quantities supplied for irrigation.

Based on the results obtained for the yield and irrigation water amount applied, irrigation water use efficiency per treatment was determined.The highest value of 27.30 kgm^{-3}was obtained for T2treatment, where the lowest irrigation water amount was applied. This result was obtained because the decrease of the yield was lower than that of the water amount applied for irrigation. Reduction of the irrigation rate by 40% caused yield reduction by 18% compared to the yield under full irrigation. IWUE decreased in the other treatments as the amount of water applied for irrigation was larger.

Table 1. Irrigaion Water Amount, Total Yield, Yield per Plant and Irrigation Water Use Efficiency of Tomato as Affected by Irrigation Level

Treatment	Irrigaion Water Amountm^3ha^{-1}	Yield per Plantkg	Yield$t\ ha^{-1}$	IWUE$kg\ m^{-3}$
T1	3424.71	4.2	89.205	26.05
T2	2547.00	3.6	69.54	27.30
T3	2969.97	3.6	79.92	26.91
T4	3572.22	5.6	88.11	24.67

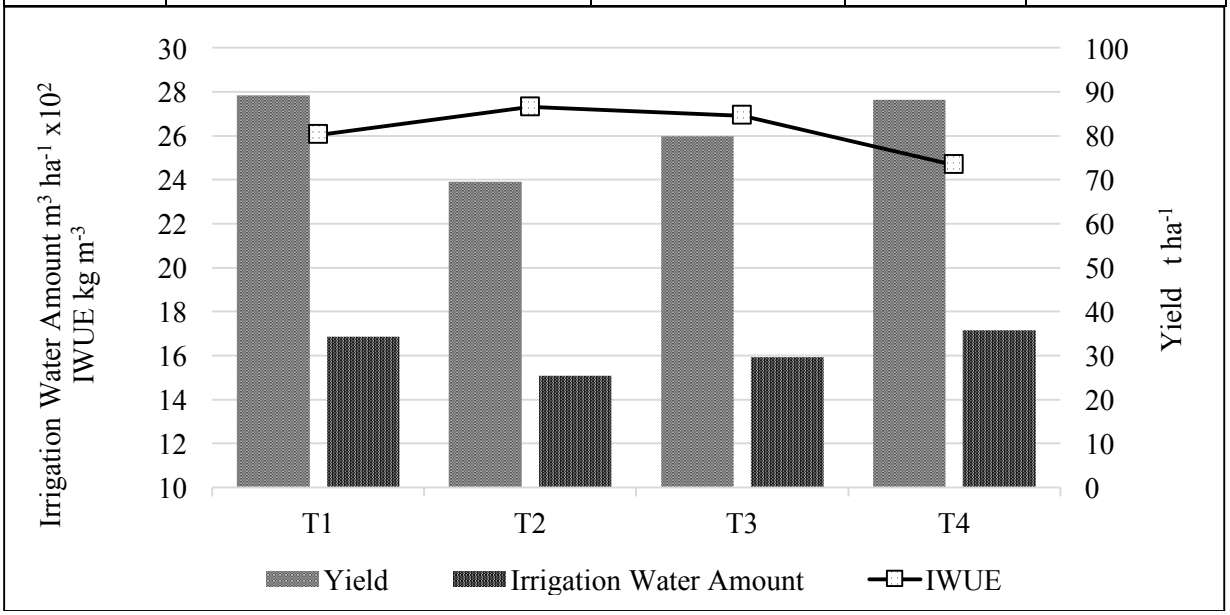


Figure 4. Irrigaion Water Amount, Total Yield and Irrigation Water Use Efficiency per Treatment

Using the results obtained in this experiment an economic analysis and comparative assessment of the treatments were made. It was based on the fact that for the growing of tomatoes at different levels of irrigation in the greenhouse, production costs were the same, the production was realized at a single price, different were the costs of water, picking up production and the revenue received.

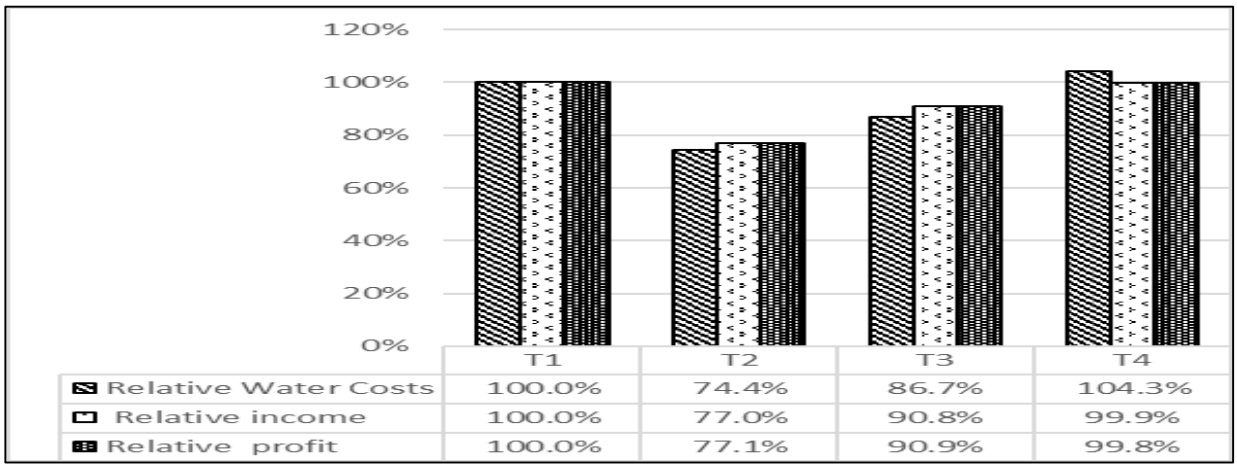


Figure 5. Relative Water Costs, Income and Profit per Treatment

As a basis for comparacion T1 treatment was selected in which the highest marketable yield was obtained and the relative values in water costs, production revenue and profit were calculatedand grafically represented at Figure 5.

Reducing the application rate of 20% to 40% resulted in lower profits in a T3treatment by 9.1 % and T2treatment by 22.9 % compared to the profit under full irrigation.

4. Conclusions

The experimental results have shown that the amount of water applied for irrigation significantly influence the yield of tomato growing in a greenhouse. Full irrigation with application rate 100% of water requirements (T1treatment) is best for good plant development and obtaining the highest yield. Close to it in performance is T4treatment - irrigation with 100% pan evaporation-based application rate.

Experimental results have also shown that the water use efficiency in drip irrigation of greenhouse tomato was influenced by the size of the irrigation water amount applied. The highest irrigation water use efficiency obtained in T2 treatment– irrigation with lowest application rateof 60% of the crop water requirementsshows that deficit irrigation is applicable for effectivemanagement of scarce water resources. This result is in agreement with previous studies of other researchers claimed positive effect of deficit irrigation on irrigation water use efficiency (Chen et al., 2013).

Based on the experimental results for drip irrigated tomato groing in an unheated polyethylene tunnel-type greenhouse, an optimum irrigation rate of 513.71 mm was determined with irrigation water use efficiency of 26.05 kg m^{-3}.

Acknowledgements

The present work is based on researches that are funded from the Bulgarian National Science Fund of theMinistry of Education and Science under a bilateral cooperation project between Bulgaria and China, on topic: Evapotranspiration-Based Irrigation for Sustainable Agriculture: Estimation of Irrigation Water Requirements of Greenhouse Plants.

References

Allen, R.G., Pereira L.S., Raes D., &Smith.,M. (1998). Crop evapotranspiration: guidelines for computing crop water requirements. Irrigation and Drainage Paper 56, FAO, Rome.

Chen, J., Kang., S., Du T., Qiu R., Guo P. & Chen., R.(2013). Quantitative response of greenhouse tomato yield and quality to water deficit at different growth stages. Agricultural Water Management, 129, 152-162.

Doorenbos, A. J.,& Pruitt W.O. (1977). Guidelines for Predicting Crop Water Requirements. Irrigation and Drainage Paper 24. FAO, Rome.

Dzhuninski, B.(1980). Irrigation Systems. Tehnika, Sofia (Bg).

Locascio, S.J.,&Smajstrla,A.G.(1996).Water application scheduling by pan evaporation for drip-irrigated tomato, Journal of the American Society of Horticultural Science:121(1): 63-68

Sezen, S.M., Celikel, G., Yazar, A., Tekinand, S., &Kapur. S.(2010).Effect of irrigation management on yield and quality of tomatoes grown in different soilless media in a glasshouse. Sci. Res. and Essay: 5(1):41-48.

Sinclair T., R., Tanner, C. B. &. Bennett J. M. (1984). Water-Use Efficiency in Crop Production. BioScience: 34(1): 36-40.

A RESEARCH ON DETERMINATION OF FARMER'S PREFERENCE AND THEIR PROBLEMS IN CREDIT USE

Ali Berk
Ministry of Agriculture and Forestry, Turkey**,** Email: berk_ali@ hotmail.com

Süleyman Armağan
KOP Regional Development Administration, Turkey, Email: suleyman.armagan@ kop.gov.tr

Abstract

The purpose of this study was to determine the socioeconomic characteristics of farmers who use agricultural credit, to analyses the behaviors on agricultural credit, and to propose solutions on current problems. For this reason, data was collected from 67 farmers by survey method and finding were presented and interpreted in company with tables and graphs. It was found that ¾ of the farmers were using agricultural credit but most of them have difficulties to pay back it because of high interest rate. The granting loans with low interest rate and increasing income supports would be considered as a solution proposal.
Keywords: Agricultural Credit, Farmer Behaviors, Niğde, Karaman

ÇİFTÇİLERİN TARIMSAL KREDİ TERCİHLERİ VE SORUNLARININ BELİRLENMESİ ÜZERİNE BİR ARAŞTIRMA

Özet

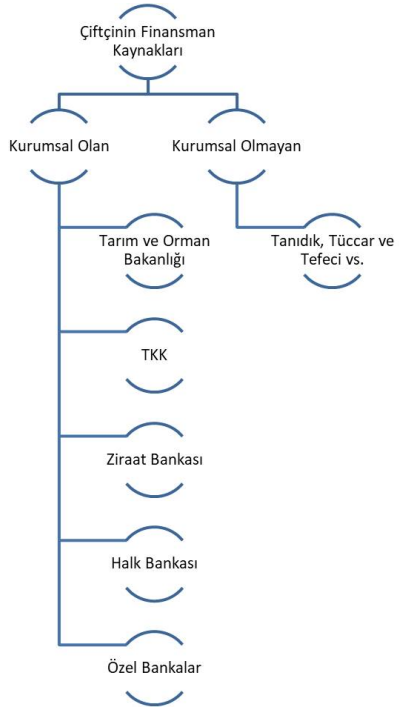
Bu çalışmanın amacı, Niğde ve Karaman illeri özelinde tarımsal kredi kullanan çiftçilerin sosyoekonomik özelliklerini tespit etmek, tarımsal kredi davranışlarını analiz etmek ve tarımsal kredi kullanımıyla ilgili sorunlara çözüm önerileri geliştirmektir. Bu amaçla 67 çiftçi ile anket yöntemiyle veriler toplanmış, sonuçlar çizelge ve grafik haline getirerek yorumlanmıştır. Çiftçilerin ¾'ünün kredi kullanmakta ama çoğunun krediyi geri ödemekte zorlandıkları tespit edilmiştir. Bunun nedeni olarak da faizlerin yükselmesi olduğu görülmektedir. Çiftçiye düşük faizli kredi verilmesi, gelir arttırıcı desteklerin artırılması bazı çözüm önerileri arasında sayılabilir.
Anahtar Kelimeler: Tarımsal Kredi, Çiftçi Davranışları, Niğde, Karaman

1. Giriş

Türkiye'de tarımsal işletme sayısı yaklaşık 3,1 milyon olup, işletmelerinin ortalama genişliği 6,1 ha iken, işletme başına 4,1 parça düşmektedir. İşletmelerde 50 da'danküçük işletmeler sayısal olarak toplam işletmelerin %65'ni oluşturmaktadır (TÜİK, 2001). Bu yapınınbaşta ölçek olmak üzere, parçalılık, miras-hisselilik, arazi altyapılarında yaşanan sorunlar ve suya erişim gibi sorunları olduğu bilinmektedir. Ayrıca küçük ölçekli tarım işletmelerinin ağırlıklı olduğu Türkiye gibi ülkelerde, üretimin ve işletmenin devamlılığı için sermaye büyük önem taşımaktadır (Çiçek, 1994).Sermaye tasarruf oranlarının düşüklüğü ise mevcut üretim kaynaklarının potansiyelinin değerlendirilmesi ve modern tarıma geçiş sürecinde sermaye ve finansman önemli rol oynamaktadır.

Bu açıdan yeterli finans kaynağından yoksun olan bir çiftçinin gübre, tarımsal ilaç, kesif hayvan yemi, belli konularda uzman işgücü gibi girdilerin kullanımına gereksinim duyacağı için modern tarım yapma imkânı yoktur. Bunların uygun zaman ve yeterli miktarda temin edilebilmesi ise sürekli bir nakit çıkışına yol açmaktadır. Ancak tarımın yapısı nedeniyle, çiftçiler sürekli bir nakit çıkışı ile karşı karşıya olmalarına rağmen, hasat dönemine bağlı olarakyılda bir ya da birkaç kez gelir elde edebilmektedirler (Özçelik ve ark. 2005; Hayran ve Gül, 2018). Bu durum çiftçilerin tarımsal destekler, sübvansiyonlar ve kredi gibi çeşitli yollarla finanse edilmelerini zorunlu kılmaktadır. Çiftçilerin gerekli zaman ve yeterli miktarda krediye erişebilmeleritarımsal aktivitelerini

geliştirebilmelerine ve modern teknolojileri uygulayabilmelerine yardımcı olabilir (Bülbül, 2006; Hayran ve Gül, 2018).Tarımsal işletmelerde öz sermaye oranı %90 düzeyindedir. Bunda tarım arazisinin toplam sermayede önemli bir yer tutmasının ve bunun da önemli ölçüde mülk araziden kaynaklanmasının etkisi bulunmaktadır. Yapılan araştırmalar tarımsal işletmelerin %78'inin tarımsal kredi kullandığı görülmektedir (Akdemir ve ark. 1997).



Kaynak: Taşkıran ve Özüdoğru (2010)'dan faydalanılmıştır.

Şekil 1. Türkiye'de Tarımsal Kredi Organizasyon Yapısı

Türkiye'de tahsis edilmiş tarım kredilerinin bölgelere ve bazı illere göre dağılımı Çizelge 1'de gösterilmiştir. Buna göre, 2017 yılında tarımsal kredilerden en fazla faydalanan bölge 68.239 milyon TL ile Ege bölgesi (12.487 milyon TL) olmuştur. Çalışma alanı olarak seçilen Karaman ili toplam tarımsal kredilerden faydalanma düzeyi 471 milyon TL iken Niğde ilinde 684 milyon TL olarak gerçekleşmiştir (Anonim, 2017).

BBDK verilerine göre ülkemizde Gıda, Meşrubat, Tütün, Ziraat ve Balıkçılık alanında kullanılan kredi miktarı 2010 yılında 22 Milyar TL iken, bu rakam 8.1 kat artarak 2017 yılında 179 Milyar TL'ye yükselmiştir. Tarımsal kredilerin %42'si ise sadece 9 ilde kullanılmaktadır. 2017 yılı itibariyle toplam tarımsal kredi kullanımında Ankara ilinin payı %8,5, İzmir %6,1, Konya %5,4, Adana %4,7, Antalya %4,2, Manisa %3,8, İstanbul %3,5, Mersin %3,1 ve Bursa %3 ile ilk sıralarda yer almaktadır. Ayrıca çalışma bölgesi olarak belirlenen Niğde'de bu oran %0,8 iken Karaman'da %0,6 olarak gerçekleşmiştir.

Bu gelişmelerin yanısıra, yıllardır tarım sektörüne kredi veren Ziraat Bankası ve tarım kooperatifleri gibi geleneksel kamu kuruluşlarının yanında özel bankaların da tarım sektörüne gittikçe artan oranlarda kredi vermeye başladıkları görülmektedir. Tarım kredisi kullandıran özel sermayeli banka, 2001 yılında sadece Şekerbank iken bu bankayı 2004 yılında Denizbank ile Anadolu Bank, 2005 yılında Finansbank dahil olmuştur (Güneş, 2009). Bu bankalara ilaveten Vakıfbank, Halkbank, İş Bankası, Garanti Bankası, Akbank, Yapı Kredi, Türkiye Ekonomi Bankası gibi bankalar da tarım sektörüne kredi veren bankalar arasına girmiştir. Bu sebeple, 2010-2014 döneminde özel sektörün tarımsal kredideki payı %28'den %37'ye yükselmiştir (TEB, 2014).

Tablo 1.Türkiye'de Tarım Kredilerinin Bölgelere ve Bazı İllere Göre Dağılımı (2017)

Bölge ve Bazı İller	**Miktar (Milyon TL)**
İstanbul	891
Batı Marmara	5.856
Ege	12.487
Doğu Marmara	5.256
Batı Anadolu	7.005
Karaman	**471**
Akdeniz	12.095
Orta Anadolu	6.393
Niğde	**684**
Batı Akdeniz	4.696
Doğu Karadeniz	1.580
Kuzeydoğu Anadolu	3.013
Ortadoğu Anadolu	2.672
Güneydoğu Anadolu	6.220
KKTC	74
Toplam	**68.239**

Kaynak: Anonim, 2017.

Tarımsal kredi kullanımı ile ilgili literatürde birçok çalışma olmasına rağmen, araştırma bölgesi olarak kabul edilen Niğde ve Karaman illeri ile ilgili olarak herhangi bir çalışmaya rastlanmamıştır. Literatür taraması sonucunda bulunan ilgili çalışmalar ise aşağıdaki gibi özetlenebilir;

Bülbül ve Bektöre (1981) veArtıkoğlu (1993), Türkiye'de tarımsal kredi politikaları, Karacan (1991), tarımsal işletmelerin finansmanı, Yurdakul ve ark. (1994), GAP alanındaki tarım işletmelerinin sosyo-ekonomik yapısını, üretim girdilerinin kullanım durumunu, tarımsal kredi kullanım düzeyini, Jouault ve Featherstone (2006) ise Fransız bankalarınca kullandırılan tarımsal kredileri üzerine, Duvat (2003), Tarımsal finans ve kredi altyapısı üzerine, Altürk (2007), Ankara ili Polatlı ilçesinde tarım işletmelerinin sermaye talebi ve kredi kullanımını, Özden ve ark. (2012), Kırsal kesimde tarımsal kredi kullanımı ve tarım işletmesi üzerine etkileri, Ljioma ve Osondu (2015),Idemili Yerel Yönetiminde tarımsal kredi kaynakları ve çiftçiler tarafından kazanılan tarımsal kredi edinimlerinin belirlenmesi, Güneş ve Movassaghi (2017), tarımsal kredi piyasaları ve çiftçi duyarlılığı, Mitra ve ark. (2018) Bangladeş'te seçilmiş bir bölgede domates üreticilerinin krediye erişimini belirleyen faktörler üzerine çalışmaları mevcuttur.

Bu çalışma, coğrafi olarak Orta Anadolu bölgesinde yer alan Niğde ve Karaman illerinde tarımsal kredilerden faydalanan çiftçilerin sosyoekonomik özelliklerinin belirlenmesi, tarımsal kredi kullanım davranışları ve kredi piyasasında bulunan bankalara karşı bakış açılarını tespit etmeyi amaçlamıştır.

2. Materyal ve Yöntem

2.1.Materyal

Araştırmada kullanılan birincil veriler Karaman ve Niğde illerindeOransal Örnekleme tekniği ile belirlenen 67 işletmeden anket yöntemi ile 2017 yılında toplanmıştır. Ayrıca konu ile ilgili ikincil veriler ve daha önce yapılan araştırma sonuçlarından da yararlanılmıştır. Elde edilen veriler çizelge ve grafik haline getirilip yorumlanmıştır.

2.2. Yöntem

Çalışmanın ana materyalini oluşturan örnek sayısını hesaplamak için araştırma bölgesi gayeli olarak seçilmiş olup, örnek hacminin belirlenmesinde aşağıda formülü (1) verilen "Oransal Örnekleme Metodu" kullanılmıştır. Karaman ve Niğde illerinde ÇKS'ye kayıtlı bulunan toplam işletme sayısı 30.340 adet olup, çalışma kapsamında görüşülecek üretici sayısı oransal örnek hacmi formülü yardımıyla hesaplanmıştır.

$$n = \frac{Nxpxq}{(N-1)x\sigma_{P_x}^2 + pxq} \quad (1)$$

q=1-p

$$\sigma_{P_x}^2 = \left(\frac{r}{Z_{\propto/2}}\right)^2$$

N=Anakitle büyüklüğü
n= Örnek Sayısı
p= Anakitle içerisindeki genç çiftçi sayısı (oransal)
q= p'nin dışında kalanların oranı
σ= Standart Sapma
r= Ortalamadan sapma
Z= Z skoru (Miran, 2007; Aksoy ve Yavuz, 2012)

Çalışmada, örnek büyüklüğünün mümkün olduğu kadar büyük olmasını sağlamak için p (1-p) çarpımında en büyük değeri verecek olan p=0.50 değerinin kabul edilmesi önerilmektedir. Bu amaçla maksimum örnek hacmine ulaşabilmek için tarımsal kredi kullanma eğilimi olan üreticilerin oranı 0.50 olarak kabul edilmiştir. Araştırma için %90 güven aralığında ve ortalamadan %10 sapma ile anket sayısı 68 olarak tespit edilmiştir. Eksik bir anket çıkarıldıktan sonra değerlendirmeler 67 anket üzerinden yapılmıştır. Anket sayısının iller arasında dağıtımında ise illerin sahip olduğu işletme oranı dikkate alınmıştır.

3. Araştırma Bulguları

Araştırma kapsamında incelenen çiftçilerin ortalama yaşı 36,9 iken, hane genişliği 5,3 olup, işletmeden ortalama 3 hane geçimini sağlamaktadır. Ayrıca çiftçilerin ortalama 16,5 yıl mesleki deneyime sahip olduğu görülmektedir. Çiftçilerin eğitim düzeyi incelendiğinde; görüşülen çiftçilerin %4,5'inin sadece okuryazar iken, %22,4'ünün ilkokul, %26,9'unun ortaokul, %38,8'inin ise lise düzeyinde eğitim aldığı belirlenmiştir. Ayrıca lisans ve üzeri seviyesinde eğitim görenlerin oranının ise %7,4 olduğu görülmektedir.Lisans düzeyinde eğitim alan 11 kişiden, 4 tanesi (%36,4) ziraat-veterinerlik bölümlerinden mezun olup, halen çiftçilik yapmaktadırlar. Diğer yandan ikamet durumuna bakıldığında %66,7'sinin köyde ikamet ederken, %27'sinin ilçede ikamet ettiği görülmektedir. Bununla birlikte işletme sahiplerinin %3,2'sinin sadece şehir merkezinde, %3,2'sinin ise Köy+Şehir merkezinde ikamet ettikleri belirlenmiştir.

Bölgede çiftçilerin tarım dışı gelir durumları incelendiğinde %40,4'ünün tarım dışında farklı bir geliri olduğu belirlenirken, %59,6'sının ise sadece tarımdan gelir elde ettiği görülmektedir. Ayrıca mesleki durumlarına bakıldığında işletmecilerin %73,7'sinin tarım dışında mesleği bulunmadığı tespit edilmiştir. Tarım dışı meslekler olarak ise %5,3 ile tüccar, %1,8 ile sanayici, %3,5 ile memur ve %2,5 ile de işçi ön plana çıkmaktadır.

İncelenen işletmelerde ortalama işletme genişliği 92,6 dekar olup, %11,5'ninarazi tasarruf şekli mülk arazi iken, kira oranı %34,9 ve ortakçı oranı %14,4 olarak bulunmuştur. Ayrıca bölgede hazine arazisi oranı % 39,2 olup, bu oran arazi mülkiyet yapısı açısından önemlidir

İşletmenin mekanizasyon düzeyini göstermesi açısından önemli bir gösterge olan traktör durumuna bakıldığında, incelenen işletmelerde ortalama 1,2 adet traktör bulunduğu ve işletmecilerin % 79,3'ünde traktör bulunduğu görülmektedir. Buna karşın yaklaşık 1/5'inde ise traktör bulunmamaktadır. Traktör sayısına bakıldığında ise 1 (bir) adet traktörü bulunan çiftçilerin oranı % 88,9'dur.

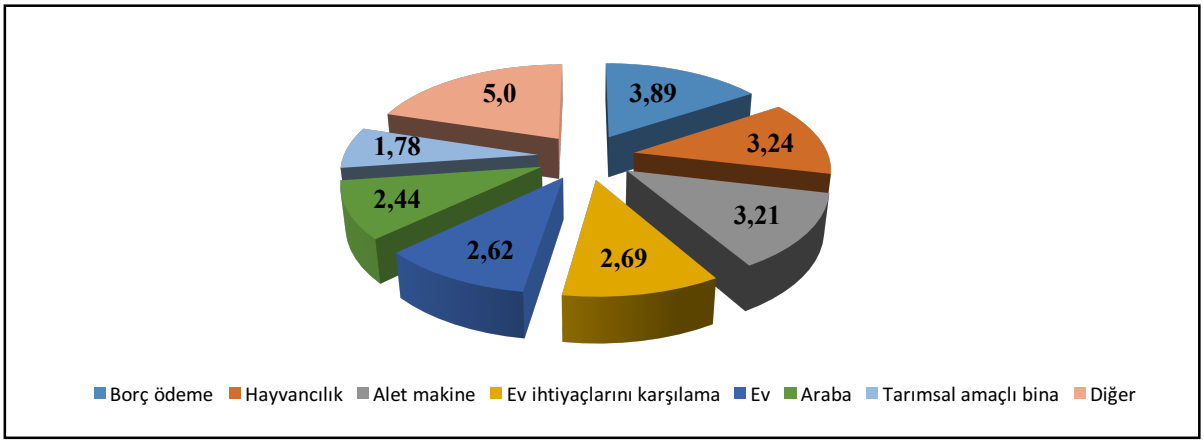
3.1.Tarımsal Kredi Kullanımı ve Kredi Kullanımına Karşı Bakışı

Araştırma bölgesinde tarımsal kredi kullananların oranı %76,7 gibi yüksek bir oran bulunmuştur. Kredi kullanmayanların nedenleri olarak; %50 ile krediye gerek görmeme ilk sırada yer alırken, küçük çiftçi (%20) olmanın, krediye istekli ancak arazi büyüklüğünden (%10) yani ipotek sorunun, geri

ödemede zorlanma düşüncesinin (%10) ve mevcut borç durumunun (%10) etkili olduğu görülmektedir.

Bölgede ihtiyaç duyulan kredinin temin edilebilme düzeyi düşük (%34,5) bulunmuştur. Kredi ihtiyacını karşılayamayanların oranı ise % 65,5'tir. Ancak yeteri kadar kredi kullanamamanın etkileri incelendiğinde ölçeği büyütmek amacı ile işletmenin genişletilememesi (%20,2) ve işletmeye yeni yatırım yapılamaması (% 20,2), fiyat düşüklüğüne rağmen hasat sonrası ürün satışı (% 16,2), üretim girdilerinin daha pahalıya alınması (% 15,2) ve yeteri kadar girdi kullanılamaması (% 14,1) ile hasat öncesi ürün satışı (% 14,1) ön plana çıkmaktadır. Bu bağlamda, işletmeciler açısından krediye erişimin zorluk olduğu, kredi talebinin halen var olduğu ve finansman ihtiyaçlarının devam ettiği şeklinde yorumlanabilir. İşletmeciler açısından tarımsal kredi kullanımının etkilerine bakıldığında işletmecilerin %68,9'u kredi kullanımından olumlu etkilendiğini ürün satılan kişilerden üretim aşamasından önce ve üretim aşamasında avans (kredi) alanların oranının %19,4 düzeyinde, almayanların ise %80,6 oranında olduğu görülmektedir.

2017 yılında bölgede kullanılan tarımsal kredi miktarı ortalama 179.967 TL olarak hesaplanmış olup, bu kredinin %45,8'ini işletme (82.500 TL), %54,2'sini ise yatırım (97.467 TL) kredisi oluşturmaktadır. Kullanılan bu kredinin başlıca kullanım alanı; düğün gibi diğer (5) ve borç ödeme (3,89) gibi daha çok tarım dışı aktivitelerdir. Tarımsal amaçlı olarak hayvancılık (3,24), alet-makine alımı (3,21) ön plana çıkmaktadır. İşletmelerde kredi kullanımının olumlu etkisine bakıldığına, işletmeciler tarafından, kredi kullanımının ortalama 8,6 kişilik ek istihdam yarattığı ve işletme gelirlerinde ise %31,5'lik artışa neden olduğu belirtilmiştir. Söz konusu bu istihdam artışında; 1-3kişilik istihdam artışının payı %66,7 iken, istihdamın azaldığını belirtenlerin oranı ise %11,1'dir. İşletme gelirlerinde ise %40'a kadar artış yaşandığını ifade edenlerin oranı ise % 69,7'dir. Buna karşın kredi kullanımından kaynaklı gelirinin azaldığını düşünenlerin oranı ise %6,1'dir.



Not:1:En az, 3: Normal, 5:En Fazla

Şekil 2. Kullanılan Kredinin Kullanım Alanları

Bölgede kredi kullanımına karşı bir eğilim olduğu görülmektedir. Bu durum (kredi talebi) tarımsal kredi kullanan ve kullanmayan işletmeciler açısından incelendiğinde mevcut kredi koşullarında ve ipotek sorunu olmaması durumunda tarımsal kredi kullananların kredi talebinin kullanmayanlara oranla yaklaşık 1,5 kat fazla olduğu belirlenmiştir. Söz konusu bu miktarın 163.250 TL iken, tarımsal kredi kullanmayanların talebinin 105.714 TL olduğu tespit edilmiştir. Tüm işletmeler ortalamasında ise bu rakamın 134.482 TL olduğu belirlenmiştir.

İşletmeciler açısından söz konusu kredi talebinin karşılanması durumunda ise kullanılacak kredinin % 76,6 oranında tarımsal amaçlı, % 23,4 oranında da tarım dışı amaçlarla kullanılacağı ifade edilmiştir. (Çizelge 2). Üreticinin kredi kullanımından önceki ve/veya sonraki 2 yıl içinde düğün yapıp yapmadığı konusunda ise çiftçilerin % 44,6'sı düğün yaptığını, yapmayanların oranı ise % 55,4, ifade etmektedirler.

Tablo 2. Kullanılacak Kredinin Başlıca Kullanım Alanları*

Kredi Kullanım Amacı	Frekans (adet)	%
Tarımsal Amaçlı	59	76,6
Hayvancılık	20	26,0
Tarımsal alet-ekipman	5	6,5
Arıcılık	2	2,6
Tarla Alımı	2	2,6
Meyvecilik	2	2,6
Sulu tarım	1	1,3
Girdiler (yem, gübre, mazot vb.)	1	1,3
Diğer	26	33,8
Tarım Dışı	18	23,4
Ticaret	2	2,6
İhtiyaçlar	1	1,3
Borç Ödeme	1	1,3
Diğer	14	18,2
Toplam	77	100,0

Not:**çoklu cevap vermiştir.*

Son yıllarda artan döviz kuru ve üretim maliyetlerinden dolayı gelir seviyesi ile alım gücü düşen üreticilerin kredi geri ödemesinde sorun yaşadığı bilinmektedir. Son yıllarda çiftçilerin kredi borcunun değişimi hakkında ise işletmecilerin %69,3'ünün borcun arttığı, %3,7'si ise azaldığı yönünde görüş belirtmişlerdir.

İşletmecilerin %18,6'sı kredi ödeyememe sorununu en az bir kez yaşamış olup, bu sorunu yaşama nedenleri olarak gelir yetersizliği (%25), ürün veriminde azalma ve üretim azalması (%25), ürün fiyatlarının düşüklüğü (%25) ve kuraklık (%12,5) belirtilmiştir.

Görüşme yapılan çiftçilerin %87,1'i faizi ana sorun (en öncelikli+öncelikli) olarak görürken, %79,4'ü ise kredi miktarını ana sorunlar olarak görmektedirler.

Bölgede kredi kullanımında yaşanan sorunlara karşın çiftçilerin kredi kullanımı hakkında genel düşünceleri incelendiğinde faizlerin yüksekliği (%24,4) ana sorun olarak görülürken bunu mevcut kredi sistemini olumlu bulanlar (%15,6), kefil ve ipotek fazlalığı (%11,1), kredinin kısa vadeli olmasının (%8,9) olumsuzluğu, kredi desteğinin çeşitlendirilerek (%4,4) alternatif modellerin hayata geçirilmesi talebi, nakit kredi yerine girdi fatura karşılığı ödeme veya tarım yatırım yapacaklara özel kredi şartları gibi ek talepler takip etmektedir.

4. Sonuç ve Öneriler

Bölgede tarımsal faaliyetin geleceği açısından işletmecilerin %58,2'si işletmesini genişletmeyi, %16,4'ü yeni ürünlere yönelmeyi ve %14,9'u ise tarımı terk etmeyi düşünmekte olup kalan kısımda kararsızdır.

Bu veriler ışığında araştırma bölgesinde tarımsal üretimde bulunan çiftçilere yönelik olarak, özel alternatif finansman modellerinin hayata geçirilmesi, özellikle gelir arttırıcı destek ve faaliyetlerin yürütülmesi ile özel yayım ve tarımsal danışmanlık programlarının uygulanması tarımsal faaliyetin sürdürülebilirliği açısından önemlidir.

Diğer yandan kredi piyasasında halen önemli bir yeri olan Ziraat Bankasının tarıma sektörüne verdiği kredilerde azalma yaşanması ve özelleştirme duyumları tarım kesiminin finansman sorunlarını daha da arttırmaktadır. Bu durum tarımsal işletmelerin talep etmiş oldukları kredinin tam karşılanmamasına yol açmaktadır. Ayrıca tarımsal kredilerin faiz oranında, kaynak maliyetinin üzerine eklenen kredi masrafları, özellikle aile işletmeleri ile küçük ölçekli işletmeler açısından önemli sorun oluşturmaktadır. Bu masrafların belirli bir fon veya Kredi Garanti Fonu kanalıyla desteklenmesi üreticiye yansıtılan maliyetlerin azaltılmasına yol açarak küçük ölçekli işletmelerin krediye erişimini kolaylaştıracaktır.

Kaynaklar

Akdemir S., Yurdakul O., Erkus A., Aksoy S., (1997). "Leseffetsdespolitiques de prix, de subvention et de fiscalité sur l'agricultureTurque". In: Akesbi N.,Maraveyas N. (eds.). Prix et subventions : effets sur lesagriculturesfamilialesméditerranéennes (étudesnationales).

Aksoy, A. Yavuz, F., (2012). "Çiftçilerin Küçükbaş Hayvancılık Yetiştiriciliğini Bırakma Nedenlerinin Analizi; Doğu Anadolu Bölgesi Örneği.". Anadolu Tarım Bilim. Dergisi, 012, 27(2) :76 -79.

Altürk, D., (2007). "Polatlı İlçesi Tarım İşletmelerinde Münavebede Yer Alan Başlıca Ürünlerde İşletme Sermayesi Talebi ve Kredi Kullanımının İncelenmesi". Ankara Üniversitesi Fen Bilimleri Enstitüsü Tarım Ekonomisi ABD. Basılmamış Yüksek Lisans Tezi. Ankara. DOI: 10.1501/0002705.

Anonim., (2017). Türkiye Bankalar Birliği, İstatistikî Raporlar, Türkiye Bankalar Birliği Yayınları, İstanbul.

Anonim., (2018). "Türkiye'de Bankacılık Sistemi İllere ve Bölgelere Göre Mevduat ve Kredi Çeşitlerinin Dağılımı", Rapor Kodu:YT02

Artukoğlu, M. M., (1993). "Tarımsal Kredinin Tarım Sektörünün Gelişmesindeki Önemi ve Manisa Merkez İlçe Tarım İşletmelerinde Kredi Kullanımı", EÜ Fen Bilimleri Enstitüsü Tarım Ekonomisi Bölümü, İzmir.

Bülbül M., (2006). Tarımsal İşletmelerin Finansmanı. 1 – 20 s. Ankara.

Bülbül, M., Bektöre, N., (1981). "Tarımda Kredi Politikası", II. Tarım Kongresi, s.410, Ankara

Çiçek A., (1994). "Tokat İlinde Seçilmiş Bir Yöredeki Tarım İşletmelerinin Sermaye Bileşimi ve Kredi Kullanımı Üzerine Bir Araştırma", GOP Ziraat Fakültesi Dergisi, Sayı 11,s 17-29, Tokat.

Duval, A.T.,(2003). "AgricultureFinance andCreditİnfrastructure- Conditions, PoliciesandChannels". Agric. Econ. – Czech, 49, 2003 (3): 106–112

Güneş, E.,(2009). "Türkiye'de Tarımın Kredilendirilmesindeki Gelişmeler ve Tarım Sektörüne Yansımaları". Türktarım Tarım ve Köyişleri Bakanlığı Dergisi, 187:14-21.

Güneş, E., Movassaghi, H., (2017). "Agricultural Credit Market and Farmers' Response: A Case Study of Turkey". Turkish Journal of Agriculture-Food Science and Technology. 5(1): 84-92, 2017.

Hayran, S, Gül, A., (2018). "Mersin İlinde Çiftçilerin Tarımsal Kredi Kullanım Kararlarını Etkileyen Faktörler. Araştırma Makalesi", Iğdır Üni. Fen Bilimleri Enst. Der. 8(1): 271-277, 2018.

Jouault, A. Featherstone, M. A., (2006). "DeterminingtheProbability of Default of AgriculturalLoans in a French Bank", 2006 Annual Meeting, July 23-26, LongBeach, CA 21376, AmericanAgriculturalEconomicsAssociation.

Karacan, A.R, (1991). "Tarımsal İşletmelerin Finansmanı ve Tarımsal Kredi", EÜZF Yayınları No:498, İzmir.

Ijioma, J.C., Osondu, C.K., (2015). "AgriculturalCreditSourcesandDeterminants of CreditAcquisitionbyFarmers in IdemiliLocalGovernmentArea of AnambraState". Journal of AgriculturalScienceandTechnology B 5 (2015) 34-43 (doi: 10.17265/2161-6264/2015.01.004), David Publishing

Miran, B., (2007). IntroductiontoStatistics, Ege University, Pages: 297, İzmir, Turkey.

Mitra, S. and Prodhan, M. M. H.,(2018). "Factors Determining Credit Access of Tomato Farmers in a Selected Area of Bangladesh". National Journal of Multidisciplinary Research and Development, 3 (1): 406-410.

Özçelik A, Güneş E, Artukoğlu MM, (2005). "Türkiye'de Tarımsal Kredi: Sözleşmeli Tarım ve Üretici Örgütleri Üzerinden Kredi Uygulamaları". Ziraat Mühendisliği VI. Teknik Kongresi, 3- 7 Ocak 2005, Ankara.

Özden, F., Topuzoğlu, İ., Pıtır, S., (2012). "Kırsal Kesimde Tarımsal Kredi Kullanımı ve Tarım İşletmesi Üzerine Etkileri: İzmir İli Torbalı İlçesi Örneği". 10. Ulusal Tarım Ekonomisi Kongresi. 5-7 Eylül 2012. Sayfa: 713-719. Konya.

Taşkıran, R., Özüdoğru, H.,(2010). "Türkiye'de Tarımsal Kredi Uygulamaları", Ticaret ve Turizm Eğitim Fakültesi Dergisi, Sayı 1, 2010, s. 152.

TEB, (2014).“Faiz İndirimi Uygulanan Tarım Kredilerinin Etkilerine İlişkin Ön Çalışma. Türkiye Ekonomi Bankası”, KOBİ Bankacılığı Pazarlama Departmanı, İstanbul

Yurdakul, O., Akdemir, Erkan, O. VD.,(1994). “GAP Alanındaki Tarım İşletmelerinin Ekonomik Analizi: Kısa, Orta ve Uzun Vadedeki Kredi İhtiyaçlarının Araştırılması”, Ankara, Cilt: 11, TÜBİTAK Projesi.

EFFECT OF IMPROVED MAIZE PRODUCTION TECHNOLOGY ON THE POVERTY STATUS OF RURAL FARMERS IN KADUNA STATE, NIGERIA.

Usman Shaba Mohammed
Federal University of Technology, Department of Agricultural Economics and Farm Management, Nigeria, Email: usman.shaba@ futminna.edu.ng & hsshabausman@ yahoo.co.uk

Cornelius Owoniyi Adebayo
Federal University of Technology, Department of Agricultural Economics and Farm Management, Nigeria

Akuniyi Matthew Durba
Federal University of Technology, Department of Agricultural Economics and Farm Management, Nigeria

Abstract

Improved maize production technology will increase output per hectare which could translate into increased income. Maize is a major crop produce in Kaduna State, Nigeria. This study examined the effect of improved maize production technology on the poverty status of farmers in Kaduna State, Nigeria. Data for the study were collected through the use of questionnaire and interview schedule. Foster-Greer-Thobecke technique was used to obtain the poverty status of the maize farmers and chow test was conducted to test the effect of the use of improved maize technology on poverty status. Two categories of farmers were selected for the study i.e adopters and non-adopters of improved maize production technology. The result of the study showed that 25.34 and 44.44% of the adopter and non-adopters respectively, are still living in poverty.What is required to bring 24.59%, 33.83% and 37.39% of the adopters, non-adopters and the pooled sample to the poverty line was 72,557.99, 66.763.75 and 94.072.70 Naira respectively. The chow test revealed that, the use of improved maize production technology had a significant positive effect on the poverty status of the maize farmers. The study recommends that, sustained use of improved maize production will get the farmers out of poverty.
Keywords: Foster-Greer-Thobecke, Production Technology, Poverty, Adopter, Chow Test.

1. Introduction

Poverty is a global phenomenon which affects continents, nations and people differently. It affects people in various depths and levels at different times and phases of existence. There is no nation that is absolutely free from poverty. . Nigeria had a poverty level of barely fifteen percent of its population in 1960, and currently struggling to bring it down from about seventy one percent of its about 162 million people (World Bank, 2012). The issue of poverty is central to social and economic development of the developing nations of the world. According to the Multi Dimensional Poverty Index (MPI, 2010), 46% of Nigerians lived below the national poverty line.. Efforts at reducing poverty by were rightly targeted at the rural communities where nearly 70% of the poor population reside, although world bank (2014) argued that is only 33% of the Nigeria population were poor. The phenomenon is more severe in the area where agricultural production is predominantly practice(Awotide et al., 2011). Researchers like Oni and Yusuf (2006) have stress the important of agricultural sector particularly crop production sub-sector in reducing poverty in developing nations of the world. Maize is one of the most important staple food crop in developing countries Nigeria inclusive . Improving the productivity of maize farm by using improved production technologies will enhance farmers welfare.

Improved maize production technology was promoted by a non-Governmental organization, *Sasakawa* Global 2000 (SG-2000). Part of the objectives of the organization is to diffuse improved

agricultural technology to farm households in order to increase output. One of these efforts is the introduction of improved maize production technology in some States in Northern Nigeria. The organization work through the Agricultural Development Projects (ADPs) established in participating States (SG 2000, 2010). Production technology adoption could reduce poverty by increasing farm productivity which will increase farm income.

Therefore, these study analysed the effect of improved maize production technology adoption on poverty status of the rural farmers in Kaduna State, Nigeria

2. Methodology

2.1 Study Area

The study was conducted in Kaduna State. The state is located in the northern part of Nigeria and is located between latitudes 10°21′ N to 10°33′ N and longitudes 7°45′ E to 7°75′ E.. March is the warmest month at 30.4°C, January is the coldest month of the year at 12.7°C, Rainfall is heaviest in the south and decreases northwards with an annual mean rainfall varying between 942mm and 1000mm which last from April-October (NAERLS, 2012).The people of the State are engaged in agricultural production activities. The main crops which are grown in the State include maize, sorghum, soya bean, millet, rice, groundnut, yam and sugarcane. By the 2006 census of the National population commission, Kaduna State population is currently estimated at 6,113,443 (Indexmundi, 2016). There are 23 LGAs in the State, the State has a land mass of about 43,460km^2.

2.2 Sampling Technique and Procedure

A multi-stage sampling technique was adopted for this study. At the first stage, a purposive sampling technique was used to select one maize technology transfer adopting and non-adopting zone that is, Lere and Samaru zones respectively. The second stage involved a random sampling of two LGAs from each of the selected zones. This gave a total of four LGAs for the study. The third stage involved a random selection of three communities from each of the selected LGAs. This gave a total of twelve communities for the study. At the last stage, following Nwadike (2016) and Adewumi (2017), 10% of the adopters and non-adopters of the improved maize technology in each of their respective selected communities were sampled. The summary of sampling procedure is presented in Table 1.

Table 1. Sampling Design

Agricultural Zone	Local Government	Community	Sample Frame	Sample Size (10%)
Lere (Adopting Zone)	Lere	Yarkasuwa	312	31
		Saminaka	251	25
		Lere	229	23
	Igabi	Jaji	218	22
		Kwanan Parikwoi	208	21
		Ungwan Kanawa	236	24
Sub-Total			**1,454**	**146**
Samaru (Non-Adopting Zone)	Jama'a	Wadon	187	19
		Fadia	212	21
		Zonkwa	233	23
	Zango Kataf	Samaru Kataf	144	14
		Jankasa	219	22
		Mabushi	176	18
Sub-Total			**1,171**	**117**
Total			**2,625**	**263**

Source: Field survey, 2017

2.3 Method of Data Collection

Primary data were used for this study. The data were collected with the use of structured questionnaire which was complemented with interview schedule. Also, extension agents and trained enumerators were engaged to assist during the period of data collection.

2.4 Analytical Techniques

The farm budgeting model used byYusuf *et al.* (2008) and Adewumi (2017) was adopted and specified in equation (1) as:

$$NFI = \sum_{i=1}^{n} P_i Y_i - \sum_{j=1}^{m} P_j X_j - \sum_{k=1}^{f} F_k \quad (1)$$

Where;
NFI = Net farm income
Y_i = quantity of maize output (kg/ha)
P_i = Unit price of maize
X_j = Quantity of the variable inputs per hectare (where j =, 1, 2, 3, …, m variable inputs)
P_j = Price per unit of variable inputs.
F_k= Cost of fixed inputs per hectare (where k =, 1, 2, 3, …, f fixed inputs)

The Foster-Greer-Thorbecke (1984) model used by Sallawu (2014) and Pelemo (2016) was adopted to determine the poverty status of respondents in the area.

$$P_\alpha = \frac{1}{N} \sum_{i=1}^{Hi} \left(\frac{z - y_i}{z} \right)^\alpha \quad (2)$$

Where, N = total number of respondents;
y_i = Annual household expenditure;
Z = poverty line of respondents in the study areas.
α = Poverty Aversion Parameter Index which take on the values of 0, 1 and 2 representing incidence of poverty, poverty gap and severity of povertyrespectively. The measure relates to different dimensions of the incidence of poverty. The poverty line was placed at two-third mean expenditure of respondents. Based on this, respondents were classified into three groups. a

The first group is the proportion of the population that falls below the poverty line. This is called the head count or incidence of poverty, which was determined with the formula in equation.

$$P_O = \frac{H_0}{N} \quad (3)$$

If $\alpha = 1$, then FGT becomes

$$P_1 = \frac{1}{N} \sum_{i=1}^{Hi} \left(\frac{z - y_i}{z} \right) \quad (4)$$

This is the depth of poverty. It is the percentage of expenditure required to bring each individual below the poverty line to poverty line.

If $\alpha = 2$, then FGT becomes

$$P_2 = \frac{1}{N} \sum_{i=1}^{Hi} \left(\frac{z - y}{z} \right)^2 \quad (5)$$

This is the severity of poverty. It is indicated by giving longer weight to the extremely (core) poor. It is achieved by squaring the gap between their expenditure and the poverty line to increase its weight in the overall poverty measure.

A z-test model was used to determine the effect of *Sasakawa* improved maizeproduction technology on the poverty status of the farmers. The model is specified in equation (6) as:

$$Z = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}} \quad (6)$$

Where;

$\bar{X}_1$ = Mean outcome of the Sasakawa maize technology adopters
$\bar{X}_2$ = Mean outcome of the Sasakawa maize technology non − adopters
σ_1^2 = Outcome variance of the Sasakawa maize technology adopters
σ_2^2 = Outcome variance of the Sasakawa maize technology non − adopters
n_1 = Number of observation of the Sasakawa maize technology adopters
n_2 = Number of observation of the Sasakawa maize technology non − adopters

3. Results and Discussions

3.1 Poverty Status of Maize Farming Household

The poverty status of the maize farming households' heads was analysed using FGT index and the results are presented in Tables 2. Farm households were categorized into poor and non-poor. The result showed that only 25.34%, 44.44% and 31.56% of the adopters, non-adopters and pooled data were poor using the $1.98 per day. This implies that there is still the incidence of poverty in the study area. The poverty head count or incidence (P_0), poverty gap or depth (P_1), and squared poverty gap or severity (P_2) was also calculated and the results are presented in Table3. The mean incomes of all adopters, non-adopters and pooled data were estimated to be ₦442,606.69, ₦296,026.1 and ₦377,397.85 per annum respectively as presented in Table4.. The relative poverty line was thus defined based on the average income of the farmers. The poverty line is an income-based threshold line that divides the poor and the non-poor farm households in the study area. The value of the poverty line for the adopters, non-adopters and pooled data was estimated as ₦295,071.13, ₦197,350.75, 606.70 and ₦251,598.56. Consequently, farmers that earned less than two-third of the mean income, that is, the poverty line were considered to be poor. This approach was used in similar studies in Nigeria by Nmadu, *et al.* (2014) and Omobaba (2016).

Table 2. Poverty Status of Household

Poverty Status	Adopters		Non-Adopters		Pooled Data	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Poor	37	25.34	52	44.44	83	31.56
Non-Poor	109	74.66	65	55.56	180	68.44
Total	146	100.00	117	100	263	100

Source: Computed from field survey, 2017.

Table 3. Estimated FGT Indices of the Respondents

FGT Indices	Adopters	Non-Adopters	Pooled Data
Head Count (P_0)	0.2587	0.4444	0.3156
Poverty Depth (P_1)	0.2459	0.3383	0.3739
Poverty Severity (P_2)	0.0846	0.1511	0.1819
Mean Income (₦)	442606.69	296026.12	377397.85
Poverty Line (₦)	295071.13	197350.75	251598.56

Source: Computed from field survey, 2017

The P_0 for the entire adopters, non-adopters and pooled data were 0.2587, 0.4444 and 0.3156 respectively. The poverty gap index (P_1) usually referred to as the depth of an average poor person from the poverty line for the adopters, non-adopters and pooled data were estimated to be 0.2459, 0.3383 and 0.3739. This implies that 24.59% of the adopters, that is, ₦72,557.99; 33.83% of the non-adopters, that is, ₦66,763.75 and 37.39% of the pooled data, that is ₦94,072.70 were required to bring an average poor person within the group to the poverty line respectively. This is the minimum cost of eliminating poverty (relative to the poverty line) and this shows the amount that could be transferred to the poor to bring their income up to the poverty line. Thus, this measure is an indicator of the potential savings to the poverty alleviation budget. The poverty gap (P_2) which measures the distance of each poor person to another was found to be 0.0846, 0.1511 and 0.1819 for the adopters, non-adopters and pooled data respectively. This means that among the poor household heads, 8.46%, 15.11% and 18.19% respectively were severely poor. This indicates that the poor household heads were not equally poor but they vary in their degree of poverty being more pronounced for the non-adopters compared to the adopters. These estimates are similar to the 37% reported by Sallawu (2014) for farming households surveyed in Niger State but lower than the 46.75% reported by Omobaba (2016) based on the income-poverty line measure.

Table 4. Estimated Income for Adopter and Non-Adopter of Improved Maize Production Technologies

Annual Income (₦)	Adopter	Non- Adopter	Pooled Data
1 – 100,000	1 (0.68)	11 (9.40)	12 (4.56))
100,001 – 200,000	10 (6.85)	41 (35.04)	51 (19.39)
200,001 – 300,000	28 (19.18)	6 (5.13)	34 (12.93)
300,001 – 400,000	20 (13.70)	11 (9.40)	22 (8.37)
400,001 – 500,000	56 (38.36)	35 (29.91)	70 (26.62)
Above 500,000	31 (21.23)	13 (11.11)	74 (28.14)
Mean	442,606.69	296,026.12	377,397.85

Source: Computed from field survey, 2017

3.2 Effect of SG-2000 Improved Maize Technology on the Poverty Status of the Adopters

The result of the z-test analysis of the effect of SG-2000 improved maize technology on the poverty status of the adopters is presented in Table5. The result shows an estimated mean poverty depth index of 0.2459 and 0.3383 for the adopters and non-adopters respectively. It also indicated an estimated mean poverty depth difference of -0.0924 between the adopters and non-adopters with a z-value of -2.3938 which was significant at the $p<0.05$ probability level. This implies that the poverty depth of the adopters is 9.24% lower than that of the non-adopters. This could be attributed to effect of *Sasakawa* maize technology on the adopters. This implies that SG-2000 improved maize technology had a positive and significant effect on the poverty status of adopters in Kaduna State in that there poverty has been significantly reduced compared to the non-adopters.

Table 5. Analysis of Effect of SG-2000 Improved Maize Technology on the Poverty Status of the Adopters

Variables	Mean	Standard Deviation	Z-Value
Adopters Poverty Depth	0.2459	0.1575	-2.3938**
Non-Adopters Poverty Depth	0.3383	0.1933	
Poverty Depth Difference	-0.0924	0.0734	

Source: Field survey, 2017.

4. Conclusion and Recommendation

Based on the findings of the study, it was concluded that the use of improved maize technology had significant and positive effect on the poverty status of the maize farmers in Kaduna State

This suggests that adoption of improved maize production technologies significantly generate an improvement in farming household poverty status. Hence, efforts should be intensified to ensure farmers have access to improved maize production technologies at the right time. All programs, strategies and policies that could lead to increase in improved maize production technology adoption should be encouraged in order to achieve the much desired poverty reduction in the rural farming communities in Nigeria.

References

Adewumi, A. (2017). Optimum production plans for cassava-based crop farmers in Kwara State, Nigeria. Unpublished MTech Thesis, Department of Agricultural Economics and Extension Technology, Federal University of Technology, Minna Nigeria.

Awotide , B.A., T.T. Awoyemi , A. Diagne, and V.T. Ojehomon (2011). Impact of Access to Subsidised Certified Improved Rice Seed on Income: Evidence from Rice Farming Households in Nigeria. OIDA International Journal of Sustainable Development 02:12 (2011).

The Global Multidimensional Poverty Index by the U.N (2010). http://www.dataforall.org/dashboard/ophi/index.php/

Nmadu, J. N., Yisa, E. S., Simpa, J. O., & Sallawu, H. (2014). Poverty Reduction in Nigeria: Lessons from Small Scale Farmers of Niger and Kogi States. *British Journal of Economics, Management and Trade*, 5(1), 124-134.

National Agricultural Extension Research and Liaison Services (NAERLS), (2012). Agricultural Performance Survey of 2012 Wet season in Nigeria. Pp 110

Nwadike, C. C. (2016). Comparative economic analysis of yam and sweet potato marketing in Federal Capital Territory, Abuja, Nigeria. Unpublished MTech Thesis, Department of Agricultural Economics and Extension Technology, Federal University of Technology, Minna Nigeria.

Omobaba, R. Y. (2016). Income diversification and poverty status of arable crop farmers in Shiroro Local Government area of Niger State, Nigeria. Unpublished B. Agric. Tech thesis, Department of Agricultural Economics and Extension Technology Federal University of Technology, Minna, Nigeria

Oni, A.O and S.A. Yusuf(2006). Dterminants of Expected Poverty among Rural House holds in Nigeria. Final report presented at AERC, Biannual workshop in Nairobi, Kenya

Sallawu, H. (2014). Livelihood and income diversification strategies among farm households in Niger State, Nigeria. Unpublished *MTech thesis,* Department of Agricultural Economics and Extension Technology Federal University of Technology, Minna, Nigeria

Sasakawa Global 2000 (2010), *Preliminary report on Adoption situation in Northern Nigeria*, SG 2000.

Pelemo, J. J. (2016). Effect of cashew production on rural poverty alleviation in Kogi State Nigeria. Unpublished MTech thesis, Department of Agricultural Economics and Extension Technology Federal University of Technology, Minna, Nigeria

World Bank, (2012). Nigeria: poverty in the midst of plenty. The challenge of growth with inclusion. World Bank Poverty Assessment. Population and Human Resources Division, West Africa Department, Africa Region. Report No. 14733 UNI. World Bank, Washington DC, USA.

World Bank. (2014). *Nigeria economic report (English)*. Nigeria economic report; no. 2. Washington, DC World Bank Group.http://documents.worldbank.org/curated/en/337181468100145688/Nigeria-economic-report.

VULNERABILITY OF SUGARCANE CROP PRODUCTION TO CLIMATE CHANGE IN PAKISTAN: AN EMPIRICAL INVESTIGATION

Usman Shakoor
Comsats University Islamabad, Department of Economics, Pakistan
Email: usman.shakoor@comsats.edu.pk

Mudassar Rashid
Comsats University Islamabad, Department of Economics, Pakistan

Muhammad Iftikh-ul-Husnain
Comsats University Islamabad, Department of Economics, Pakistan

Tahir Arif
Researcher, Email: Tahir_ch007@ hotmail.com

Abstract

Climate change and its impact on agriculture productivity has gain an important consideration in recent times. Pakistan is in that part of the world, which is the one most vulnerable region to the climate change. Sugarcane is one of the cash crop of Pakistan which contributes significantly towards total agriculture crop productions. It is therefore dire need to evaluate climate change impacts on sugarcane crop production. The current evaluated the impacts of climate change on sugarcane crop production of Pakistan using ARDL (Auto Regressive Distributed Lag) bound testing approach. The empirical results guided as that climate change has significant positive effect on sugarcane crop production of Pakistan. Increase in rainfall would increase sugarcane production. One percent increase in rainfall would increase sugarcane production by 0.17 percent in long run. effect on crop production of Pakistan. Increase in mean temperature also increased sugarcane crop productions. Fertilizer use and water availability in form of ground and canal has contributed positively towards sugarcane production.
Keywords: Climate Change, Sugarcane Production, ARDL, Pakistan

1. Introduction

The quantity of sugarcane produced globally has increased four times from that of what it was in 1965 reaching over 2 billion tons globally (Mckay etal., 2016). The crop contributes significantly towards its agriculture share in GDP in major sugarcane producing economies such as Pakistan, China and Brazil. Almost from three decades mostly researchers from agriculture sector are motivated to understand the economic costs of changes in climate.To better understand changes in variables like air temperature, and atmospheric carbon dioxide (CO2) those influence sugarcane production should be under concerned (Zhao, 2015).

Sugarcane is one of the cash crop of Pakistan which plays a significant role in the up lift of socioeconomic conditions of local farming community. Pakistan is 5th largest sugarcane producer country in the worldwhile stands at 8th position in terms of sugarcane consumption respectively in the world. this crop is widely grown in Sindh, Punjab and NWFP provinces. Average per hectare productivity of sugarcane in last few years isbetween 45 to 50 ton/hectare. It is poorest among 16 sugarcane producing agriculture countries.Cropcover roughly about5% of the crop area, consuming approximately 10 percent of total water availability hence, sugarcane is consuming a hugequantity of water available through Indus basin when compared to the area (Nazir etal., 2013).

2. Climate Change and Sugarcane Production in Pakistan

The climate of Pakistan generally favors crop productivity through-out the year but extreme weather hinders sugarcane production in Pakistan. With growing debate on climate change all over the globe and having a sufficient and authentic literature about climate change happenings, climate change is supposed to effect different sectors of economy however agriculture sector is one most vulnerable sector because it is totally dependent on natural climatic conditions. Any significant deviations from the climatic means are supposed to effect agriculture production negatively. Extreme weather conditions are very much evident for last ten years where erratic rainfalls withextreme summers has been encountered. Pakistan's agriculture sector is very much exposed to climate change because of its geographical location. Sugarcane is one of the important cash crop of Pakistan and is supposed to be affected by these climatic extremes. This crop is a high water requiring crop so climate change would definitely affect this crop. The question arises that would be the effects of climate change on sugarcane production of Pakistan. Either climatic changes are good or bad for sugarcane production. We need to look in to these outcomes, so a proper long-term policy could be designed based on empirical examination.

3. Material and Methods

3.1 Data Description

The current study used total of six variables out of which climatic variables are mean temperature, mean rainfall and water availability while area under cotton crop, fertilizer used for sugarcane crop are the non-climatic variables. sugarcane production is dependent variable measured in metric tons. mean temperature is expressed in Celsius scale, mean rainfall taken in millimeters, water availability is measured in million-acre feet (MAF), while area under cotton production is in thousands hectare, fertilizer in thousand nutrients tons. The data of climatic variables is collected from Pakistan Meteorological Department,the data of sugarcaneproduction, area under sugarcane crop production were collected from different editions of Pakistan economic survey while the data of fertilizer used for cotton received from National fertilizer development center (NFDC).

3.2 Econometric Model

The study has used Auto Regressive distributive lag model first introduced by Pesaran et al. (2001). The basic assumption to use ARDL is that all variable should be stationary at same level or at 1st difference. None of the variable should be stationary at level 2.In this study,ARDL is best suitable method to meet our objectivesto check the impact on sugarcane production in the both long and short run. It will also provide coefficients of cointegration. This technique is generalized by Pesaran and Pesaran(1997), Pesran and Smith (1998), Pesaran and Shin (1999) and Pesaran *etal*., (2001) Known as Autoregressive Distributed Lag model (ARDL). The ARDL model is preferable to the other co-integration models for the reason that the model does not involve the pre-testing variables, which means the test on existence of relationship between variables in level can be applicable irrespective of whether the underlying repressors are purely I(0), purely I(1) or fractionally co-integrated Pesaran and Pesaran(1997). Janjua *et al.,* (2014) used ARDL model to check the impact of climate change on wheat crop production. Odhiambo (2009)examined the relationship between energy consumption and growth of economy using Auto Regressive Lag Distributed model.

General equation of Auto Regressive distributive lag model is

$$Y_t = \alpha_0 + \Sigma\alpha_i Y_{t-i} + \Sigma\beta_i X_{t-i} + U_t \quad (1)$$

Whereas the general correlation model of Auto Regressive distributive lag model is

$$\Delta Y_t = \alpha_0 + \Sigma\beta_j Y_{t-i} + \Sigma\beta_j X_{t-j} + \psi ECM_{t-1} + U_t \quad (2)$$

In the equation ψ show the speed of adjustment parameter and ψ must be negative for significant of error correction model (ECM). The relationship between dependent and independent variables are as follow,

Sugarcane Production = f (AVGMT$_{emp,}$ AVGR$_{ainfall,}$, A$_{rea}$ under Sugarcane crop, F$_{ertilizer}$ Used, Water Avaliability (3)

Log transformation has been applied which gave us the proficient and suitable results as compared to the simpler form.

$\ln S_{ugarcane}=\beta_1+\beta_2 \ln AvgTemp+\beta_3 \ln AvgR_{ainfall}+\beta_4 A_{rea}$under sugarcane crop$+\beta_5 \ln F_{ertilizer}+\beta_6$Water avalibility (4)

Auto Regressive distributive lag model for the study to find long run relationship between the variables are $\ln S_{ugercane}= \alpha_0+\Sigma\alpha_1 \ln Sugarcane_{t-i}+\Sigma\alpha_2 \ln AvgTemp_{t-i}+\Sigma\alpha_3 \ln AvgRainfall_{t-i}+\Sigma\alpha_4 \ln Area_{t-i}+\Sigma\alpha_5 \ln Fertilizer_{t-I}$ (5)

Auto Regressive distributive lag model for short run is

$\Delta \ln S_{ugercane}= \beta_0+\Sigma\beta_1 \Delta \ln Sugercane_{t-i}+\Sigma\beta_2 \Delta \ln AvgTemp_{t-i}+\Sigma\beta_3 \Delta \ln Rainfall_{t-i}+\Sigma\beta_4 \Delta \ln Area_{t-i}+ \Sigma\beta_5 \Delta \ln Fertilizer_{t-i}+$ (6)

Where β_i (i=1, 2, 3 ……., 9) are all regression coefficients.

3.3 Bound Testing Model

Bound testing is to check the long-run relationship amongst the dependent and independent variables. In first step the null hypothesis of no co-integration $H_0:\delta_1=\delta_2=\delta_3=\delta_4=\delta_5=0$ amongst the variables is checked against the substitute hypothesis H_1: $\delta_1\neq \delta_2\neq \delta_3\neq \delta_4\neq \delta_5\neq 0$ of co-integration amongst the variables.F-Statistics is use to test the joint significance of lag levels of the variables in a conditional unrestricted equilibrium ECM (error correction model) Pesaran*et al*. (2001). The distribution of F-statistics is non-standard regardless of where the variables are I (0) or I (1) or partially co-integrated. Pesaran*et al*. (2001) devised two sets of critical values. One set assume that the variables are I (0), whether the other set to be assume that all the variables are at first difference.

3.4 CUSUM & CUSUMSQ Test

After the development of long-run relationship of variables, CUSUM and SUSUMQ test has been applied. This test is developed by Brown *et al*. (1975). it checks the R(sqr) for ARDL as suggested by Pesaran*et al*. (2001). Both tests are combined on the residuals of the error correction model and fabricate results in graphical form.

4. Results and Discussion

4.1 Unit Root Testing

Before applying auto regressive distributed lag bound testing approach, stationarity of the variables has been checked. The null hypothesis stated that the variables have unit root i.e. the variable is non-stationary and the alternative hypothesis is that the variables have no unit root it means that the variable is stationary.

Table 1. ADF Unit Root Test

Variables	At Level	At First Difference	Stationarity Result
Average.Temperature	-1.9020	-9.1897	First Difference
Average Rain Fall	-1.6844	-11.6708	First Difference
Fertilizer Used	-2.0461	-4.0977	First Difference
Area under sugarcane crop	-0.79419	-5.178	First Difference
Water Availability	-3.0631	-7.6839	At Level
Sugarcane Production	-0.5073	-7.3092	First Difference

The null hypothesis will be accepted if the value of ADF statistics is great or in between the critical values and the null hypothesis is rejected if the ADF statistics value is less than the critical value and alternative hypothesis will be accepted. The table (1) shows the results of unit root testing, show that the mean temperature, average rain, fertilizer used, area under sugarcane crop and sugarcane production are stationary at first difference while water availability is stationary at levels.

4.2 ARDL Model

To select the appropriate lags for best ARDL model we used Akaike information Criterion (AIC) and Schwarz information criterion (SIC). The lowest values of AIC and SIC directed us to use appropriate model for the study. LnPrd denote annual production of sugercane, Lnrn represent mean rainfall, LnMt denote mean maximum temperature, Lnfrt denote fertilizer used , Lnar represent area under cotton crop and lnrn represents the average rainfall.For checking long run co-integration among variables we run ARDL bound testing. Table (3) shows the results of bound testing which clearly show that the F-statistic value that is -7.4640 is greater than the upper bound value that is 3.79. So, in this case we reject the null hypothesis of having no long run co-integration against alternative hypothesis of having long-run co-integration. Therefore, it is concluded that there exists long run co-integration among the variables.

Table 2. ARDL Bound Testing

F-static	Critical Value	Lower Bound	Upper Bound	Result
-7.464077	1%	3.41	4.68	Co-Integration exists
	5%	2.62	3.79	
	10%	2.26	3.35	

Table (3) showed the results of long run elasticities of sugarcane production and independent variables i.e climatic and non-climatic variables. In Table (3), the t-statistic value for average temperature is 5.299, which is statistically significant. A one percent increase in average temperature will increase sugarcane production by 1.47 percent. Average rainfall also showed statistically significant results. It was observed that a one percent increase in average rainfall would increase sugarcane production by 0.17 percent, showing a positive effect of increase in rain fall on sugarcaneproduction. One of the important variable of the study i.e. water availability also showed significant impacts on sugarcane crop production. One percent increase in water availability would increase sugarcane production by 0.41 percent, also showing the positive affect of increasing water availability. Fertilizer use and area under the sugarcane crop production also showed significant positive effect on the production of sugarcane crop. If there is one percent increase in fertilizer use and area under sugarcane crop would increase sugarcane production by 0.11 and 1.13 percent respectively.In table 4 the error correction coefficient (– 1.61) has the expected negative sign and is highly significant. This helps reinforce the finding of a long run relationship among the variables in the model. In addition, it also indicates a very speedy convergence to long-run equilibrium of the model.

From the above mentioned empirical results it has been gathered that that the climate change has imparted significant impacts on sugarcane production. Current study doesn't find any significant negative effects of the climatic variables as evident from the results that are reported above. Sugarcane crop is a high water requiring crop so increase in rainfall would definitely increase sugarcane production. water availability variable which includes the canal water and underground water has shown significant positive effect on sugarcane production. Timely and sufficient availability of canal water is very important to further increase sugarcane production (Deressa *et al*., 2010) showed that sugarcane production is less sensitive to average rainfall. Study also doesn't find any negative significant effect of increasing temperature, so this study guided us in way that if the temperature increases with more rainfalls and more water in the canals, the sugarcane production would increase in the long run. (Ali *et al.,* 2017) evaluated that increase in temperature will increase sugarcane production. Non- climatic variables i.e. Fertilizer use enhances the sugarcane production in both short

and long run. (Sidiqui *et al*., 2013) also deducted in his study that increase in fertilizer use would affect sugarcane production positively. Similarly area under crop production also contributed positively towards sugarcane production.

Table 3. ARDL Long Run Form

Variable	Co-efficient	Std. Error	t-Statistics	Prob.
Lnmt	1.474943	0.278304	5.299750	0.0000*
Lnfrt	0.115349	0.027594	4.180149	0.0005*
Lnar	1.138710	0.058026	19.624042	0.0000*
Lnwa	0.416514	0.097911	4.253986	0.0004*
Lnrn	0.172642	0.021020	8.213335	0.0000*

Not:* significant at 1% level of significance ** significant at 5% level of significance

Table 4. ARDL Short Run Form

Variable	Co-efficient	Std. Error	t-Statistics	Prob.
D(Lnmt)	1.444850	0.371468	3.889567	0.0009
D(Lnfrt)	0.186652	0.042846	4.356384	0.0003
D(Lnar)	1.250923	0.093447	13.386378	0.0000
D(Lnwa)	0.673984	0.195451	3.448351	0.0025
D(Lnrn)	0.092154	0.026365	3.495303	0.0023
D(Lnrn(-1))	-0.056543	0.027524	-2.054270	0.0533
CointEq(-1)	-1.618153	0.218823	-7.394790	0.0000

Not:* significant at 1% level of significance ** significant at 5% level of significance
*** significant at 10 % level of significance

4.3 Cumulative Sum and Cumulative Sum of Squares

It is to be applied to check the R (sqr) of ARDL model used by Pesaran*et al*. (2001). CUSUM and CUSUMQ have two graph with 5% critical value. If the model is in between the 5% critical values then we can say that the model is stable and goodness for fit. Figure (1) and (2) showed the results of CUSUM and CUSUMQ test respectively. It shows that model under study is stable.

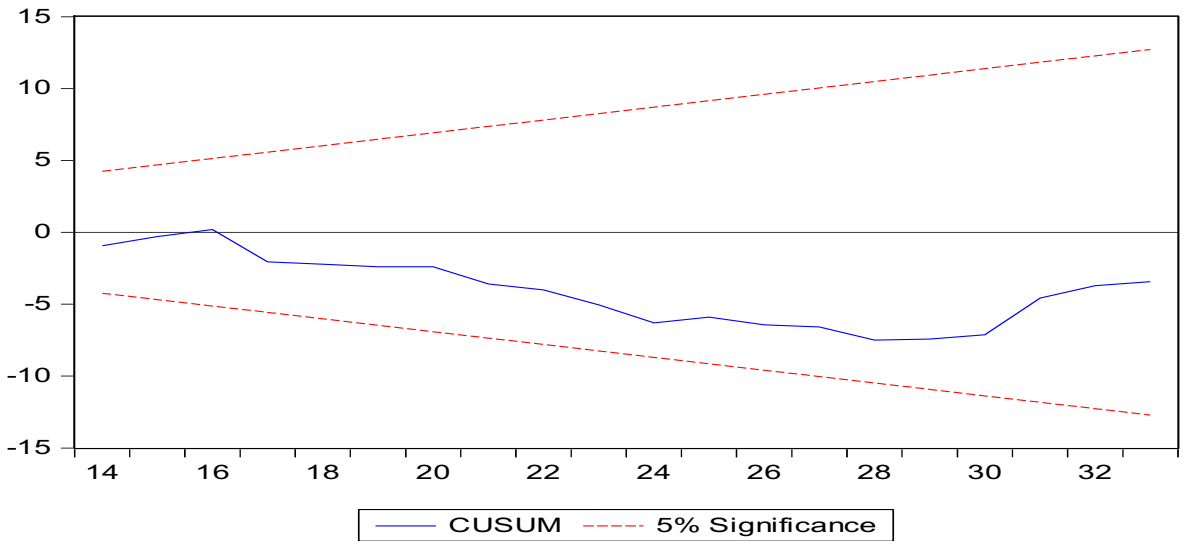


Figure 1. CUSUM Test

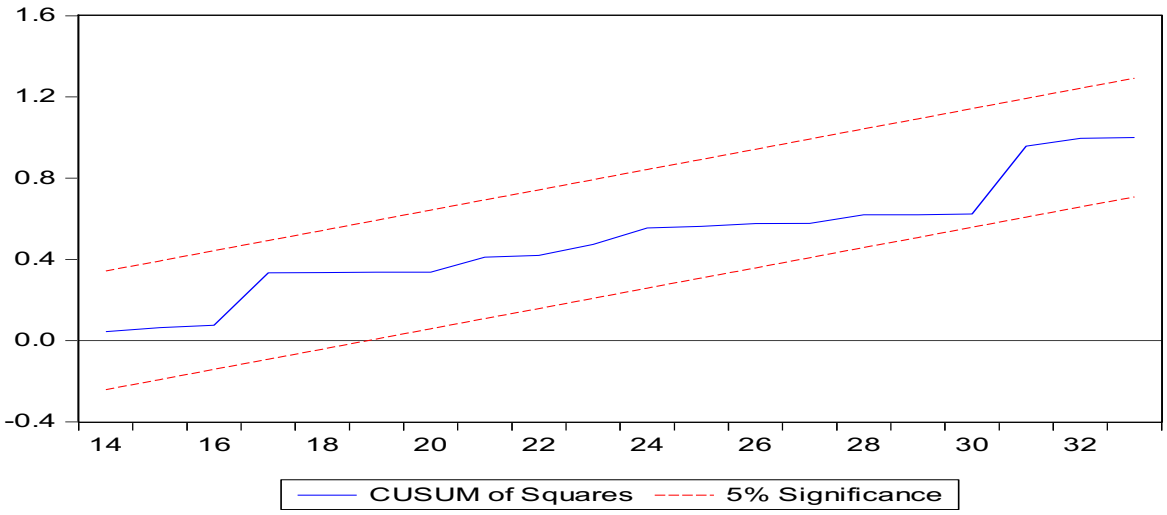


Figure 1. CUSUMQ Test

5.4 Diagnostic Tests

Serial Correlation LM Test (χ)	0.661 (0.718)
Heteroscedasticity Test (χ)	6.99 (0.726)

Serial Correlation LM test and Heteroscedasticity test reported above confirmed that there was no problem of autocorrelation and Heteroscedasticity in our model.

6. Conclusion

From empirical examination of the climate change impact on sugarcane crop production of Pakistan the study concluded that climatic changes are not threating to the sugarcane crop production of Pakistan. Almost all the climatic variables were found to have positive impacts on sugarcane crop production. Sugarcane cultivation requires a tropical or subtropical climate so increase in both the rainfall and temperature were contributing positively towards overall sugarcane production. Water that is available to the sugarcane crop throughout the crop season provided in the form of canal water, river flow and tube well water also found to be a critical factor towards increased sugarcane production. Fertilizer used also contributed towards increased sugarcane production. As rainfall and water availability was found to be the most critical factors to increase sugarcane production the study suggests a revisited water policy for Pakistan in context of current climate change events. A lot of river flow is wasted throughout the years due to no water storage which also reduces the water availability. Study considers it as the most important policy derivative for having a better crop production in future.

References

Ali, A., & Jan, A. U. (2017). Analysis of Technical Efficiency of Sugarcane Crop in Khyber Pakhtunkhwa: A Stochastic Frontier Approach. Sarhad Journal of Agriculture, 33(1), 69-79.

Brown, R. L., Durbin, J., & Evans, J. M. (1975). 'Techniques for testing the constancy of regression relationships over time.' *Journal of the Royal Statistical Society. Series B (Methodological)*, 149-192.

Deressa, T. T., Ringler, C., & Hassan, R. M. (2010). Factors affecting the choices of coping strategies for climate extremes. The case of farmers in the Nile Basin of Ethiopia IFPRI Discussion Paper, 1032.

Janjua, P. Z., Samad, G., & Khan, N. (2014). 'Climate change and wheat production in Pakistan: An autoregressive distributed lag approach.' *NJAS-Wageningen Journal of Life Sciences, 68*, 13-19.

McKay, B., Sauer, S., Richardson, B., & Herre, R. (2016). The political economy of sugarcane flexing: initial insights from Brazil, Southern Africa and Cambodia. The Journal of Peasant Studies, 43(1), 195-223.

Nazir, A., Jariko, G. A., & Junejo, M. A. (2013). Factors affecting sugarcane production in Pakistan.

Odhiambo, N. M. (2009). 'Energy consumption and economic growth nexus in Tanzania: An ARDL bounds testing approach.' *Energy Policy, 37*(2), 617-622.

Pesaran, H., & Shin, Y. (1999). *An Autoregressive Distributed Lag Modelling Approach to Cointegration "chapter 11*. Paper presented at the Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium.

Pesaran, M. H., & Pesaran, B. (1997). 'Working with Microfit 4.0: interactive econometric analysis;[Windows version].' *Oxford University Press.*

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). 'Bounds testing approaches to the analysis of level relationships.' *Journal of applied econometrics, 16*(3), 289-326.

Pesaran, M. H., & Smith, R. P. (1998). 'Structural analysis of cointegrating VARs.' *Journal of Economic Surveys, 12*(5), 471-505.

Siddiqui, R., Samad, G., Nasir, M., & Jalil, H. H. (2012). 'The impact of climate change on major agricultural crops: evidence from Punjab, Pakistan.' *The Pakistan Development Review*, 261-274.

Zhao, D., & Li, Y. R. (2015). Climate change and sugarcane production: potential impact and mitigation strategies. International Journal of Agronomy, 2015

CONSUMER BEHAVIOUR AND PROMOTIONAL STRATEGIES DIFFERENCES ON THE MARKET OF MILK IN TURKEY AND SLOVAKIA

Jana Rybanská
Slovak University of Agriculture in Nitra, Department of Marketing and Trade, Slovak Republic
Email: rybanska@ is.uniag.sk

Doğukan Polat
Marmara University, Department of Film Design, Turkey

Ľudmila Nagyová
Slovak University of Agriculture in Nitra, Department of Marketing and Trade, Slovak Republic

Alexandra Andocsová
Slovak University of Agriculture in Nitra, Department of Marketing and Trade, Slovak Republic

Andrej Géci
Slovak University of Agriculture in Nitra, Department of Marketing and Trade, Slovak Republic

Abstract

The paper deals with the consumer behaviour of young Slovak and Turkish consumerson the market of cow's milk.Opinions of nutrition specialists differ on whether it is beneficial or notfor humans to consume the cow's milk.However, in general, milk is considered to be a very important component of the diet not only for children but also for adults. Both countries, Turkey and Slovakia rank among important producers of milk and milk products. This study explores and compares consumers' preferences for milk in chosen areas of Turkey and Slovakia and also tries to determine the profiles of young adult consumers based on their preferences, selected psychological dispositions and socio-demographic factors. To reach these objectives, the simple questionnaire was designed, and data were collected among young adults in Turkey and Slovakia. In our study we work with two independent samples. The first sample consists of 270 young adults (aged 25 – 42) from Nitra, Slovakia and the second sample consists of 585 young adults from Istanbul, Turkey.The paper provides useful information about the consumer behaviour of young adults (Millennials) in both countries and analysespromotional strategies of milk on Turkish and Slovak market for this target group. Associations that consumers have with milk can influence their buying behaviour on the market of milk and milk products. The way consumers perceive milk can also influence the way they perceive milk packaging. Milk packaging that consumers have already known can influence their associations with milk and also with other milk packaging that they expect. Product packaging is essential for consumer perception and resulting buying behaviour.
Keywords: Cow's milk, Milk Market, Consumer Behaviour, Consumer Choice, Millennials

1. Introduction

Throughout the world, there are more than 6 billion consumers of milk and milk products (Kapaj & Deci, 2017). Opinions of nutrition specialists differ on whether it is beneficial or not for humans to consume the cow's milk. However, in general, milk is considered to be a very important component of the diet not only for children but also for adults.

In 2018 Slovakia produced 0,8million tonnes and Turkey produced more than 10 million tonnes of raw cow's milk which was delivered to dairies (Eurostat, 2019). Milk production in Turkey has shown significant development in recent years (Kýrdar& Karaca, 2017). Both countries, Turkey and Slovakia rank among important producers of milk and milk products, Slovakia mainly as a part of EU 28.

The average consumption of dairy products in 2016 in Slovakia was about 173 kg per capita. The average consumption of drinking cow's milk was 45,8 kg per capita (Masár, 2018). The most consumed dairy products in Turkey are yoghurt, white cheese, kashar cheese and ayran (drink made of yoghurt and water). Per capita consumption of dairy and dairy products in Turkey is around 236 kg. Consumption of drinking milk is low, but recently, market share of UHT milk and low-fat milk has been increasing (Duyum, 2016). Because the consumption cow's milk is generally considered to be very important for human health, it is important to motivate consumers to buy this product.

This study explores and compares consumers' preferences and attitudes towards milk in chosen areas of Turkey and Slovakia and also tries to determine the profiles of young adult consumers based on their opinions, selected psychological traits and socio-demographic factors.

Consumers' choice is generally considered to be a rational, well-judged cognitive process. Increasingly however, research has shown that a significant part of consumer decision-making is unconscious (Fitzsimons et al., 2002). Clegg (2000), Dijksterhuis et al. (2005), Dhar (2012), Krishna et al. (2014) and others found that only limited number of consumers' choices are based on conscious information-processing strategies. A significant part of choices made by consumers is unconscious and results from different cues present in the external and internal environment of individuals. Many experimental studies in consumer behaviour research and social psychology have confirmed that environmental cues together with various internal factors strongly influence the final buying behaviour (Jacob et al., 2011).

The influence of personality characteristics and temperament structure on consumer behaviour is very discussed, but rarely explored topic of marketing research. There are only a few authors who investigate personality traits and their influence on the buying behaviour.

2. Material and Methods

In our study we work with two independent samples. The first sample consists of 270 young adults (aged 25 – 42) from Nitra, Slovakia and the second sample consists of 585 young adults from Istanbul, Turkey. The chosen cities are not capital cities, but both are very important metropolises in given countries. All respondents, according to their structure, belong to the demographic segment of "Generation Y" or "Millennials". This segment was chosen intentionally because it has a great purchasing power on the market and thus, on the market of milk as well. The generation of young adults is also able to influence both older and younger generations of consumers greatly. All respondents have completed at least secondary education, they live in Nitra or in Istanbul and they are all employed. Other characteristics are stated in Table 1.

Table 1. Respondents according to Gender and Income

Nitra, Slovakia		Income			Total
		less than 500€/month	500-1000€/month	more than 1000€/month	
Gender	Male	4	68	18	90
	Female	26	110	44	180
Total		30	178	62	270
Istanbul, Turkey		Income			Total
		less than 500€/month	500-1000€/month	more than 1000€/month	
Gender	Male	8	191	30	229
	Female	61	273	22	356
Total		69	464	52	585

Source: Authors′ elaboration

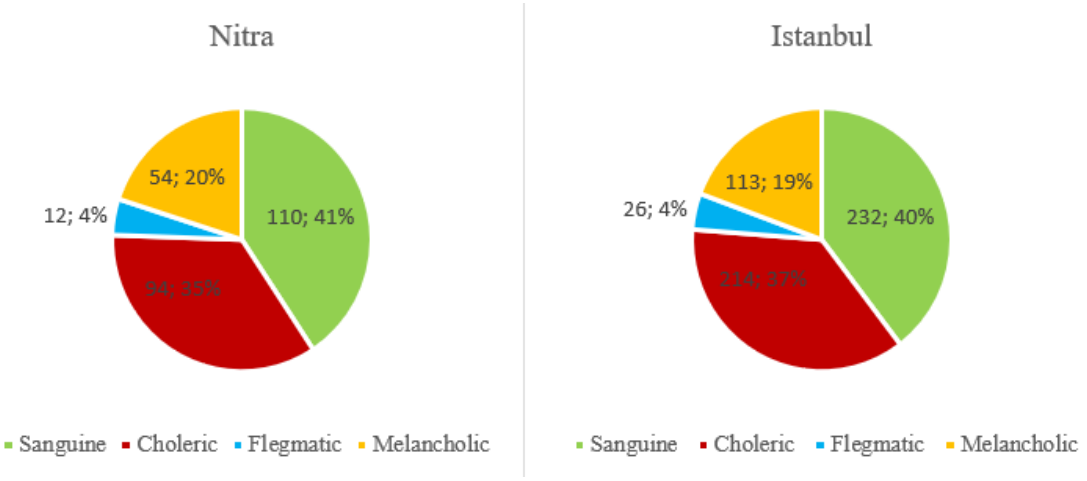
A simple questionnaire was constructed to achieve the research objectives. It was translated into Turkish and English language. A questionnaire consists of several parts. First part represents the short personality inventory based on the Big Five Model (NEO FFI) and Eysenck Personality Questionnaire (EPQ). Four personality traits were determined – neuroticism (N), extroversion (E), openness to

experience (O) and conscientiousness (C). From the scale of neuroticism and extroversion, the temperament of respondents was calculated. Second part of the questionnaire represents a basic association experiment. Respondents were asked to write down words that appear in their minds when they hear/see a word"milk" and words that they have associated with the packaging of milk. Third part consists of several statements connected to the milk consumption and buying behaviour on the market of milk. Respondents were asked to express if they agree or disagree with mentioned statements on the 5-degree Likert-type scale. Last part of the questionnaire gathers demographic information about respondents.

The dependences between psychological characteristics of respondents and their preferences were investigated by suitable statistical methods (Mann-Whitney U test, Kruskal-Wallis one-way analysis of variance and correlation analysis). https://en.wikipedia.org/wiki/Kruskal%E2%80%93Wallis_one-way_analysis_of_variance

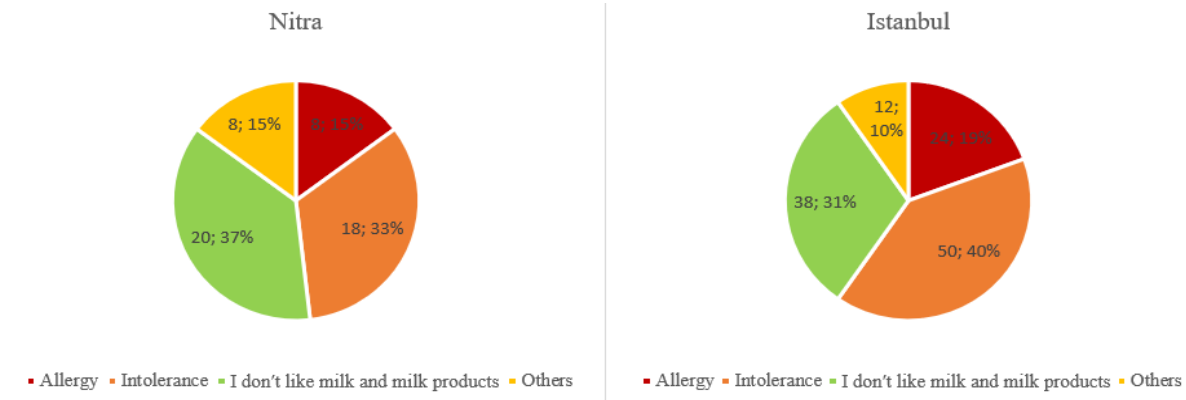
3. Results and Discussion

Representation of selected personality traits (neuroticism and extroversion) of respondents corresponds with the anticipated representation of these characteristics in the worldwide population. Researchers state that there are 50-75% of extroverts in the worldwide population, but all sources are inconclusive. There is no research that would prove the exact worldwide distribution of extroversion.



Source: Authors′ elaboration

Figure 1. Distribution of Temperament Traits among Respondents from Nitra and Istanbul



Source: authors′ elaboration

Figure 2. Reasons why Consumers do not Consume Cow's Milk

The distribution of individual temperament traits of respondents from Nitra and Istanbul is surprisingly similar. There are 24% of introverts among respondents from Nitra and 23% of introverts among respondents from Istanbul (Figure 1).

Table 2. Associations that Consumers Have with "Milk" and "Milk Packaging"

	Association with milk	Association with milk packaging
Nitra	cow, white colour, health, strength, Alps, Granko, lactose, chocolate, bones, breakfast	cow, white colour, blue colour, nature, grass, glass of milk, farm
Istanbul	health, cow, calcium, white colour, cheese, nature, Sütlava, Muhallebi, chocolate	cow, nature, meadow, white colour, blue colour

Source: Authors′ elaboration

20% of Slovak consumers and 21,2% of Turkish consumers do not consume milk and milk products. Reasons why they do not consume milk, which they stated, are shown in Figure 2. More than 48% of Slovak respondents and almost 60% of Turkish respondents, who do not consume cow's milk, suffer from health problems connected with the consumption of milk. The number of respondents who are allergic to milk protein or lactose intolerant is surprisingly high and can indicate a spectrum of problems on the milk market.

Table3. Results of the Correlation Analysis (Slovak Consumers)

Slovakia/ Nitra		When buying milk, the most important factor is quality.	When buying milk, the most important factor is the price.	The packaging of milk is very important for me.	I have a favourite brand of milk.	I often buy different brands of milk.	I prefer milk from local/regional producers.
Spearman's rho	When buying milk, the most important factor is quality.	1	-,427**	0,127	,180**	-,147*	,339**
	When buying milk, the most important factor is the price.	-,427**	1	-0,023	-0,117	0,107	-,175**
	The packaging of milk is very important for me.	0,127	-0,023	1	0,071	0,012	,214**
	I have a favourite brand of milk.	,180**	-0,117	0,071	1	-,608**	,188**
	I often buy different brands of milk.	-,147*	0,107	0,012	-,608**	1	-,134*
	I prefer milk from local/regional producers.	,339**	-,175**	,214**	,188**	-,134*	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Authors′ elaboration

Mostly stated other reasons for not consuming milk were bad taste of milk and milk products, veganism, another type of diet and/or healthy lifestyle.

The association experiment has shown the main associations that consumers have with milk and milk packaging. The results for both countries (cities) are stated in the Table 2. Respondents who do not consume cow's milk were not excluded from the experiment.

The main associations of Slovak consumers represent logical associations of the product's environment (cow, nature), gained knowledge about health benefit of milk (health, strength, bones), but also habits (breakfast, Granko – the typical Slovak cocoa powder for milk beverages). The word "lactose" was mostly stated by respondents who are lactose intolerant and therefore they cannot consume milk and milk products. Words "Alps" and "chocolate" are probably strongly associated with a milk chocolate Milka, which is very popular in the country.

The main associations of Turkish consumers are also mostly connected with "cow", with generally accepted health benefits of milk (health, calcium), with milk products (cheese, chocolate) and many respondents also stated Sütlavaand Muhallebi – Turkish milk desserts.

Table 4. Results of the Correlation Analysis (Turkish Consumers)

Turkey/Istanbul		When buying cow's milk, the most important factor is quality.	When buying cow's milk, the most important factor is the price.	The packaging of milk is very important for me.	I have a favourite brand of milk.	I often buy different brands of milk.	I prefer milk from local/regional producers.
Spearman's rho	When buying milk, the most important factor is quality.	1	-,418**	0,039	,175**	-,146**	,177**
	When buying milk, the most important factor is the price.	-,418**	1	-0,053	-,106*	,113*	-0,032
	The packaging of milk is very important for me.	0,039	-0,053	1	-0,003	0,074	0,07
	I have a favourite brand of milk.	,175**	-,106*	-0,003	1	-,628**	-0,088
	I often buy different brands of milk.	-,146**	,113*	0,074	-,628**	1	0,054
	I prefer milk from local/regional producers.	,177**	-0,032	0,07	-0,088	0,054	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: authors′ elaboration

It is interesting that even though consumers from both countries, who cannot consume milk due to health issues, they also associate milk with health and strength.

We can assume that associations that consumers have with the milk can influence consumer perception, consumer behaviour and decision-making process of consumers on the milk market and help to sell milk products, if sellers use above mentioned associations on the packaging. On the other hand, milk packaging that consumers have already known can influence their associations with milk and also with milk packaging that they expect. Anyhow, we can assume that the product packaging is essential for consumer perception and resulting buying behaviour.

Subsequently, the attitudes of consumers towards the cow's milk were investigated. Respondents who do not consume cow's milk were excluded (54 respondents from Nitra and 124 respondents from

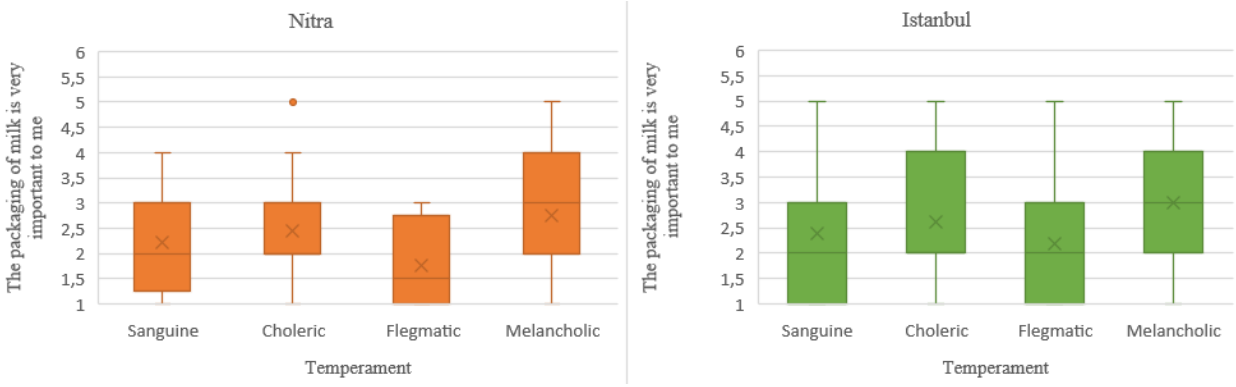
Istanbul). Remaining respondents were asked several questions related to their buying behaviour on the milk market.

Using the nonparametric correlation analysis,the correlations among individual answers were found (Table 3, Table 4). The more important is the quality of milk, the less important is the price of the product. More than 64% of Slovak respondents and more than 66% of Turkish respondents stated that the most important factor when they are buying milk is its quality. The more consumers prefer quality, the more they prefer local/regional producers. When consumers find a brand that they like, they tend to stay loyal to this brand. Respondents who prefer quality and prefer local/regional producers will more likely have a favourite brand of milk.

Again, we can see that behavioural tendencies of Slovak and Turkish consumers are very similar, so we can assume, that the consumer behaviour on the milk market is probably very similar in different parts of the world.

We also investigated if consumers differ in the conscious perception of milk packaging according to their temperament structure and according to individual personality traits (NEOC). Using Kruskal-Wallis one-way analysis of variance and Mann-Whitney U test it was found out that temperament structure and neuroticism (N) significantly influence the perception of milk packaging.

Kruskal-Wallis test has shown (Figure 3) that there is a significant difference in the subjective importance of milk packaging between individual temperaments (p = 0,026 for Nitra, p = 0,01 for Istanbul)



Source: Authors′ elaboration

Figure 3. Different Importance of Milk Packaging among Respondents in Nitra and Istanbul

Mann-Whitney U test has shown that respondents with higher neuroticism perceive milk packaging differently in comparison with respondents with lower degree of neuroticism (Table 5, Table 6).

Table 5. Mann-Whitney U Test for Neuroticism

Nitra	The packaging of milk is very important for me.	Istanbul	The packaging of milk is very important for me.
Mann-Whitney U	4796,000	Mann-Whitney U	21942,500
Wilcoxon W	9452,000	Wilcoxon W	42852,500
Z	-2,199	Z	-3,094
Asymp. Sig. (2-tailed)	0,028	Asymp. Sig. (2-tailed)	0,002

Source: Authors′ elaboration

Table 6. The Difference in Importance of Milk Packaging among Consumers in Nitra and Istanbul

Neuroticism – NITRA		N	Mean Rank	Sum of Ranks
The packaging of milk is very important for me.	High	120	116,53	13984,00
	low	96	98,46	9452,00
	Total	216		
Neuroticism – ISTANBUL		N	Mean Rank	Sum of Ranks
The packaging of milk is very important for me.	High	257	247,62	63638,50
	low	204	210,06	42852,50
	Total	461		

Source: Authors′ elaboration

We can assume that consumers with less emotionally stable temperaments (melancholic and choleric) perceive emotional cues of the environment more sensitively and their buying behaviour on the milk market differs from consumers with higher emotional stability.

4. Conclusions

Milk has been known as an important sourceof human nutrition since 4000 BC. Even though opinions of nutrition specialists differ on whether or not it is beneficial for humans to consume the cow's milk,it is considered to be a very important component of the diet not only for children, but also for adults.It is interesting that consumers from Nitra and Istanbul, who cannot consume milk due to health issues, still associate milk with health and strength.

We can assume that associations that consumers have with milk can influence their buying behaviour on the market of milk and milk products. The way consumers perceive milk can also influence the way they perceive milk packaging. Milk packaging that consumers have already known can influence their associations with milk and also with other milk packaging that they expect. We can conclude that the product packaging is essential for consumer perception and resulting buying behaviour.

It was also found out that temperament structure and personality traits significantly influence the perception of milk packaging. Consumers with less emotionally stable temperaments (melancholic and choleric) perceive emotional cues of the environment more sensitively and their buying behaviour on the milk market differs from consumers with higher emotional stability. Surprisingly, there are no big differences in consumer behaviour of young adults in Nitra and Istanbul.

Based on our results and the results of other authors we can assume that the personality of consumer significantly influences buying behaviour. For example,Verplanken and Herabadi (2001) found the positive dependence between impulsive buying behaviour and extroversion and the negative dependence between impulsive buying behaviour and conscientiousness. Matzler et al. (2006) confirmed the dependence between personality traits and the hedonic value of products. Chen (2007) proved the significant influence of the personality on the selection of food products. Rybanská et al. (2018) proved the influence of temperament structure on the perception and evaluation of product packaging.

Apart from the personality and the temperament structure, there are also other important factors that can lead consumers to the final buying decisions. Fazio et al. (1982),Jain and Posavac (2004), Singh and Verma (2017), Jaeger et al. (2018), Rybanská et al. (2019), and others found out that associations with specific products significantly influence consumers' perception and decision-making process. Previous experience is important as well, mainly for the creation of associations with selected products.

The results of presented research are promising for determination of suitable promotional strategies on the milk market for young adults in Turkey and Slovakia, although the further research is needed.

Acknowledgement

The paper is a part of the research project APVV-16-0244 "Qualitative factors affecting the production and consumption of milk and cheese", solved at the Department of Marketing and Trade, Faculty of Economics and Management, Slovak University of Agriculture in Nitra.

References

Chen, M. F. (2007). Consumer attitudes and purchase intentions in relation to organic foods in Taiwan: Moderating effects of food-related personality traits. Food Quality and Preference, 18(7), 1008-1021.

Clegg, B. (2000). Capturing customers´ hearts: Leave your competition to chase their pockets. New York, Prentice Hall.

Dhar, R. (2012). The irrational consumer: Four secrets to engaging shoppers. Retrieved March 20, 2019, from https://www.huffingtonpost.com/ravi-dhar/psychology-shopping_b_1280341.html

Dijksterhuis, A., Smith, P. K., Van Baaren, R. B., & Wigboldus, D. H. (2005). The unconscious consumer: Effects of environment on consumer behavior. Journal of Consumer Psychology, 15(3), 193-202.

Duyum, S. (2016). Milk surplus in Turkey. Retrieved March 21, 2019, from https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Milk%20Surplus%20in%20Turkey_Ankara_Turkey_5-4-2016.pdf

Eurostat (2019). Cows' milk collection and products obtained - annual data. Retrieved March 20, 2019, from http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=apro_mk_cola&lang=en

Fazio, R. H., Chen, J., Mcdonel, E. C., &Sherman, S. J. (1982). Attitude accessibility, attitude-behaviour consistency, and the strength of the object-evaluation association. Journal of Experimental Social Psychology, 10(1), 139-148.

Fitzsimons, G. J., Hutchinson, J. W., Alba, J. W., Chartrand, T. L., Huber, J., Kardes, F. R., Menon, G., Raghubir, P., Russo, J. E., Shiv, B., Tavassolini, N. T., & Williams, P. (2002). Non-conscious influences of consumer choice. Marketing Letters, 13, 269-279.

Jacob, C., Guéguen, N., & Boulbry, G. (2011). Presence of various figurative cues on a restaurant table and consumer choice: Evidence for an associative link. Journal of Foodservice Business Research, 14(1), 47-52.

Jaeger, S. R., Lee, P., & Ares, G. (2018). Product involvement and consumer food-elicited emotional associations: Insights from emoji questionnaires. Food Research International, 106, 999-1011.

Jain, S. P., &Posavac, S. S. (2004). Valenced comparisons. Journal of Marketing Research, 41(1), 46-58.

Kapaj, A., & Deci, E. (2017). World Milk Production and Socio-Economic Factors Effecting Its Consumption. Dairy in Human Health and Disease Across the Lifespan, 107-115. doi:10.1016/b978-0-12-809868-4.00007-8

Krishna, A., Morrin, M., & Sayin, E. (2014). Smellizing cookies and salivating: A focus on olfactory imagery. Journal of Consumer Research, 41(1), 18-34.

Kýrdar, S.S. & Karaca, O.B. (2017). An overview of Turkish dairy sector. Indian Journal of Dairy Science, 70(3), 249-255.

Masár, I. (2018). Mlieko. Retrieved March 21, 2019, from http://www.vuepp.sk/dokumenty/komodity/2018/Mlieko06_18.pdf

Matzler, K., Bidmon, S., & Granber-Kräuter, S. (2006). Individual determinants of brand affect: The role of the personality traits of extraversion and openness to experience. Journal of Product & Brand Management, 15(7), 427-434.

Rybanská, J., Nagyová, Ľ., & Horská, E. (in press). Milk product packaging features as the key factor of successful canvassing techniques. 20th International Scientific Conference: Economic Science for Rural Development 2019.

Rybanská, J., Nagyová, Ľ., & Tkáč, F. (in press). Selected psychological factors as predictors of consumer choice on the market of milk products. Olsztyn Economic Journal.

Singh, A., & Verma, P. (2017). Factors influencing indian consumers´ actual buying behaviour towards organic food products. Journal of Cleaner Production, 167, 473-483.

Verplanken, B., &Herabadi, A. (2001). Individual differences in impulse buying tendency: Feeling and no thinking. European Journal, 15, 71-83.

ANALYSIS OF CONSUMPTION BEHAVIOUR AND CONSUMER PROFILE FOR TABLE EGGS: A PILOT STUDY FOR EGG CONSUMERS IN TURKEY

Osman İnanç Güney
Çukurova University, Vocational School of Adana, Turkey, Email: inancguney@ gmail.com

Levent Sangün
Çukurova University, Vocational School of Adana,Turkey

Abstract

The purpose of this study is to investigate consumer attitudes and behaviors towards table eggs in order to analyse the consumer profiles. It is aimed to create possible linkages between the obtained consumer groups and table eggs consumption frequencies. The data employed in this paper were taken from a face to face cross-sectional survey conducted with 547 individuals in the major cities (İstanbul, Ankara, İzmir, Trabzon, Adana, Van, and Gaziantep) of the seven regions of Turkey during the period February-May 2017. The answers of the survey questions were designed based on Likert-type scale in order to make the analysis. The data were analysed using descriptive statistics, Principal Component Analyse (PCA) with Varimax rotation and ordered probit regression methods by SPSS© 21 and STATA© 13 software's. Results show that nutrition, taste, health and freshness are the main factors effecting consumers' table egg consumption preferences. To detect the perceived differences among the consumers by creating clusters a Principal Component Analyse was performed and 5 consumer groups (suspicious and eco-sensitive, marketing consciousness, enthusiasts, food security sensitive and reluctant) with different characteristics were obtained on the preference for table eggs (KMO: .754; Bartlett's Test Sig: 0.000). Later these 5 egg consumer groups were associated with consumption frequencies by the ordered probit regression model. The analysis show that three of these consumer groups were found to have a significant relationship with the consumption frequencies. The marginal impacts were also calculated to show consumption position and structure of these consumer groups for each group of consumption frequency.
Keywords: Consumer Profile, Principal Component Analyse, Ordered Probit Model, Table Eggs, Turkey.

1. Introduction

1.1 Egg Market: An Overview

Livestock sector plays an important and continuous role in the nutrition of the societies around the world for ages(Kızıloğlu et al., 2013; Schönfeldt et al., 2013). Animal source foods of a wide variety provide rich sources of complete protein, energy, and an array of micronutrients that are often limiting in the diet. The proteins in animal based foods are considered as the highest quality available which they contain a full complement of essential amino acids, micronutrients and most resemble the proteins of the human body in their amino acid composition(Neumann et al., 2002). Although there are differences between developed and developing countries, livestock products contribute 17% to kilocalorie consumption and 33 % to protein around the world (Thornton, 2010). Rapidly increasing incomes, populations and urbanisation in the developing world have been largely responsible for the rapid growth in human consumption of animal source proteins in place of carbohydrate-rich staples over past decades (Boland et al, 2013; Kearney, 2010).Projected demand for protein show that the world demand for animal source protein will double by 2050(Henchion et al., 2017; Steinfeld, 2003).

The breeding and feeding models in the poultry sector, which is an important component of the livestock sector, have the ability to produce healthy solutions for human nutrition in a short period with one of the most technological processes in livestock farming (Kızıloğlu et al., 2013; Buriak et al., 2018).Eggs are known as the best protein quality product among animal source foods and contains all nutrients required for human life(Hansstein, 2011; Demircan et al, 2018; İskender and Kanbay, 2014).

Eggs are an important source of protein, amino acids, choline, riboflavin, vitamin B12, and selenium and also provide vitamin A, folate, and zinc (Water et al., 2018; Buriak et al., 2018).Besides, eggs are an affordable source of animal proteins for consumers their availability in rural areas contributes to poverty reduction, through improved human health and consumed all around the World (Demircan et al., 2018; Bett et al., 2013). Since 1957, the British Egg Marketing Board recommends the ingestion of eggs at the breakfast in order to start the day with a high quality protein source (Bertechini and Mazzuco, 2013).The future patterns of egg consumption to 2050 suggest that the consumption of eggs will continue to rise (Kearney, 2010).

1.2 Consumer Perspective for Egg Market

It is evident that the perception and attitudes towards food attributes such as taste, nutritional qualities and convenience are the key determinants of food choice whichhas been changing over the years mainly due to a number of personal characteristics, such as education, socio-economic status, age and sexand increased access to information (Fearne and Lavelle, 1996; Bertechini and Mazzuco, 2013).

Taste, size, nutritional characteristics, convenience and variety are the traditional determinants of consumers in food selection and these characteristics also have great effects on the table egg preferences of the individuals (Hansstein, 2011; Karakaya et al.,2014).Besides its nutrient rich content, eggs are relatively cheap and have ease and various consumption formscompared to the other animal source foods which increases the consumption of eggs worldwide (Çiçekgil, 2014; Headey et al., 2018; Karakaya et al.,2014). The increasing demand is also depending on the socio-economic factors and eating habits of the societies (Buriak et al., 2018). When the product oriented factors on eggs are examined, shell colour, packaging, brand, size, expiration date and production methods are found to be important on the choice process for eggs(Mızrak et al., 2012; Kumar, 2017; Kosa et al., 2015; Ness and Gerhardy, 1994; İskender and Kanbay, 2014).

Although there are many factors that encourage consumption of table eggs, there are also obstacles to consumption that varies by countries. Main barriers to consume table eggs are, fewer set traditional family meals, increased consumption for food away from home concern for animal welfare, cholesterol and foodborne diseases like salmonella (Mızrak et al, 2012; Fearne and Lavelle, 1996; Hansstein, 2011; Bertechini and Mazzuco, 2013).

1.3 Egg Market in Turkey

In recent years, while egg production and export performance of Turkey is increasing rapidly, consumption per capital is below the world average (İskender and Kanbay, 2014; Çiçekgil, 2014; Durmuş et al., 2007; Demircan et al., 2018). Per capita protein consumption per capita in developed countries is 102 grams, of which about 70% is derived from animal foods,in Turkey, 73% of the amount of protein consumed daily is obtained from vegetable source foods (Kızıloğlu et al., 2013). The main reasons for the low egg consumption in Turkey are, cholesterol fear, changing life styles, increasing food prices, degreasing per capita disposable incomeand changing eating habits (İskender and Kanbay, 2014; Açıkgöz and Önenç, 2006; Demircan et al., 2018; Durmuş et al., 2007; Çelik and Şengül, 2001).

In this study the results of a consumer survey for egg consumption was presented and concluded. In this context,main tendencies and factors effecting the table egg consumption attitudes of the consumers were determined. Besides with identifying consumer profiles for table egg consumption, it is aimed to investigate possible relationships between consumer characteristics and marketing aspects of these products. The findings from this study would help in understanding the consumer behaviour towards eggs. This would facilitate egg producers and marketers in developing efficient marketing and production strategies. Moreover, it would be useful to meet the consumers' preferences and expectationsaccurately for eggs.

2. Material and Method

2.1 Data Gathering

The data employed in this paper were taken from a face to face cross-sectional survey conducted in the major cities (İstanbul, Ankara, İzmir, Trabzon, Adana, Van, and Gaziantep) of the seven regions of Turkey during the period February-May 2017. In total 552 consumers sampled through convenience sampling who are responsible for their household or family purchases and samples size for each city was determined considering their populations. Final sample size is extracted from an infinitive population and assuming a confidential level of 95.5% (p=0.5). The answers of the survey questions were designed based on Likert-type scale in order to make the analysis.

Table 1. Socio-Demographic Characteristics of the Sample

	Frequency	Percent		Frequency	Percent
Sex			**Income**		
Female	313	56,7	No permanent income	69	12,5
Mail	239	43,3	1501<	120	21,7
Age			1501-2500	195	35,3
35<	232	42,0	2501-3500	116	21,0
35-49	205	37,1	3501-4500	41	7,4
50-69	106	19,2	4500>	11	2,0
69>	9	1,6			
Education			**Occupation**		
Literate	25	4,5	Officer / worker public	67	12,1
Primaryschool	176	31,9	Worker-private sector	154	27,9
High school	215	38,9	Housewife	144	26,1
University	136	24,6	Tradesmen / craftsmen	71	12,9
Household numbers			Employer / self-employed	29	5,3
alone	42	7,6	Private sector-manager	20	3,6
2	92	16,7	Unemployed	28	5,1
3	109	19,7	Student	32	5,8
4	145	26,3	Retired	7	1,3
4>	164	29,7	Private sector-manager		

2.2 Methodology

In order to determine the consumer behaviour associated with the table egg consumption motivations and detect the perceived differences among the consumers first a factor analyse was applied to the obtained data. The exploratory factor analysis was established to identify the set of factors and verify the structure within the set of the observed variables. This analysis was also conducted to reduce the number of items and to capture the central dimensions based on consumers' knowledge level and perceptions (Franz et al., 2012; Heiseand Theuvsen, 2017; Vecchio and Annunziata, 2013). Principal component analysis (PCA) with Varimax rotation was used to simplify and summarize the variables that load highly on one factor (Callieris et al. 2016; Kraus, 2015). Later, variables with factor loadings of ≥0.4 were removed from the factor set (Backhaus et al., 2011). Subsequently, the quality of the factor analysis was verified using the Kaiser-Meyer-Olkin criterion and the Bartlett test for sphericity with subsequent reliability analysis (Heise and Theuvsen, 2017). The factor analyse was performed by the SPSS© 21 software.

In order to associate the obtained consumer profiles and consumption frequencies an ordered probit regression model was established. Inordered probit model factors obtained from the PCA was accepted as independent variable and the consumption frequencies as the dependent variables of the regression

model. The probit model also calculated the marginal effects to show consumption position and structure of these consumer groups for each group of consumption quantity. The ordered probit regression model was performed by STATA© 14 software.

With this set of data, it is possible to perform the probit model and thus calculate the probability of response for each level or combination of variables.

Given the following model

$$P(y=1/x)=G(\beta_0+\beta_1x_1+...+\beta_kx_k)=G(\beta_0+\beta X)$$

where G is a function that takes values between zero and one for all real numbers *z*(Maddala, 1983).

To describe the basic features of the data, descriptive statistic was also usedto provide simple summaries about the sample. In this context means and frequencies of the measures were calculated bySPSS© 21 software.

3. Results and Discussions

This section presents the findings of the study. The discussion begins with results of the descriptive analysis of the research. In this context, it is determined that 99.1% of the participants involved to the questionnaire are consuming eggs. The consumption frequencies were also demonstrated in the Figure 1 and they mainly consume 1 egg a day (Figure 1).

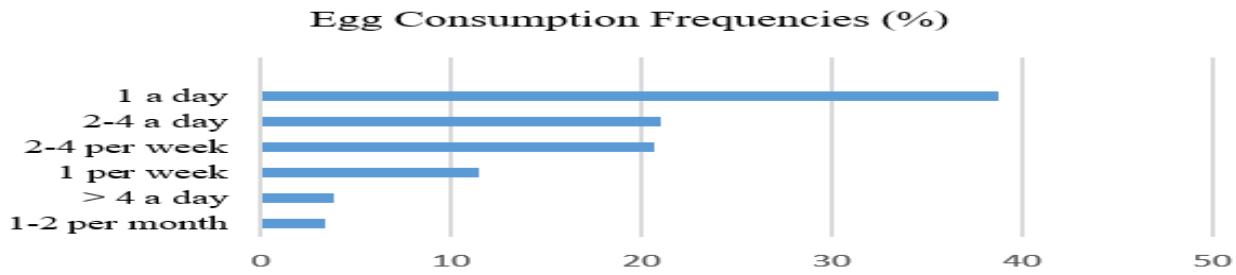


Figure 1. Egg Consumption Frequencies (%)

The figure 1 presents that consumers are mainly consume one table egg per day (%39). In addition, daily egg consumption habits of the consumers are also high (63.7%).

The descriptive statists analysis also determined the consumers'perceptionsand opinions on the table eggswhich is demonstrated in the Figure 2.

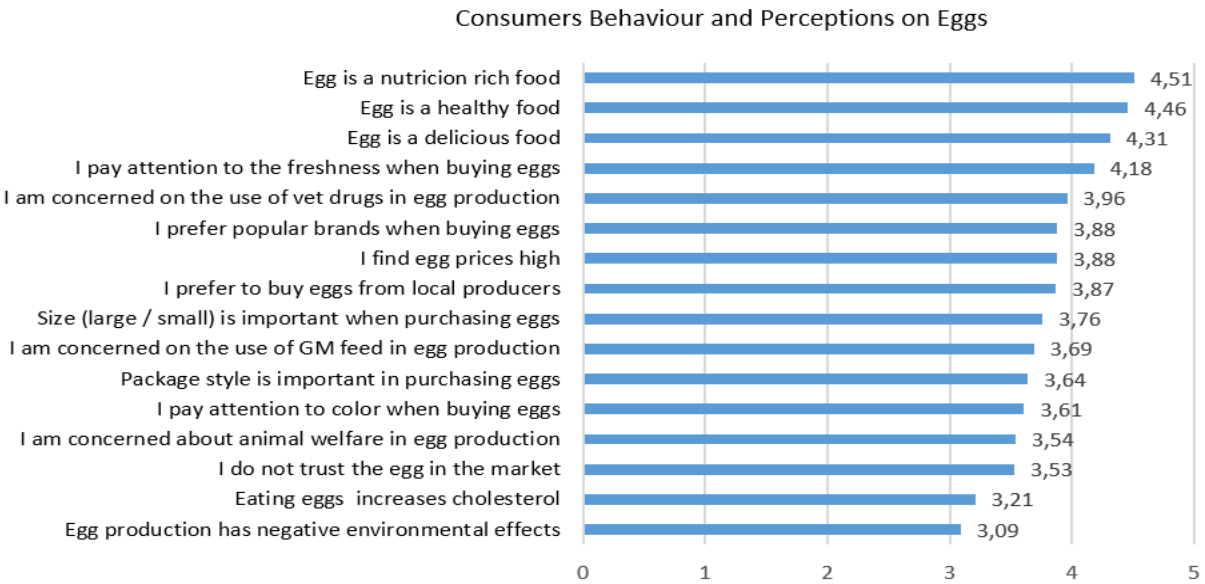


Figure 2. Consumer Behaviour and Perceptions on Eggs

Figure 2 shows that, consumers are perceivingtable egg as a nutrition rich healthy food. In common,consumers like the taste of the eggs and the most important point on their purchase activities is the freshness. Moreover, the most effective factor for their concerns on egg consumption is the vet drug usage for the production.

The study continues with the factor analyse to identify the consumer groups and their intentions for table egg consumption attributes. The PCA was applied to the questions about the consumer opinions and perceptions for eggsand 5 factors with16 variables were obtained (Table 2). These factors were entitled (suspicious and eco-sensitive consumers, marketing consciousness, egg enthusiasts, sensitive to food security and reluctant consumers) according to their representation power of the variables. Factor 1 represents the suspicious and eco-sensitiveconsumers who don't trust the market especially because of the GM usage. They are also worried about the negative environment effects of egg production. The second factor consist of consumerswho pay more attention to the external attributes of the eggs which we called them marketing consciousness. The third group are egg lovers who thinks that the egg is a nutritious, healthy and delicious food. Fourth factor is relevant to food security concept and these consumers are sensitive on healthy and fresh products where they believe they can benefit from local food. The fifth group are the reluctant consumers and they are unconfutable with the price and cholesterol issues.

The reliability test results demonstrate variables related to egg consumption are well suited for the factor analysis as the Kaiser-Meyer-Olkin measure of sampling adequacy is relatively high at 0.754 and Bartlett's test of sphericity was statistically significant ($p = 0.000$), yielding correlation coefficients for the population with values other than zero.

Table 2. Result of the Principal Component Analysis

Factors and related variables	**Factor Loadings**
1.Suspicious and eco-sensitive	
I am concerned about animal welfare in egg production	,817
I am concerned about the use of GM feed in egg production	,730
I do not trust the eggs in the market	,715
Egg production has negative environmental effects	,649
2. Marketing consciousness	
I pay attention to colour when buying eggs	,728
I prefer popular brands when buying eggs	,709
Package style is important in purchasing eggs	,706
Size (large / small) is important when purchasing eggs	,695
3. Egg enthusiasts	
Eggs are rich in nutrients	,873
Eggs are good for health	,851
Eggs are delicious	,740
4. Food security sensitive	
I prefer to buy eggs from local producers	,771
I am concerned about the use of vet drugs in egg production	,687
I pay attention to the freshness when buying eggs	,585
5. Reluctant	
Eating eggs increases cholesterol	,729
I find egg prices high	,710

Kaiser-Meyer-Olkin measure = 0.70; Bartlett's Test of Sphericity Sig: ,000

In order to analysethe relationship between results of the factor analyse and consumption frequencies an ordered probit model was applied in the study. Table 3 shows the coefficient estimates of the explanatory variables in the ordered probit model.

Table 3. Ordered Probit Model Coefficient Estimates

Source	Value	Std. Err.	P>|z|
Suspicious and eco-sensitive	-0.10107	0.04468	0.024*
Marketing consciousness	0.04467	0.04456	0.316
Egg enthusiasts	0.10687	0.04478	0.017*
Food security sensitive	-0.08342	0.04462	0.052**
Reluctant	0.06781	0.04459	0.128

Table 3 demonstrates that relationship between suspicious and eco-sensitiveconsumers, egg enthusiasts and food security sensitive consumersand consumption frequencies are statistically significant according to probability values (<0.0001). The model gives negative relation with suspicious and eco-sensitiveand food sensitive consumer groups which indicates the more presence of these consumer groups will reduce the egg consumption frequency. The egg enthusiast has positive relation with the egg consumption frequencies as it is supposed to be. The ordered probit model also estimatedthe marginal impact values for each consumption frequency category (Table 4).

Table 4. Ordered Probit Model Marginal Impact Values

Consumer Groups	Egg Consumption frequencies					
	Once or twice a month	Once a week	Once or twice a week	One a day	2-4 a day	>4 a day
Suspicious and eco-sensitive	0.007*	0.016*	0.014*	-0.005*	-0.023*	-0.008*
Marketing consciousness	-0.003	-0.007	-0.064	0.002	0.010	0.003
Egg enthusiasts	-0.007*	-0.017*	-0.015*	0.006*	0.025*	0.009*
Food security sensitive	0.006**	0.013*	0.011**	-0.005**	-0.019**	-0.006**
Reluctant	-0.005	-0.010	-0.009	0.004	0.016	0.005

*: p<0,05; **: p<0,01

According to the Table 4, suspicious and eco-sensitiveconsumers and food security sensitive consumers have negative marginal impact values for daily egg consumptionstatus. For these consumer groups as the frequency of consumption increases, the probability of consumption decreases.The most preferred consumption frequency of these two consumer groups is once a week (1.6% more for suspicious and eco-sensitiveconsumers and %1.3 more for food security sensitives). The marginal impact values of the daily egg consumption frequencies are negativefor these two groups and this express that the probability of daily consumption for these groups is degreasing. The marginal impact values are different for the egg enthusiasts. They like to consume eggs and the marginal impact values also reflects this situation. The low consumption frequencies are with negative values which express they like to consume more. They all have positive values for different daily consumption frequencies and prefer to they consume egg 2-4 per (2.5% more)

4. Conclusion

Understanding consumer preferences and demands is a key element to succeed in current economic order. Today, consumers are becoming more aware of the product attributes and this situation is also valid forthe eggs consumers for attributes and quality (Bertechini and Mazzuco, 2013).

The currentstudy showsalmost all consumers consume eggs(99.1%) with different consumption levels and daily consumption habit of egg is very high (63.7%).The high percentage of those consuming two and more eggs per (25%)also indicates that egg is an important daily consumed food product. In the study it is also found that the motivations, tendencies and perceptions for egg consumption is different among the consumers. In this direction it is found 5 consumer groups with different motivations and perceptions in the market. According tothe ordered probit model 3 of these consumer groups has significant relationswith consumption frequencies. Suspicious and eco-

sensitiveand Food security sensitive consumers have negative relation with increased frequency of consumption and they mainly consume 1 egg per week. However, egg enthusiast haspositiverelation with increased consumption frequencies and they usually eat egg 2-4 a day.

5. Acknowledgements

This study was derived from the SBA-2018-10763 project, which was supported by the Scientific Research Projects Unit of the University of Çukurova, Turkey.

References

Açıkgöz, Z. & Önenç, S.S. (2006). Fonksiyonel yumurta üretimi, Hayvansal Üretim 47(1): 36-46.

Backhaus, K., Erichson, B., Plinke, W. and Weiber, R. (2011). Multivariate analyse methoden: eine anwenderorientierte einführung. Springer, Berlin.

Bertechini, A.G. & Mazzuco, H. (2013). The table egg: A review, Ciênc. agrotec., Lavras 37(2): 115-122.

Bett, H.K., Peters, K.J., Nwankwo, U.M., Bokelmann, W. (2013). Estimating consumer preferences and willingness to pay for the underutilised indigenous chicken products, Food Policy 41: 218-225.

Boland, M.J., Rae, A.N., Vereijken, J.M., Meuwissen, M.P.M., Fischer, A.R.H., van Boekel, M.A.J.S., Rutherfurd, S.M., Gruppen, H., Moughan, P.J., Hendriks, W.H. (2013). The future supply of animal-derived protein for human consumption, Trends in Food Science & Technology 29: 62-73.

Buriak, R., Rudenko, M., Chornodid, I. (2018). Marketing research of table eggs market, Baltic Journal of Economic Studies 4(4): 69-75.

Callieris, R., Brahim, S. and Roma, R. (2016). Different consumer behaviours for organic food in Tunisia. A cluster analysis application. NewMedit 15(2): 53-62.

Çelik, Y. & Şengül, T. (2001). Şanlıurfa İli Kentsel Alanında Tüketicilerin Yumurta Tüketim Düzeyleri ve Tüketim Alışkanlıklarının Belirlenmesi, Hayvansal Üretim 42(2): 53-62.

Çiçekgil, Z., 2014. Kümes Hayvancılığı Ürün Raporu, Tarımsal Ekonomi ve PolitikaGeliştirme Enstitüsü, Ankara.

Demircan, V., Oncebe, S., Terzi, S.B. (2018). Determining egg consumption level and preferences of families in isparta province in Turkey, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development 18(2): 155-162.

Durmuş, İ., Demirtaş Ş.E., Can, M., Kalebaş, S. (2007). Ankara ilinde yumurta tüketim alışkanlığının belirlenmesi, Tavukçuluk Araştırma Dergisi 7(1): 42-45.

Fearne, A & Lavelle, D. (1996). Segmenting the UK egg market: results of a survey of consumer attitudes and perceptions, British Food Journal 98(1): 7-12.

Franz, A., Deimel, I. and Spiller, A. (2012). Concerns about animal welfare: A cluster analysis of german pig farmers. British Food Journal 114(10):1445-1462.

Hansstein, F., Nys, Y.(Ed.), Bain, M.(Ed.), Van Immerseel, F.(Ed.). (2011). Profiling the egg consumer: attitudes, perceptions and behaviours, Improving the Safety and Quality of Eggs and Egg Products, Woodhead Publishing.

Headey, D., Hirvonen, K., Hoddinott, J. (2018). Animal sourced foods and child stunting, Amer. J. Agr. Econ. 100(5): 1302-1319.

Heise, H. and Theuvsen L. (2016). What do consumers think about farm animal welfare in modern agriculture? Attitudes and shopping behaviour. International Food and Agribusiness Management Review 20(3):379-399.

Henchion, M., Hayes, M., Mullen, A.M., Fenelon, M., Tiwari, B. (2017). Future protein supply and demand: Strategies and factors ınfluencing a sustainable equilibrium, Foods 6(53): 1-21.

İskender, H. ve Kanbay, Y. (2014). Üniversite öğrencilerinin yumurta tüketim alışkanlıklarının belirlenmesi, YYU Veteriner Fakülktesi Dergisi 25 (3):57-62.

Karakaya, E., İnci, H., Söğüt, B., Şengül, T. (2014). Bingöl il merkezinde yaşayan hane halklarının yumurta tüketim durumu üzerine bir araştırma, Türk Tarim Ve Doğa Bilimleri Dergisi 1(2): 239-247.

Kearney, J. (2010). Food consumption trends and drivers, Phil. Trans. R. Soc. B 365: 2793–2807.

Kızıloğlu, R., Kızılaslan, H., Dölek G.(2013). Ekolojik yumurta ile endüstriyel yumurtatüketim tercihlerinin belirlenmesi üzerine bir araştırma: Tokat il merkez örneği, Alınteri 24(B): 20-28.

Kosa, K.M., Cates, C.S., Bradley, S., Godwin, S., Chambers, D. (2015). Consumer shell egg consumption and handling practices: Results from a National Survey, Journal of Food

Protection 78(7): 1312-1319.

Kraus, A. (2015). Factors influencing the decisions to buy and consume functional food. British Food Journal 117(6):1622-1636.

Kumar, J. 2017. An analytical study on consumer's preferences for eggs attributes through conjoint survey, Pacific Business Review International, 9(7).

Madalla, G.S. (1983) Limited-dependent and qualitative variables in econometrics, Cambridge MA., Cambridge University Press.

Mızrak, C., Durmuş, İ., Kamanlı, S., Demirtaş Ş.E., Kalebaşı, S., Karademir E., Doğu, M. (2012). Determination of egg consumption and consumer habits in Turkey, Turk. J. Vet. Anim. Sci., 36(6): 592-601.

Ness, M.R. & Gerhardy, H. (1994). Consumer preferences for quality and freshness attributes of eggs, British Food Journal 96(3): 26-34.

Schönfeldt, H.C., Pretorius, B., Hall, N. (2013). The impact of animal source food products on human nutrition and health. South African Journal of Animal Science 41 (3): 394-412.

Steinfeld, H. (2003). Economic constraints on production and consumption of animal source foods for nutrition in developing countries, Animal Source Foods and Nutrition in Developing Countries Conference, American Society for Nutritional Sciences, Washington, D.C.

Thornton, P.K. (2010). Livestock production: recent trends,future prospects, Phil. Trans. R. Soc. B 365: 2853–2867.

Vecchio, R. and Annunziata, A. (2013). Consumers' attitudes towards sustainable food: a cluster analysis of Italian university students. NewMedit 12(2): 47-56.

Waters, W.F., Gallegos, C.A., Karp, C., Lutter, C., Stewart, C., Iannotti, C. (2018). Cracking the egg potential: Traditional knowledge, attitudes, and practices in a food-based nutrition intervention in highland Ecuador, Food and Nutrition Bulletin 39(2): 206-218.

BREAKING YIELDS IN RICE PRODUCTION: HIGH YIELDS OR HIGH PROFITS?

Bruno Lanfranco
Instituto Nacional de Investigación Agropecuaria (INIA), Applied Economics, Uruguay
E-mail: blanfranco@inia.org.uy

Bruno Ferraro
INIA, Applied Economics, Uruguay

Enrique Fernández
INIA, Applied Economics, Uruguay

Juan M. Soares de Lima
INIA, Applied Economics, Uruguay

Abstract

Uruguay is the most export-oriented rice producing country in the world. The annual production rounds 1.4 million metric tons (TMT), more than 96% of which is exported globally. The average yields obtained at the national level are among the highest in the world. In the last 5 years, the average yield surpassed 8.1metric tons per hectare, with a maximum of 8,686 kg/ha in 2014/15. In the last years, the National Institute of Agricultural Research (INIA) of Uruguay has been running a research project, in coordination with farmers and millers, with the objective of generating integrated crop management practices capable to increase yields by at least 10% compared to those obtained with the technology currently used by the top 5% rice growers. The challenge is the generation of economically feasible alternatives to increase productivity with respect to that obtained by producers in the top quintile.

This article shows the results of the cost-benefit analysis performed on different technology alternatives defined for six different locations in the East of Uruguay, which is the in the traditional rice-producing region. Uruguay plants annually about 170 thousand hectares of rice. Sixty-percent of this area is located in the East part of the country. With the objective of defining the best-improved alternative for each of the six locations, an experiment was run for three consecutive years starting with 18 alternatives, three per location. After a screening process to discard the less promising ones, one alternative per location was selected for the production and economic analysis inthe last crop season involved in the study (2016/17). Three different plots of 7-10 ha each, were included in the last year in each location.

They were installed on fields belonging to commercial firms consistently ranking in the first quintile in terms of yields. The first plot corresponded to the witness, the second one corresponded to the selected best alternative, and the third one corresponded to an exact copy of what the farmer was doing that year.In essence, the treatments were defined on the basis of four factors: a) rice variety; b) density of seeds and seed treatment; c) levels of fertilization; d) disease control practices (Pyriculariaoryzae), including use of resistant cultivars. In all cases, the calculation of income and costs was performed using the same set of prices. The money values were expressed per hectare in terms of both US dollars and units of 50-kilo bags.

The obtained results showed that the alternatives were clearly superior in terms of the expected profits in only two of the six locations under analysis, for the conditions expressed in the 2016/17 season. In both cases, the gain was explained mainly by differences in performance achieved with the use of a new cultivar released recently in substitution to the old one currently used by farmers, along with new management practices associated with it. With an expected increase between 27% and 29% in yields, profits multiply from a minimum of 1.9 times to 14 times. The key issues of the new variety apart from being more productive, was its resistance to Pyricularia, which derived in a dramatic

reduction in costs related to disease control. In the remaining locations, the technological alternative did not mean an advantage compared to the witness, even assuming a significant loss in any of these cases. In all cases, the benefits obtained by the new technology package were offset by the rising costs implied by this change. In one of the cases, the use of the new technology was indifferent to the old one, from an economic point of view. In the remaining cases, the increment in costs more than surpassed the gains in production; the alternative technology directly led to an economic loss that ranged from 12% to 150%

Conclusions should be taken with caution since the analysis was performed with the production results for only one year, even though a sensitive analisis was performed. Nevertheless, some elements deserve to be highlighted. The results seem to confirm the need for a thorough review in the cost structure at the fieldlevel.Minor adjustments in the technology, such as the election of the variety, could be the difference between getting a positive or negative economic outcome.

Keywords: Rice, Economic, Production Costs, Technology,

ECONOMIC BENEFITS OF STANDARDS

Caspar von der Crone
University of Sopron, Graduate Engineer Agrarian Sciences, Hungary, Email:info@ cvdc.de

Abstract

In the European Union there are comprehensive legal requirements, especially in the field of animal processing. Standards therefore play a very important role. First and foremost, producers and suppliers try to position themselves on the market vis-à-vis competitors with stricter requirements than those of the statutory regulations. The EU criteria are the basis, whereby the scope for interpretation in the various countries proves to be very diverse. This results in a very difficult environment for consumers and market participants to evaluate the respective requirements objectively. The contribution to the economic benefit of standards is intended to filter out examples of this in the field of poultry meat production. In the course of the past years, numerous innovations have been made here. On the one hand, the EU Commission is trying to protect the common market against dumping prices from third countries, which have competitive advantages due to better location conditions, with customs duties and specifications. On the other hand, private standard setters with significantly higher standards, e.g. in the areas of animal welfare, ecological production and sustainability issues, have increasingly established themselves on the market. Ultimately, however, this is also about profit. The economic benefit plays an extraordinarily large role. However, there are restrictions for suppliers outside the EU due to numerous restrictions, customs regulations, requirements in the area of food hygiene, animal welfare and animal disease issues.

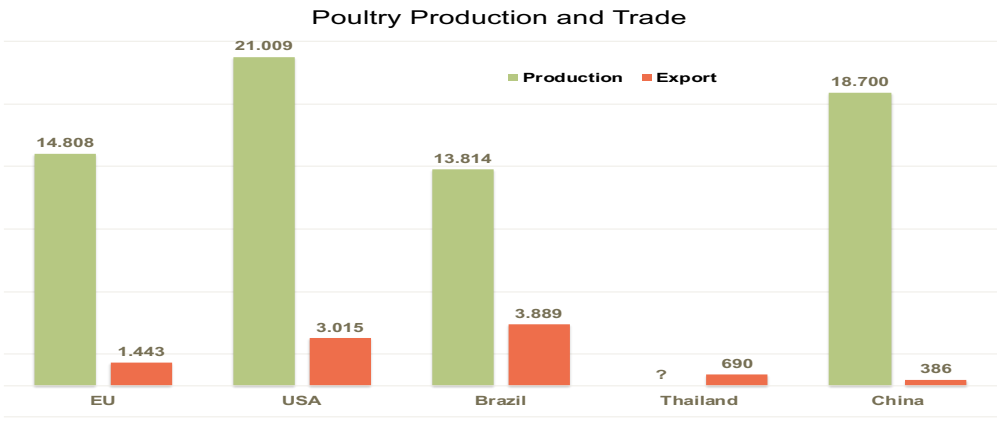
The poultry sector continues to be a growth market as consumers' demands for high quality and low-calorie food are particularly met. The contribution is intended to highlight the economic benefits of standards and requirements that go beyond them. But also, restrictions on the basis of legal requirements and differentiations from other countries through customs duties and additional duties are to be explained.

Keywords: Standards, EU Requirements, Restrictions, Economic Benefits, Competition

1. The Situation

The trade in poultry meat has developed rapidly within the European Union. At the beginning of the 1960s, the production of poultry meat was insignificant. At that time, poultry meat was imported from Eastern European countries, but also from the USA. In the meantime, however, the situation has changed. The European Union is today one of the world's largest producers of poultry meat. Consumption is growing steadily, and self-sufficiency is well above 100%. While many years ago it was still necessary to meet the growing demand with imports, today poultry meat is exported to keep the market in balance. Despite increasing consumption, there is overproduction. World trade in poultry meat and products is therefore very important and new markets are being opened up.

Imports of poultry meat remained largely constant at just under one million tons. They concentrate on high-quality deboned chicken meat, as it makes little sense to transport whole animals because of the transport costs. The main export countries are Brazil and Thailand. But there is also trade in poultry meat within the EU, in particular turkeys, ducks and geese. The main producers are France, Hungary and Poland.



Source: Own Survey (2018), MEG Market Balance for Eggs and Poultry

Figure 1. Poultry Production and Trade, 2017

The European Union has created a large number of regulations and standards for regulation. These range from production requirements within the framework of marketing standards, hygiene standards, residue requirements, animal health regulations to traceability and traceability along the entire process chain. There are also trade barriers for sensitive products in the form of tariffs and additional duties.

The evaluation of standards and the resulting economic benefits have a high priority, especially in the area of animal welfare with farming projects play an important role in many countries. Especially in Germany there are numerous initiatives. Animal welfare, NGO´s, legislation and the food retail trade all rely on specifications and standards. The food companies have agreed on a uniform seal for the labelling of the farming methods. Labelling requirements are gradually being introduced on the packaging of pork, poultry and beef products. The main interest is not so much ideological as economic aspects.

This common marking shall provide information on how the animals have been kept directly on the packaging of the products concerned. The consumer gets an orientation guide when buying these products. Animal welfare entails additional costs and therefore higher prices are the result. However, there is now an enormous variety of different seals that go into the thousands. The following overview is only a very small selection of the variety of seals available.

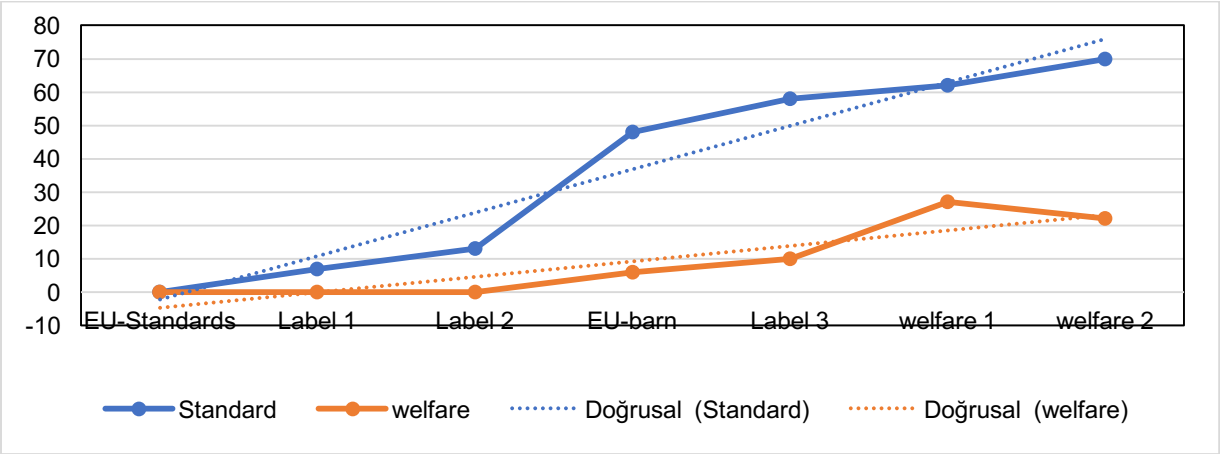
Source:LWL-Labelling, Caspar von der Crone, CD Consulting gUG

Figure 2. Example of Different Labels

2. Method for Evaluating Standards

The Livestock Welfare Initiative (LWL) has developed standards for the assessment of animal welfare claims based on the Housing Condition Score (HCS). On the basis of an evaluation scheme, it is emphasized on a neutral basis how the respective standards of the system providers are to be assessed. This includes the entire animal processing. In addition, there are parameters for traceability along the process chain. The example of poultry meat will be used to examine the essential characteristics. The basis for this are scientific statements and evaluations of the so-called animal fairness index of Professor Bartussek, Austria. The specifications were further developed within the framework of the LWL initiative and adapted to current circumstances. The focus was on animal welfare, traceability, quality features, feed and controls along the process chain.

With the definition of clear evaluation criteria, according to the state of the art of research and science, which focus on animal behavior, aspects of husbandry, management and animal health are equally taken into account. This includes the clarification of the added value for the consumer through a label with recognition value. The evaluation is based on an integrative approach. In order to achieve the necessary balance between science and practice, the correct selection and combination of different animal welfare indicators is of utmost importance.



Source: LWL-Labelling, Caspar von der Crone, CD Consulting gUG

Figure 3. Welfare Standards of Broiler, %

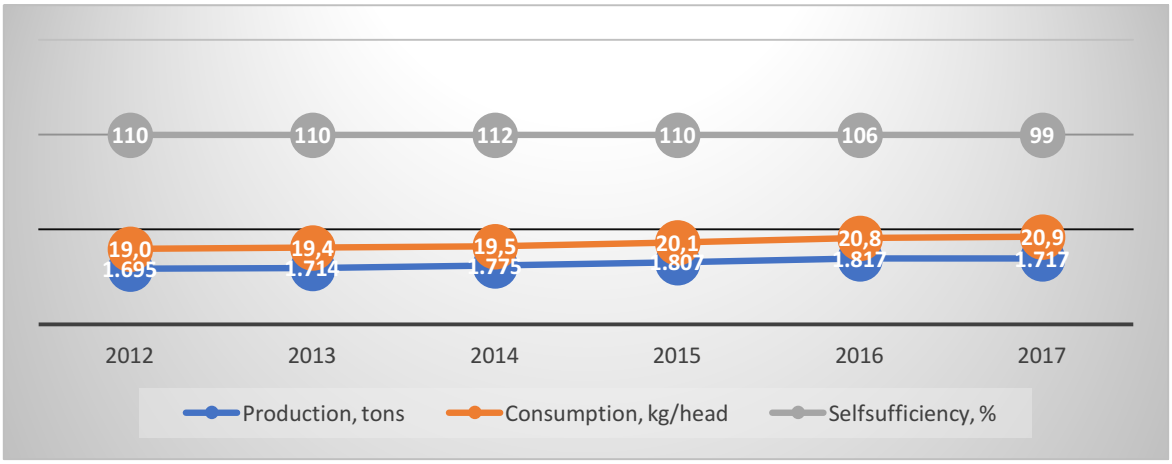
2.1 Hypotheses

On this basis, the following hypotheses are put forward:
H1: Seals offer consumers benefits for orientation and promote sales.
H2: Quality criteria are neglected with seals and special features.
H3: Animal protection and animal welfare are in the focus, actually it concerns however only marketing.
H4: Seals have a clear added value compared to unlabeled products.

2.2 Label Diversity and Its Evaluation

Food safety and transparency play a decisive role alongside origin and traceability. In addition, an evaluation of the respective standards within the process chain is carried out. In addition, the different marketing channels of the food retail trade, which also tries to stand out from the competition with special positioning, above all through animal welfare and sustainability issues on the market, are presented. In addition, the course of production costs and the revenue situation are presented. Benefit of labelling also means creating a profitability overview based on production costs and sales prices. Different structures on the customer side, prices and relations to the revenue situation are also approaches

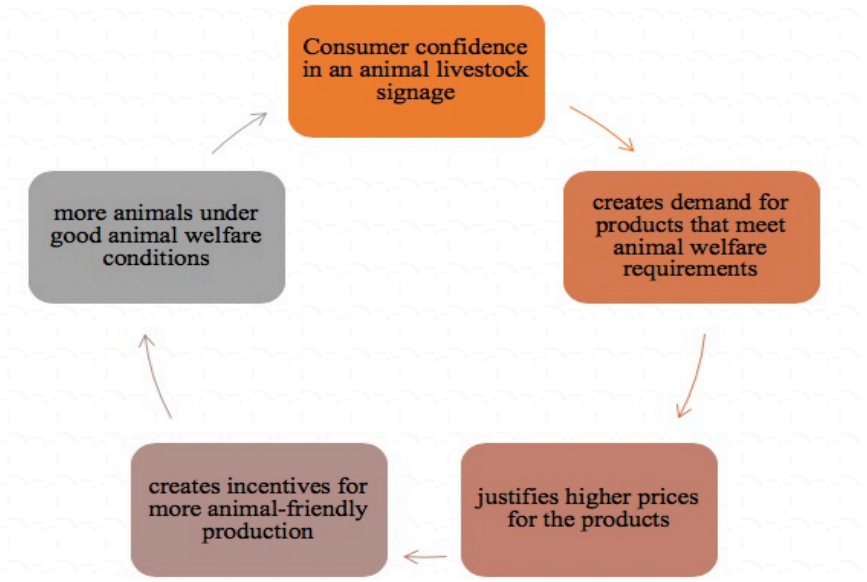
to the evaluation of seals. It is therefore only a foray into the field of poultry, as the subject of labelling is very complex and can only be evaluated to a limited extent within the framework of this presentation.



Source: MEG Market Balance for Eggs and Poultry2018, Own Survey

Figure 4. Consumption and Supply Data

The approaches range from standards and verbal statements to very demanding seals, which have consistent specifications, animal welfare and sustainability standards, but also include social aspects with specifications for employees, e.g. no child labor, exploitation of the disadvantaged, etc. Overall, the aim is to add value to the standard in order to signal to consumers that they are buying something special.



Source: Own Survey

Figure 5. Assessment of Standards / Welfare

In principle, the marketing of seals and quality marks is subject to trademark law, which applies throughout the EU. The aim is to ensure that the signs in question are capable of being protected. This also creates a degree of legal certainty for the consumer. However, no statement is made about the quality of the products bearing the seal; this is the responsibility of the respective distributor.

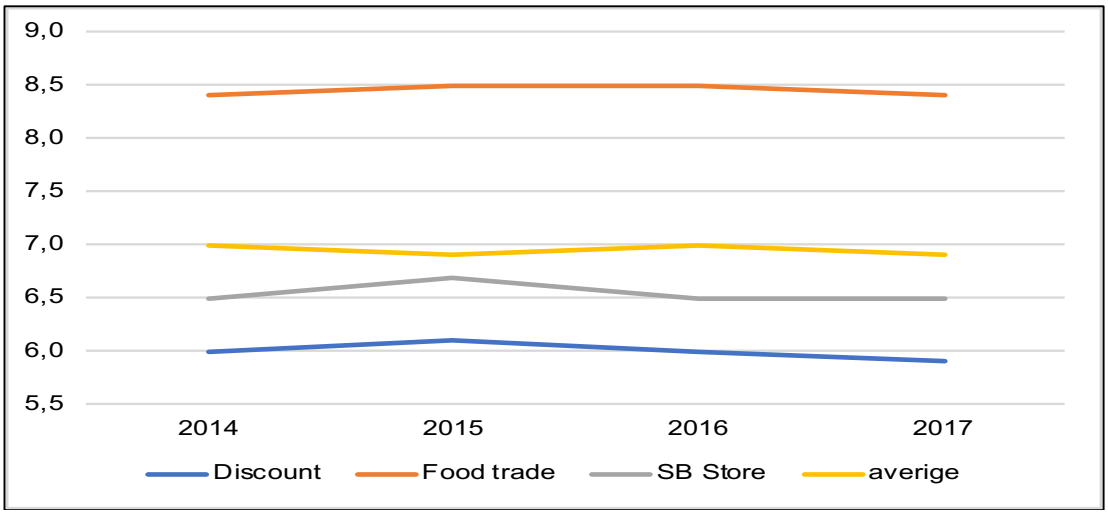
The "Assessment of Standards/Welfare" overview shows the effects of how standard and quality programs can be recorded and defined. This is about transparent and credible labelling of products that trigger a positive cycle. Consumer confidence is an essential feature. It creates demand for products that meet certain quality characteristics and/or higher animal welfare requirements. As a result, this in turn means demanding the justification of higher prices. This, in turn, offers producers incentives to expand production to higher standards or animal-friendly or animal welfare-oriented standards. The result is a positive cycle for evaluating standards and animal welfare requirements. The chart also shows that it is quite possible to establish oneself in the market with higher targets.

3. Production Costs, Prices

The following overview is based on our own surveys. The standard, legal requirements for the broiler mast were rated with the index 100. In the area of barn management, slowly growing breeds with additional run up into the so-called winter garden and lower stocking density, higher costs arise. This applies especially to the additional provision of an outlet in the open. The organic production has significantly longer fattening times, slow growing breeds and sets additional standards for the standard and the feed, which comes from organic production and is free of genetic engineering and contains no residues such as pesticides.

Source: Own survey

Figure 6. Production Costs According to Standards (Standard Index 100)



Source: MEG-Market Balance for Eggs and Poultry 2018, GfK, Ulmer Verlag

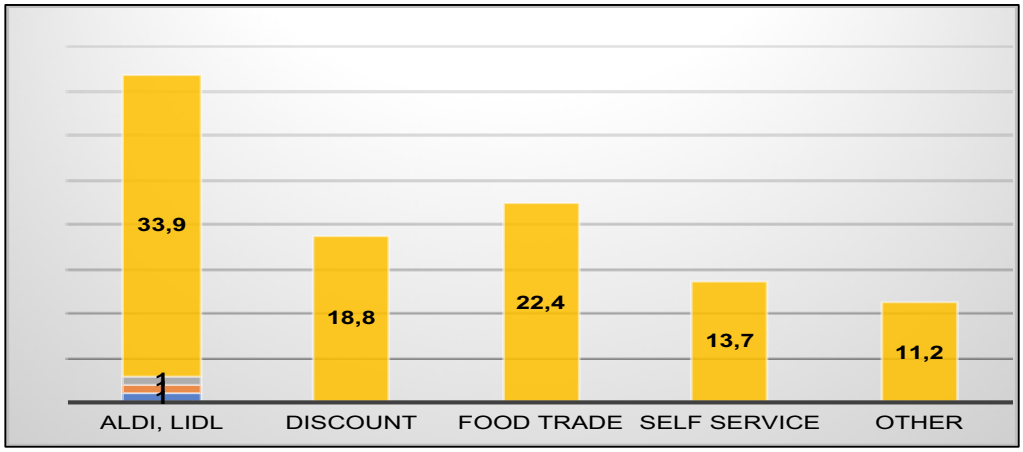
Figure 7. Consumer Prices for Chicken Breast, Fresh, €/kg in Different Market Area

Animal welfare has less strict requirements with regard to feed, here additional criteria apply for animal welfare, in particular more free space and significantly fewer animals per square meter. The costs for the rearing of male animals are extremely high due to the high feed consumption during the long rearing period. The feed evaluation is very bad in comparison to the broilers. In addition, the animals come from ecological breeding.

The price development of poultry meat is illustrated using the example of consumer prices for chicken breast (fresh). It is interesting to note that the discount with low prices differs considerably from the other sales channels. Particularly high prices are achieved on weekly markets, as consumers apparently expect higher standards and regionality here. However, if you look at sales, the largest share of sales is accounted for by the discount segment.

4. Distribution Channels for Poultry

The purchasing behavior of consumers is of particular interest. Most poultry meat (whole animals and cuts, fresh, frozen) is sold in discount stores. Aldi and Co. reach over 70% in Germany, while the traditional food retail trade (REWE, EDEKA and Co.) accounts for around a quarter of the market.



Source: MEG-Market Balance for Eggs and Poultry 2018, GfK, Ulmer Verlag

Figure 8. Household Purchase Food Trade, Poultry

5. Evaluation of Label and Standards

The topic of animal welfare has become particularly important in many countries. In Germany, the food retail trade has come out in favour of uniform husbandry labelling. That's unique. With the Animal Welfare Initiative, an attempt was made for committed retail groups to agree on a uniform seal for the labelling of animal husbandry methods. It is intended to provide information on how the animals from which the meat originated were kept. On the basis of the four-stage categorisation, based on existing quality, animal welfare and organic standards, how the animals were kept is to be shown.

Stage 1 Stable housing

Stage 2 Stable housing plus

Stage 3 Outdoor climate

Level 4 Premium (this category also includes organic products).

Ultimately, however, it is also a question here of highlighting an added value compared with the standard. Only at first glance is the new labelling a good approach. Level one is merely the legal standard. Stages two and three also contain more or less only legal requirements with a little more space in the stables. This again makes it clear that it is actually only a matter of benefit, from which less the animals, but rather the producers and marketers' profit. Consumers thus fall by the wayside, because they have to spend more money on what is already regulated according to legal requirements.

6. Evaluation Requirements

The Livestock-Welfare-Initiative (LWL) aims to make existing standards and quality programmes comparable and thus to offer a simple, credible and easily understandable evaluation of products with animal welfare standards, ultimately with the statement "how much animal welfare has been considered in the production of a product? As a result, higher standards and animal welfare justify higher prices for producers.

The specifications of the LWL initiative for the implementation and evaluation of systems, standards and labels are based on a so-called 3-pillar principle:

- postural parameters
- animal parameters
- Control and verification of specifications

The LWL-Initiative (Livestock-Welfare-Labelling) has developed parameters with participants from science, animal protection, producers, food trade and quality managers and evaluated standards in the field of animal production. It is a holistic procedure that requires the establishment of minimum space requirements for body movement, undisturbed eating, elimination, resting, drinking, exercise, etc. The first step is to check compliance with minimum standards and requirements. The provisions of the relevant EU directives and ordinances as well as the national specifications and animal protection regulations in their current version apply as a basic principle. The standards to be evaluated contain defined test systematics. In addition, independent external controls and corrective actions must be defined.

6.1 Evaluation of Posture-Related Parameters

The evaluation of posture-related parameters (indicators) is carried out in accordance with the specifications or holding criteria of the respective standards. These are defined in the marketing standards or organic production. Any additional parameters of the respective standards are also taken into account.

6.2 Animal-Related Parameters

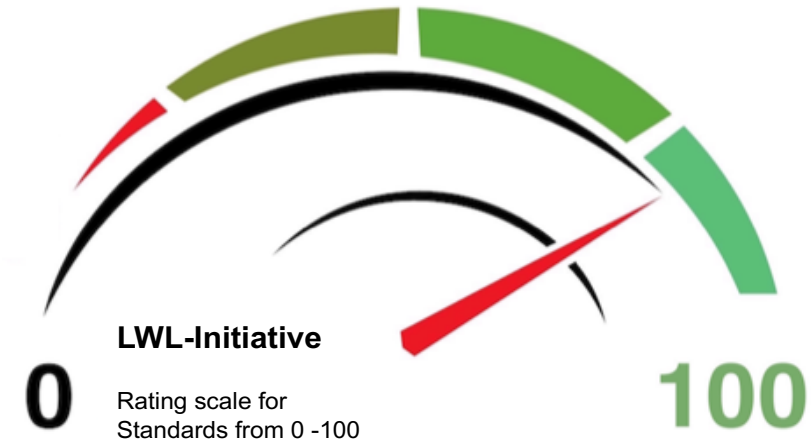
The animal-related parameters focus on the animal welfare aspect. They illustrate the necessary balance between science and practice and are therefore fixed on a manageable number of practicable, transparent and unambiguous indicators.

6.3 Additional Parameters

In addition, feed and traceability parameters are assessed. In particular, the renunciation of genetic engineering in feed and antibiotic prophylaxis are KO criteria. In addition, the special requirements in the area of organic production must be taken into account, such as area-based production, regionality, use of animal feed and additional purchases. Traceability is regulated by law, but not a batch or at least quantity-based traceability or traceability along the entire process chain.

7. Presentation about the Sign

The label is intended to present to the consumer the results of the evaluation of how much animal welfare the quality program has taken into account when producing the product.The presentation is based on a point system from 0 to 100 and can therefore be easily and comprehensibly traced. The higher the score, the better the standard. Based on the color scheme from red to light green, analogous to the traffic light system in the food sector, a clear statement is made. Green means that a higher standard of animal welfare is achieved, while red merely represents the commercial attitude required by law.



Source: LWL-Initiative

Figure 9. Example LWL-Labeling

8. Hypotheses

H1**:** Seals offer consumers benefits for orientation and promote sales.

The offer of a product indicates the special feature of the offered product and increases the number of buyers. In fact, special markings can lead to higher sales. However, it must be ensured that the statements are actually correct.

H2: Quality criteria are neglected with seals and special features.

It can be, but it doesn't have to be. If the specifications do not meet the expected criteria, the advertised products lose acceptance. Because higher prices have to justify themselves on the market.

H3:Animal protection and animal welfare are in the focus, actually it concerns however only marketing.

Consistent animal protection is transparent. This also includes marketing, but only to show the differences between the respective standards.

H4: Seals have a clear added value compared to unlabeled products.

That's 100% true.

9. Conclusions

Benefit of Labelling is a very complex area. Evaluating standards in different areas is a challenge that only works if certain parameters are set. These are determined on the one hand by the respective requirements of the standard setters and on the other hand by the additional bases of the valuation principles.

The results determined by the LWL-Initiative illustrate the significance of the respective labels and standards very clearly by means of the scores achieved in the graphic representation. This is not only about animal protection and sustainability aspects, but also about contents that are set by the legislator at national and EU level, but also about more far-reaching specifications of the respective standard setters.

The production costs and thus also the economic aspect are difficult to classify in the evaluation. This also applies to competition, demand, wages, regions, social aspects and infrastructure. In addition, additional specifications are cost-intensive, because the provision of open land, the renunciation of genetic engineering, no killing of male animals in the area of laying hen husbandry, low stocking density, etc. mean more effort and higher costs. In this respect, the comparison of different seals can only be made with regard to specifications and content. Uniform parameters for evaluation, which enable comparability of contents and awards, are decisive for this.

References

HCS system chickens for fattening, manual ISBN: 978-3-946947-02-8, Januar 2018
Housing Condition Score (HCS-System), Bartussek, von der Crone, http://www.lwl-initiative.deEU market situation for Poultry meat and Eggs, EU-Commission, https://ec.europa.eu/agriculture/index_en
EUR-Lex (Acces to European Union law), http://eur-lex.europa.eu/homepage.html
Livestock Welfare Labelling (LWL) Initiative, by the Crone, system specifications of a transparent evaluation scheme, Handbook ISBN:978-3-946947-01-1 of 1.2.2018
MEG market balance for eggs and poultry 2018, Beck, Ulmer Verlag Stuttgart, www.marktinfo-eier-gefluegel.de, ISBN 978-3-8186-0684-8
Statistics, EUROSTAT, https://ec.europa.eu/info/departments/eurostat-european-statistics_de
Animal Fairness Index, Applications, Scientific Contributions and Guidelines, Bartussek, Austria, http://www.bartussek.at/veroeffentlichungen/index.html
System specifications for organic production, BIO-Initiative gGmbH, von der Crone, System specifications, http://www.bio-initiative.de, ISBN: 978-3-946947-04-2, 8/2018
Association for controlled alternative forms of animal husbandry (KAT), http://www.kat.ec

DETERMINATION OF FACTORS INFLUENCING THE ADOPTION OF RETURNABLE PLASTIC CRATES (RPCS) IN REDUCING TOMATO LOSSES AMONG TRADERS IN LAGOS STATE, NIGERIA

Aghadi Crystal Nwabuogo
University of Nairobi, Department of Agricultural and Applied Economics, Kenya
Email: crystalaghadi@ gmail.com

Mburu John
University of Nairobi, Department of Agricultural and Applied Economics, Kenya

Kalaba Mmatlou
University of Nairobi, Department of Agricultural and Applied Economics, Kenya

Abstract

The Returnable Plastic Crates (RPCs) was introduced into the tomato industry due to its effectiveness in curbing tomato postharvest losses in Nigeria; however, the level of adoption remains low. The study examines the factors including the socio-economic characteristics and barriers influencing the adoption of RPCs among tomato traders in Lagos state. The survey was carried out on 93 wholesalers and 152 retailers making a total of 245 traders in fourteen different markets in Lagos. A total of 72 traders were currently making use of the RPC while 173 were making use of baskets and other containers. Frequencies, percentages and Pearson's chi-square distribution were employed to make useful inferences. The study found out that the income of the trader, their position in the value chain, the sex of the respondent, access to media and being a household head were major socio-economic characteristics affecting the adoption of RPCs. Also, the inability of the RPCs to contain much tomatoes; high costs associated with the use of RPCs and the familiarity accustomed to the baskets were the major barriers hindering the adoption of RPCs. The study also discovered the overall low level of training programs of reducing tomato postharvest losses and minimal access to credit services among the tomato traders. Therefore, the study recommends appropriate policies that would increase the number and frequency of training programs, credit services and awareness through the media on reducing tomato postharvest losses through RPCs and other technologies. Also, the public and private institutions should pay more attention to the design, cost and availability of RPC to the traders.

Keywords: Returnable Plastic Crates (RPCs), Tomato, Postharvest Losses, Adopter, Non-Adopters.

1. Introduction

The postharvest losses encountered globally along the value chain from farm to the household level is estimated to feed about 1.5billion people annually (Gustavsson, Cederberg, Sonesson, & Emanuelsson, 2013). This alarming level of losses encountered globally is not concurrent with the universal trend towards food security (zero hunger), ending poverty and ensuring sustainable food systems especially with the continuous rise in population. Therefore, reducing postharvest losses along the value chain has become a global priority (Kikulwe et al., 2018). The focus on ending hunger and poverty was reflected in SDG 1 and 2 while the goal of reducing postharvest losses was further communicated through the Sustainable Development Goal (SDG) 12.3. The SDG 12.3 states that by 2030, there should be reduction of food losses along the production and supply chain including postharvest losses (United Nations, 2016). Also, the Malabo Declaration of 2014 committed to reducing postharvest losses by at least half in 2025 (NEPAD, 2016).

Arah et al (2015), defines postharvest losses as challenges encountered after harvest by the producers, processors, retailers and distributors as well as the exporters in the process of handling the produce until it gets to the final consumers. According to Jaspreet & Anita (2014), postharvest losses

includes both food losses along the supply chain and food wastage by the consumers. However, the study focuses on tackling food losses along the chain with the use of Returnable Plastic Crates (RPC) because these types of losses are more precarious in African countries than food wastage at the consumer level (Jaspreet & Anita, 2013; Sheane, McCosker, & Royston, 2008).

Tomato is an important crop globally as it accounts for 60% of the total global vegetable production at 177million tonnes in 2016 (Fatobi, Uwejeyan, Akoyi, & Oyeleke, 2018). It is the world's largest and most widely consumed food crop after potato and ranks the highest in terms of canned vegetable in the world (Kimura & Sinha, 2008). In Nigeria, tomato is the most important vegetable after onions and pepper in terms of demand (Orebiyi, Ben-Chendo, & Effiong, 2016). It also accounts for about 18% of the daily vegetable consumption (Babalola, Makinde, Omonona, & Oyekanmi, 2010). It possesses diverse and numerous uses varying from consumption in its raw form to its usefulness in the preparation of many dishes across the globe and therefore sustains a high demand in the throughout the year.

The focus on tomato in Nigeria is linked to its production levels, high demand and contribution to the welfare of its farmers, traders and the economy as a whole in the country. Nigeria produces about 31% of the total tomato output in SSA and is therefore ranked as the largest producer with about 2.2million tonnes produced annually (FAOSTAT, 2016). About 70% of the tomato produced in the country originates from Northern states and Kano state (which is also a Northern State) is the largest tomato producing state in the country (Ugonna, Jolaoso, & Onwualu, 2015). However, a larger percentage of the fresh tomato supply goes to the major markets in the country like the one in Lagos state (Babarinsa, Ogundele, Babarinsa, & Omodara, 2018). Therefore, tomato farming and marketing forms a major source of livelihood for actors in the tomato supply chain who resides in areas like Kano and Lagos States (Ugonna et al., 2015).

Although, the tomato industry in Nigeria possess the capacity to provide employment, help in ensuring food security and poverty reduction, generate foreign exchange and improve the economy (Natsa, 2015). However, the losses faced along the tomato value chain hampers the growth of the industry in the country. Sibomana, Workneh, & Audain (2016) recorded that Nigeria experiences the highest level of postharvest losses along the tomato supply chain in Africa and Ugonna et al. (2015) placed these losses at 45%. Furthermore, Babarinsa et al. (2018) recorded up to 42% postharvest loss occurring during the distribution of the fresh tomato from the small-scale farmers in Kano to the retailers in Lagos.

The annual production of fresh tomato (as at 2016) was about 2.2mil tonnes(FAO, 2018). However, with the 45% post-harvest loss, only an estimate of 1.2mil tonnes was left to feed the demand for tomatoes (Fatobi et al., 2018). Moreover, the annual demand for tomatoes in Nigeria is about 2.3million tonnes(Ugonna et al., 2015). The country is therefore left with a huge tomato demand gap of about 1.1million tonnes to feed the fast growing population. Although there are a number of factors that could lead to this demand gap like an increased money supply leading to higher demands. However, there is no doubt that the tomato postharvest losses contributes a higher percentage as it reduces the supply of tomatoes in the market (Rutten, 2013). Nigeria therefore has to import about 63 thousand tonnes of tomato paste worth up to $60million to meet up with the tomato demand (FAO, 2018).

The high losses indicated at the packaging stage in the tomato value chain (Gustavsson et al., 2013) implies that the method of packaging and technology used could have great influence on the level of tomato losses. According to Adegbola, Bamishaiye, & Olayemi (2011), there has been a shift from the traditional method of handling and packaging fruits and vegetables to more modern technologies like the use of plastic and cardboard crates in developed countries. However, Nigeria and some other African countries are still making use of the old and loss-provoking methods thereby incurring greater losses (Babarinsa et al., 2018). These bad practices and methods includes the use of woven baskets for packaging tomato in Nigeria or wooden crates in Ghana (Arah et al., 2015) and other materials like jute bags, sacks and polythene bags in use in African countries. Arah et al. (2015) proved that these methods are unsuitable for handling and packaging and incurs greater losses to the produce.

In a bid to reduce tomato losses, the Global Alliance for Improved Nutrition (GAIN) through the Postharvest Loss Alliance for Nutrition (PLAN) introduced the Returnable Plastic Crates (RPCs) into the fresh tomato supply chain in 2017 (GAIN, 2017). The RPC is meant to replace woven baskets in packaging and handling of fresh tomato along the supply chain in Nigeria. According to Idah,

Ajisegiri, & Yisa (2007), the right packaging should be able to protect the produce from physical damages during handling, storage, transportation and marketing. However, the woven baskets have sharp edges which causes mechanical injuries to the tomato produce and the over-sized nature leads to excessing compression and crushing of the tomatoes at the base (Hurst, 2010). Also, the basket is not easily stackable and does not permit sufficient air flow leading to excessive heat that enhances deterioration of the produce (Hurst, 2010). In contrast, the RPC possesses smooth edges and reduced depth. It is also easily stackable due to its firmness and affords sufficient airflow to the produce (Babarinsa et al., 2018). Moreover, it can be re-used many times unlike the baskets and does allow more than 25kg which is the standard quantity a packaging/harvesting container should carry (Naika, Van Lidt De Jeude, De Goffau, Hilmi, & Dam, 2005). According to Adegbola et al. (2011), the plastic crates are more efficient and effective in handling and packaging FFV through all the stages in the supply chain but its use in the country is very low.

A case study in Afghanistan realized that the tomato farmers' proceeds increased by a total of US$75,000 and the buyers were willing to pay up to 33% more for tomatoes sold with RPC (Lipinski et al., 2013). Although, Adegbola et al. (2011) who performed an ex-ante study identified unavailability, inaccessibility and high cost as the major barriers to RPC use for FFV in Nigeria. However, the programme by GAIN (2017) made them available, accessible and at a subsidized cost (Sahel Research, 2017). Likewise, Olumuyiwa, Folorunso, & Richard (2017) illustrated their willingness to adopt the RPC technology. However, there is still a predominance of the use of woven baskets in packaging and handling of tomatoes (Arah, 2015; Babarinsa et al., 2018). Therefore, this study intends to analyze the socio-economic factors and barriers hindering the adoption of RPCs in reducing tomato losses among traders in Lagos state.

2. Methods

2.1 Study Area

Lagos State is a megacity located in the South-Western Nigeria with latitudes 6° 23¢N and 6°41¢N and longitudes 2°42¢E and 3°42¢E. It is bordered in the north and east by Ogun State, in the west by the Republic of Benin and the south by the Atlantic Ocean (Obayelu, Arowolo, Ibrahim, & Croffie, 2014). The 2006 census conducted in Nigeria placed the population in the state at about 9.1 million people making it the second largest number with Kano as the first (NBS, 2013). Although, Lagos has the second largest population in the country, it is however the smallest in terms of land mass as it covers an area of 3,671 square kilometers (NBS, 2013). The population density of the state is as high as 4,193 persons per square km (Obayelu et al., 2014).

2.2 Sampling Procedure

A multi-stage sampling procedure was used in the selection of respondent to be interviewed for the study. The first stage involved the purposive selection of Lagos state due to their abundance of tomato traders in the country who have been introduced to the RPC technology. Also, 14 markets were randomly selected. In the second stage, a stratified random sampling technique was used where each trader was be divided into two stratum-wholesalers and retailers. The selection of a respondent into a particular strata was based on the functions performed and the amount of tomato sold/bought. 92 wholesalers and 152 retailers were chosen randomly leading to a total of 245 respondents. The reason for the choice of 245 respondents is because previous studies on adoption of similar postharvest technologies (Adegbola et al., 2011; Elemasho, Alfred, Aneke, Chugali, & Ajiboye, 2017b, 2017a) have used above or below 150 respondents for each state in Nigeria.

2.3 Data Collection

The study made use of focus group discussions and interview of key informants as part of the tools in data collection. Also, a well-structured questionnaire was administered with a combination of ODK and paper-based format in the study area.

The focus group discussion and interview of key informants was carried out in the Mile 12 market (one of the biggest tomato market in Nigeria) which involved the major stakeholders in the fresh tomato supply chain. These stakeholders involved the executives of the tomato sellers association in Nigeria and a few traders who make use of both baskets and plastic crates.

2.4 Analytical Tools

The objectives of the study were realized using frequencies, tables, percentages and charts. Also, the study made use of Pearson's chi-square distribution to analyze the relationship between several socio-economic variables and the level of adoption.

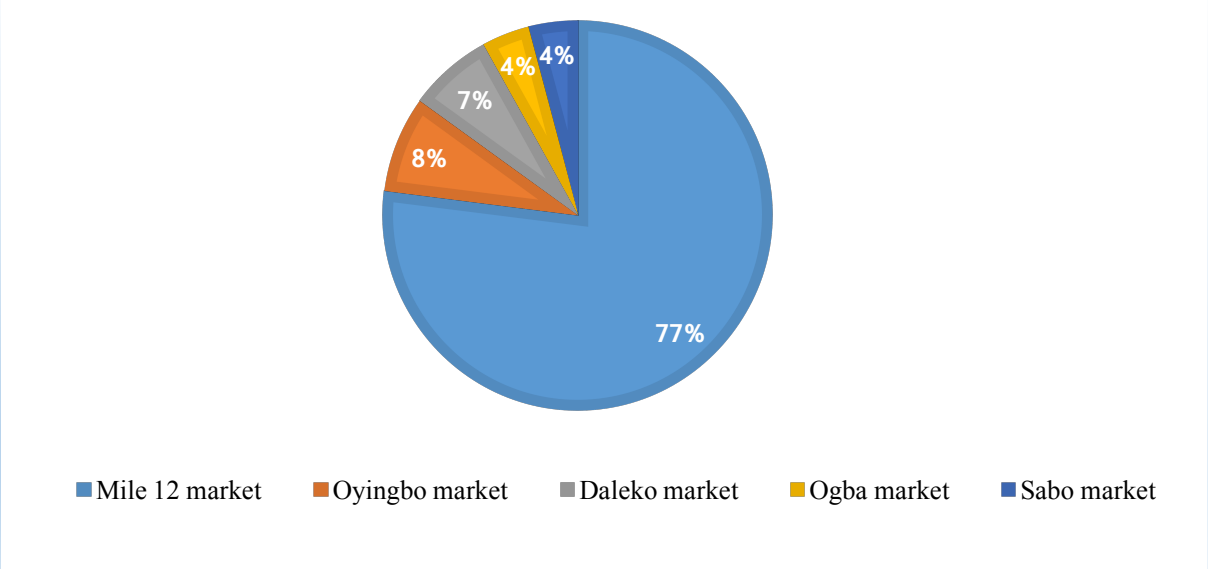
3. Results

This section starts with an analysis of the socio-economic characteristics of the tomato traders including the adopters of the Returnable Plastic Crates (RPC) and the non-adopters. It is followed by an analysis of the trader's perception towards the importance of RPCs and the barriers hindering the use of RPCs by tomato traders in the study area.

3.1 Socio-Economic Characteristics of Adopters and Non-Adopters of RPC

The study examined a total of 245 respondents out of which 93 were wholesalers and 152 were retailers of fresh tomatoes in fourteen different markets in Lagos state, Nigeria.

Most of the respondents were between the age bracket of 30 to 39 years and 40 to 49 years as can be seen in Table 1 which has 40% and 32% respectively. The higher percentages seen in the age brackets of 30 to 49 years similarly applies to the adopters and non-adopters and does not have a strong relationship with the level of adoption of RPCs as seen in Table 2. However, the age bracket shows that a larger percentage of the tomato traders are still in their active working age which shows could indicate their willingness to take the risks associated with the tomato trade and bear the physical labor it entails. This result agrees with the study by Adeoye, Odeleye, Babalola, & Afolayan (2009) where majority of the tomato traders were between the ages of 31 to 40 years.

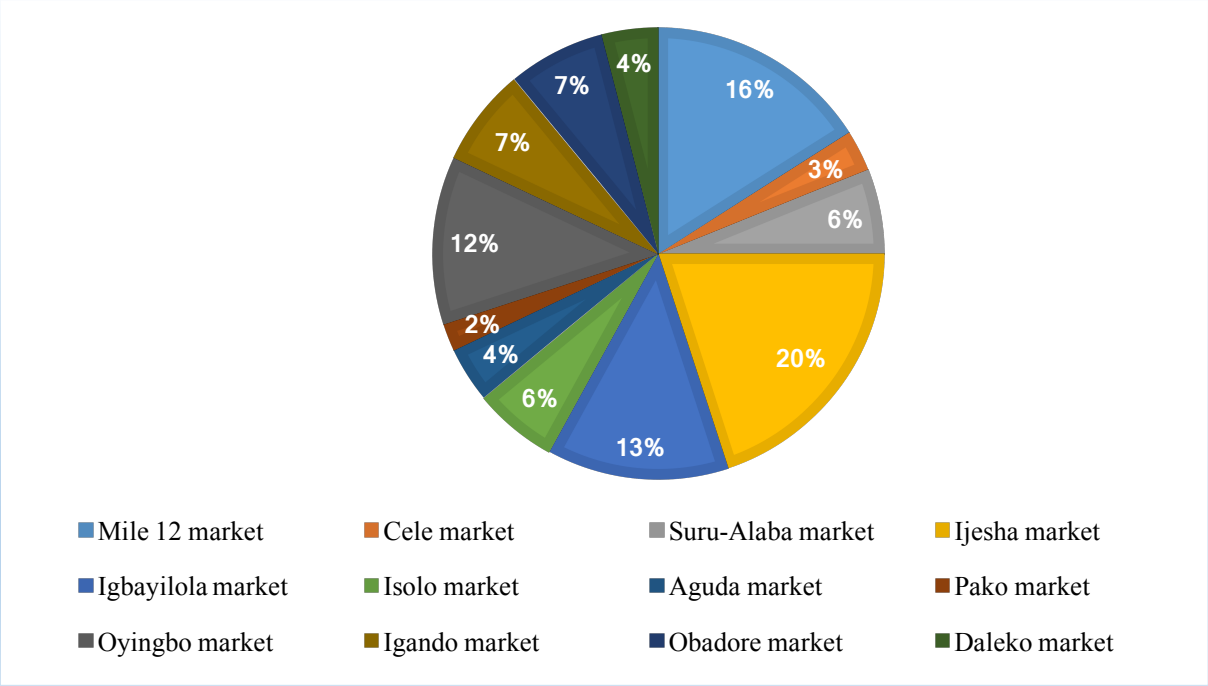


Source: Author's construction from field survey, 2019.

Figure 1. Distribution of Wholesalers Markets in Lagos State

The case is quite different in the level of formal education received by adopters and non-adopters. A higher percentage (42%) of the adopters did not receive any formal education unlike the non-adopters where only 8% received no formal education. Also, Table 2 shows that there is a strong

relationship between the formal education of the respondent and the rate of adoption. This result however contradicts with the study of Adegbola et al. (2011) and Elemasho et al. (2017) who said that formal education increases the probability of adopting a postharvest loss technology. The contradiction could arise from the facts that majority of the wholesalers who had no formal education stayed together in the same market and belonged to the same market association. Therefore, these wholesalers had more incentives to adopt the RPC technology as discussed by Obuobisa-darko (2015) who stated that the respondents who belonged to a market association constituted a higher percentage of the adopters. This postulation is further affirmed as 93% of the adopters cited their co-traders as their source of information on the use of RPC.



Source: Author's construction from field survey, 2019

Figure 2. Distribution of Retailers across Different Markets in Lagos State

Table 2 shows that there is a strong relationship between the sex of the respondents and their level of adoption. Although, among all the respondents interviewed, there was an almost equal distribution of the male and female sex of 51% and 49% respectively. However, the male gender was dominant among the adopters with a percentage level of 79% unlike the non-adopters which constituted only 39%. This could be because majority of the men spend less time at home catering for the children and more time with their co-traders from which they are able to gather more information about the use of RPC as indicated in their source of information in Table 1. This result agrees withAdegbola et al. (2011) who found out that the tomato famers and wholesalers were dominated by the male gender by a figure of 100% in the study performed in Kano State, Nigeria.

A higher percentage of the respondents (63%) indicated that they were the household head. Similarly, a much higher percentage (86%) of the adopters compared to the non-adopters also indicated that they were the heads of their household.The level of significance existing between being the household head and the level of adoption in Table 2 indicates a strong relationship between the two factors. This could imply that those who have people depending on them as the household head are more willing to adopt the RPC technology and this could be due to the advantages the technology brings with it. The study by Obuobisa-darko (2015) also found out that households that are larger in sizes constitutes more of the adopters.

Majority of the respondents were married and this includes the adopters and non-adopters showed by 85% and 83% respectively and an overall of 84% for all the traders. This results agrees with the

results of Elemasho *et al.* (2017) on farmer's perception to postharvest technologies in Nigeria where 84% of the respondents were also found to be married.

Table 1. Socio-Economic Factors Associated with Adopters and Non-Adopters of the RPC

Variable	Category	All respondents (245)		Adopters (72)		Non-adopters (173)	
		Frequency	Relative Percent (%)	Frequency	Relative Percent (%)	Frequency	Relative Percent (%)
Position in the Value Chain	Wholesalers Retailers	93 152	38 62	60 12	83 17	33 140	19 81
Age	15 to 29 years 30 to 39 years 40 to 49 years 50 to 59 years 60 years and above	37 99 78 26 5	15 40 32 11 2	14 33 22 2 1	19 46 31 2 1	23 66 56 24 4	13 38 32 14 3
Formal Education	No formal education Primary school Secondary school University education and above	43 69 128 5	18 28 52 2	30 14 27 1	42 19 38 1	13 55 101 4	8 32 58 2
Sex	Male Female	124 121	51 49	57 15	79 21	67 106	39 61
Household Head	Yes No	154 91	63 37	62 10	86 14	92 81	53 47
Marital Status	Single Married Widowed	33 205 7	13 84 3	11 61 0	15 85 0	22 144 7	13 83 4
Income (₦)	20,000 and below 20,001 to 40,000 40,001 to 60,000 60,001 to 80,000 80,001 to 100,000 Above 100,000	81 82 41 8 12 21	33 33.5 17 3 5 8.5	13 12 14 4 10 19	18 17 19 6 14 26	68 70 27 4 2 2	39 41 16 2 1 1
Access to Credit	Yes No	23 222	9 91	9 63	13 87	14 159	8 92
Access to Media	Yes No	107 138	44 56	47 25	65 35	60 113	35 65
Source of Information on the Choice of Packaging Container	Co-trader Friend Family Buyer Training programme	228 8 7 1 1	93 3 3 0.5 0.5	66 3 1 1	93 4 1.5 1.5	161 5 7	93 3 4

Source: Author's calculation from field survey, 2019.

The level of income category for the entire sample is highest at 33.5% between 20,001 and 40,000 followed by the income category below 20,000 which is at 33%. From the results of Table 2, there exists a strong relationship between the income category and the level of adoption of RPCs. This relationship is indicated in Table 1 where the highest income category of adopters falls above

₦100,000 whereas the highest income category for non-adopters falls between ₦20,001 and ₦40,000. This shows that the adopters earn much higher income than the non-adopters and this might be why they are willing and able to afford the RPC which is more expensive than the usual baskets.

Table 2. Relationship between Socio-Economic Characteristics and the Level of Training and Awareness on RPC Received by the Respondents and the Level of Adoption of RPC

Relationships	Df	P-value	Decision (95% C.I)
Relationship between the position in the chain and the level of adoption	1	0.000	Significant
Relationship between age and the level of adoption	4	0.085	Not significant
Relationship between formal education and the level of adoption	3	0.000	Significant
Relationship between sex and the level of adoption	1	0.000	Significant
Relationship between being the household head and level of adoption	2	0.000	Significant
Relationship between the income and the level of adoption	5	0.000	Significant
Relationship between access to media and the level of adoption	1	0.000	Significant
Relationship between the source of information on the choice of packaging container and the level of adoption	4	0.093	Not significant
Relationship between the training on RPC and the level of adoption	1	0.000	Significant
Relationship between the level of awareness on the existence and use of RPC and the level of adoption	1	0.000	Significant

The level of access to credit for the entire sample in the study points to 91% for those who do not have a possible means of accessing credit for their tomato trade and only 9% are able to access credit services. This also applies to the adopters and non-adopters of the RPCs. This results points to an overall low level of access to credit among tomato traders and could be a major hindrance to the adoption of RPCs and other postharvest loss reducing technologies. This results agrees with the work of Essien and Arene (2018) where low level of access to formal credit was discovered.

A slightly lesser percentage (44%) of the entire respondents has access to media which includes TV, radio and internet services. However, this access to media has a strong relationship with the level of adoption as can be seen in Table 1 and 2. In Table 1, 65% of the adopters had access to media unlike the 35% among the non-adopters. This shows that access to media services increases the level of adoption due to the level of exposure the media has to upcoming technologies. This result agrees with the study of Adeniji and Ega (2004) that mass media increases the awareness and adoption of technologies.

3.2 Awareness and Use of Returnable Plastic Crates (RPCs)

Table 3 shows the level of awareness on the existence and use of the RPCs in the study area to be 67% which means that more tomato traders are aware of RPC as a postharvest loss reducing technology. This is an improvement from the study of Adegbola et al. (2011) where the 91% of the respondents rated the awareness level of RPCs as very low. Also, Table 2 shows the significant relationship the level of awareness has with the level of adoption. However, the level of adoption and the training received on the plastic crates is still quite low as indicated in Table 3.

This result is also similar to the study by Adegbola et al. (2011) where the adoption rate of RPC was at 21% in the study area. It can further be seen from Table 2 that the level of training received on the use of RPC also affects the level of adoption of RPCs.

Table 3. Summary of other Factors Influencing the Level of RPC Use

Variable	Category	Frequency	Relative Percentage (%)
Level of awareness on the existence and use of RPC	Aware Unaware	164 79	67 33
Level of RPC use	Non-adopters of RPC Adopters of RPC	173 72	71 29
Level of training received on the use of RPC	Recipients of any training or awareness program Non-recipients	5 240	2 98

Source: Author's calculation from field survey, 2019.

3.3 Barriers Hindering the Adoption of RPCs

Table 4 shows the barriers hindering the adoption of RPCs as highlighted by the respondents. 36% of the respondents did not highlight any barriers and these mostly composed of those who are already using the RPCs and acknowledging its benefits. However, the highest barriers were highlighted as the inability of the RPCs to contain as much tomatoes as the baskets; the high cost associated with the use of RPCs and the familiarity accustomed to baskets as old habits could be difficult to change.

Table 4. Barriers Hindering the Use of Returnable Plastic Crates (RPCs)

Barrierstowardstheuse of ReturnablePlasticCrates (RPC)	Frequency	Percentage (%)
No barrierstowards RPC use	88	36
Inabilitytocontain as muchtomatoes as baskets	46	19
High costassociatedwith RPC use	40	16
Familiaritywiththeuse of baskets	29	12
Lowcost of obtainingbaskets	16	7
Insufficientknowledge on theuse of RP	11	4
Unavailability of RPC	6	2
Thedifference in themethod of measure	5	2
Buyer'spreference	4	2
Total	245	100.00

Source: Author's calculation from field survey, 2019.

This result also agrees with the study of Adegbola et al. (2011) where the high cost, difference in unit of measurement and unavailability were listed as the major barriers hindering the use of RPCs in the study area in Nigeria.

4. Conclusion and Recommendation

The study found out that the position in the value chain, income, sex of the respondent, access to media and being a household head were major socio-economic characteristics affecting the adoption of RPCs.Also, the inability of the RPCs to contain as much tomatoes as the baskets; the high cost associated with the use of RPCs and the familiarity accustomed to baskets as old habits could be difficult to change were also the major barriers hindering the adoption of RPCs. Furthermore, there was generally a low levels of access to credit services, low RPC use and exposure to training programs on reducing postharvest losses with the use of RPC and other technologies. Therefore, the study recommends that the public and private institutions should enable better access to credit in order to enable the trader purchase and make use of the RPCs. Also, more training and sensitization through different mediums should be given to the tomato traders on the use of RPC to increase the adoption and awareness rate.

References

Adegbola, A., Bamishaiye, E. I., & Olayemi, F. (2011). Factors Affecting the Adoption of the Re-Usable Plastic Vegetable Crate in Three Local Government Areas of Kano State , Nigeria. *Asian Journal of Agricultural Sciences*, *3*(4), 281–285.

Adeniji, O. B., & Ega, L. A. (2006). Impact of Mass Media on Adoption of Agricultural Innovations in Kaduna State, Nigeria. In *Journal of Agriculture and Social Research* (Vol. 6). Retrieved from https://www.ajol.info/index.php/jasr/article/view/2874

Adeoye, I. B., Odeleye, O. M. O., Babalola, S. O., & Afolayan, S. O. (2009). Economic Analysis of Tomato Losses in Ibadan Metropolis, Oyo State, Nigeria. *African Journal of Basic & Applied Sciences*, *1*(56), 87–92. Retrieved from https://idosi.org/ajbas/ajbas1(5-6)09/1.pdf

Arah, I. K. (2015). Africa: Diversity and Development An overview of post-harvest challenges facing tomato production in Africa. *African Studies Association of Australasia and the Pacific (AFSAAP) 37th Annual Conference*. Retrieved from http://afsaap.org.au/assets/Arah-Isaac-Kojo.-An-overview-of-post-harvest-challenges.pdf

Arah, I. K., Kumah, E. K., Anku, E. K., & Amaglo, H. (2015). An Overview of Post-Harvest Losses in Tomato Production in Africa: Causes and Possible Prevention Strategies. *Journal of Biology*, *5*(16).

Babalola, D. A., Makinde, Y. O., Omonona, B. T., & Oyekanmi, M. O. (2010). Determinants of post harvest losses in tomato production: a case study of Imeko – Afon local government area of Ogun state. *Journal of Life and Physical Science*, *3*(2), 14–18.

Babarinsa, F. A., Ogundele, R. B., Babarinsa, O. A., & Omodara, M. A. (2018). Evaluation of plastic crate as replacement for raffia basket to prevent in-transit damage of packaged tomatoes. *Journal of Postharvest Technology*, *06*(3), 70–79. Retrieved from http://www.jpht.info

Elemasho, M. K., Alfred, S. D. Y., Aneke, C. C., Chugali, A. J. C., & Ajiboye, O. (2017a). Factors affecting adoption of post-harvest technologies of selected food crops in Rivers State, Nigeria 1. In *International Journal of Agricultural Economics and Extension* (Vol. 5). Retrieved from www.internationalscholarsjournals.org

Elemasho, M. K., Alfred, S. D. Y., Aneke, C. C., Chugali, A. J. C., & Ajiboye, O. (2017b). Farmers ' Perception of Adoption of Post-harvest Technologies of Selected Food Crops in Rivers State, Nigeria. *International Journal of Agricultural Resource, Innovation and Technology*, *7*(1), 22–26.

Essien, U. A., & Arene, C. J. (2018). An Analysis of Access to Credit Markets and the Performance of Small Scale Agro-Based Enterprises in the Niger Delta Region of Nigeria. *International Journal of Food and Agricultural Economics*, *2*(3), 105–120. Retrieved from http://www.foodandagriculturejournal.com/vol2.no3.pp105.pdf

FAO. (2018). FAOSTAT Database. Retrieved January 13, 2018, from Food and Agriculture Organization of the United Nations website: http://www.fao.org/faostat/en/#rankings/countries_by_commodity_imports

FAOSTAT. (2016). *Global Tomato Production in 2016*. Retrieved from http://www.fao.org/faostat/en/#rankings/countries_by_commodity

Fatobi, A., Uwejeyan, A., Akoyi, Y., & Oyeleke, B. (2018). *X-raying the Nigerian tomato industry Focus on reducing tomato wastage*. Retrieved from www.pwc.com/ng

GAIN. (2017). *PLAN NIGERIA CRATING WORKSHOP REPORT*.

Gustavsson, J., Cederberg, C., Sonesson, U., & Emanuelsson, A. (2013). The Methodology of the FAO study: Global Food Losses and Food Waste - extent, causes and prevention. In *Swedish Institute for Food and Biotechnology*. Retrieved from http://www.diva-portal.org/smash/get/diva2:944159/FULLTEXT01.pdf

Hurst, W. C. (2010). *Harvest, Handling and Sanitation Commercial Tomato Production. Handbook B 1312*. Retrieved from http://extension.uga.edu/search.html?q=Harvest%2C+Handling+and+Sanitation+Commercial+Tomato+Production&refinement=publications

Idah, P. A., Ajisegiri, E. S. A., & Yisa, M. G. (2007). Fruits and Vegetables Handling and Transportation in Nigeria. In *AU Journal of Technology* (Vol. 10). Retrieved from http://www.journal.au.edu/au_techno/2007/jan07/vol10no3_article6.pdf

Jaspreet, A., & Anita, R. (2013). Post-Harvest Food Losses Estimation -Development of Consistent Methodology. *Selected Poster Prepared for Presentation at the Agricultural & Applied Economics*

Association's 2013 AAEA & CAES Joint Annual Meeting. Retrieved from http://www.fao.org/fileadmin/templates/ess/documents/meetings_and_workshops/GS_SAC_2013/Improving_methods_for_estimating_post_harvest_losses/Final_PHLs_Estimation_6-13-13.pdf

Kikulwe, E. M., Okurut, S., Ajambo, S., Nowakunda, K., Stoian, D., & Naziri, D. (2018). Postharvest losses and their determinants: A challenge to creating a sustainable cooking banana value chain in Uganda. *Sustainability (Switzerland)*, *10*(7), 1–19. https://doi.org/10.3390/su10072381

Kimura, S., & Sinha, N. (2008). Tomato (Solanum lycopersicum): A Model Fruit-Bearing Crop. *CSH Protocols*, *2008*(11), pdb.emo105. https://doi.org/10.1101/PDB.EMO105

Lipinski, B., Hanson, C., Lomax, J., Kitinoja, L., Waite, R., & Searchinger, T. (2013). *Reducing Food Loss and Waste*. Retrieved from http://www.worldresourcesreport.org.

Naika, S., Van Lidt De Jeude, J., De Goffau, M., Hilmi, M., & Dam, B. V. (2005). *Cultivation of tomato production, processing and marketing* (Fourth Edi; B. Van Dam, Ed.). Retrieved from https://cgspace.cgiar.org/bitstream/handle/10568/52975/17-e-2005-screen.pdf?sequence=1

Natsa, R. T. (2015). *Tackling Post-harvest Losses Towards Food Security*. Retrieved from http://www.milanfoodlaw.org/wp-content/uploads/2015/11/15-11-08-Tackling-Post.pdf

NBS. (2013). *NATIONAL BUREAU OF STATISTICS (NBS) Annual Abstract of Statistics, 2011*. Retrieved from http://istmat.info/files/uploads/53129/annual_abstract_of_statistics_2011.pdf

NEPAD. (2016). Guidelines CAADP Country Implementation under the Malabo Declaration. *New Partnership for Africa's Development*.

Obayelu, A. E., Arowolo, A. O., Ibrahim, S. B., & Croffie, A. Q. (2014). Economics of Fresh Tomato Marketing in Kosofe Local Government Area of Lagos State, Nigeria. *Nigerian Journal of Agricultural Economics (NJAE)*, *4*(1), 58–67. Retrieved from https://ageconsearch.umn.edu/record/267884/files/Economics of Fresh Tomato Marketing .pdf

Obuobisa-darko, E. (2015). Socio-Economic Determinants of Intensity of Adoption of Cocoa Research Innovations in Ghana. *International Journal of Africa and Asian Studies*, *12*, 29–41.

Olumuyiwa, B., Folorunso, B., & Richard, O. (2017). Willingness to Adopt Plastic Crate by Actors in the Tomato Value Chain in Nigeria. *The 1st All Africa Post Harvest Congress & Exhibition, Reducing Food Losses and Waste: Sustainable Solutions for Africa*, 146–147. Retrieved from https://www.cabdirect.org/cabdirect/abstract/20183237987

Orebiyi, J. S., Ben-Chendo, G. N., & Effiong, P. (2016). *Economics of Tomato Post-harvest Losses at Market Level in Akwa-Ibom State, Nigeria*. Retrieved from http://www.aes.ac.uk/upload_area/member_documents/Nkiru_BEN-CHENDO_ECONOMICS OF TOMATOES LOSES- BEN-CHENDO.pdf

Rutten, M. M. (2013). What Economic Theory Tells Us about the Impacts of Reducing Food Losses and/or Waste: Implications for Research, Policy and Practice. *Agriculture and Food Security*, *2*(13). https://doi.org/10.1186/2048-7010-2-13

Sahel Research. (2017). The Tomato Value Chain in Nigeria. *Catalysing Sustainable Agriculture and Nutrition*, *15*. Retrieved from http://www.sahelcp.com/wp-content/uploads/2017/07/Sahel-Newsletter-Volume-15_Tomato.pdf

Sheane, R., McCosker, C., & Royston, S. (2008). *Food System Framework: A focus on Food Sustainabilbity*. Retrieved from www.ifst.org

Sibomana, M. S., Workneh, T. S., & Audain, K. A. (2016). A Review of Postharvest Handling and Losses in the Fresh Tomato Supply Chain: A Focus on Sub-Saharan Africa. *Food Security*, *8*, 389–404. https://doi.org/10.1007/s12571-016-0562-1

Ugonna, C. U., Jolaoso, M. A., & Onwualu, A. P. (2015). Tomato Value Chain in Nigeria: Issues, Challenges and Strategies. *Journal of Scientific Research and Reports*, *7*(7), 501–515. https://doi.org/10.9734/JSRR/2015/16921

United Nations. (2016). *Transforming our world: the 2030 agenda for sustainable development*.

THE IMPACT OF HELMINTHES PARASITES INFECTION ONSERUM PROTEINLES PROFILE OF CATFISH CLARİES LAZERA USING POLYACRYLAMİDE GEL ELECTROPHORESİS

Eshraga Dafa Alla Mahmoud
University of Al- Neelain, Fisheries Department, Khartoum, Sudan, Email: e.abubker121 @gmail.com

Asma Abdelrahman Ahmed
University of Al- Neelain, Department of Biology, Sudan
Email: Asmabdelrahmanahmed780 @gmail.com

Abstract

The fresh water fisheries are increasingly important economically to the people living along the banks of the Nile that can maintain sustainability of the resources, so fishes has been a major of source of protein and energy that pointed out by many survey and laboratory investigation (Khalil 1971). The mean sources are contribution in the total fish catch is 82% for the White Nile so freshwater fishes occurring in the Sudan may represented a great potential for the future developing of aquaculture with economical and social consequences further research on fish diseases urgently needed especially the infection of parasites which from about 80% of fish diseases. There were many the economically losses due to fish diseases were manifested in high mortality rate and , unmarketable (FAO, 2005). Screening common Nile fishes for helminthes parasites infection revealed Clarias lazera among the most infected fishes by nematodes and Cestodes. A number of hundred Clarias lazera collected from Jebel Aulia reservoir on the White Nile south of Khartoum (45Km) in 2010-2013 were segregated due to the intensity of infection from high to low when both nematodes and cestodes parasites were present. Polyacrylamide gel electrophoresis for the blood sera was used to investigate the impact of parasite infection on serum proteins profile as indicator to fish health status. These findings can, as well, used to check the principle on immunity to diseases in fishes. Polyacrylamide gel electrophoresis (PAGE) known to provide a high resolution method for fractionation and physical – chemical characterization of molecules based on size conformation, and net charge. Its application in the present study recorded different protein types as indicated by different fractional bands. Accordingly, and following the standard marker of serum protein profile, these recorded fractions detected were classified in four groups namely: albumin (9-57KD), alpha globulin (≥57KD,81 KD), Beta globulin (≥81-185 KD) and Gamma globulin, (≥200 KD). The results showed that helminthic parasites affect with reduction in the level of albumin and immune globulins IgM. The recommended more polyacrylamide gel electrophoresis investigation on fish pathogens as research programs are need .

Keywords: Serum Proteins, Fish Claries Lazera, Parasites, Gel Electrophoresis.

1. Introduction

Polyacrylamide gel electrophoresis (PAGE) provides, a high resolution method for fractionation and physical – chemical characterization of molecules on the basis of size, conformation, and net charge.Two – dimensional polyacrylamide gel electrophoresis (2D – PAGE), is used to separate mixtures of protein after staining this protein enable the relative abundances of protein to be quantified (Haleem et al., 2008). Serum protein electrophoresis is applied to examine conditions of chronic infection collagen disease connective tissue disease (Horita et al., 2005). In the past, the identification of fish was carried out mainly by examining the external morphological characteristic but in the present day, electrophoresis of sarcoplasmic protein, serum protein liver and number of enzymes often have been used by some researchers as an aid in species identification of fish (Miyazaki et al., 1998; Pinero et al., 2001) so it's great importance in the physiological and immunology range

to know roles in health and disease. Many available published reports are on) electrophoresis studies of serum fractions of healthy fish (Deutsch and Goodloe, 1945; Hongkun et al., 2008). In the present study polyacrylamide gel were used for separating the serum protein fractions of fish Clarias lazera infected with parasites Cestodes and nematodes compared with serum protein fractions of healthy C. lazera.

2. Literature Review

The Sudan for different varieties fishes there are about 200 species belong to22 families , but 50 of these species are economic important the mean sources are contribute in total fish catch economically proximity about 75/000 tons from the White Nile production used about 13/000 tons per / year , the internal fisheries stocks were proximity in Jebel Aulia reservoir 15/000 tons (Gideiri, 1984). Research on parasitic diseases culture fish in Sudan and African now being important which may be reduce the quality of fish meat, in Arab world and the Sudan the diseases economically effects were absent but the other countries registration at India in 1994, China in 1993, Japan 1998 economic losses proximity 17.6, 400, 144.4 million dollars respectively (FAO, 2005).

3. Methodology

Fish Claries lazera infection and non infection were procured from the White Nile the blood was collected by using the disposable syringe from the hart, bulbus arterious and ventral arota then blood transferred to the vacuum tube counting heparin lithium then the blood centrifuged at about 5000 rpm to separate the serum from the blood . Sera were stored at -4 0C till use. All the sera were used for protein separating by 12, 5 % (Laemmi, 1970).

4. Results

The electrophoresegrams of the blood sera of C. lazera infected with two helminthic worms showed nineteen protein bands as indicated by different molecular weights presented in Plate (1) Appendix (1) , Figs. (1&2), and Tables (1&2). According to markers obtained from the literature (Yilmaz [3] the fractions detected were classified in four groups namely : albumin(9-57KD),alpha globulin (≥57KD ,81 KD) , Beta globulin (≥81-185 KD) and Gamma globulin, (≥200 KD).The albumin fraction towards the anode , the globulin fraction in the middle of the gel and the other above towards the cathode Appendix (1) at 227 KD is IgM ,and the other below this fraction belong Again Plate1,Figs (1 & 2) Table 1 ,A ppdx (1) show the reduction in the level of albumin in sera of .C. lazera at high Cestode infection and medium and high nematode infection in comparison with control .In all levels of infections with both parasites there was reductions or absence in the alpha globulin band areas (81KD) . There was a rise in the beta globulin band areas with the increase in intensity of infection especially for nematode high infection. Similar results were observed in case of gamma globulins which showed large area in low nematode and high Cestode infections Table 2).

Table 1. The Presence and Absence of Protein Bands in Sera of Infected and non-infected Host

Marker (MW: KD)	Cont.	Ces.H	Ces.L	Nem.H	Nem.M	Nem.L
227	+	-	-	-	-	-
207	+	-	+	-	-	-
205	+	+	-	-	-	+
203	+	+	-	+	+	-
200	+	-	-	+	+	+
185	+	+	+	+	+	-
158	+	-	-	-	-	-
116	+	-	+	-	+	+
97	+	+	+	-	-	-
81	+	-	-	-	-	-
70	+	-	+	-	-	+
57	+	-	-	-	-	-
45	+	-	+	+	+	+
33	+	-	+	-	+	-
30	+	-	-	-	-	+
26	+	+	-	+	-	+
20	+	-	-	+	+	+
11	+	-	-	-	-	+
9	+	+	+	-	-	-

Table 2. The Distribution of Protein Types along the Different Profile Zones for the Infected and none-infected Hosts

Sample	Status	Albumin	α globulin	β globulin	γ globulin	No. of bands
1	NeM	20,45,57	81,97	116,185	200,	8
2	Ce H	9,26	97	185	205	5
3	NeL	9,11,20,45	-	116,185	200, 205	8
4	NeH	20,33, 45	-	116, 185	203,200	7
5	CesH	15	50	0	70	
6	CesL	9, 33,45	70	116, 185	207	7
7	CONT	9, 11,20,26 30,33,45,57	70, 81,97,	116,158, 185,	200,203,205,207,227	19

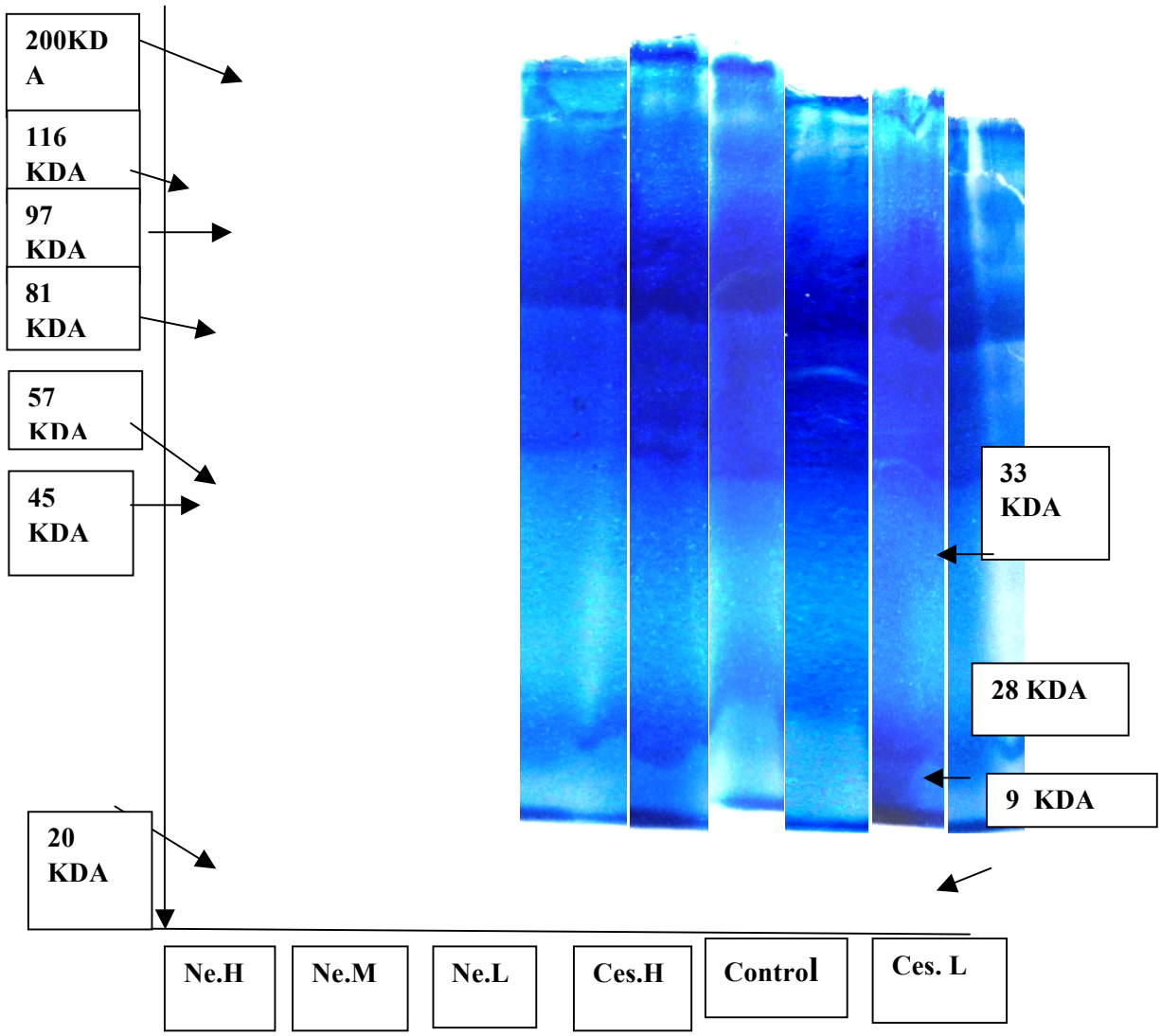


Plate1. (SDS- PAGE) Polyacrylamide Gel Electrophoresis Showing Serum Protein Bands of B C. Lazera Stained with Commissar Brilliant Blue

The percentage of change in serum bands due to infection with helminthic parasites was obtained from the following formula.

Source : Bio, RAD $\frac{\text{Number of different bands in control sera}}{\text{Numberof bands found (in specific sample)}} \times 100$

The changes were as follows:

Cestode Corallobothrium solidum high infection = 5/10 ×100=50 %

C. solidum low infection = 2/10× 100= 20%

Nematode Contraceaum sp. high infection = 6/10× 100= 60%

Contraceaum low infection = 3/10×100=30 %

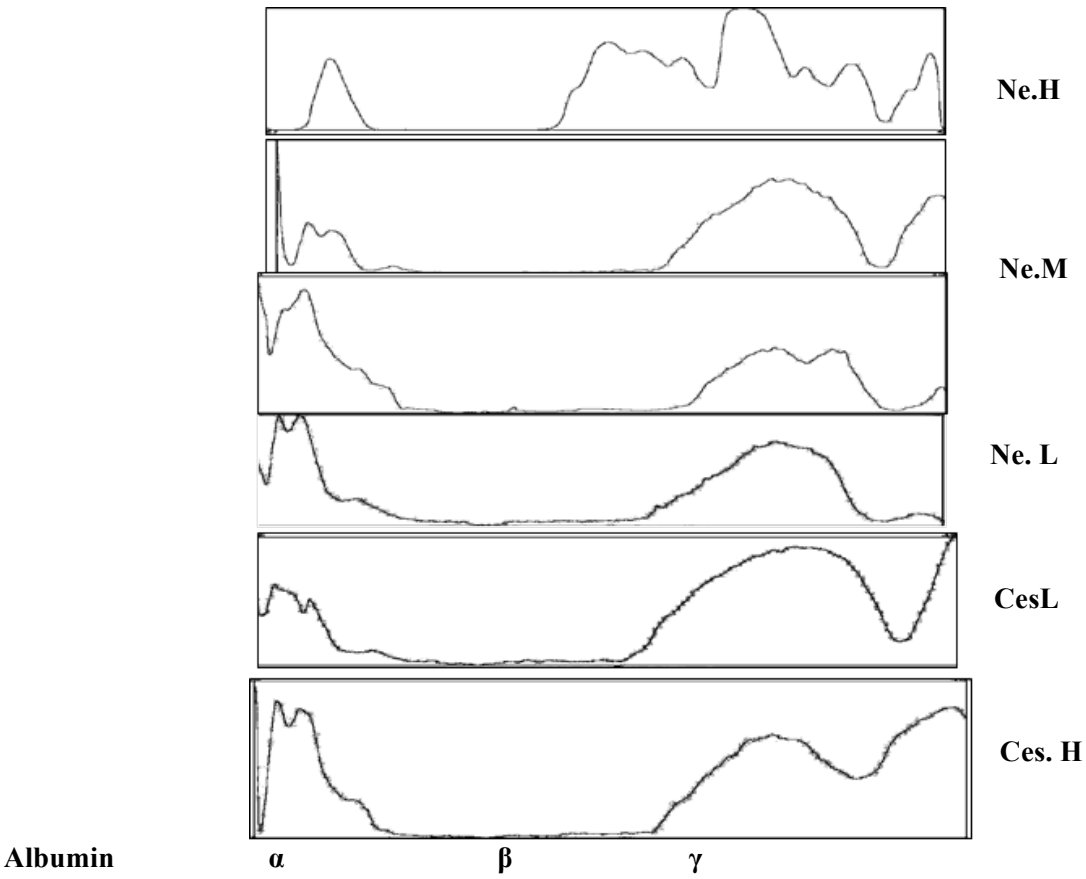


Figure 1. Serum Protein Electrophoresis Bands Found in C. Lazera İnfected with Contraceaum and Corallobothrium Solidum Compared with non-infected

Ces. H.: Cestode high infection, Ces.L : Cestode low infection ,C. : Control

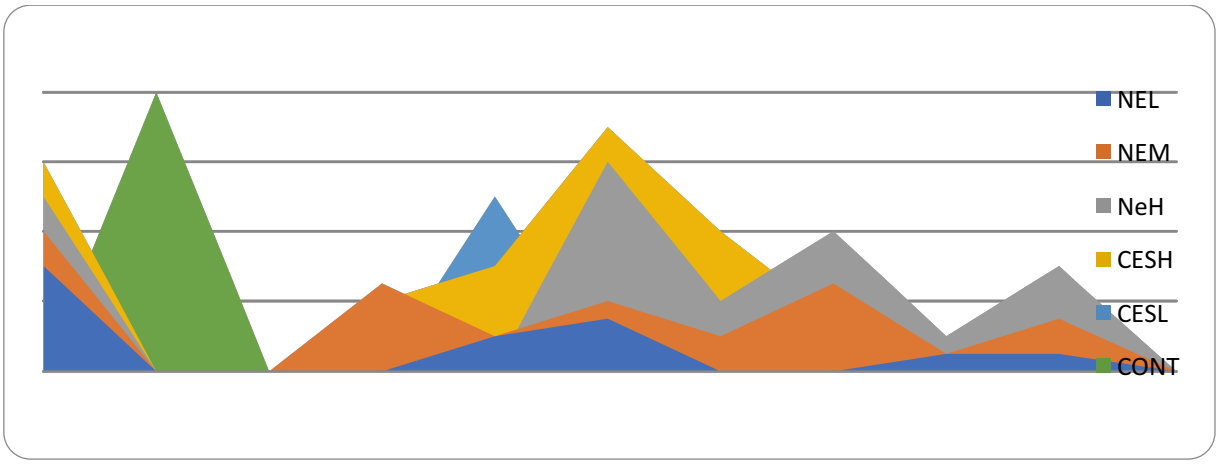


Figure 2. Areas of Different Zones of Serum Protein Showing Albumin(A) and Different Types of Globulins Alpha (α), Beta (β) and Gamma Globulin (γ), in Infected and non-infected Control

Dissection

Pinero et al. (2001), Miyazakiet et al. (1998), used electrophoresis of sarcoplasmic proteins, serum proteins, liver proteins and a number of enzymes for identification of fish species . Yilmaz et al. (2000), showed that serum proteins band of Capoeta trutta and Capoeta Capoeta were significantly different in a taxonomical study for species of fish in Turkey. Moreover Yilmaz et al. (2000), indentified the molecular weight of protein bands of four species of fishes : Leuciscus cephalus 13 bands (98,89,68,65,63,52,49,40, 43,31,27,28,9); Brama marmid 11bands (101,79,66 ,61,51,38, 33, 31, 27,28,9) and Chondrostrma regiium 11 bands (95,63,56,52,49,36,31,28,21,9) similarly in the present study serum protein electrophoresis was applied to indentify the changes in serum proteins due to helminth infection compared to control. . The number of bands in control were 16: these were 227, 207 , 203 ,205 , , 200 , 116, 98, 81 , 70, 57, 45, 30, 33, 28, 20,9.KD .The bands >200 KD were specific to the region of immuno globulin (gamma globulin), the others were 116, 98, KD ,specific to beta globulin 81, 70 ,45, 57, KD, specific to alpha globulin , and 33, 28 ,20KD specific to albumin. Shahida and Gayasuddin (2011) agreed but reported the appearance of some new bands or the absences of others due to infection by parasites the absences in infection with high Cestode are 227, 207 , 200 , 158, 116 , 7 , 57 ,45, 33, 2o ,11 , problem in the globulin regions in low infection with the c estode absences 30, 26, 20 11, 9 , there were problem in the albumin region the new bands appearances 227, 207 ,205 , 203 , 70 . 11, 9 KD compared with control . These results were confirmed by the studies of Horita et al. (2005). In the present study it was observed that low infection with the Cestode C .solidum was associated with a decrease in the region of gamma globulin due to the absence of 200KD (IgM). According to Horita et al. (2005), this indicates chronic infection and haemorrhages, whereas absence of band 57 KD in the region of alpha globulin indicate liver disease and absence of band 28KD in the region of albumin also indicates chronic infection. In high infection with the Cestode Corabothrium solidum the decrease in albumin was reflected in the absence of the bands 28, 33, 45 ,this also indicates chronic infection. In high nematode infection with Contracaecum sp. there was a decrease in numbers bands due to the absence of band 116, 97 KDA in the Beta region which indicates protein malnutrition . Absence of band 57 in the region of alpha globulin and absence of the band 33 KDA in region of albumin was also reported by Horita et al. (2005), where they stated that indicates liver disease

5. Conclusion and Recommendations

Infection of fish Clarias lazera with the helminth parasites , caused biochemical effects that was presented by the observed quality and quantity of blood proteins.. Changes in band locality and area of sera Proteins in gel electrophoresis observed indicates the involvement of the immunity system due to infection more similar to higher animals respond.,. Hence more advance investigations are important to confirm the pathogenic effects.

References

Shahida .S .J. and M. Gayasuddin, (2011). Comparative Study of Serum protein of Man and Four Fish Teleosts using Gel Electrophoresis Polyacrylamide , Poona , College of Arts ,science and Commerce, Pune, P. G. Department of Zoology , India. Journal of Advances in Biological Research 5 (3): 170 -173, 2011 , ISSN 1992- 0067 . 411001

Haleem,J, Issaq and Veenstra,D. T. (2008) twodimensional polyacrylamide gel electrophoresis (2D-PAGE)perspectives. BioTechniques and 44: 697- 699: advances.

Honkun, N. A., H . Qingyu, C. Yingying and H. Huang, 2008. Differential proteins revealed with proteomics in the brain tissue of paralichthys olivaceus under the stress of methyl parathion. Chinese J. Chromatography. 26 (6) 662- 666.

Yilmaz M . Ramazan H .Alas A (2007). An electrophoretic taxonomic study on serum proteins of Acanthobrama marmid , Leuciscus ceregium phalus and Chondrostoma, Univ , Turkey, Jour Aksaray of BioSciences 3, 22-27.

Horita. M. D., Theodore. X. O. Connell, M. D., Timothy .J .and Kasravi .M .D. (2005). Understanding and interpreting serum protein Electrophoresis. Kaiser Permanente Woodland Hills Family Medicine Residency Program, Woodland Hills, Califomia Am Fam Physician 1:71 (1):105 – 112 .

PineroC , Vazquez J , Marina Al , Barros-Velazqyez J, Gallard (2001). Characterization and partial sequencing of species specific sarcoplasmic polypeptides from commercial hake species by mass spectrometry following two –dimensional electrophoresis . Electrophoresis 22, 8, 1545- 1552.

Yilmaz M, Cigremis Y. Gaffaaroglu M. (2000). An electrophoretic ttaxonomic studyon blood serum proteins of some fish in Karakaya Dam Lake J of Selcuk Univ veterinary Sci 16, 1, 89 – 92.

Miyazaki. J .Hirabayashi, T . Hosoya .K. (1998) Study of the systematic of Cyprinid fishes by two dimensional gel electrophoresis .Environ. Boil. Fish. 52, 173 -179

Deutsch, M. F. and Goodloe. (1945) An electrophoretic survey of various animal plasma. J. Bio .Chem, 161: 1- 20.

Khalil, L.F. (1971) Check list of the helminthes parasites of African freshwater fishes, tech – Commune Burs. Helminthol

FAO (2005). On Fish disease diagnosis and workshop training in Arab Countries, Egypt.

Gideiri, A.Y. (1984). Fish of Sudan University Press, Khartoum.

Laemmi, (1970). Cleavage of structural protein during the a assemble of the head of bacteriophage T4 Nathor : 227: 680.

MANAGING POST HARVEST LOSSES FOR IMPROVED FOOD SECURITY IN NIGERIA: A CONCEPTUAL REVIEW

Musa Gambo Kasuwar Kuka
School of Management Studies, Department of Marketing, Kano State Polytechnic, Nigeria
Email: gambokk@ gmail.com

Abstract

The problem of post-harvest losses among Smallholder farmers in developing countries is a recurring phenomenon which affects the socio-economic well-being of farmers. It also determines the achievement of sustainable food security in an economy. Food losses occur when harvesting, handling, processing, marketing, packaging and storing agricultural produce. In Nigeria, post-harvest losses have risen to over $9 billion annually which is estimated to be about 50% of foods produced in the country. In fact, crops like fruits and vegetables experience more than 50% of such losses. Consequently, the paper contains a conceptual review on the nature, causes, impact and strategies involved in managing postharvest losses of food crops and products in Sub-Saharan Africa with particular emphasis on Nigeria. Relevant texts, journals, online articles and other publications were selected and reviewed in preparing the paper. The discussion reveals that post-harvest losses occur at different stages of the value chain and they differ based on the type of crops involved. Fruits and vegetables undoubtedly incur the greatest percentage of loss. It also reveals that a significant reduction in post harvest food loss in Nigeria can reduce the need for food importation and significantly increase food availability in the country. Therefore, the challenges of managing post harvest losses are not insurmountable. What is needed here is to create awareness among farmers through capacity building, extension services and practical demonstrations of post harvest loss mitigation technologies to ensure quick adoption and wider acceptance. Similarly, relevant stakeholders should collaborate to develop a sustainable and workable eco-system for managing post harvest losses through value added market-driven programs.

Keywords: Post-Harvest Losses, Food Security, Food Crops, Food Loss Management, Nigeria

BREAD-BAKING TRADITIONS INCORPORATED IN A RURAL TOURISM PRODUCT IN LATVIA

Aija Eglite
Latvia University of Life Sciences and Technologies, Department of Economics and Regional Development, Latvia, Email: aija.eglite @llu.lv

Dace Kaufmane
Latvia University of Life Sciences and Technologies, of Economics and Social Development, Department of Social and Human Sciences, Latvia, Email: dace.kaufmane @llu.lv

Abstract

Nowadays, enjoying national dishes is considered an essential component of any kind of tourism, as it gives experiences specific to the nation. In tourism, dishes are important to any target audience. There are many nationalities in the world, and they differ from one another in their specific culture and national cuisine. Since ancient times, rye bread has been the main food for Latvians. Today too, rye bread is one of the symbols of Latvian identity and a treat for everyone wishing to get introduced to Latvian culture. Cultural heritage and cultural values are, to some extent, stagnant if not revived and cultivated. Cultural and historical heritage could be learnt through upbringing and education as well as its incorporation in a tourism product. Rye bread, the traditions of baking it, organic and natural foods and the setting – a rural farmstead, a festivity and a bakery where to taste the foods and participate in preparing the foods – could be referred to as the most significant resources with potential for development. Gastronomic tourism is promoted in rural areas, and small enterprises and local governments, considering the economic development of their administrative territories, are particularly interested in the growth of it. The research employed content analysis to analyse the incorporation of bread-baking traditions in rural tourism products in Latvia. An analysis of information available on the websites of municipalities and tourism associations give insight into the awareness and the ways of popularisation of gastronomic tourism. The research aim is to examine the ways how bread-baking traditions are incorporated in rural tourism products in Latvia.

Bread baking traditions-related tourism services are created by entrepreneurs, while local governments and the national government and the non-governmental sector are involved in popularising the offers in the Internet environment. Activities of the private and public sectors aimed at popularising gastronomic tourism involve cooperation, as many websites are interlinked.
Keywords: Bread-Baking Traditions, Rural Tourism, Cultural Heritage, Cooperation, Latvia.

1. Introduction

For centuries, bread has been considered the key food and the main component of nutrition in Latvia. In national folklore, food production is associated with bread. Latvians have identified themselves in their culture and ideology with farmers, a people of ploughmen, and considered countryside the key depository of Latvianness, national stability and traditions. The transition to a market economy in the early 1990s very negatively affected the rural areas of Latvia. Collective farms were liquidated, resulting in high unemployment. Private property ownership was restored, and it was necessary to seek new occupations in rural areas and change the current understanding of rural areas, namely, the rural areas would not represent only the environment for farming andan agricultural upturn would also lead to the overall revitalisation of rural areas. As the share of income from agricultural activity in the total net income of households decreased in Latvia, new mechanisms for generating income from alternative economic activitieshad to be created (Eglite, 2004). One of such economic activities was rural tourism. In Latvia, rural tourism has developed dynamically for almost 20 years, and the generation of entrepreneurs engaged in this activity changes and so does the rural tourism.

The new EU rural policy is based on the Cork Declaration (1986) and Salzburg Conference (2003) decisions that envisage balanced rural development, the application of an integrated rural approach and economic diversification in rural areas. In recent decades in Latvia, rural areas have become more attractive and offer various kinds of natural landscapes, thereby turning rural tourism into a serious source of economic diversification that is integrated into agricultural activities.

The food produced by farmers in Latvia could be characterised as follows: domestic, chemical-free, organic, tasty, healthy etc. Latvians have always given a place of honour on the table to bread, which symbolises prosperity. A cultural canon – a set of the most outstanding and important cultural values – has been created both in European countries and in Latvia, which represents the most significant cultural achievements. Its section National Traditions refers to a cultural value such as rye bread. To meet the market demand for bread, large industrial-scale bakeries are used, yet former food recipes and traditions are kept and passed on from generation to generation in families and at school, and bread-baking traditions are incorporated in rural tourism products, thus familiarising tourists with the traditions. Content analysis was employed to analyse the ways bread-baking traditions are incorporated in rural tourism products in Latvia. An analysis of publications and studies placed on the websites of municipalities and tourism associations give insight into the awareness and the ways of popularisation of the relevant issue. The research aims to identify the ways how bread-baking traditions are incorporated in rural tourism products in Latvia.

2. Value of Bread in Latvian Culture

Culture and the system of human values are inextricably linked. The values recognised by the civilised society as classical serve as a guide. Each era brings its own views and values. Any cultural environment formed as a result of the economic and social activities of individuals and keeps the traces of the activities. N.L.Gage and D.C.Berlinerassociatea cultural environment with a group of individuals sharing similar views and symbols and interpreting things and phenomena in a similar way (Geidžs, Berliners, 1999). Knowledge of the cultural environment is maintained and passed on to next generations through communication. It isthe tangible and intangible heritage that attracts individuals and could be the basis for effective marketing and economic and social development. Tangible cultural heritage represents all the evidence that is, to some extent, a physical embodiment of cultural values. Intangible cultural heritage represents traditional culture and folklore or the popular culture that is created or practised;it is directly linked with the “place” –the individuals, their traditions and their knowledge.

Along with other elements, intangible cultural heritage encompasses the native language, literature, music, dance, games, mythology, rituals, customs, crafts, architecture and other arts. The mentioned elements should be complemented by the traditional forms of communication and information. The concept of traditional culture refers to the part of national cultural heritage that is associated with inheriting collective traditions within society (or some social group). It encompasses the native language, mythology, rituals, customs, national festivities, oral folklore, music, dance, gesticulation, crafts,gastronomy, traditional medicine etc. Traditional culture is the “invisible”, intangible part of national cultural heritage that is preserved through being passed on to next generations, yet nowadays it is converted into a tangible form – written records, descriptions, sound records, books etc. This gives an opportunity to revitalise the traditional culture in society, thus strengthening the cultural identity of the nation (Kaufmane, Paula, 2007).

Cultural heritage, cultural values are to some extent frozen if not being revitalised and nurtured. Cultural and historical heritage is learnt through upbringing, education or cultural or cognitive tourism. The scientific value of it is determined by how much information about an environment, activity or object could be acquired through getting familiarised with it (Kaufmane, Eglite, 2017). National dishes are part of the unique cultural and historical heritage and different identity of any nation. National dishes are prepared from the foods available in the local area and have specific names that often could not be translated into another language. In Latvia, the nation’s values in relation to national dishes are identified and nurtured, without denying other potential values. National dishes and beverages are represented in the code of sacral values in many nations, including Latvia, yet the value most often referred to is rye bread, which is raised above the everyday food, granting it a special status and placing it in first position in the register of symbolic dishes (Kursīte, s.a.).

For Latvians, bread is live, and it is a value in our culture, pertaining to both the secular and the spiritual realms. Rye bread has always been one of the main dishes in Latvian homes, and today it is also one of the symbols of Latvianness. Rye bread is included in the canon of Latvian culture, section National Traditions, giving the following explanation: "In Latvian cuisine, bread has always been the main dish giving satiety. Bread is also an object of culture: so much folklore – beliefs, magic, and prophecies –pertains to preparing no dishother than it. Step by step – from dough mixing to placing the loaf on the table and slicing the loaf.Special rituals of respect and blessingare dedicated to bread. Nowadays, rye bread is one of the symbols of Latvianness – a treat for everyone who wants to get introduced to Latvian culture and a souvenir to be taken home by foreigners–, and Latvians themselves take it with themselves in order to have a sense of home while being abroad (Canon of Latvian Culture). Just like in other European countries, in Latvia too a canon of culture represents a set of the most outstanding and important works of art and cultural values that reflects the most important achievements of the nation in the field of culture. In Latvia, sweetened rye bread is a kind of naturally fermented bread baked of coarse rye flour; the bread-making technology involves parboiling the flour and preparing the sourdough starter. This kind of bread is baked on a hot floor oven; the loaf is of elongated shape, it weighs a kilogram or several kilograms and its crust is smooth and dark, which is coated with starch paste or water after baking it (Official Journal of the European Union, 2013).

Former Latvians paid a lot of attention to everyone involved in bread-baking: sowers, ploughmen, millers and bakers. At present in Latvia, only small local bakeries keep this bread-baking tradition alive. The bakeries produce genuine rye bread according to various recipes having different nuances. In Latvia, there are still families that have preserved the tradition of baking bread at home, as well as some cafes and restaurants serveguests our special rye bread in small quantities with the main course. The fact that bread played an important role in the lives of people is indicated by various customs related to baking, preparing and eating the bread. For example, in former times it was advised to start slicing a loaf of bread from its thinker side in order for rye ears to grow larger. Former people also tried not to drop bread crumbs because it was considered to be a sin. If bread fell on the ground, it was picked up and kissed, thus giving respect and thanks to it.

Earlier, on 25 July people celebrated St Jacob's Day, which was traditionally dedicated to new bread. In this way, people marked the end of haymaking, which was followed by rye and barley harvest. St Jacob's Day was also marked as the day of bread when a loaf of new rye bread was put on the table and everyone had to eat a small piece of bread in silence in order to feel the joy about the new harvest, rethink of the long way to go from sowing a seed to having bread. The newly-baked bread was, first of all, tasted by the host and afterwards all the others tasted it (History of Bread in Latvia, 2015). A mark was made on the loaf of elongated shape by use of fingers or the side of the palm. Most often, it was a cross, an oblique cross or stripes. The entire loaf was never taken out of home in order not to lend someone else the blessing. The loaf was sliced by the host or hostess, making a cross under the loaf with the knife before it. Answering a question "What is more valuable than gold?" by saying "bread", we think of food in general. Bread is respected in Latvian oral folklore – in proverbs, sayings and folksongs.

Rye and barley in particular are the most ancient cereals suited to local natural conditions. Being the best sower, harvester, baker and the one who plies with bread was a matter of honour. Today, Bread Day as a meeting with bakers is celebrated around this time in various places in Latvia – in Araisi, Rucava and elsewhere.

3. Bread in Consumption Today

Latvia has ancient bread-baking traditions and a very broad assortment of bread. In Latvia, bread is very tasty, and its quality has been appreciated beyond the national borders. Latvia is a country that is proud of strong bread-baking traditions and an enviably broad assortment. The specifics of the bread market could be characterised by the general public's awareness of bread as an important food, and most of the population perceive it as the most important food. Latvian traditional bread is baked today in the same way as it was baked in former times, using the recipes of our ancestors. Rye bread is often taken abroad to Latvian nationals so that they do not forget the "taste of fatherland" or taken with oneself when traveling.

The bread market gradually changes (Eglīte, Kunkulberga, Vilciņa, 2007). The bread market could be used as an indicator of life quality across various social groups. As the standard of living rises, bread consumption declines. In recent years, bread consumption tended to stabilise, andbread was not a necessity because of a higher standard of living. The population have a greater choice to choose the product that fits their perception of life quality and a healthy lifestyle.

According to surveys, rye bread consumption across all the socio-demographic respondent groups rose in recent ten years. According to the respondents, they tended to consume more rye bread because the quality and assortment of rye bread increased. The statistics, however, reported an opposite trend.

According to studies, wheat bread is chosen by consumers based on price, while a creation for the choice of rye bread was the manufacturer. Many consumers are in search of their bread as a source of healthy nutrition. Consumers are loyal to their chosen kind of bread and producer even if the quality (temporarily) has not been high (Eglīte, Kunkulberga, 2015).

Rye bread is an excellent source of energy. Its components enhance the health of teeth, optimise the performance of the digestive tract, normalise the levels of cholesterol and sugar in blood, protect against cardiovascular diseases. In Latvia, rye bread is both a traditional countryside bread and a bread of excellent quality, as climatic conditions in Latvia are suited to produce rye of excellent quality (Eglīte, Freytag-Leyer, 2015).

To contribute to the preservation of rye bread consumption traditions for next generations, bread producers, for whom national values are important, popularise rye bread at schools and preschool education institutions through a free rye bread programme. The Latvian Association of Bakers declared 2005 a year of Rye Bread. Latvian bakers actively participate in various public events – city festivals, symposiums as well as exhibitions where they popularise rye bread.

A survey conducted by the authors revealed that the respondents' spontaneous associations with rye bread were as follows: tasty, good bread, national, patriarchal and traditional values, healthiness, dark brown colour, smell (Table 1).

Table 1. Consumer Opinions about Rye Bread

Typical expressions	Situation/ meal	Consumed together with	Target audience
Rye bread is a Latvian/national product; Rye bread is a traditional product; Rye bread is a healthy product; Rye bread is a bread for the entire family.	Dessert – in lunch, supper; It is similar to sweet-and-sour bread, as it is difficult to use rye bread with other foods because of the specific taste of it; It is similar to the main course, as it gives satiety; It is strong, you can consume a lot of it; 1-2 slices a dayare enough. Oneloaf of wheat bread = 2 slices of rye bread.	- bacon; - honey; - cheese; - sugar; - main courses; with nothing else or with butter, margarine.	-There is a notion from Soviet times that rye bread is a bread consumed by the rural population; - bread for those doing physical work; - bread for 30-60 years old men; -Bread with fruitsand other additives – for elegant women and wealthy female gourmets.

The respondents expressed an opinion that "today it is not enough that an individual is told that rye bread is a good bread. The consumer is"moredemanding and more educated, things have to be explained from the scientific perspective and it is required to stress some research findings that draw attention, and the consumer is lost in thoughts". Several participants of the discussion had seen an advertisement for rye bread witha map of Latvia in the background. The advertisement stressed

"healthiness" rather than "Latvianness", trademarks and a special taste: "The emphasis has to be placed on healthiness, fibre and "convincing evidence"; more stress has to be put on the advantages and functionality of the product – it should be bought not because you are a Latvian but because the product gives strength and energy to do more work – just like batteries do" (Eglīte, Kunkulberga, Vilciņa, 2007).

A survey conducted in 2007 allowed concluding that the possible reasons for the decreasing consumption of rye bread, in the opinion of the respondents, could be a lack of effective advertisementsforrye bread as a product of high nutritional value and a lack of new products in the segment of rye bakeryproducts (Kunkulberga, Straumīte, Eglīte, 2007).

At present, however, the assortment of rye bread with various additives is very broad. Rye bread with fruits and nuts has been a delicacy in demandin Latvia for a long time, while foreigners are surprised about the compatibility of rye with fruits. Familiarising German students with various kinds of rye bread – traditional rye bread and sweet-and-sour bread as well as rye bread with fruits –, surprising research findings were made. The German students rated traditional rye bread the highest. In contrast, the respondents coming from other world regions other than Europe (the Far East) rated the innovative solution – rye bread with fruits – the highest, which could be explained bythat region population's stronger sense of sweet taste (Eglīte, Freytag-Leyer, 2015).

The previous research studies focused on how to encourage the population to consume more rye bread, while a research study seeking to identify whether a foreign tourist is interested in rye bread has not been done yet. German tourists could be certainly attracted by catchwords aboutLatvianness and genuineness. A catchword about innovations should be reserved for tourists from the Far East who can combine their sense of fruit taste with an unusual additive – rye bread.

4. Incorporation of Bread-Baking Traditions into Rural Tourism Products

Bearers and preservers of traditional culture are needed to keep intangible cultural heritage alive. The environment is also important, as intangible cultural heritage is associated with a particular place or context. Intangible cultural heritage too could be turned into a tourism product, thereby popularising it. Usually, both tangible and intangible cultural values are incorporated in a tourism product. However, intangible cultural heritage in particular creates more challenges to the tourism industry, as it is more important to tourists. A tourist can get a deeper understanding of the tourist destination if s/he had participated in local traditions, festivals and craftsmen workshops or visited the local marketplace (Kaufmane, 2007).

In the globalised world, tourists seek ethnic, cultural and historical peculiarities – everything that is characteristic of the particular culture. Ethnic factors are usually associated with cultural and historical ones, which are among the most important geographic factors in tourism geography (Kaufmane, Eglite, 2017).

Today in Latvia, the issue of cultural environment quality and attractiveness has become much more urgent at the municipality level and from the population perspective. When it comes to sustainable territorial development, natural environment preservation is usually strongly stressed, yet recently cultural environment preservation has become a focus as well. The perception of rural areas as a whole has also changed in the second half of the 20th century. The preservation and enhancement of the rural environment is one of the key requirements of EU policies for the Member States. The philosophical basis of rural policies is the idea of balance. Incorporating cultural heritage in a tourism product, one essential aspect has to be taken into consideration – not all cultural values have potential for tourism. Initially, the choice of cultural heritage and tourism sites and objects is done by the local public, and this choiceis determined not by potential for tourism but by other considerations. These could be unusual objects of local significance, traditions, occupations characteristic of the local community, applied arts etc.

The more numerous and diverse tourism resources are, the greater the possibilities are to create new, innovative products for tourists. Under favourable conditions, culinary heritage could serve as a resource and idea generator for creative industries that directly contribute to both the national economy and tourism by designing cultural goods and services. Incorporating cultural heritage elements in tourism products fosters small and medium enterprises that particularly contribute to the

socio-economic viability of rural communities and environmental sustainability in the regions, innovation and creativity.

Food is a necessity of any tourist, and catering is one of the integral and key components of the tourism industry. Gastronomic tourism is one of the newest kinds of tourism, with a few-decades-long history, yet it has become one of the sub-kinds of cultural tourism. Cultural tourism specialists B.McKercher and H.Du.Cros too consider gastronomic tourism to be a sub-kind of cultural tourism and a form of travel, the key purpose of which is to enjoy diverse, often national or local specific foods and beverages (Makkerčers, Krosa, 2007). The most important resources with potential for development are the dishes and cooking traditions that involve organic, natural produce and a specific setting – manor houses, palaces, castles, restaurants and farmsteads – where to participate in cooking and enjoy the dishes. Rye bread is one of such dishes. Small enterprises and local governments, which are interested in economic growth in their administrative territories, are particularly interested in incorporating rye bread in tourism products. Local food producers and farmers too are among those interested in it, as it gives them an extra opportunity to increase their sales owing to an increase in the number of consumers in municipalities. Rye bread is not only a food – it is also an object of culture: so much national knowledge and folklore – beliefs, magic, and prophecies – pertains to preparing no dish other than it– from dough mixing to placing the loaf on the table and slicing the loaf. The traditions might slightly vary across municipalities, which makes similar tourism products even more interesting. Analysing tourism services advertised on the websites of municipalities on Latvia, the authors sought the tourism products associated with rye bread and related traditions. The research identified several ways howrye bread-related traditions were incorporated in tourism products (Figure 1).

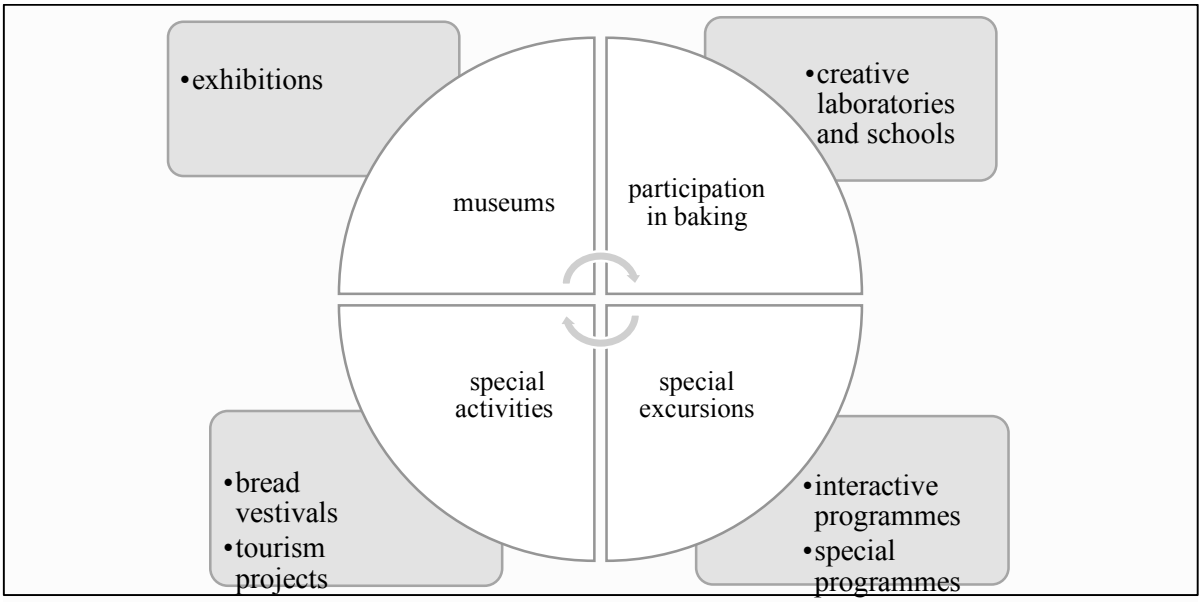


Figure1. Ways of Incorporating Rye Bread-Related Traditions in Tourism Products

One of the ways of incorporating rye bread-related traditions in tourism products involves a museum. In Aglona, there is a museum of bread where visitors can see the way of making bread from the stage of grain to a ready loaf and can participate in this process. The museum offers bread tasting (and herbal teas) with theatrical performances for baptism, weddings, anniversaries, etc. The museum also offers freshly baked bread and works of local craftsmen. On Saturdays, the museum "Pastarins" offers an entertainment programme Saturday in the Farmstead, in which visitors are familiarised with country life and daily rural work. Visitors can also witness the bread-baking traditions of the end of the 19th century, bake a loaf themselves and participate in Latvian anniversary festivities. A special laboratory was opened in Kazdanga Palace. In the laboratory, visitors have an opportunity to participate in various workshops, acquiring new skills and knowledge. As the interest in traditional Latvian cultural values increased, the first Bread School opened its doors to visitors.

All the municipalities of Latvia givetourists an opportunity to visit farmsteads or small bakeries where bread is baked according to ancient traditions – dough is parboiled in a kneading trough, kneaded with love; loaves are placed on maple leaves in an oven heated with firewood. Visitors have an opportunity to make and bake a loaf and take the loaf home.

An analysis of differences in tourism products revealed two main approaches:

- small visitor groups (up to 20 people) are given an opportunity to participate in the bread-baking process;
- hostesses demonstrate the bread-baking process and offer an opportunity to taste or purchase the bread.

Some festivities are associated with bread baking, e.g. Bread Day as a meeting with bakers is celebrated in various places in Latvia – in Araisi, Rucava and elsewhere particularly on St Jacob's Day, which is celebrated in Latvia on 25 June as Host Day.

The CraftHouse of Drabesi Manor is engaged in the project Passing on Bread Baking Traditions in CesisCounty. In Cesis Palace, it offers an interactive programme Bread Baking Traditions in the Middle Ages – the bread is baked in a reconstructed genuine outdoor oven in the garden of the palace.

The analysis of the tourism services advertised on various websites allows concluding that the same tourism products were marketed by several organisations, which indicated mutual cooperation among a number of persons or enterprises or a cooperation network (Figure 2) aimed at achieving interlinked goals basedon information exchange.

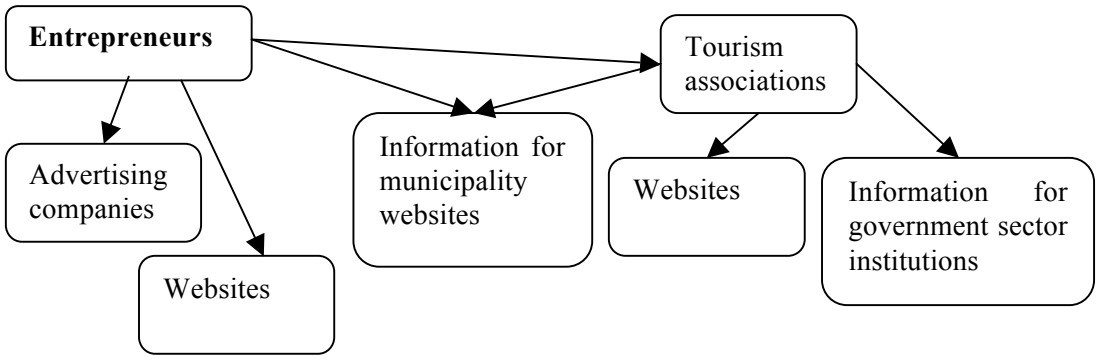


Figure 2. Cooperation Network for the Popularisation of Rye Bread through Rural Tourism Products

As shown in Figure 2, all the sectors are involved in popularising tourism products, and the target audience could be better reached if the relevant information is available on various websites. Visiting some place, tourists can find information about tourism services provided in the nearest vicinity on the website of the municipality. Government sector organisations and regional tourism associations publish relevant information on their websites and also make it available at market tourism exhibitions and in international tourism markets.

Rye bread is a unique resource, the rational exploitation of which takes the following forms:

- active cooperation aimed at preserving local cultural heritage;
- uniqueness of local cultural heritage is emphasised relative to the other regions;
- tourism development programmes are designed, stressing the role and uniqueness of local resources.

5. Conclusions

In Latvian culture, rye (black) bread is raised above everyday food, granting it a special status and placing it in first position in the register of symbolic dishes as well preserving the various traditions related to baking, preparing and eating bread and passing them on to next generations.

Today too cultural traditions are a factor affecting consumption habits. Rye bread consumption habits are associated with centuries-long cultural traditions and national mentality. Rye bread consumption is steady, and large bread producers diversify the assortment of rye bread.

Rye bread baking-related traditions are incorporated in rural tourism products in all the regions of Latvia. The entrepreneur activities could be considered to be innovative and attractive not only by national but also by foreign tourists.

In popularising rural tourism products, entrepreneurs are supported by local governments and producer associations, which indicates organised cooperation aimed at enhancing the competitiveness of rural tourism services.

References

Canon of Latvian Culture (2016). Retrieved from: http://www.tradicijas.lv/?page_id=161

Eglīte, A. (2004). Evaluation of Production Resources of Latvian Private Households in the Context of Sustainable Rural Development. *ACTA AGRARIA ET SILVESTRIA*. Series Agraria. Vol. XL, pp. 55-61.Krakow, Poland.

Eglīte, A.&Freytag-Leyer, B. (2015). Potential Rye Bread Consumer. *Proceedings of the international scientific conferenceEngineering for Rural Development*. Vol. 14, pp. 694-698.Jelgava, Latvia.

Eglite A. & Kantike, I. **(**2011). Bread Prices, Consumption and Purchasing Power.*Proceedings of the 6th International Congress Flour-Bread'11 - 8th Croatian Congress of Cereal Technologists*,pp.550-556. Osijek, Croatia.

Eglīte, A. & Kunkulberga, D.& Vilciņa, A. (2007).Maizes tirgus kā dzīveskvalitātesrādītājs (Bread Market as a Life Quality Indicator) *Proceedings of the 9th international scientific conference Society and Culture*,Vol. IX, pp. 228- 233. Liepaja, Latvia.

Eglīte, A. &Kunkulberga, D. (2015). Consumer Behaviour in the Bread Market in Latvia. *Proceedings of the international scientific conference Economics Science for Rural Development*, Vol. 40, pp. 72-82. Jelgava, Latvia. Retrieved from http://www.esaf.llu.lv/sites/esaf/files/files/lapas/No40%20Economic%20Science%20for%20Rural%20Development_0.pdf

Official Journal of the European Union(2013). Retrieved fromhttps://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2013:177:0012:0017:LV:PDF

Geidžs, N. L. & Berliners, D. C. (1999). Pedagoģiskā psiholoģija (Pedagogical Psychology). Riga: Zvaigzne ABC.

History of Bread in Latvia (2015). Retrieved fromhttp://www.videsvestis.lv/maizes-vesture-latvija/.

Kaufmane, D. & Paula, L. & Ābele, J. (2007). Tourism as a Way of Popularization of Non Material Cultural Heritage in Rural Areas of Latvia. *Thematic proceedings of the international scientific meetingMultifunctional Agriculture and Rural Development (II) – Rural Values Preservation*, pp. 448-457. Beograd-Beočin, Serbia.

Kaufmane, D. &Eglite, A. (2017). Popularisation of Gastronomic Tourism in Latvia.*Economy and Business*. Vol. 11, pp. 433-442.

Kunkulberga, D. & Straumīte, E. & Eglīte, A. (2007). The Bread Market in Latvia. *Proceedings of the 4th International Congress Flour-Bread'07 - 6th Croatian Congress of Cereal Technologists*, pp.306-311. Opatia, Croatia.

Kursīte, J. (2016).Sakralitātesjebsvētumauztveremūsdienās. LatvijasZinātņuakadēmijasvēstis (Perception of Sacrality Nowadays. News of the Latvian Academy of Sciences).Retrieved fromhttp://www.lza.lv/LZA_VestisA/70_1/9_Janina%20Kursite.pdf.

McKercher, B. & Du Cros, H. (2007). Cultural Tourism: The Partnership between Tourism and Cultural Heritage Management. Riga: Neputns.

ECONOMIC EVALUATION OF HYDROPONIC FODDER FEEDING TECHNOLOGIES

Astrida Miceikiene
Vytautas MagnusUniversity, Faculty of Bioeconomy Development, Lithuania
Email:astrida.miceikiene@ vdu.lt

Abstract

Livestock fodder and feeding technologies are one of the key determinants of the economic performance of livestock farms. Scientists note that innovative feeding technologies are one of the most important economic factors in livestock farms.Thisresearchdeals with economic evaluation of a hydroponic fodder feeding technology dedicated toincreasing dairy and beef cattle performance,at the same time reducing production costs and cost of the produce as well as improving quality of the produce.

Researchers have emphasized that selection of the most appropriate feeding technologies is a highly relevant issue compared to other factors in light of the efforts to improve performance and viability of livestock farms. A properly developed fodder diet is one of the key determinants of milk cost, composition, and quality. Proteins and fats contribute considerably to the quantity and price of collected milk. The revenue generated from milk depends not only on the quantity sold, but also on its composition.

Research aim:evaluation of economic benefit of the hydroponic fodder feeding technology for livestock and impact on financial indicators of farms. In view of the research aim, economic benefit of application of the technology was analysed at five livestock farmssubject to the experiment of feeding hydroponically sprouted grasses to cows and fattening livestock.

Research was carried out in eight Lithuanian farms in 2017-2018.

Analysis of sprouted grass feeding to fattening cattle has shown thatthe costs per kg of weight gain for the experimental cattle group were 3.02 % higher than the costs per kg of weight gain for the control group. This is partially due to the fact that the sprouted grasses were fed in addition to the conventional fodder diet. Taking into consideration that the costs of the sprouted grasses accounted for approx. 7 % of the total costs, and the difference between costs per kg of weight gain was only approx. 3 %, the economic benefit of the sprouted grasses was considered to have been determined. Alfalfa sprouting was found to have been the most costly due to the alfalfa seed price 4.92 EUR/kg. To compare, the price on other seeds was 0.25-0.29 EUR/kg.Average weight gain per animal in the experimental group of fattening cattle was 3.24 % higher than in the control group.

Economic results of feeding dairy cows under the innovative technologies have demonstrated that the cost of 1 litre of milk at the farms exercising the experimental feeding technology was ranging from 0.26 to 0.32 EUR/kg. The costs on fodder in the total cost comprised0.12-0.13 EUR/kg, including the sprouted grasses, which accounted for approx. 10 - 20 %, depending on the kind of the sprouted grass. Financial results of milk production both for the experimental and the control group were negative in the experimental period. Profit was generated from sale of milk during one month only. Nonetheless, milk yield of the cows fed with sprouted grasses was 10-15% higher than of the cows fed with conventional fodder.Total milk production costs (costs of sprouted grasses excluded) showed downward trend, decreasing in proportion to the reducing volume of milk.

Keyword: Economics Indicators, Hydroponic Fodder Feeding Technologies, Economic Benefit, Innovation, Livestock.

STORAGE LIFE MANAGEMENT OF SOME RAW VEGETABLES

Barna Octavian
Dunărea de Jos University Galați, Faculty of Food Science and Engineering, România

Iordăchescu Gabriela
Dunărea de Jos University Galați, Faculty of Food Science and Engineering, România
Email: gabriela.iordachescu @ugal.ro

Baston Octavian
Dunărea de Jos University Galați, Faculty of Food Science and Engineering, România

Ploscuțanu Gabriela
Dunărea de Jos University Galați, Faculty of Food Science and Engineering, România

Pricop Eugenia Mihaela
Dunărea de Jos University Galați, Faculty of Food Science and Engineering, România

Abstract

There is a high demand of fresh fruits and vegetables and therefore we must know how to keep and handle them for improving their storage life. When keeping fresh fruits and vegetables for sometimes there are many factors that affect the storage life and quality.

After harvesting the fruits and vegetables from the field, losses may occur before they can be marketed due to the wrong storage and transportation practices. The paper specifiesthe factors that influence the storage life of fresh fruits and vegetables as well as the influence of the storage parameters on their shelf life.

Hereinwesummarizethe specific loading requirement for the refrigerated storage of fruits and vegetables, the parameters at normal and controlled atmosphere storage, and the factors that influence the postharvest storage life for tomatoes, cherries, grapes and figs.Also are presented the parameters for normal atmosphere storage such as temperature and relative air humidity, as well as those for controlled atmosphere storagesuch as temperature, relative humidity, oxygen and carbon dioxide concentrations, and,where is the case, for ethyleneamount.

The paper is pointing out the variation of the storage parameters in controlled atmosphere with species and cultivars, all of those finally influencing the storage life of the considered fruits and vegetables.

Reported informationsare recommended specially for the industry that keeps large quantities of fruit and vegetables in warehousesbefore distributing to the retail.

Keywords: Raw Vegetables, Refrigerated Storage, Controlled Atmosohere, Losses

Aknowledgements: Erasmus + Project „Best Innovative Approach to Minimize Post Harvest Losses within Food Chain for VET" [POSTHARVEST], Project number: 2017-1-TR01-KA202-045709

RISK MANAGEMENT PROBLEMS AND SOLUTIONS IN RURAL TOURISM IN LATVIA

Dace Kaufmane
Latvia University of Life Sciences and Technologies, Department of Social and Human Sciences, Latvia, E-mail: dace.kaufmane@ llu.lv

Aija Eglite
Latvia University of Life Sciences and Technologies, Department of Economics and Regional Development, Latvia, E-mail: aija.eglite @llu.lv

Abstract

As project management practiceexpandedin national and nongovernmental organizations in Latvia, the role of various project-related activities increased. Latvia is a Member State of the EU that obtains EU funding and implements a lot of EU co-funded projects in various industries of the national economy, including rural tourism. In Latvia, rural tourism is defined as a kind of tourism aimed at offering tourists opportunities to rest or use tourist accommodation facilities in countryside based on local social, cultural and natural resources. Implementing a project involves potential problems or risks that can affect the pace of the project implementation. Rural tourism projects are exposed to both industry-specific risks and classical financial, technological, administrative, human resource, fraud and legal risks. National institutions, associations and countless private entrepreneurs that have received EU funding for their project proposals under support programsdeal with project implementation. The association PierigasPartneriba, the administrations of Kurzeme planning region and Vidzemeplanning region, the association Rural Traveler etc. could be referred to as one of the largest project implementers in terms of amount of funding involved. Risk management is a component of project management that deals with a successful and effective project implementation pace; therefore, it is important to identify how to minimize every potential risk. The aim of the paper is to identify risk management problems and solutions in rural tourism in Latvia based onananalysis of relevant research investigations. A content analysis revealed main risk management problems and solutions to the problems. A solution could be found to most of the problems with rural tourism projects even if a risk occurs unexpectedly, and a solution is easier to find to a timely identified risk, as well as more time is available for finding the solution.
Keywords: Risk, Risk Management, Rural Tourism, Projects.

1. Introduction

Rural tourism is popular in Latvia. An increasing number of individuals look for an opportunity to rest not only during their leave but also during weekends and short holidays near their places of residence. In Latvia, rural tourism is defined as a kind of tourism aimed at offering tourists opportunities to rest or use tourist accommodation facilities in countryside based on local social, cultural and natural resources (Tourism Law, 1999).The association Rural Traveler, which supports rural tourism entrepreneurs in Latvia and makes efforts to improve rural tourism infrastructures and implements rural tourism-related projects as well as produces informative materials for this industry, suggests the following definition: rural tourism is a kind of tourism aimed at offering tourists opportunities to rest and/or use tourist accommodation facilities in populated rural areas, except cities under state jurisdiction, based on local social, cultural and natural resources (Rural Traveler, s.a.).

One of the aspects in regard to risks is the supply of services of rural tourism in particular. A successful tour, without any problem, could be made owing to good planning and safety as well as success. Entrepreneurs have to offer tourism activities that are safe and, at the same time, attractive to clients. An understanding of risks and dangers is an important prerequisite of safety. This understanding is necessary for assessing the risks and managing them. The purpose of risk management in rural tourism is to reduce losses for clients and entrepreneurs.

Second, an assessment of risks in rural tourism should involve identifying and assessing also natural risks, climate change-related risks in particular. Assessing all climate change-related risks and preparing for them gives a possibility to avoid losses in the future. Rural tourism is affected by factors such as cross-border pollution risks and environmental degradation risks in active tourism areas. Any rural tourism business has to change to keep up with time, otherwise losses are incurred.

The third reason for assessing risks in rural tourism pertains to project management. In Latvia, countless projects have been and still are implemented in the tourism industry,being co-funded by the EU Funds. The projects are mainly aimed at developing new tourism services or enhancing the existing ones, and risk management is an important component of the management of the projects.

In Latvia, a number of research investigations focusing on risk identification and management have been carried outat Latvia University of Life Sciences and Technologies within doctoral dissertations and master papers as well as by public sector organisations. The aim of the paper is to identify risk management problems and solutions in rural tourism in Latvia based on an analysis of relevant research investigations. The main research method employed by the research is content analysis. Limitations of the research: information sources are research studies, doctoral dissertations and master papers.

2. Specifics of Risks in Rural Tourism

The first specific task of the research aims to characterize the specifics of risks in rural tourism. Usually, a risk is ofan event nature that could be predicted. An event is probable, as it might occur or not occur, and it might affect other events. If an event occurs, the effect might be both positive and negative (Uzulans, 2010). From the philosophical perspective, a risk could be defined as follows: it is a situation or event, in which somethingis at stake(including individuals themselves), and the outcome is unclear (Jaeger et al., 2001). The definitions overlap across a number of keywords, and the authors define a risk as an event of an uncertain nature than might or might not occur, causing uncertainly over achieving a goal.

Table 1. Risk Assessment System for Rural Tourism Enterprises

Component	Points	Risk	
		Characteristics	Notes
Possibility ofrisk occurrence	1	very small	once in acentury
	2	small	once in 10-25 years
	3	minor	once in5-10 years
	4	medium	once in3-5 years
	5	high	once in a year
	6	very high	several times in a year
Possible amount of losses	1	Insignificant losses	around EUR 150 per year
	2	minorlosses	around EUR 300 per year
	3	acceptablelosses	around EUR 500 per year
	4	mediumlosses	around EUR 700 per year
	5	significant losses	EUR 1400-4000 per year
	6	large losses	more than EUR 4000 per year
Period of risk influence	1	Occurs in a long period, providing possibilities for reduction of its influence	risk occurrence is known several months/years in advance
	2	Occurs quickly, but its influence appears in several periods of account. Possibilities for internal warning are restricted	event is followed by expenses in a certain period
	3	Occurs suddenly, its influence appears at once	without a warning

Source:authors' construction based on Zvaigzne A. (2005)

A few research investigations into risks in rural tourism in Latvia are available. The first and most extensive research was a doctoral dissertation Risk Management in Rural Tourism Enterprises in Latvia by A.Zvaigzne (Latvia University of Life Sciences and Technologies).The key findings of thedissertation are as follows:

1) risk identification in rural tourism – "risk is a possibility of an event or a set of simultaneously accidental events with positive or negative, particularly advantageous or disadvantageous economic consequences for a rural tourism enterprise";
2) the three stage approach to risk management in rural tourism enterprises encompasses:
   - identification of the kinds of risks the enterprise might face,
   - determination of the potential impact of the risks identified,
   - minimization of each potential risk (Zvaigzne, 2005);
3) nine key problems for rural tourism enterprises, which can affect tourism project implementation, and the solutions;
4) a system designed for assessment of risks for rural tourism enterprises, with relevant explanations provided, which is useful for assessing project risks and creating a risk matrix for ranking the project risks identified (Table 1).

The research findings could be applied not only to tourism enterprises but also to project management, as projects are an integral component of enterprise operation.

3. Assessment of Natural Risks in Rural Tourism

Rural tourism services are provided in rural areas. Accordingly, the second specific task of the research aims to argue the need for assessing natural risks. Traditionally, tourism is perceived as an industry being sensitive to climate and volatile. It is important to comprehend a connection between tourism and its role in sustainability, which involves the protection and management of natural resources that represent the basis for economic and social development. Rural tourism exploits the natural environment, yet at the same time it has to take care about ecological processes in order to preserve natural heritage and its diversity. In general, there are many known risks in the tourism industry in Latvia. The key sources of relevant information are research studies done by tourism enterprises and an assessment of climate change in Latvia; besides, the researches have identified risks with both positive and negative effects (Assessment of Risks and Vulnerability…, 2016). Entrepreneurship in rural tourism is exposed to the risks of climate change and weather conditions during all the four seasons. Weather represents a relatively unpredictable risk, which everyone is aware of, yet in Latviathe weather could be accurately forecasted for not more than two weeks. Just like risks, weather involves uncertainty, although the fact that the weather could change, is known, and as accurate a weather forecast as possible is of great importance.

The findings of the mentioned assessment that pertain to the rural tourism industry and the risks in the industry are as follows:

1. Pronounced seasonality is typical of the natural conditions in Latvia, which is one of the key factors affecting tourism in Latvia;
2. The assessment reveals the key climate-change related risks associated with the tourism industry in Latvia:
   - risk of change in the duration and other characteristics of the winter season,
   - risk of floods (high water levels in rivers and lakes),
   - risk of flooding and erosion of the coast of the Baltic Sea and the Gulf of Riga,
   - risk of change in the duration and other characteristics of the summer season (Assessment of Risks and Vulnerability …, 2016).

Table 2 presents the key risks specific to Latvia.

Table 2. Climate-Change Related Risks for Tourism in Europe and the World

Risks			
With Positive Effects		**With Negative Effects**	
Risk	**Description**	**Risk**	**Description**
Increase in the average air temperature	Can contribute to beach and internal water tourism and longer tourist stays	Increase in the average water temperature	Can affect winter active recreation and tourism (ice fishing, ice skating, ice sailing etc.)
Increase in the average water temperature	Can contribute to beach and internal water tourism and longer tourist stays; cruisetourismthroughout the year	Volatile precipitation	Can affect any kind of outdoor tourism in case of unexpected precipitation
Extended swimming season	Can contribute to beach and internal water tourism and longer tourist stays	Change in the wind regime	Can affect wind-related tourism (surfing, kiteboarding, sailing, flying with a balloon etc.) because of lack of wind or too strong wind
Volatile precipitation	Can affect any kind of outdoor tourism in case of unexpected precipitation	Increase in extreme natural phenomena	Can affect the entire tourism industry (floods, droughts, heatandcoldwaves, stormsetc.)
Change in the wind regime	Can promote wind-related tourism (surfing, kiteboarding, sailing, flying with a balloon etc.)	Chance in the duration and other characteristics of the tourism season	Can shorten the summer tourism season and decrease expected revenues
Chance in the duration and other characteristics of the tourism season	Can extend the summer tourism season and increase revenues	Increase in sea level in the coastal area	Can cause coastal erosion and saltwater entry into groundwater, affecting the quality of drinking water and changing the composition of river and lake water
Change in marine, coastal and inland fauna and flora	Can promote the disappearance of undesired species (mosquitos, ticks, insectsetc.)	Forest fires	Can damage a natural landscape and exterminate forest animals and insects, thereby affecting the natural forest environment
		Change in marine, coastal and inland fauna and flora	Can promote the emergence of undesired species (blue-green alga, jellyfish, insectsetc.)

Source:authors' construction based on Assessment of Risks and Vulnerability and the Identification of Adaptation Measures for Landscape Planning and Tourism, 2016

Some risks have both positive and negative effects and rural tourism services, depending on risk materialization, could be diversified.

4. Project Management Risks in Rural Tourism

The third specific task of the research aims to analyzerisks in rural tourism in the context of project management. Latvia is a Member State of the EU that obtains EU funding and implements a lot of EU co-funded projects in various industries of the national economy. The legal framework for EU funding management is applicable to such projects and project managers. Since the achievement of any goals involves uncertainty posing risk to a successful outcome, the European Commission has set a requirement for the Member States to introduce an EU funding management framework encompassing risk management(Risk Management Strategy, 2014). This means that many projects planned and implemented in Latvia in the period 2014-2020 have to be risk-managed in accordance with the Risk Management Strategy for the Programming Period 2014-2020. In Latvia, in parallel with the strategy, Cabinet Regulation No. 326 prescribes basic internal control system requirements, including a requirement tomanagerisks and the procedure fororganizing, supervising and enhancing risk management,fordirect supervision institutions(Risk Management Strategy, 2014).With regard to risk management, the Cabinet regulation stipulates identification of internal and external risks (that could hinder institutions from achieving their goals), assessment of risk occurrence probability (risk severity) and risk impact (on goal achievement) and the determination of an acceptable risk level (classifying the risks from high to low).

A single database on all rural tourism projects has not been established in Latvia. National institutions, associations and countless private entrepreneurs that have received EU funding for their project proposals under support programs deal with implementing such projects. The association PierigasPartneriba, the administrations of Kurzeme planning region and Vidzeme planning region, the association Rural Traveler etc. could be consideredto be one of the largest project implementers in terms of amount of funding involved. After summarizing information on rural tourism and rural areas, one can conclude that the rural tourism projects implemented throughout Latvia, except cities under state jurisdiction, are aimed at providing tourists an opportunity to rest and use tourist accommodation facilities based on local natural, cultural and social resources. Regardless of the size of a project or a field where the project is implemented, the project is exposed to risks. Every project involves some uncertainty related to the activities implemented during the project, which might affect the outcome of the project (Kendrick T., 2015. 12). Risks might and might not be predicted. It depends on the risk management approach to projects. Risk management is a proactive process, and uncertainty is characteristic of risks. Risk managers (project managers or other specialists assigned to this job) often are exposed to uncertainty rather than particular risks (Loosemore et al., 2006). A team of authors in the United Kingdom definerisk as the “effect of uncertainty on goals. The goals mainly represent an organization’stargets, which might include the subordinate objectives of the project or stakeholders” (Cooper et al., 2014). However, the risk management process involves systematically establishing processes for risk identification, analysis, assessment, processing, control and reviewing as well as communication about the risks (Cooper et al., 2014).

Risk management practices employed in rural tourism projects were examined within master papers at Latvia University of Life Sciences and Technologies. The present research applied a qualitative research approach to six structured interviews, questioning public sector project managers about their experience in risk management in rural tourism-related projects. All the interviewed project managers’ projects received EU funding. The projects were co-funded by the EU Funds, e.g. the project Establishment of a Nature Trail by the Lake of Babite was co-funded by the European Agricultural Fund for Rural Development, while the projects Development of a Gauja National Park Tourism Cluster and Industrial Heritage Revitalization for Tourism were co-funded by the European Regional Development Fund. Each of them was supervised and project reports had to be produced; the projects were controlled by various national institutions or bodies responsible for controlling project budget spending.

The research identified 32 risks in rural tourism projects, which are summarized in Table 3.

Table 3. Classification of Identified Risks by ex-post Risk Characteristic

No.	Classificationby Risk Characteristic	Risks
1.	Technological risks	• Technological problems • Digitaltechnologieschange fast and becomeoutdated
2.	Administrative risks	• Partner change • Partner passivity • Diverse partners organisations • Number of partners • Lack of experience in managing EU funding • Slow reporting • Language barrier • Unstructured information • Problems with approval of informative materials • Problems with cooperation within the project team • Postponement of activities • Problems with attracting the audience
3.	Human resource risks	• Lack of employees • High turnover of personnel
4.	Financial risks	• Lack of funds • Unpredictability of costs incurred
5.	Legal risk	• Lack of legal support
6.	Property risks	• Damagingofoutdoor information boards • Problems with property ownership • Damaged roads
7.	Fraud risk	• Fraud during the project
8.	Industry risks	• Change in the tourism industry • Change in trends in tourism
9.	Political risks	• Change in policies • Insufficient cooperation with national institutions • Procurement problems
10.	Geopolitical risk	• Problems with attracting tourists
11.	Seasonality risks	• Seasonality • Weather conditions
12.	Competition risk	• Competition with large enterprises

Source: authors' construction based on Apoga, 2018

Internal project management risks are as follows: technological, administrative, human resource, financial, legal, property and fraud risks, while external ones are as follows: industry, seasonality, legal, property, geopolitical, fraud, technological, financial, political and competition risks.

The research found that for rural tourism projects, the number of external risks was larger than that of internal ones, and administrative risks were the largest category of internal risks. For this reason, special attention has to be paid to administrative risks when planning and implementing a project.

The interviews revealed the following ways of tackling the risks that have materialised:

- Concluding a contractfor transferring responsibility to another enterprise or organisation;
- Placing a persistent focus on risk management, which is the responsibility of the project manager who has to timely allocate extra time and funds;

- Seeking alternative solutions to the risks identified in a timely manner, as pointed out by interviewee 1 – *"for example, this time the summer is expected to be rainy, that is why I am going to shift from outdoor to indoor tourism services"*;
- Enhancing the internal information system to solve the problem of incompletely structured information;
- Using reserved or saved funds, as pointed out by interviewee 3 – *"more funds have been allocated for some particular activity than it cost in reality. It resulted in some surplus, and then the surplus could be used to solve some problems that have emerged";*
- Concluding a contract with cooperation partners;
- Making amendments to the concluded contracts with suppliers; imposing fines for breaching the contract terms;
- Attracting extra funds from external sources – local government funding, funding from other funds (e.g. the State Cultural Capital Fund);
- Supervising and motivating cooperation partners, negotiating with them;
- Introducing new activities instead of risky project activities;
- Attracting and hiring specialists;
- Extending the project period;
- Holding risk reporting meetings as an essential component of risk management in rural tourism at the beginning, in the middle and at the end of the project or once every quarter, which is useful for the entire project team (Apoga, 2018).

In the projects examined, a focus had been placed on risks only when they materialized because the problems could threaten the achievement of the project's goal and outcome. A solution could be found to most of the problems in rural tourism projects even if the risk occurred unexpectedly, yet finding a solution to the risk identified in advance was easier to do, and more time was available.

5. Conclusions

In Latvia, rural tourism is a kind of tourism that is exposed to both general and industry-specific risks, which has to be taken into account upon starting up a business in this industry and in tourism project management, developing new tourism products.

Rural tourism enterprises are advised to use relevant research findings and the legal framework for risk management to manage the risks in this business.

Rural tourism extensively exploits the natural environment; therefore, the risks of climate change and weather conditions have to be taken into consideration during all the four seasons. Besides, the factor of sustainability is also important if doing business in the rural tourism industry.

For rural tourism projects, the number of external risks was larger than that of internal ones, and administrative risks were the largest category of internal risks.

In Latvia, the manager of every project is the most appropriate professional for managing risks in rural tourism projects, as s/he can better understand the situation with the project and can find an adequate solution to the problem.

To minimise risks, an important role in a project team is played by cooperation to identify risks and deal with them, yet the culture of cooperation depends on the priorities set by the project manager and the overall culture of the organisation.

References

Apoga, A. (2018).RiskManagement in Rural Tourism Projects in Latvia (unpublished master'sthesis). Latvia University of Life Sciences and Technologies, Jelgava

Assessment of Risks and Vulnerability and the Identification of Adaptation Measures for Landscape Planning and Tourism (2016). Retrieved from: file:///C:/Documents%20and%20Settings/Administrator/My%20Documents/Downloads/Lauksaimnieciba_mezsaimnieciba.pdf

Definition of rural tourism (s.a.). Retrieved from http://www.celotajs.lv/cont/prof/assoc/definition_lv.html?lang=lv

Cooper, D.& Bosnich, P. & Grey, S.& Purdy, G.& Raymond, G.& Walker, P. & Wood, M. (2014). Project Risk ManagementGuidelines. Oxford: John Wiley&Sons

Jaeger, C. C.& Renn, O.& Rosa, E. A.& Webler, T. (2001). Risk, Uncertainty, and Rational Action. London: Earthscan Publications Ltd

Kendrick, T. (2015). Identifyingand Managing Project Risk: EssentialToolsforFailure-ProofingYour Project, Third Edition, American Management Association. Retrieved from https://books.google.lv/books?id=BnuZBgAAQBAJ&printsec=frontcover&hl=lv#v=onepage &q&f=false

Loosemore, M.& Raftery, J. & Reilly, C. & Higgon, D. (2006). Risk ManagementinProjects.Secondedition. NewYork: Taylor & Francis.

Risk Management Strategy for the Programming Period 2014-2020 (2014). Ministry of Finance of the Republic of Latvia (in Latvian). Retrievedfrom http://www.esfondi.lv/upload/14-20_gads/2014-12-19_Risku_parvaldibas_strategija_2014.-2020.gada_planosanas_perioda.pdf

TourismLaw (1999). Saeima of the Republic of Latvia. Retrieved from https://likumi.lv/doc.php?id=50026

Uzulans, J. (2010).Risk Management in Project Context. Latvia: Drukatava.

Zvaigzne, A. (2005). Risk Management in Rural Tourism Enterprises in Latvia(Summary of the doctoral dissertation). Latvia University of Agriculture, Jelgava. Retrieved from http://llufb.llu.lv/dissertation-summary/economy/Anda_Zvaigzne_a-l.pdf

CAUSAL RELATIONSHIP BETWEEN AGRICULTURAL R&D SPENDING AND AGRICULTURAL OUTPUT: THE CASE OF TURKEY

Bekir Pakdemirli
Ministry of Agriculture and Forestry, Turkey, Email:bekir @pakdemirli.com

Abstract

The last 40-yearswitnessed the structural transformation process, in which the share of the agricultural sector in the world economy has declined compared to the share of non-agricultural sectors.This process has led to differences of opinion among policymakers and academicians whether it has an impact on the acceleration of economic growth and the reduction of poverty. Although the global agricultural GDP between 1970-2016 increased from 0.9 trillion dollars to 3.0 trillion dollars in real terms, the share of agriculture in the real global GDP decreased from 4.9% to 3.9% (FAO, 2018). On the other hand, an increasing number of empirical studies recently found that agricultural growth is more effective in combating poverty than non-agricultural growth. (Ravallion and Datt, 1996, Tiffin and Irz, 2006, Suryahadi, Suryadarma and Sumarto, 2009). In this context, increasing agricultural productivity and production has a strategic importance.

R&D investment plays an important role in innovation, increasing productivity and increasing economic growth. Research and development expenditures are carried out by the public and private sectors in order to increase the quality and productivity in agricultural production. The purpose of this study is to examine the causality between the agricultural sector R&D spending and agricultural product in Turkey. In addition, agricultural sector R&D spending will be classified as public sector and private sector, and the results will reveal which side has a stronger relationship with the agricultural product.

Keywords: R&D, Agriculture, Agricultural Output, Granger Causality, Turkey.

TARIMSAL AR-GE HARCAMALARI VE TARIMSAL HASILA ARASINDAKİ NEDENSELLİK İLİŞKİSİ: TÜRKİYE ÖRNEĞİ

Özet

Tarım sektörünün, tarım-dışı sektörlere göre dünya ekonomisindeki payının azaldığı son 40 yıllık yapısal dönüşüm sürecinin ekonomik büyümeyi hızlandırıcı ve yoksulluğu azaltıcı etkisi olup olmadığı konusu hem politika belirleyenler hem de akademisyenler arasında görüş ayrılıklarına neden olmuştur. 1970-2016 arası global tarım gayri safi milli hasılası reel olarak 0,9 trilyon dolardan 3,0 trilyon dolara çıkmasına rağmen, tarımın reel global gayri safi milli hasıladaki payı %4,9'dan %3,9'a düşmüştür (FAO, 2018). Öte yandan yakın tarihte artan sayıda ampirik çalışma, tarımsal büyümenin tarım-dışı büyümeye nazaran yoksullukla mücadelede daha etkin olduğunu ortaya koymaktadır. (RavallionandDatt, 1996, Tiffinand Irz, 2006, Suryahadi, Suryadarma ve Sumarto, 2009).Bu bağlamda tarımsal verimliği ve üretimi arttırmak stratejik bir öneme sahiptir.

Ar-Ge yatırımları inovasyonda, verimliliğin arttırılmasında ve ekonomik büyümenin artmasında önemli bir rol oynamaktadır. Tarımsal üretimde de kalite ve verimliği arttırmak için kamu ve özel sektör tarafından araştırma ve geliştirme harcamaları yapılmaktadır. Bu çalışmanın amacı, Türkiye tarım sektöründe yapılan Ar-Ge harcamaları ve tarımsal hasıla arasındaki Granger nedenselliğini incelemektir. Buna ek olarak, tarım sektörü Ar-Ge harcamaları kamu sektörü ve özel sektör şeklinde sınıflandırılacak ve sonuçlar hangi tarafın tarımsal hasıla ile daha güçlü ilişkisi olduğunu ortaya koyacaktır.

Anahtar Kelimeler: Ar-Ge, Tarım, Tarımsal Hasıla, Granger Nedensellik, Türkiye.

WILL NON-AGRICULTURAL EMPLOYMENT PROMOTE FARMERS' AGRICULTURAL INVESTMENT: A STUDY OF TEA IN CHINA

Xiaorong Zhang
Renmin University of China, School of Agricultural Economics and Rural Development, China
Email: xrzhang_chn @126.com

Xiangzhi Kong
Renmin University of China,School of Agricultural Economics and Rural Development, China

Abstract

The rapid development of the city and the continuous improvement of the level of agricultural modernization have led to a large number of farmers going out to work. Non-agricultural employment has increased the income of farmers, but it also has an impact on the labor supply of farmers' agricultural production. Farmers will adjust the planting structure of the crop based on non-agricultural workers. De Brauw (2007) used the World Bank's survey data in Vietnam to show that migrant workers will reduce labor-intensive agricultural production and increase the production of land-intensive crops. In addition, farmers will also adjust their agricultural inputs. However, most of the existing researches focus on the production and management decisions of major food crops, but neglect the study of economic crops. Although economic crops have low yields, they are expensive, such as tea, coffee, and ginseng. In our research, the price of ordinary tealeaves and processed tea are ten times different. For example, the average price of tea after finishing in Fujian is 269.25 yuan / kg, while the average price of ordinary leaves is only 27.91 yuan / kg. There is a big difference between cash crops and ordinary agricultural products. We cannot study these special agricultural products with the idea of studying rice, corn or wheat. In addition, different farmers have different ways of dealing with production and management, especially between pure farmers and part-time farmers. Therefore, whether the non-agricultural employment of tea farmers can promote their processing investment will be the supplement and exploration of this research on the previous studies.

The interviewees of this paper are tea farmers from Fujian and Hubei Province of China, the largest tea producing area in China. The data we collected included a sample of 952 farmers in 38 administrative villages. Whether the scale of processed refined tea and processed refined tea will be the explanatory variable and the dependent variable is whether the farmer goes out to work. The control variable are the characteristics of tea farmers (Such as age, educational level, health level), family characteristics (such as tea planting area, family number), external environmental characteristics (such as terrain, village convenience). We uses the Probit discrete selection model and the Tobit restricted dependent variable model for regression analysis.

$$P(Y_1 = 1 | nonfarm; X') = \Phi(\beta_0 + \gamma \cdot nonfarm + \beta X' + \varepsilon) \quad (1)$$

$$Y_2^* = \beta_0 + \gamma \cdot nonfarm + \beta X' + \varepsilon, \quad Y_2 = \max(0, Y_2^*) \quad (2)$$

Both equations (1) and (2) are estimated using the maximum likelihood method. Among them, Y_1 means "whether or not the refined tea is processed", and the processed refined tea is taken as 1, and

the unprocessed refined tea is taken as 0. Y_2 represents the actual "scale of processed refined tea", and Y_2^* is a latent variable of "scale of processed refined tea". Nonfarm is a non-agricultural employment variable, and X^' is another control variable, including individual and family endowments, social capital, external support, geographic location, and county dummy variables.

In addition, we used PSM for endogenous testing. Based on the above measurement methods, this paper studies the impacts and differences of different types of non-agricultural employment on farmers' tea processing decisions by selecting different non-agricultural employment variables. We get the following conclusion:Off-farm employment has a significant negative impact on famers' refined tea processing decisions, with the improvement of off-farm employment rate of the family; the possibility and the scale of refined tea processing have significantly reduced.Different types of off-farm employment have significant differences in the impact of farmers' refined tea processing decisions. Compared with the local off-farm employment, off-farm employment in the field has a more negative impact on the refined tea processing decision of farmers.

Keywords: Off-farm employment, farmer, refined tea processing, tea, labor.

THE PERFORMANCE OF THE AGRICULTURAL SECTOR FOR THE CASE OF KOSOVO

Anera Alishani
University "UkshinHoti" in Prizren, Faculty of Economics, Kosovo
Email: anera.alishani @gmail.com

Abstract

In most of the countries of the world, agriculture has always been one of the most important sectors of national economy or at least the sector with the longest history. Agriculture improves the competitiveness of the sectors and helps in the achievement of sustainable economic growth. As a result, the performance of this sector represents an important challenge for development.

Kosovo as a country found in the Balkan Penisula, is a lower- middle country which had a modest economic growth since the end of the war in 1999. The main drivers of this economic growth are considered to be the private consumption and investments. But also the agriculture is considered as key sector for economic development as agriculture activities have traditionally been part of the daily life of many people living in the rural areas. In addition, due to the supply of agriculture labour, good climate and also due to some advantages that have been provided for free access to the European Union, the agriculture activities have to be considered a priority in the policy agenda of the government of Kosovo.

The aim of this paper is to evaluate the performance of the farms in Kosovo compared to some other transition economies in terms of technical efficiency and of exogenous variables that influence positive or negative the technical efficiency score. The data used for this paper are cross-section data from FADN and will be used to investigate the performance of Kosovo farms which is considered of substantial policy relevance because contributes to better policy making.

The results reveal that from 395 observations, on average a farm produces 17.7% of the maximum output. This low level of efficiency means that the rest of the potential output, 82.3 %, is lost due to technical inefficiency. Subsidies have negative effect on technical efficiency score, however is not found significant. As a result it is suggested that there should be more targeted agricultural policies
Keywords: Agriculture, Performance, Transition Economies, Policy, Kosovo.

MUNICIPALITIES REVENUE AUTONOMY IN THE BALTIC COUNTRIES

Neringa Slavinskaitė
Vilniauskolegija/University of Applied Sciences, Faculty of Economics, Accounting Department, Lithuania, Email: n.slavinskaite@ ekf.viko.lt

Aušra Liučvaitienė
Vilniauskolegija/University of Applied Sciences, Faculty of Economics, Insurance Department, Lithuania

Abstract

Fiscal decentralization phenomenon is highly discussed at various levels and aspects, and the Organization for Economic Co-operation and Development (Eng. Organization for Economic Co-operation and Development, hereinafter - the OECD) gives it an extreme attention as well as the World Bank. Fiscal decentralization has become an interesting topic until today because researchers about fiscal decentralization are not only considered from the economic perspective, but also from other perspectives such as politic, geographic, other subjects. The articleobject – localgovernmentrevenueautonomyofBalticcountries. The aim of this article is to analyse the theoretical aspect of fiscal decentralization, calculate theindexofrevenueautonomyinBalticcountries. Three Baltic States similar in their area, number of inhabitants, and governmental peculiarities have been chosen for the analysis. This paper compares the three Baltic countries that formally became independent from the Soviet Union in September 1991: Estonia, Latvia and Lithuania. The research methods employed in preparation of this article are theoretical methods of analysis of scientific literature and sources, SAW method for index, comparative and logical analysis and generalisation. ThelowestrevenueautonomyindexoflocalgovernmentofBalticcountrieshasLithuania (0.27), thehighest – Latvia (0.49).If the revenue autonomy index is near 1, it is mean that local government has a big power to control own revenue.
Keywords: Fiscal Decentralization, Revenue Autonomy, Baltic Countries.

1. Introduction

The Baltic countries (Estonia, Latvia and Lithuania) are often considered as one region with similar economic profiles and common political and social values. They are geographically and historically closely related, particularly during the Soviet era. Also their post-Soviet development has been rather analogous. Nevertheless, there are significant differences with respect to local administrative systems and government finance. During the threedecades the Baltic countries have created new public institutions, introduced a democratized system of local government and provided the foundation for pluralistic and democratic society. However, there are still essential reforms that are waiting for implementation. One of the main problems is limited fiscal autonomy and inadequate revenue bases for local government.

This paper compares the three Baltic countries that formally became independent from the Soviet Union in September 1991: Estonia, Latvia and Lithuania. Local government reform in the three Baltic States has been the subject of earlier publications (Wrobel, 2003; Vilka, 2004, 2012; King, Vanags, Vilka& McNabb, 2004; Vanags&Vilka, 2006; Trasberg, 2009; Linnas, 2011; Mäeltsemees, 2012; Šaperkienė&Lazauskienė, 2012, Groenendijk&Jaansoo 2016), but these publications do not always specifically deal with public finance or local government revenue autonomy. This paper the situation regarding local government revenue autonomy in the three Baltic countries is analysed in 2017 year.

The research methods employed in preparation of this article are theoretical methods of analysis of scientific literature and sources, SAW method for index, comparative and logical analysis and generalisation. Three Baltic States similar in their area, number of inhabitants, and governmental peculiarities have been chosen for the analysis.

The first and second parts of the paper gives a general fiscal decentralization principles and local government revenue autonomy theoretical aspects. In the third part gives methodology of evaluation of Baltic countries local government revenue autonomy. The last part introduces the results of research.

2. Theoretical Aspect of Fiscal Decentralization

The theoretical foundations of fiscal decentralization highlight the efficiency and welfare-maximizing aspects of multi-level governmental structures for society. The widely referenced works of Tiebout (1956), Musgrave (1959) and Oates (1972) articulate a broad rationale for fiscal decentralization and its positive outcomes. Researchers have emphasized several important theoretical aspects of fiscal decentralization.

First, decentralization supports better fulfillment of local residents' needs for public goods. Smaller population and spatial size of local governments provide better opportunities to bring out residents' particular needs more explicitly (Oates 1972). As a result, compared with centralized public provisions, it becomes possible to calibrate more precisely residents' preferences for public goods in local jurisdictions. Second, as sub-national governments are likely to provide residents with a more precisely attuned preference-related set of public provisions than central government, a positive outcome will be better public resource use or allocation efficiency. Despite the difficulty of measuring preference-satisfaction level and the consequential overall allocation efficiency in the government sector, 'the idea that fiscal decentralization leads to allocative efficiency gains has won widespread acceptance' (Rodrıguez-Pose et al. 2007).

Third, fiscal decentralization may enhance competition between sub-national governments. In this context, local jurisdictions are considered as welfare-maximizing institutions for their residents. Municipalities provide various kinds of public goods and collect taxes from their residents. The 'voting with one's feet principle' would suggest that individuals will locate themselves within the particular jurisdiction which maximizes their personal utility (Tiebout 1956). In other words, a person will choose to reside in the municipality where the 'ratio' between the package of public services received and the tax burden is most favorable. The assumptions of the Tiebout model assume perfect mobility of residents and availability of information. As an outcome, one can expect the formation of more homogeneous-preference local governments, i.e. municipalities where more and more residents share similar preferences. Municipalities compete over individual (preferably wealthy) taxpayers, attracting them to reside in their jurisdictions. Municipalities are also interested in attracting businesses to their territories because they create jobs for their population. As an outcome of competition, municipalities search for ways to deliver services at the minimum feasible cost, thus enhancing producer efficiency at the sub-national level (Martınez Vazquez &McNab 2003). These theoretical arguments gave strong support to fiscal decentralization reforms in the Baltic countries following the over-centralization of the Soviet-period.

3. Revenue Autonomy of Local Government

Reviewing the relevant literature, there are studies that have attempted to quantify the degree of revenue autonomy oflocalgovernments (Fossati, Panella 1999; Stegarescu 2005). A revenue source can be categorised as the municipality's own revenue if it fulfils three conditions (Swianiewicz 2003): 1) the revenue source must be given to local governments in full without any additional conditions and for an undefined period; 2) the revenue source must be related to the local economic base, so that economic growth causes the increase of the municipality's own revenues; 3) local governments must be able to exercise at least some discretion over this source of revenue (e.g. they have the right to set the tax rate, at least within the limits set by law).

Among them is the most detailed study is the one made by OECD Taxing Powers of State and Local Government, which provided a methodological framework for classification of taxes sharing between central and local government according to the degree of autonomy in their determination.

Since taxing power better reflects the fiscal decision-making power of local governments, it has filled a gap between theoretical and empirical research on fiscal decentralisation. However, there still

remain challenging issues to be resolved with regard to the measurement of fiscal decentralisation. One such issue is the definition of tax sharing used by the OECD (1999).

In defining taxing power, local revenue from tax sharing is completely excluded. However, in many developed and developing countries, local governments depend significantly on the revenue from tax sharing between central and local governments.

The concept of "tax autonomy" captures various aspects of freedom local governments have over their own taxes. Recognising this problem, the OECD (1999) developed the concept of "taxing power" by categorising local taxes into five types. The OECD's definition of taxing power is viewed by many researchers as a better alternative to the conventional measures of fiscal decentralisation. Criticising empirical studies that use sub-central shares of revenue or expenditure to measure the degree of fiscal decentralisation.Ebel, Yimaz (2003) show that the result of previous studies on the effect of fiscal decentralisation, such as that of Davoodi,Zou (1998), is reversed when instead taxing power is used. Stegarescu (2005) also discusses the problems of using sub-central revenue or expenditure shares as the measure of fiscal decentralisation. He argues that the common spending or revenue shares tend to considerably overestimate the extent of fiscal decentralisation.

Although tax sharing is a system of revenue allocation between the central and local governments used worldwide, the treatment of tax sharing in the taxonomy of local revenue and in measuring fiscal decentralisation is surprisingly simplistic.

Although the possibility of measurement error of the share of sub-central expenditure or revenue is recognised, these measures are still used by many researchers due to the lack of alternatives. Even though the taxing power index might be recognised as a better alternative, the data on taxing power is available only for OECD countries over a limitedtime span. For an empirical study based on a broader sample of countries for a longer period, the share of local government revenue is still the only available data to measure fiscal decentralisation.

Tax sharing is used in many countries as a system of allocating national tax revenues across levels of government. According to the OECD surveys on local governments' tax revenue structure (OECD 1999, 2002; Blöchliger, Petzold2009), it is a dominant source of local tax revenue for several OECD countries. In Austria, the CzechRepublic, Germany, Mexico, and Turkey, the shares of tax sharing in local tax revenue are respectively 89%, 97%, 75%, 84% and 100%. Besides these countries, the shares of tax sharing are also quite significant in such countries as Australia, Belgium and Spain, which are respectively 42%, 46% and 32%.

In sum, the current definition of taxing power developed by the OECD (Blöchliger,Petzold2009) can be modified with the concept of "tax base proportionality", which is defined as tax sharing subtracted by horizontal grants. This approach has two advantages. Firstly, it will prevent the degree of fiscal decentralisation in many federal/regional countries from becoming close to zero. Secondly, the dichotomous nature of the current definition of the OECD (Blöchliger,Petzold2009) can be overcome by calculating the contribution of the local tax base to tax sharing revenue on a continuous basis.

But there are more indicators in scientific literature, but there is not one indicator which could evaluate the revenue autonomy of local government, so multicriteria method (SAW) will help to make index of revenue autonomy of local government. The next section presents the methodology of local government revenue autonomy index.

4. Methodology of Research

Multicriteria evaluation methods have been used in Lithuania for more than 30 years. At first they were used for solving technological problems in construction.Various evaluation techniques beginning with simple (sum of places, geometric average), more accurate ones (SAW COPRAS) and finishing by the most complicated ones – TOPSIS, VIKOR, MOORA, MULTIMOORA, ELECTRE, PROMETEY, PROMETEI II and others) are used.

SAW (Simple Additive Weighting) is the oldest, most widely known and practically used method (Hwang, Yoon 1981; Podvezko*et al.*2010; Nugaras 2014).

Quantitative evaluation methods are based on the matrix of the criteria, describing the compared object, statistical data or experts' estimates $R = ||r_{ij}||$ and thecriteriaweights ω_i, i =1,...,m; j =1,...,n, where m is the number of the criteria, n – the number of the objects (alternatives) compared.

Thequantitativeassessmentof local government revenue autonomy may also be done by applying a multi-criteria model based on the SAW(Simple Additive Weighting) method(Hwang, Yoon 1981):

SAWmulticriteria evaluation method is one of the most understandable and the simpliest ones embodying indexes values and weights connection into a single evaluating size – method criterion. Revenue autonomy by SAW method can be calculate in this way:

$$S_j = \sum_{i=1}^{m} \omega_i r_{ij}, \quad (1)$$

where: *Sj* – the value of the quantitative assessment of local governmentrevenueautonomy ω_i – theweight of indicator of local governmentrevenueautonomy; $\tilde{r}_{ij}$ –thenormalizedvalue of indicator *i* of local government revenue autonomy. The multi-criteria assessment SAW method requires the nature of change of all indicators to be the same, i.e. all of them need to be maximizing or minimizing.

We need to determine of local government revenue autonony of a country, therefore we should perform normalization employingthe ESP method.In this case, the normalization of the initial data can be performed bytheformula(Ginevičius2011):

$$\overline{r}_{ij} = \frac{r_{ij}}{\max\limits_{j} r_{ij}}, \quad (2)$$

wherer_{ij} – the normalized value of indicator *i*; max r_{ij}– the highest value of indicator *i* (obtained from statistical data or established through expert assessment).

Indexes weights can be determined in two main ways: direct and indirect. The first way is suitable when thenumber of evaluated indexes is not big – tillsome (Ginevičius 2011). Experts determine the weights of indexes inparts of a unit at once. This technique is very simple, understandable and convenient to apply. When the number ofevaluation indexes increases, it becomes problematic to apply it. The reason is that it is harder for an expert todetermine the correlated relations of indexes weights from the point of view of an examined phenomenon. At thesame time the incompatibility of opinions grows which often exceeds allowable limits.The best known one is T.Saaty hierarchy analysismethod(Saaty 1980;Aqhdaie*et al.* 2013). In this case the experts compare only two indexes, but not all at once. The other one which is less widespread for the present, named FARE method, is also grounded on reciprocity of indexes (Ginevičius 2011). On the basis of minimal initial information about the main index influence on other system indexes, the interrelations and strength of all the rest indexes are determined by applying an analytical technique. It allows to form completely coordinated matrix of indexes interactions and to calculate the weights of a larger number of indexes considerably more accurately.

The weight values can be used in further multicriteria evaluation, provided that experts judgments are consistent (in concordance). The concordance level can be determined by Kendall's concordance coefficient W (Kendall 1970):

$$W = \frac{12S}{r^2 m(m^2 - 1) - r\sum_{j=1}^{r} T_j}, \quad (3)$$

where*r* is the number of experts, *m* – the number of the criteria considered.

In fact, the concordance degree of experts' estimates is determined by the value χ^2 rather than the concordance coefficient W (Kendall 1970):

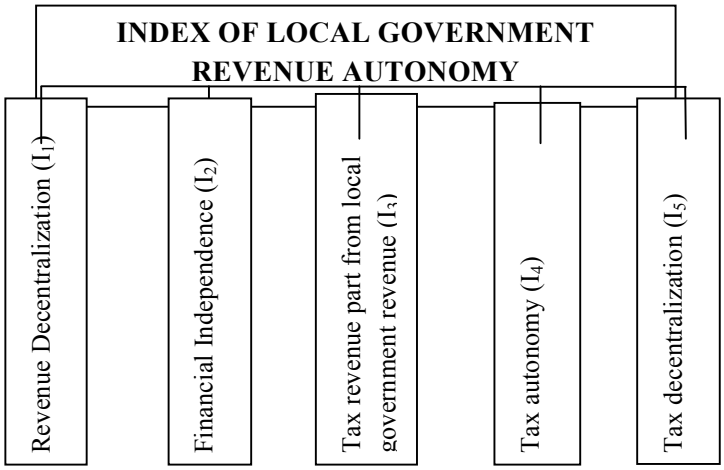
$$\chi^2 = Wr(m-1) = \frac{12S}{rm(m+1)} \quad (4)$$

It has been shown (Kendall 1970) that if the value of χ^2 calculated by formula (4) is larger than its critical value 2 χ^2_{kr} taken from the distribution table of χ^2 with ν = m – 1 degree of freedom and the significance level α chosen to be close to zero, then the statistical hypothesis about expert estimates' consistency is adopted.

5. Local Government Revenue Autonomy Index in the Baltic Countries

The main purpose of this section is to calculate the local government revenue autonomy index in the Baltic countries.

A hierarchical system of indicators has been developed to be assessed simultaneously.



Source: Author

Figure 1. Hierarchical System of Indicators of Local Government Revenue

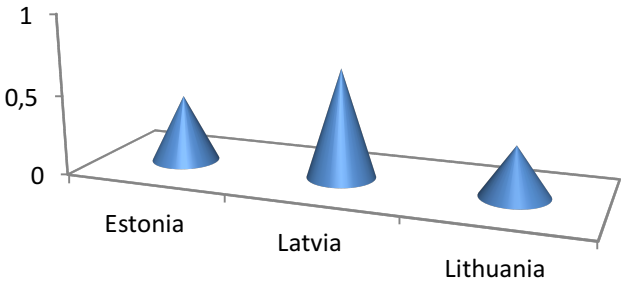
This is necessary because experts are able to assess the weight of indicators. Based on the available statistical information, it has been determined that 5 indicators give an indication of the Revenue autonomy of Local government (1 figure). Data was taken from Word Bank, OECD, Eurostat and calculated (2 Table).

Table 1.Baltic Countries Indicators

Indicators / **Countries**	**I_1**	**I_2**	**I_3**	**I_4**	**I_5**
Estonia	0.36	0.19	0.06	0.42	0.05
Latvia	0,41	0,81	0,92	0,68	0.80
Lithuania	0.36	0.14	0.09	0.31	0.08

Source: Author

Using the calculated structure of tax revenue (OECD) was built an index of tax autonomy for the Baltic countries. The index's values indicate the degree of local and regional governments control over their own tax revenues, ranging from 1 till 0. The degree of tax autonomy of local government in Baltic countries is different.



Source: Author

Figure 2.Tax Autonomy Index of Local Government in Baltic Countries

Latvia has the highest tax autonomy – 0,68, Lithuania lowest – 0,31, Estonia - 0.48. If the tax autonomy index is near 1, it is mean that local government has a big power to control own tax revenue. In second step was calculated weights for local government revenue autonomy index. The weights of local government revenue autonomy indicators of the countries were determined by interviewing experts. A great number of weight determination methods are available. They range from the rating of criteria and direct evaluation to criteria pairwise comparison AHP (Analytic Hierarchy Process) developed by Saaty (Saaty 1980). In the present investigation, a direct method of weight determination was used, when each expert assesses the weight of a particular criterion, expressing it in per cent, so that the sum of criteria weights is equal to 1 (or 100 percent).

The estimates of 5 indicators (figure 1) provided by 10 experts from different countries (such like Austra, Italy, Rumunia, Slovenia and other, see 2 Table).

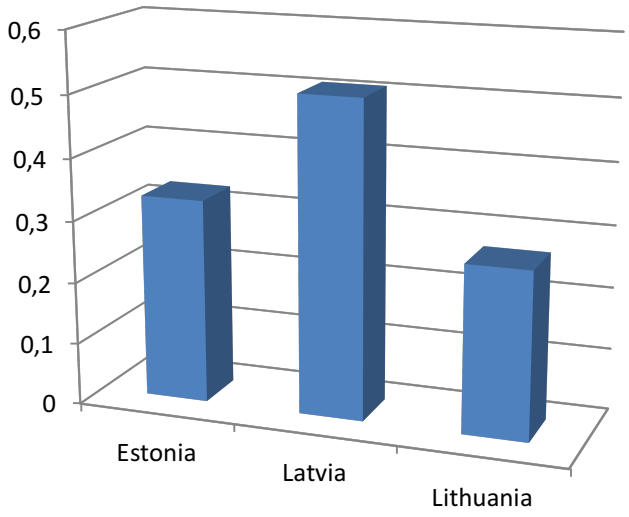
Table 2.Experts by Countries

Expert / Country	1	2		3	4	5	6	7	8	9	10
Austria										+	
Italy	+										
Lithuania					+				+		+
Portugal								+			
Rumunia		+		+							
Slovenia						+					
Turkey							+				

Source: Author

The concordance coefficient W = 0.74 was calculated by formula (3). The value of χ^2 = 33.25 calculated by formula (4) exceeds the critical value χ^2_{kr}= 11,07 with the significance level α = 0.05. It shows that experts' judgements are consistent and the criteria weights, calculated based on expert estimates can be used in multicriteria evaluation.

In the last step (formula 1) was calculated index of local government revenue autonomy in Baltic countries (see 3 Figure).



Source: Author

Figure 3. Revenue Autonomy Index of Local Government in Baltic Countries

Calculation results are shown in 3figure for Baltic countries. As seen in Figure 3, revenue autonomy index range from as high as 0.49 in Latvia and less 0.27 in Lithuania.

5. Conclutions

1. Fiscal decentralisation is influenced by many countries specific factors such as politics, history and culture. Therefore the measurement of fiscal decentralisation with consistent criteria across countries is a challenging task.
2. During the three decades the Baltic countries have created new public institutions, introduced a democratized system of local government and provided the foundation for pluralistic and democratic society. However, there are still essential reforms that are waiting for implementation.
3. Multicriteria evaluation methods have been used in Lithuania for more than 30 years. At first they were used for solving technological problems in construction. Their universal nature allowed to start applying them later in analysing socioeconomic systems, especially in quantative evaluating of the processes which have such nature and for evaluation of expressions position.
4. Local government revenue autonomy index in Baltic countries range from 0,49till 0,27(0.47 in Latvia and less 0.27 in Lithuania). Local government revenue autonomy index in Lithuania is the lowest among Baltic countries.

References

Aqhdaie, M. H.; Zoltani, S. M.; Zavadskas E. K. (2013). Market segment evaluation and selection based on application of fuzzy AHP and COPRAS- G methods, Journal of Business Economics and Management 14(1): 213–233.

BlochligerH.;Petzold O. (2009). Finding the *dividing line between tax sharing and grants a statistical investigation*. OECD Working Papers on Fiscal Federalism.

Davoodi, H.; Zou H. (1998). Fiscal decentralization and economic growth: a cross-country study, Journal of Urban Economics, 43, pp. 244–257.

Ebel, R.D.; Yilmaz S. (2003). On the measurement and impact of fiscal decentralization, in J. Alm and J. Developing and transition countries: essays in honour of Richard M. Bird, Edward Elgar Press, Cheltenham, pp. 101–120

Fossati, A., Panella, G. (1999). Fiscal federalism in the European Union.Routledge studies in the Europe Economy.

Ginevičius, R. (2011). A new determining methot for the criteria weights in multicriteria evaluation, International Journal of Information Technology & Decision Making 10(6): 1067–1095.
Groenendijk&Jaansoo (2016).Fiscal federalism in transition countries: the three Baltic states compared. Public Finance and management. 16(3): 255-280.
Hwang, C. L.; Yoon, K. (1981). Multiple attribute decision making-methods and applications. A state of the art survey. Springer Verlag, Berlin, Heidelberg, New York.
Kendall, M. (1970). Rank correlation methods. Griffin, London.
King, G. J., E. Vanags, I. Vilka& D. McNabb (2004). Local government reforms in Latvia, 1993-2003: Transition to a democratic society. Public Administration 82(4): 931-950.
Linnas, R. (2011). Attempts at local government reform in Estonia. Kunnallistieteellinenaikakauskirja, 2/11: 178-195.
Mäeltsemees, S. (2012). Local government in Estonia, in: A-M Moreno (ed) Local Government in the Member States of the European Union: A Comparative Legal Perspective, pp. 157-184, Madrid: INAP.
Martınez-Vazquez, J. & McNab, R. M. (2003). Fiscal Decentralization and Economic Growth', World Development, 31, 9, pp. 1597–1616.
Musgrave, R. 1959. The Theory of Public inance (NewYork, McGraw-Hill).
Nugaras, J. (2014). Assessment of networking of higher education institution: doctoral dissertation. Vilnius: Technika, 126
Oates, W. (1972). Fiscal Federalism (NewYork, Harcourt Brace Jovanovich).
OECD (1999). Taxing powers of state and local government, Tax Policy Studies, 1, OECD Publishing
OECD. (2002). Fiscal design surveys across levels of government. OECD: Paris.
Rodrıguez-Pose, A., Tijmstra, S. &Bwire, A. (2007) Fiscal Decentralization, Efficiency, and Growth', Paris, 47th Congress of the European Regional Science Association, available at: http://www.ersa.org
Saaty, T. (1980). The analytical hierarchy process: Planning, priority setting, resource allocation. McGraw-Hill, NY.
Šaparnienė, D. & A. Lazauskienė(2012). Local government in Lithuania, in: A-M Moreno (ed) Local Government in the Member States of the European Union: A Comparative Legal Perspective, pp. 389-410, Madrid: INAP.
Stegarescu, D. (2005). Public sector decentralization: Measurement concepts and recent international trends, FiscalStudies, 26(3): 301–333.
Stegarescu, D. (2005). Public sector decentralization: Measurement concepts and recent international trends, Fiscal Studies, 26(3): 301–333.
Swianiewicz, P. (2003). Foundations of Fiscal Decentralization. Benchmarking Guide for Countries in Transition. Local Government and Public Service Reform Initiative, Open Society Institute, Discussion Papers, No 26, 58 p.
Tiebout J. (1956). A pure Theory of Local Expenditures', in Oates, W. (ed) (1998).
Trasberg, V. (2009). Baltic local governments' fiscal situation: Two decades of reform. Journal of Baltic Studies 40(2): 179-200.
Vanags, E. & I. Vilka(2006). Local government in the Baltic States: Similar but different. Local Government Studies 32(5): 623-637.
Vilka, I. (2004). Local Government Reforms and Regional Development in Latvia (Ph.D. Dissertation), Riga: University of Latvia, Faculty of Economics and Management.
Vilka, I. (2012). Local Government in Latvia, in: A-M Moreno (ed) Local Government in the Member States of the European Union: A Comparative Legal Perspective, pp. 365-388, Madrid: INAP.
Wrobel, R.M. (2003). Local administration reform in Estonia: Alternatives from an economic point of view. Post-Communist Economies 15(2): 277-295.

HUMAN CAPITAL IN POLAND

Janina Sawicka
The State University of Applied Sciences in Płock, Poland
Email: j.sawicka@ pwszplock.pl

Maria Parlinska
Helena Chodkowska University of Technology and Economics, Poland
Email: maria.parlinska@ uth.udu.pl

Abstract

Human capital is defined by scientists as the useful and valuable qualifications and knowledge acquired during the process of education and vocational training of the individual human being (Samuelson P. A., Nordhaus W.D. 1980).

Human capital can be regarded as a set of qualifications and skills, determining how advanced products or services can be produced by a given sector of the economy. This makes human capital one of the most important elements of economic processes, including economic growth and technical progress.

In the paper, in the part concerning the literature review, theoretical issues and conclusions from them were presented. In the empirical part, own analyzes and assessments were made. A new approach and goal as well as the added value of the research was to enrich the definition of human capital with the supplementation of the perspective of equal opportunities mainly for women. From these studies, the authors put forward the hypothesis that: equal opportunities in the labor market, in social life, in education and in public life brings economic benefits, and their lack - losses.

The aim of proving this thesis, specifying that equality of opportunities enriches the definition of human capital, the authors used their own research results. In addition, other empirical studies and data from the Central Statistical Office, Eurostat and expert opinions from institutions such as the European Institute for Equality of Women and Men in Vilnius (EIGE), the World Economic Forum and the OECD as well as 62nd Session of the Commission on the Status of Women, United Nations Headquarters, New Yorkwere used.

Keywords: Human Capital, Poland, Labor Market.

PUBLIC POLICIES AND ORGANIZATIONAL STRUCTURE FOR SUSTAINABLE INTENSIFICATION: SYNERGIES BETWEEN POLICY-MAKING AND SCIENTIFIC KNOWLEDGE GENERATION IN URUGUAY

Nicolás Gutiérrez
National Agricultural Research Institute (INIA), Uruguay, Email: ngutierrez@ inia.org.uy

Bruno Ferraro
National Agricultural Research Institute (INIA), Uruguay

Abstract

Global population is expected to reach 9.7 billionon 2050(UN). This will requireincreasing food production by approximately 70%. Therefore, the performance of agricultural production systems and processes should be improved. The growing food demand anticipated for 2050is expected to increase the impact of agricultural production on the environment (Davis et al., 2016). Consequently, robust public policy frameworks will be required to oversee relevant environmental issues (Albright et al., 2016).In this context, the concept of sustainable agricultural intensification has been adopted in the last decade by the major international organizations (FAO, CGIAR, World Bank, etc).

Under these changing circumstances the organizational system around agriculture and food production will face the challenge of designing and implementing robust policies aimed at promoting sustainable intensification. From their side, R&D organizations are called to generate the knowledge required to ensure the sustainability of production systems. The present study contributesto understanding the interactiondynamics between agri-food research and public policy-makingin order to strengthen sustainable intensification processes.

The methodological approach involved two main components: (i)a survey of public policies promoting sustainable intensification in Uruguay, and (ii) an in-depth study of a single policy that required intensive use of scientific knowledge as well as a fluent interaction between public research organizations and policy-makers during the whole policy process. Particular attention was placed on such interaction and the dynamics of the use of scientific knowledge as the basis of policy-making processes.

The results showed an increasing implementation of policies intended to promote sustainable agricultural intensification. Moreover, we founda marked trend towards the use of some types of policy instruments, particularly*Public Support Programs*, Hence, there was small diversity of in therange of policy instruments designed and implemented by policy-making organizations. Compared to other studies, there is space for a greater use of other policy mechanisms such asdirected economic incentives for the adoption of sustainable agricultural practices. The is a need for more coordinated policy cycles involving greater interactionand common agendas between policy-makers and research organizations. The identified policies address different dimensions of sustainability; greater attention is required on freshwater use and conservation.

In addition, we found scarce knowledge generation intended to develop policy monitoring and evaluation mechanisms, as well as to assessing the impact of production systems on natural resources and their long-term sustainability.

Keywords: Sustainable Agriculture Intensification, Public Policy, Science-Based Policy

1. Introduction

Recent estimates suggest that global population would reach 9.7 billion by 2050 (United Nations, 2015). Moreover, increases in wages, quality of life and life expectancy of people globally result in larger access to goods and services. These improvements in wellbeing are associated with increased

demand for food, and particularly for protein sources.Meeting thisincreased demand will consequently require a significant growth in global food production (estimated in 70 % by FAO, 2011).

The natural resource available to foster agricultural production is limited. Hence, most of the increase in production should be achieved through a sustainable intensification of agriculture. This involves the development and implementation of productions systems that while increasing productivity also ensure the conservation of agro-ecosystems. Rising food production without an expansion of cultivated area will surely require robust public policies to address environmental issues such as soil conservation and greenhouse gas emissions in agriculture (Albright et al., 2016).

On the other hand, recent studies suggest that the projected rise in food production efficiency would not be enough to satisfy the increased demand expected for 2050 without a negative impact on the environment (Davis et al., 2016). Therefore, these authors suggest that *public policies* should also promote changes in food consumption patterns towards "lower-impact diets" (Davis et al., 2016, p125) as well as reductions in the amount of losses and waste throughout the production, commercialization and distribution processes in food systems (Pretty & Bharucha, 2014).

Sustainable agricultural intensification (SAI) has been defined as a process through which agricultural productivity is incremented without generating negative environmental impacts, improving natural resources, social capital and nutritional security (Pretty & Bharucha, 2014), and without expanding the cultivated area (Royal Society, 2009). SAI places special emphasis on environmental aspects and impacts such as the emission of greenhouse gases, degradation of soils and water sources, air quality, biodiversity, eco-system services and the conservation of natural capital (Rosas & Buonomo, 2016;) Pretty & Bharucha, 2014; Petersen & Snapp, 2013). This definition establishes goals for the process of sustainable intensification, but it does not provide any practical or technological means to achieve them (Pretty & Bharucha, 2014). Hence, some scholars maintain that SAI definition is still vague and subject to debate and (Petersen & Snapp, 2015; Rosas & Buonomo, 2016). This vagueness makes difficult the identification or definition of public policies that address the sustainable intensification of agriculture.

The concept of sustainable agricultural intensification emerged in the 90's (Pretty, 1997). Nevertheless,it was not until the publication of the report of the Royal Society in 2009, thatSAI began to be broadly adopted as a guiding principle for policy-making. Therefore, during the last decade, several organizations, international agreements and programs (NN.UU., FAO, CGIAR, etc.), national governments, ministries of agriculture and public or private organizations involved in research, generation of technology and/or agricultural development (Rosas& Buonomo, 2016) are directing their policies and strategies towards sustainable intensification.

2. The Role of Public Policies and Research on Sustainable Intensification

The public-policy instruments and mechanisms most commonly used to support SAI include, among others: promotion of best management practices; reduction of food waste (Pretty & Bharucha, 2014; Rosas & Buonomo, 2016); subsidies to practices that benefit the environment and "green systems" (Matthews, 2013; Hodge et al., 2015; Silva et al., 2016; Hunter et al., 2017); payment to eco-systemic services (Pretty & Bharucha, 2014); development of production chains and access to differentiated markets and premium prices (Pretty & Bharucha, 2014).

Some countries have made efforts and achieved significant progress in promoting 'greener agendas'– e.g. China, Denmark, South Africa, South Korea (Pretty & Bharucha, 2014). Despite these developments at the national and continental levels (Silva et al., 2016), most policy regimes at the national and global levels continue to prioritize food production incentives, but still neglecting or damaging natural capital (Pretty & Bharucha, 2014; Petersen & Snapp, 2015; Davis et al., 2016). Some scholars criticize the IAS approach since the prevailing discourse lacks quantitative environmental conservation goals. Whileemphasizing the urgency of significantly increasing production, the same peremptory character is not given to the environmental challenges and sustainability of production and food systems (Hunter et al., 2017). As a result, contrary to the maintenance or reduction of environmental impacts proposed by the IAS approach, theaggregate impacts are actuallynegative andincreasing in the last years (Hunter et al, 2017).

Regarding the care of natural capital, the focus of public policy has been regulating certain practices and/or preventing specific environmental problems, while incentives to 'positive practices' are rarely used (Pretty & Bharucha, 2014, p1589). Policies or instruments aimed at improving farmers' income and conserving natural resources may eventually fail to meet their objectives due to changes in market conditions that agriculture producers to maximize the use of resources (Pretty & Bharucha , 2014), modify its allocation to different productive activities and, consequently, to an increase in environmental impacts (Rosas & Buonomo, 2016). There is clearly a tension between policies that promote environmental care and those that promote productivity gains. Therefore, there is a need for greater understanding of dynamic models of interaction between public policies, market structure and knowledge generation that allow the expansion of sustainable agricultural practices and production systems (Pretty & Bharucha , 2014).

In the United States, agricultural subsidies and insurance schemes strongly promote production while environmental requirements are scarce resulting in a poor protection of natural resources againstpotential harms(Petersen & Snapp, 2015; Hunter et al., 2017). Due to the low political interest, it has been very difficult in that country to change the orientation of subsidy and financing schemes (which promote increases in production) towards a greater attention to environmental aspects (Petersen & Snapp, 2015). The picture in the European Union (EU) is quite different. It has achieved greater progress in implementing incentives to production systems that take care of natural resources. The EU's environmental policy and Common Agricultural Policy (CAP) have regulated since the 70's the protection of animals and biodiversity, the creation of special protected areas and the maintenance of natural habitats (Hodge et al., 2015). The CAP establishes 'agro-environmental schemes' (AES) as a mechanism for producers' compensation for the loss of income inherent in less intensive systems and natural resource conservation practices (Batáry et al., 2015). From the CAP reform of 2013, subsidies to AES are being reduced. However, 30% of direct subsidies established by the CAP turned to be conditional on the implementation of agricultural practices that favor the conservation and sustainability of agro-ecosystems (Hodge et al., 2015).

Political leaders and policy-makers at local, national and international levels should play a preeminent role in the generation of policy regimes (Geels, 2002) and more robust regulatory frameworks that promote agri-food production systems that combine food supply with the care of natural capital (Pretty & Bharucha, 2014; Petersen & Snapp, 2015). This could include the development of price-correction instruments, for instance on agricultural inputs, so that they reflect the true environmental cost from their use (Davis et a., 2016; Rosas & Buonomo, 2016). In addition, the public sector must ensure the establishment of price signals and subsidies to products obtained through the implementation of sustainable farming practices and systems (Pretty & Bharucha, 2014; Silva et al., 2016). Other authors suggest the need for public policies that modify consumption patterns through market-based solutions, so that prices can incorporate the environmental costs implicit in each type of food (Davis et al., 2016). Likewise, a great challenge for the agencies that set up this sort of policies will be to develop adequate monitoring and control capabilities in order to assess the environmental impact of production systems, as well as sanction capabilities against violations of these regulations (Rosas & Buonomo, 2016).

With regards to the contribution of research to sustainable intensification, the Royal Society emphasizes the key role of R&D organizations in the consolidation of this approach (Royal Society, 2009). Particularly, great efforts will be required for the development of indicators to assess the impact of different agricultural practices on the three dimensions of IAS: productive-economic, social and environmental sustainability (Petersen & Snapp, 2015; Rosas & Buonomo, 2016). Moreover, sinceSAI demands integrated or mixed systems that involve more complex management schemes, research should also generate information on good practices that enable producers to develop the abilities required to manage these complex systems (Rosas & Buonomo, 2016).

The public sector should not only fulfil a central role in the development and validation of environmental and sustainability indicators, but also in the definition of quantifiable long-term goals for those indicators, so as to allow monitoring and evaluating howagroecosystems are changing and consequently make decisions to ensure their long-term sustainability (Neufeldt et al., 2013; Hunter et al., 2017). For example, while many countries have proposed to reduce the carbon footprint per unit of

product, there is evidence that the use of this indicator in isolation does not reflect the absolute environmental impact; achieving that requires integrated indicators that also take into account, among others, nutrient balance, loss of biodiversity, pesticides eco-toxicity andwater eutrophication by nutrient enrichment(Picasso et al., 2014; Rosas & Buonomo, 2016). The definition of this type of country-level goals is a prerequisite when accessing United Nations "green funds"that promote climate change adaptation and mitigation (Silva et al., 2016; Fridahl & Linnér, 2015; Klein & Möhner, 2011).

To sum up, the organizational system around agricultureshould face the challenge of designing and implementing robust policies and mechanisms to promote sustainable intensification, and to ensure an effective balance among all three dimensions of sustainability: productive-economic, social and environmental sustainability. R&D organizations are called to generate the knowledge and technologies necessary to ensure the sustainability of the productive systems, as well as to generate indicators to allow effectively characterizing all dimensions of sustainability and monitoring their evolution, for example, in response to the implementation of public policy instruments. This highlights the need for coordination and alignment among R&D organizations and thosein chargeof designing public policies intended to promoteSAI. The development of shared agendas becomes a sine qua noncondition for a long-termconsolidation of the SAI approach. Among other things, the present study aims to contribute to discuss how to strengthen the linkage between agri-food research and the design and implementation of public policies.

3. Conceptual Framework and Methodology

The methodological approach involved two main components: (i) a survey of public policies promoting sustainable intensification in Uruguay, and (ii) an in-depth study of a single policy that required intensive use of scientific knowledge as well as a fluent interaction between public research organizations and policy-makers during the whole policy process. Particular attention was placed on such interaction and the dynamics of the use of scientific knowledge as the basis of policy-making processes.

The survey of policies was intended to identify the existing policies that currently promote or comprise sustainable intensification guidelines. Public policies have been defined as *a set of deliberate decisions that define "a course of action or inaction", the definition of its objectives and the means to achieve them* (Hill & Varone, 2017, p16 [1]). Through this survey we developed a standardized policy database that describes the following attributes of each policy: (i) basic descriptive information (policy name; the policy objectives; date when they have been enacted and implemented); (ii) the target audience; (iii) the organization that was in charge of the policy design and implementation; (iv) the *type* of policy instruments; (v) the dimensions or approaches to sustainability encompassed by each policy (productive, economic, environmental, and/or social); (vi) the stakeholders who compelled to put the policy problem on the public agenda; and finally (vii) intensity of the interaction and contribution of public science to policy-making. This information was collected from secondary sources (information available on websites, documents, institutional publications and previous research) following methodological guidelines designed for this study.

All policies included in the survey are in effect regardless when they were designed and implemented. The study does not attempt to provide a historical account of the policies, but a mapping exercise for their characterization and current situation. The limits of the universe of SAI policies are not clear-cut. Therefore, to the best of our knowledge, the set of policies identified through the survey offers a comprehensive account of that policy universe. This is the first account and characterization of sustainable intensification policies in Uruguay, their policy instruments, target population, as well as of how public research has contributed to the policy design and implementation processes.

The survey portrays each policy from several dimensions. Hence, below we provide the conceptual definition of the main dimensions and categories used to characterize them. First, the *sustainability approach* identifies which dimensions of sustainability are actually addressed by the policy. These dimensions may include: (i) productive-economic; (ii) environmental; and (iii) social. For a policy to be included in this survey, it should address at least two of these dimensions. The *intensity* with which

a policy addresses each of these dimensions was ranked using an interval variable that could take value 0, 1, 2, or 3, corresponding respectively to nil, weak, medium or strong *intensity* [2].

The type *of policy instrument* classifies each policy in: (i) certifications, (ii) subsidies; (iii) infrastructure; (iv) public controls; (v) support programs; (vi) fiscal regulations; (vii) preferential prices; and (viii) tax exemptions.

The *policy driving forces*refer to those actors or mechanisms that influenced the decision to formulate and implement each policy. These drivers were standardized into the following categories: (i) public opinion; (ii) international markets; (iii) government; (iv) agricultural producers; (v) large enterprises of the agriculture sector; (vi) agriculture service firms; (vii) international agreements; (viii) foreign governments; (ix) international law; (x) interest groups (NGOs, etc.); and (xi) certification systems.

Finally, we also assessed the *intensity of public R&D contribution* to policy design and implementation. We have argued that the design of SAI policies increasingly demands sound contributions from public research organizations (Royal Society, 2009). Consequently, this study attempted to identify those policies that required a more intensive use of scientific knowledge. Moreover, in order to complement the policy survey, through a case-study approach, we conducted a more detailed examination of the interaction between public research organizations and policy-makers throughout the whole policy cycle (Kingdon, 1984; Hewlett et al., 2015).

A single *sustainable intensification policy* was selected as case study (Yin, 2003) in order to perform an in-depth analysis of the policy-making process and its contribution to sustainable intensification. For its selection we looked for a policy with significant impact on the productive sector, and a case where public research had played a key role on policy design and implementation. Following these criteria we selected the Uruguayan Soil conservation policy, and specifically its more recent policy instrument called *Soil Use and Management Plans*.

The specific objectives of the case study were: (i) to identify factors that promoted setting the policy problem in the public agenda, and triggered the subsequent design and implementation of the selected policy; (ii) identify difficultiesthat SAI policies have faced in their different phases (problem definition, design, implementation, evaluation); and (iii) analyze key driving forces and processes underpinning the interaction between public research (scientific and technical capabilities) and policy development and decision-making (SAI policy).

The conceptual framework and methodological guidelines developed for the case study were based on extant literature that studies *the policy process* (Kingdon, 1984; Sabatier, 1991; Hewlett et al., 2015; Hill & Varone, 2017; Sotirov & Memmler, 2012). In general terms, public policies go through a *cycle* that involves the following stages or phases: (i) agenda setting; (ii) policy formulation (iii) decision-making; (iv) implementation; and (v) policy evaluation (Howlett et al., 2015, 2016). This framework provides an empirical tool to analyze, understand and explain change and evolution in public policies. A complementary approach on public policy-making has been postulated by Sabatier (1988; 1991). His approach places greater emphasis on the role of different actors and collective actions as the drivers of the development, implementation and evolution of public policies (Hewlett et al., 2016). By combining both, the stage-cycle and actors-driven approaches on the policy process, the case study analyzed institutional, technical and stakeholder processes, playing singular attention to the role and contribution of *public research organizations* throughout the different stages of the policy process.

For the empirical implementation of the case study, in addition to a review of previous studies and extant information, we conducted semi-structured interviews torecognized individuals from different stakeholders involved in the policy-making cycle. Interviewees included people from: (i) government agencies in charge of the design and implementation of policies; (ii) universities and research institutes; and (iii) agriculture sector organizations. The findings from the policy survey and case study are presented in the next section.

4. Results and Discussion

4.1. Survey Results: Overview of Sustainable Intensification Policies in Uruguay

The survey resulted in a consolidated database of ten (10) policies that to some extent address sustainable intensification dimensions. We first analyzed how the implementation of sustainable intensification policies has evolved over time (Figure 1).

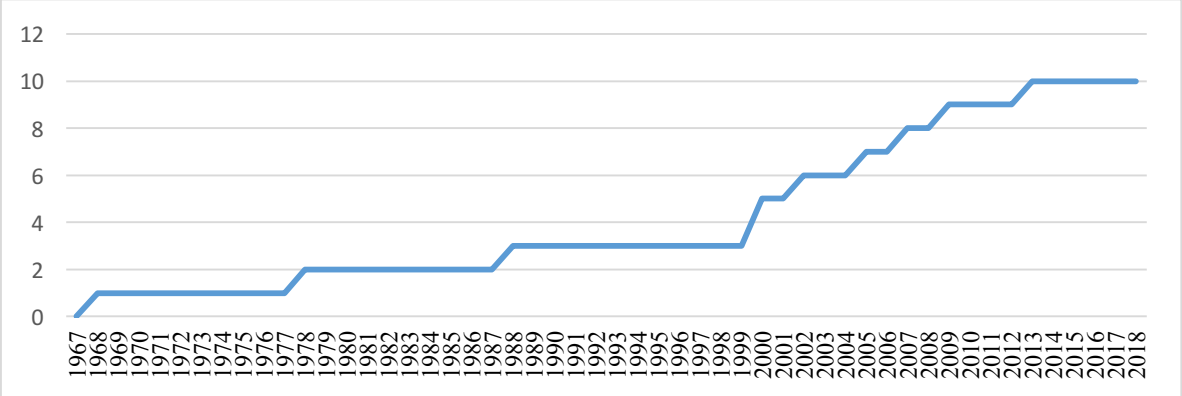


Figure1.Evolution of Sustainable Intensification Policies

SAI policies had little development in the country until late 1990s. From year 2000 onwards, the enactment and implementation of public policies for sustainable intensification (PPSI) showed a significant increase. Similar trends have been observed at the international level (Rosas & Buonomo, 2016). The signature of Uruguay to international agreements passed in the 1990s such as the United Nations Convention on Biological Diversity (CBD), the Framework Convention on Climate Change, and the Kyoto Protocol triggered the enactment of local policies concerning sustainable development goals mostly from 2000 onwards.

We then assessed how the different dimensions of sustainability are addressed by the surveyed policies, using an interval measure of *intensity*. Figure 2 reflects the aggregate results for all surveyed policies which point to the environmental and productive-economic dimensions as the main approaches to sustainability promoted by Uruguayan policies. Less attention is paid to social factors when designing SAI policies in Uruguay.

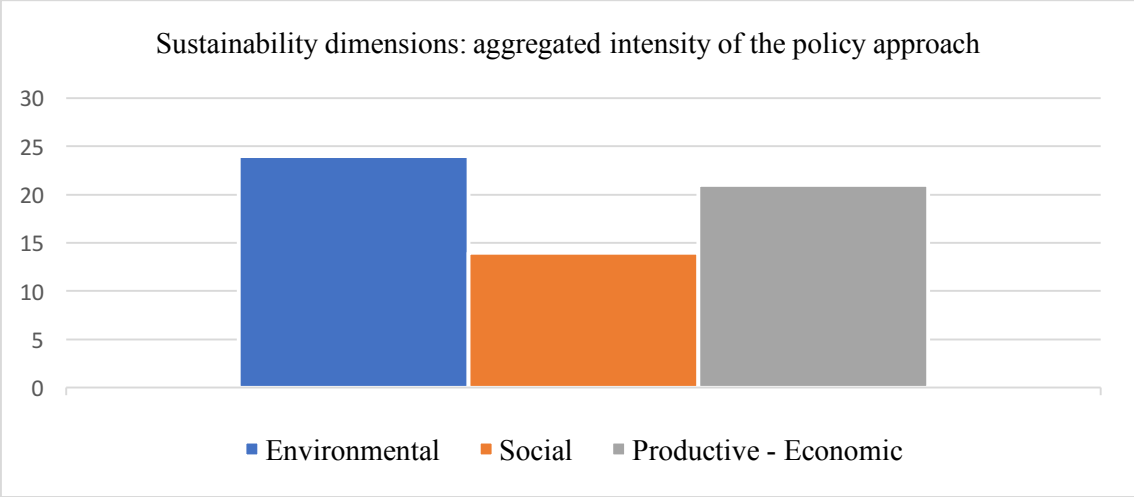


Figure 2.Sustainability Approach

Diverse environmental issues are addressed by SAI policies in Uruguay. These include, water, soil and biodiversity use and conservation, renewable energies and greenhouse gas emissions. Four out of ten policies address biodiversity issues, including the sustainable use and conservation of natural grasslands, the conservation of native forests, the definition of biodiversity protected areas, and regulations on the introduction of genetically modified organisms.

Turing to the type of *policy instruments* and intervention mechanisms employed by SAI policies, the observed distribution (Figure 3) highlights that 42% involve *support programs* as intervention approach, while *public controls* account for 21% of the total number of the instruments analyzed. These figures are even higher (46 and 34 % respectively) if we only consider the policy instruments designed by the Ministry of Agriculture and the Ministry of Environment. This evidences aprevalence of classic policy instruments.

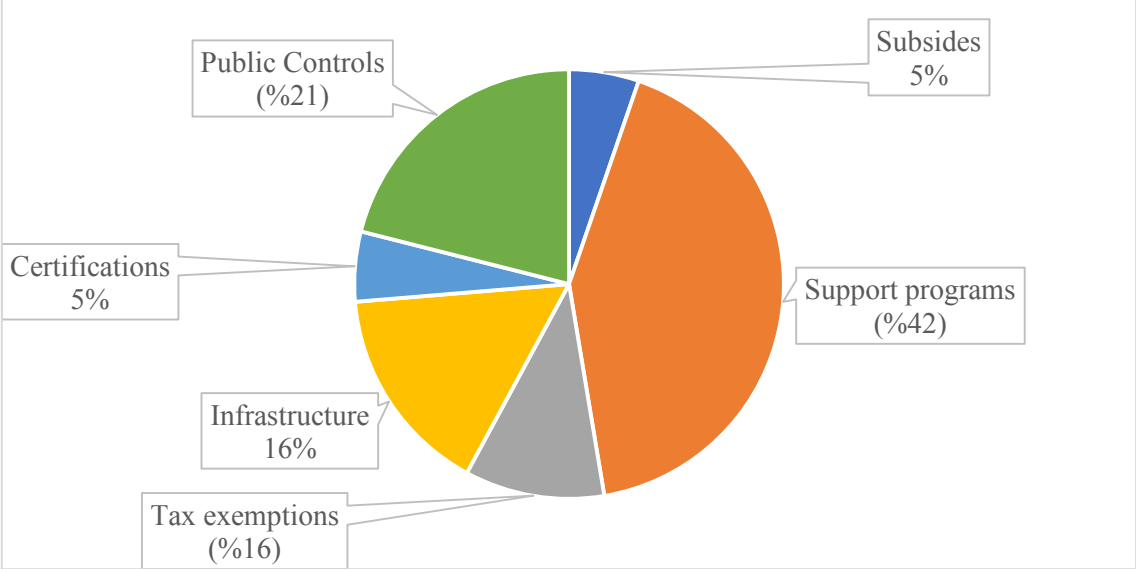


Figure 3. Policy Instruments

On the other hand, mechanisms involving economic incentives such as subsidies, tax exemption or preferential prices represent only 16% of the surveyed instruments. Among these instruments, we found financial incentives to forest tree production, biofuels industry development, waterwaste treatment and irrigation infrastructure, as well as to the adoption of sustainable agricultural practices and technologies.Similar patternshave been seen at the international level, where incentives for positive practices are seldom used (Pretty & Bharucha, 2014, p1589). However,some developed countries make greater use of subsidies to the adoption of beneficial practices – compensating economic losses intrinsic in those production systems thatensure environmental sustainability (Matthews, 2013; Batáry et al., 2015; Hodge et al., 2015; Hunter et al., 2017), as well as mechanisms supportingdifferential prices and market development (Pretty & Bharucha, 2014).

With regards to the organizational structure that supports SAI policies, we examined the involvement of different kinds of organizations in the design and implementation of each SAI policy (Figure 4).As expected, the Ministry of Agriculture has participated in the design of almost all the instruments implemented by SAI policies (13 out of 15 instruments), followed by the Ministry of Environment and the Ministry of Economy, with 6 and 5 instruments respectively.

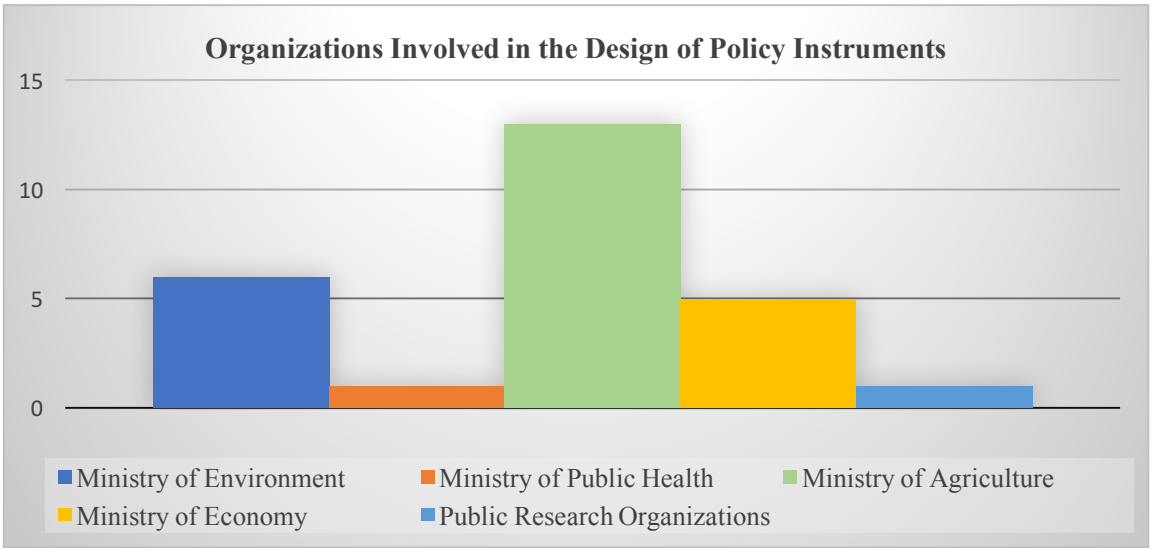


Figure 4. Policy Instruments Designed by each Organization

In addition, we analyzed the *policy driving forces*, namelythose actors or mechanisms that influenced the decision to formulate and implement each policy. Figure 5 illustrates the *aggregate intensity* (AI) of each driving force across all surveyed policies. It highlights that civil society, opinion groups and NGOs with influence on the national Government exert the most salient force driving the advent and implementations of SAI policies in Uruguay (AI = 27). Moreover, Uruguay'sinsertion in the international context plays a highly relevant traction role: the aggregate driving intensity of foreign government and international agreements, markets and regulations reach 21 points in the scale. On the other hand, organizations form the agriculture primary sector exert also a significant driving intensity (reaching 14 points in the AI scale).

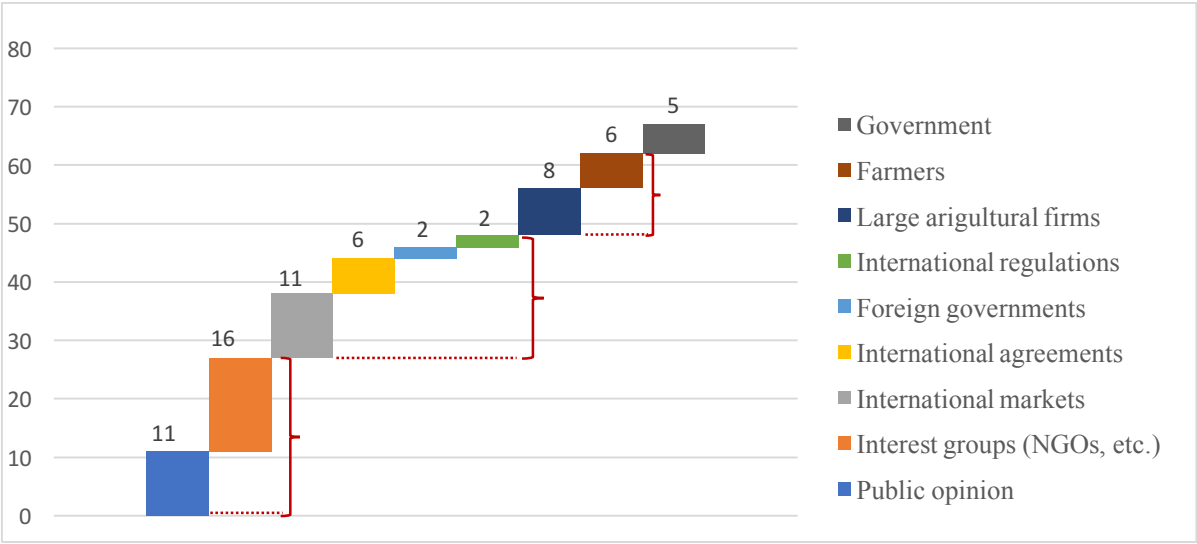


Figure 5. Intensity of Policy Driving Forces

We now dig into the specific type of policies pulled by different groups of actors. Policies backed by civil society agents pay greater attention to broader environmental concerns, to water, soil and biodiversity conservation and food safety. Forces coming from the international context and markets drive the development of similar policies as civil society but also embrace broader environmental issues such as climate change, and renewable energies policies. Finally, stakeholder from the primary

sector have influenced the development of policies that address the productive-economic dimension of sustainability, such as sectoral promotion policies (husbandry and forestry), product differentiation policies (integrated pest management), biofuel production incentives and regulations for the introduction of GM plant varieties.

Concluding the SAI policy survey, we also assessed the intensity of the interaction between policy-makers and R&D organizations during the design and implementation of eachSAI policy in Uruguay.The increasing complexity of the environmental and sustainability constraints that need to be faced demand robust solutions and evidence-based policy approaches. So having sound contributions from public R&D organizations becomes a salient input and success factor in policy-making.We found that 6 out of 10 surveyed policies required high or medium interaction with public R&D for their design. The remaining four policies made small or none use of locally developed scientific evidence since they were mostly the result of or adapted from foreign policy schemes.

In the next section, we deepen the analysis of the interaction between public R&D and policy-making. Namely, we examine a single SAI policy as case study looking at the whole policy process. When selecting the case, based on the survey results we looked for a policy that:(i) required a close involvement of publicresearch organizations and a fluent interaction with policy makers; (ii)the solution of the policy problem as well as the design and implementation of the policyinvolved significant local research contributions; and (iii) there was a clear influence of agriculture producers as drivers of the policy need and implementation.

4.2. Contribution of Public Research to Policy-Making: The Case of Soil Use, Management and Conservation Policy in Uruguay

Following the criteria described in the previous section we selected, as our case study, a public SAI policy enacted by the *Law for use and conservation of soil and surface water for agricultural purposes*, in Uruguay.

The Uruguayan Ministry of Agriculture and Fisheries (MGAP) is the main actor involved in regulating and promoting the use of natural resources for agricultural purposes. A law promulgated in 1968 in Uruguay declared of national interest the conservation of soils and waters. As a response to agricultural intensification, in 2008 the MGAP passed new regulations for the technical implementation of the Law in force, thus updating public soils policy. This regulation (decree 405/08) is today referred to as *Soils Use and Management Plans* (SUMP).

The SUMPs are a public policy tool that establishes clear technical criteria so that crop production systems in Uruguay do not exceed the tolerable use and erosion capacity of soils. This norm also establishes sanction mechanisms if infringed and defines control responsibilities. The following sections describe the conditions preceding the design and implementation of the *Soils Use and Management Plans*as well as the instruments established to promote a sustainable soiluse.

As we presented in section 2, the conceptualapproach used splits the policy “cycle” in five phases (Howlett et al., 2015, 2016):(i) agenda definition; (ii) policy formulation; (iii) decision making; (iv) implementation; and (v) evaluation. Therefore, we examine below how the SUMP policy went through these stages.

4.2.1. Agenda Definition

A relevant preceding soils erosion crisis took place in the 1950s, when the area cultivated with wheat reached 1.6 million hectares (Interviewee 1) under continuous cropping and conventional tillage systems (Ernst & Siri-Prieto, 2011). This event triggered a strong scientific research work that was the basis of all subsequent soil policies. Since then, soil conservation has been prioritized by different public actors and in particular by public research organizations (Interviewee 1).

Therefore, a relevant factor driving the historical evolution of soil conservation policyhas been previous scientific evidence on soil erosion and the development of technological solutions to address this problem.Hence, public R&D has led the construction of the policy problem as well as the definition of the policy agenda. Such knowledge and technical solutions were transferred over time to

producers and technical advisors that graduated in public R&D organizations. So, public R&D played a key role in anticipating soil conservation problems. Scientific research and graduate training were proactively oriented to the adaptation of an erosion estimation model and the development of sustainable production systems so when the decision to implement the SUMPs policy was taken, the model was adjusted and validated for Uruguayan conditions (Interviewee 1).

In 2001 the Universal Soil Loss Equation model (USLE/RUSLE) was already adapted and validated in local soils as a result of collaborative efforts between the Faculty of Agronomy (FAgro-UdelaR), MGAP and the National Agricultural Research Institute – INIA (Pérez-Bidegain et al., 2018;Interviewee 1). Despite soil conservation problems were already identified, during long periods,the institutional system did not offer effective planning and regulatory instruments on the use and management of soil resources.

During the decade 2000-2010, market factors generated significant changes in land use in Uruguay, demanding new adjustments in the regulations. Specifically, in response to the intensification of crops production and particularly soybean, in 2008 MGAP passed Decree 405/08 in order to technically implement the current law though the SUMPs instrument.

Having scientific information on the problem and its technical solutions were not enough for the emergence of the new policy. Triggering the new soil use regulations involved a convergence of multiple driving forces: (i) the expansion of soybean that tripled total cropping area of the country; (ii) farmers concernsabout soil damage and productivity losses; (iii) community of technical advisors also worried about soil deterioration; and (iv) realization of political will to tackle the identified problems (Interviewee 2). The historical trajectory of this problem, the accumulated evidence on its causes and technological solutions as well as theextensivestakeholder'sawareness resulted in a high willingness of the primary sector to adopt the regulatory changes enacted in 2008 (Interviewees 1, 2, 3, 4, and 5).

4.2.2. Policy Formulation and Decision Making

During the analysis of policy alternatives, two policy approaches toregulate the use of soils were considered within MGAP. One of the models considered was based on the control of good practices and sanctions. Another alternative considered was the implementation of incentives based on indicators of soil use capacity and productivity (Interviewees 2 and 3). Nevertheless, there were weak previous knowledge and capabilities required to measure and monitor the application of incentive instruments. So, despite there was plenty of scientific evidence to characterize soils conservation problems and technological solutions, there were no specifictechnical developments for a proper monitoring and evaluation of the impact of the policy. Therefore, based on the experience of other countries, the control and sanctions approachwereselected (Interviewees 1 and 2).

4.2.3. Policy Implementation

The normative framework has two main components: (i) the mandatory requirement for crop producers to present their Soil Use and Management Plans signed by a certified Agronomists; and (ii) a control of actual soil use compliance with the crop rotations proposed in the SUMPs. Each SUMP provides an estimateof erosion associated with the proposed crop rotation whichshould be lower that the tolerable erosion limits defined by MGAP for different types of soils in the country.

Agronomists were trained and certifiedby the Faculty of Agronomy in order to technically assist farmers in the formulation and presentation of theirSUMPs (Interviewee 2). The compliance control of SUMPs is based on the analysis of actual soil use fromsatellite images. This is complementedwith field visits when deviations are identified (Bidegain et To., 2018; Interviewee 1).

Based on scientific evidence, the SUMPs policy forcesfarmers to adopt practices, technologies and production systems technically designed to prevent soil degradation while ensuring productivity and economic sustainability.Despitemuch of this technological package was being adopted by farmers over the years, the SUMPs made itmandatory. Another policy impact took place at the level of public research organizations that were pushed to broaden their research agendas to new problems and challenges resulting from the policy implementation such as the introduction of winter crops in the

rotation. They were also required to workin a more coordinated waywith actors involved in the policy design and implementation (Interviewee 6).

4.2.4. Policy Evaluation

The evaluation of the *SUMPs policy* that has been carried out by the MGAP, has focused on assessing policy implementation. That is, it is monitoring indicators that reflect the degree of adoption of the *SUMPs* by crop producers in Uruguay. These indicators include, among others, the number of *SUMPs* presented by farmers, the agricultural land covered by the *SUMPs*presented and the percentage of the total cultivated area covered by the *SUMPs* (Interviewee 2). The goal defined by the MGAP was to have 100% of the area under crops covered by the *SUMPs*. This goal that has been achieved almost entirely (Interviewee 2).

Based on the USLE model that was adapted to Uruguayan conditions, the application of SUMPs is expected to significantly reduce the erosion generated by crop production, thus maintaining adequate levels of soil health. However, it is still pending to implement mechanisms and indicators for monitoring the actual level of erosion in soils under crop agriculture, their evolution over time, and to assess if the erotion predictions of the USLE model are being accomplished (Interviewees 1, 2, 3 and 4). These indicators were not developed and there is no baseline information to develop them. Nor was an impact study anticipated when the policy was formulated. This particular limitation results from scientific research being strongly focused on the identification of soil conservation problems and the design of their technological solutions but leaving unattended the development of soil health monitoring systems and indicators (Interviewee 3).

5. Conclusions

The survey of SAI policies identified the instrument base, type of policies and driving forcesthat havebeen generated in Uruguay to introducethe *sustainability* of agricultural production systems of as a pillar of the country's development.It represents a valuable resource to promote discussions and long-term collaborative agendas among policy makers and research organizations in order to anticipate policy problems that might require sound contributions from the scientific community.

There is a partial use of some types of policy instruments. Control mechanisms and support programs appear as the most used. We found evidence that this imbalance could be partly due to a lack of scientific progress in the development of monitoring and impact evaluation tools. These topics have little development in the agendas of public research organizations in Uruguay. The evidence offered by the survey seems to indicate that, in view of the growing implementation of policies promoting sustainable intensification, there will be space to further diversify the spectrum of policy instruments used, particularly towards a greater use of economic incentive mechanisms.

The case study allowed us to examine the interface between policy making and agricultural research organizations. The role of public research in the development of SAI policies includes, among others, the identification and characterization of technical problems;the generation of technological solutions and recommendations of best agricultural practices that ensure the sustainability of the production system; the development of models and tools to quantify the environmental and economic impact of crop production systems; and the development of indicators for impact assessment. Moreover, given the complexity ofassessing the different dimensions of sustainability, R&D organizations must deepen their efforts in the development of indicators that allow effective monitoring and evaluation of the impact of production systems on natural resources and their long-term sustainability.

Both, the policy survey and the case study suggest the need to make further progress on capacity building and research onthe assessment of how production systems impact the different dimensions of sustainability, the generation of indicators for defining baselines and monitoring the outcomes from policy implementation.

The results also suggest that the abruptintensification of crop production systems resulting from changes in international markets, and the country compliance with international agreements and

regulations, were the main forces that generated the political will to create and implement new public SAI policies.

Acknowledgements

This paper draws upon the research project *'Políticas públicas e institucionalidad para la intensificación sostenible',* supported by the Cooperative Program for Technological Development in Agriculture in the Southern Cone (PROCISUR), with the involvement of INTA (Argentina), Embrapa (Brazil), INIA (Chile), INIA (Uruguay) and IPTA (Paraguay). Useful comments andsupport from all the participants to that projectare gratefully acknowledged.

References

Albright, M.K. et al., 2016. Public and private sector interventions for global food security - A report of the Aspen Food Security Strategy Group.

Batáry, P. et al., 2015. The role of agri-environment schemes in conservation and environmental management. Conservation Biology, 29(4), pp.1006–1016.

Campbell, B.M. et al., 2014. Sustainable intensification: What is its role in climate smart agriculture? Current Opinion in Environmental Sustainability, 8, pp.39–43.

CEPAL (Comisión Económica para América Latina y el Caribe). 2012. El desafío de la sostenibilidad ambiental en América Latina y el Caribe, Santiago de Chile. http://repositorio.cepal.org/bitstream/handle/11362/37791/LCM23_es.pdf

De Sy, V., Herold, M., Achard, F., Beuchle, R., Clevers, J.G.P.W., Lindquist, E. y Verchot, L.V. 2015. Land use patterns and related carbon losses following deforestation in South America. *Environmental Research Letters*, 10(12): 124004.

Ekboir, J.M., 2003. Research and technology policies in innovation systems: Zero tillage in Brazil. Research Policy, 32(4), pp.573–586.

Ernst, O.; Siri-Prieto, G. (2011) ' Agriculture in Uruguay: Its Trajectory and Consequences ', In: Ribeiro A. [Ed.]. II National Symposium on Agriculture. University of the Republic. Faculty of Agronomy. Hemisphere South. Pp. 149-63.

FAO. 2016. *El Estado de los bosques del mundo 2016. Los bosques y la agricultura: desafíos y oportunidades en relación con el uso de la tierra.* Roma. http://www.fao.org/3/a-i5588s.pdf

FAO.2012. *Pérdidas y desperdicio de alimentos en el mundo – Alcance, causas y prevención.* Roma.

FAO. 2011. *El estado de los recursos de tierras y aguas del mundo para la alimentación y la agricultura. La gestión de los sistemas en situación de riesgo.* Organización de las Naciones Unidas para la Alimentación y la Agricultura, Roma, y Mundi-Prensa, Madrid. http://www.fao.org/3/b-i1688s.pdf

FAO, FIDA y PMA. 2015. *El estado de la inseguridad alimentaria en el mundo 2015. Cumplimiento de los objetivos internacionales para 2015 en relación con el hambre: balance de los desiguales progresos.* Roma, FAO. http://www.fao.org/3/a-i4646s.pdf

Geels, F.W., 2002. Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. *Research Policy*, Vol. 31, pp. 1257-74.

Hill, M.; Varone, F. (Eds.) (2017) The Public Policy Process. London and New York: Routledge. Seventh edition. ISBN 978- 1- 138- 90950- 2, www.routledge.com/9781138909502

Hodge, I., Hauck, J. & Bonn, A., 2015. The alignment of agricultural and nature conservation policies in the European Union. Conservation Biology, 29(4), pp.996–1005.

Howlett, M.; McConnell, A.; Perl, A. (2015) 'Streams and stages: Reconciling Kingdon and policy process theory', *European Journal of Political Research*, Vol. 54 (3), pp419-34. https://doi.org/10.1111/1475-6765.12064

Howlett, M.; McConnell, A.; Perl, A. (2016) 'Weaving the Fabric of Public Policies: Comparing and Integrating Contemporary Frameworks for the Study of Policy Processes', *Journal of Comparative Policy Analysis: Research and Practice*, Vol. 18 (3), pp273-89. https://doi.org/10.1080/13876988.2015.1082261

Hunter, M.C. et al., 2017. Agriculture in 2050: Recalibrating targets for sustainable intensification. BioScience, 67(4), pp.386–391.

INIA, 2016. Desafíos de la intensificación sostenible para la política pública. Serie técnica. INIA.

Kingdon, J. (1984) Agendas, Alternatives, and Public Policies. Boston: Little, Brown & Co.

Klein, R.J.T. & Möhner, A., 2011. The Political Dimension of Vulnerability: Implications for the Green Climate Fund. IDS Bulletin, 42(3), pp.15–22.

Levin, K. et al., 2015. Designing and Preparing Intended Nationally Determined Contributions (INDCs). World Resource Institute, p.124. Disponible en: http://www.wri.org/publication/designing-and-preparing-indcs.

Matthews, A., 2013. Greening agricultural payments in the EU's Common Agricultural Policy. Bio-based and Applied Economics, 2(1), pp.1–27.

Naciones Unidas, 1998. Protocolo de Kioto de la convención marco de las naciones unidas sobre el cambio climático. Protocolo de Kyoto, 61702, p.20. Disponible en: http://unfccc.int/resource/docs/convkp/kpspan.pdf.

Neufeldt, H. et al., 2013. Beyond climate-smart agriculture: toward safe operating spaces for global food systems. Agriculture & Food Security, 2(1), p.12. Disponible en: http://agricultureandfoodsecurity.biomedcentral.com/articles/10.1186/2048-7010-2-12.

OECD/FAO (2015), *OCDE-FAO Perspectivas Agrícolas 2015*, OECD Publishing, París. DOI: http://dx.doi.org/10.1787/agr_outlook-2015-es

Pérez-Bidegain, M.; Hill, M; Clerici. C.; Terra, J.A.; Sawchik, J.; García-Préchac, F. (2018): 'Regulatory utilization of USLE/RUSLE erosion rate estimates in Uruguay: a policy coincident with the UN Sustainable Development Goals' [in Press].

Petersen, B.; Snapp, S. (2015) 'What is sustainable intensification? Views from experts', *Land Use Policy*, Vol. 46, pp1-10.

Pretty, J.N., 1997. The sustainable intensification of agriculture. Natural Resources Forum, 21(97), pp.247–256. Disponible en: http://dx.doi.org/10.1111/j.1477-8947.1997.tb00699.x.

Pretty, J. & Bharucha, Z.P., 2014. Sustainable intensification in agricultural systems. *Annals of Botany*, 114(8), pp.1571–1596.

Rosas, F. & Buonomo, M., 2016. Marco conceptual para un desarrollo del sector agropecuario basado en la intensificación sostenible, (En) INIA, 2016. Desafíos de la intensificación sostenible para la política pública. Serie técnica. INIA.

Royal Society (2009) Reaping the benefits: science and the sustainable intensification of global agriculture. London: The Royal Society.

Sabatier, P.A. (1991) 'Toward Better Theories of the Policy Process', *Political Science and Politics*, Vol. 24 (2), pp147-156.

Silva, M.E.; Bervejillo, J.E.; Lanfranco, B.; Ferraro; B. 2016. La iniciativa «red de soluciones para el desarrollo sostenible» y las políticas públicas de intensificación sostenible en Uruguay, (En) INIA, 2016. Desafíos de la intensificación sostenible para la política pública. Serie técnica. INIA.

Sotirov, M.; Memmler, M. (2012) 'The advocacy coalition framework in natural resource policy studies - recent experiences and further prospects', *Forest Policy and Economics*, Vol. 16, pp51-64. https://doi.org/10.1016/j.forpol.2011.06.007

Tittonell, P., 2014. Ecological intensification of agriculture-sustainable by nature. Current Opinion in Environmental Sustainability, 8, pp.53–61. Disponible en: http://dx.doi.org/10.1016/j.cosust.2014.08.006.

United Nations, 1992. Rio Declaration on Environment and Development. Environmental Conservation, 19(04), p.366.

United Nations, Department of Economic and Social Affairs, Population Division. 2015. *World Population Prospects: The 2015 Revision, Key Findings and Advance Tables*. Working Paper No. ESA/P/WP.241. https://esa.un.org/unpd/wpp/Publications/Files/Key_Findings_WPP_2015.pdf

United Nations, Human Settlements Programme, 2016. Urbanization and development: Emerging futures. Nairobi, Kenya.

Yin, R. K. (2003). Case study research: Design and method (3rd ed.). Thousand Oaks, CA: Sage.

[1]The authors cite also Heclo, 1972; Smith, 1976; and Jenkins, 1978.
[2] Intensity was ranked by the authors for each policy and dimension of sustainability. The resulting rates where then validated with local and regional experts on public agricultural policies.

SOCIO-ECONOMIC ANALYSIS OF BREEDERS, BREEDERS' ASSOCIATIONS AND MEMBER RELATIONS, A CASE STUDY OF SIVAS

Murat Demirbük
United Nations Development Programme, Göksu Taşeli Watershed Development Project, Turkey
E-mail: mdemirbuk@ hotmail.com

Nuray Kızılaslan
Gaziosmanpaşa University, Faculty of Agriculture, Department of Agricultural Economics, Turkey

Abstract

Farmers' organization is an important tool for individual farmers to compete with big companies in agricultural sector and adapt changing market conditions. Small and medium size farmers have to organize to survive and improve income. Especially in developing countries, organization level is below the desired. The purpose of this research is to identify breeders' socio-economic status, their problem and relations with associations and association performance to fulfill their tasks within legal frame. The scope of the work was constituted of 3 Breeders Association members organized in the Sivas province of Turkey. These were Cattle, Sheep and Goat Breeders' Association and Associations of Beekeepers. A survey was conducted with 369 breeders to collect primary data. 94 cattle breeders, 168 sheep and goat breeders and 107 beekeepers. Non parametric tests usedto analyze the data, namely Chi square, Kruskal-Wallis and Mann-Whitney U tests. It was determined that member of different associations differed statistically in terms of income, marketing, participation in general assemblies, training and basic information sources, convincing factor to become member. However there was no difference in terms of taking part in management board and the idea of investing among members.It was found that 27.5% of the respondents did not know their associates' task and responsibilities.Government, unions and farmers must work jointly and each side take some actions for more effective farmer organization. It can be suggested that the associations have to do much more serious and intensive work on the subject of providing input, agricultural extension and especially the marketing organizations for their members. All activities and programs have to be designed by the associations according to member's availability, their workload and daily and seasonal agricultural calendar.
Keywords: Breeders' Association, Farmer, Member, Organization.

Özet

Çiftçi örgütlenmesi, bireysel çiftçilerin tarım sektöründeki büyük firmalarla rekabet edebilmeleri ve değişen pazar koşullarına uyum sağlayabilmeleri için önemli bir araçtır. Küçük ve orta ölçekli çiftçiler varlıklarını sürdürebilmek ve gelirlerini artırabilmek için örgütlenmek zorundadırlar. Özellikle kalkınmakta olan ülkelerde örgütlenme düzeyi istenilen seviyenin altındadır. Bu araştırmanın amacı yetiştiricilerin sosyo-ekonomik durumlarını, problemlerini, birlikleri ile olan ilişkilerini ve birliklerin görev yasal çerçeve içerisindeki görevlerini yerine getirme durumlarını belirlemektedir. Çalışmanın kapsamını Sivas ilinde örgütlü bulunan üç yetiştirici birliği üyeleri oluşturmaktadır. Bu birlikler sırasıyla; Damızlık Sığır, Damızlık Koyun Keçi ve Arı yetiştiricileri birlikleridir. 94 sığır yetiştiricisi, 168 koyun ve keçi yetiştiricisi, 107 si arı yetiştiricisi olmak üzere toplam 369 yetiştirici ile anket yapılmıştır. Elde edilen verilerin analizinde parametrik olmayan Ki-kare, Kruskal-Wallis ve Mann-Whitney U testleri kullanılmıştır. Farklı birliklerin üyelerinin gelir, pazarlama, genel kurullara katılım, eğitim ve bilgi kaynakları ile üyelik aşamasında ikna edici faktörler açısından istatistiksel olarak farklılaştığı tespit edilmiştir. Buna karşın yönetim kurullarında görev alma ve ilave yatırım yapma konusunda herhangi bir farklılık gözlemlenmemiştir. Anketi yanıtlayanların %27,5'i üye oldukları birliklerin görev ve sorumluluklarını bilmediklerini beyan etmişlerdir. Kamunun, birliklerin ve

çiftçilerin daha etkin bir çiftçi örgütlenmesiiçin birlikte çalışmaları gerekmektedir. Birliklerin girdi temini, tarımsal yayım ve pazarlama konularında daha ciddi ve yoğun bir mesai harcamaları gerekmektedir. Birlikler yapacakları tüm aktiviteleri ve programları üyelerinin uygun olduğu zamanlarda, iş yüklerine göre ve günlük ve mevsimsel tarım takvimine göre düzenlemelidirler.
Anahtar Kelimeler: Yetiştirici Birliği, Çiftçi, Üye, Örgütlenme

1.Giriş

Çiftçi örgütlenmesi, bireysel çiftçilerin tarım sektöründeki büyük firmalarla rekabet edebilmeleri ve değişen pazar koşullarına uyum sağlayabilmeleri için önemli bir araçtır. Küçük ve orta ölçekli çiftçiler varlıklarını sürdürebilmek ve gelirlerini artırabilmek için örgütlenmek zorundadırlar. Özellikle kalkınmakta olan ülkelerde örgütlenme düzeyi istenilen seviyenin altındadır.Her düzeyde önem atfedilmesine rağmen üretici örgütlenmesi konusunda Türkiye'deistenilen seviyeye ulaşılamamıştır.Üreticilerin mevcut örgütlere katılımı veya ihtiyaçları doğrultusunda yeni örgütlenmeleroluşturmaları çeşitli nedenlerle istenilen hızda ilerlememekte ve çeşitli faktörlertarafından etkilenmektedir. Bu faktörlerin bir kısmı yasal düzenlemelerden kaynaklanırken önemli bir bölümü de mevcut örgütlerin görev ve sorumluluğunu yerine getirmemesi, üyelerin bu örgütler üzerinde etkin olamaması gibi nedenlerden kaynaklanmaktadır.

Üreticilerin etkili bir biçimde örgütlenmesi tarımsal üretimi arttırmanın, kaliteli ürün elde etmenin ve tarım ile uğraşanların yaşam düzeylerini yükseltmenin en önemli yollarından biridir. Gelişmiş ülkelere bakıldığında, tarımsal kalkınmanın gerçekleştiği ve üretici örgütlerinin de güçlü bir şekilde var olduğu görülmektedir. Tarımpolitikalarının oluşturulması, uygulama koşullarının belirlenmesi ve böylece politikmekanizmaları etkileyebilmek, pazarda etkin olabilmek, çağdaş üretim yöntemlerinikullanıp verimliliği arttırarak kırsal alan kalkınmasını gerçekleştirmek ancak örgütlenmeden gelen güçle olasıdır (İnan ve ark., 2000).

Gelişmiş ülkelerdeki etkin çiftçi örgütleri demokratik birer baskı unsurları olarak çiftçilerin seslerinin duyurulması ve üretim etkinliğini artırmak için eğitim ve yayım faaliyetlerinde de bulunmaktadırlar. Kalkınmakta olan ülkelerde ise örgütlenmenin ya hiç oluşmadığı ya da etkin olmadığı, teorik olarak çiftçi kuruluşları olmakla birlikte, daha çok devlet kuruluşları gibi çalıştıkları görülmektedir. Ancak özellikle kalkınmakta olan ülkelerde çiftçi örgütlerinin kurulması ve etkin hale getirilmesi büyük önem taşımaktadır (Çetin, 2013).

Bir üretici örgütlenmesi, işlevlerine ve amaçlarına dayanılarak tanımlanır. Önemli olan tarım üreticilerinin kendi inisiyatiflerine dayanılarak kurulmuş olmaları ve öncelikle üretim ve satışları pazar ihtiyaçlarına uyarlayarak üye çiftliklerin ekonomik etkinliklerinin geliştirilmesi amacını taşımalarıdır. Bu nedenle üretici örgütlenmesi terimi herhangi bir yasal formu işaret etmemekle birlikte ana amacı üye üreticilerin ürünlerine pazarda yer açmak olan organizasyonu tarif ettiği söylenebilir. Literatürde ekonomik ve teknik anlamda hizmet sağlayan üretici örgütleri farklı adlarla anılmaktadır. Tüm bu farklı organizasyonların ortak paydası üyelerinin refah düzeyini artırmaktır. İlave olarak üyelerin sahip olduğu üretici örgütleri, kendilerine özgü fayda sağlayacak şekilde üyeler tarafından kurulur, denetlenir ve yönetilir (Falkowski ve Ciaian, 2016).

Bu çalışma yetiştirici birlikleri ile ilgili yasaya dayanarak Sivas ilinde örgütlenmiş, Damızlık Sığır Yetiştiricileri Birliği (DSYB), Damızlık Koyun Keçi Yetiştiricileri Birliği (DKKYB) ve Arı Yetiştiricileri Birliği (AYB) temel alınarak yapılmıştır.Bu çalışma, yetiştiricilerin sosyo ekonomik durumlarının, yetiştirici birlikleri ile üyeler arasındaki ilişkilerinin analizi ile mevcut durumun ortay konulması sonucu daha etkin bir örgütlenme için yapılabilecekler konusunda öneriler geliştirmek amacıyla yapılmıştır.

2. Materyal ve Yöntem

Çalışmanın ana verileri Sivas'ta örgütlübulunan yetiştirici birliklerinin üyelerinden yüz yüze anket yolu ile elde edilen bilgilerden oluşmaktadır. Örneklem sayısının tespitinde, ana kütleninvaryansı ve ana kütledeki birim sayısı bilindiği için;

$n = \frac{N*(Z\alpha/2)^2*\sigma^2}{(N-1)d^2+\left(\frac{Z\alpha}{2}\right)^2*\sigma^2}$ Formülü kullanılmıştır (Yamane, 2006).

Yapılanhesaplama sonucu örneklem hacmi, Damızlık Sığır Yetiştiricileri Birliği için 94,Koyun-Keçi yetiştiricileri birliği için 168 ve Arı Yetiştiricileri Birliği için ise 107olarak bulunmuştur.

Ana kütlenin dağılımının bilinmediği veya normal dağılım koşulunun yerinegelmediği durumlarda parametrik olmayan hipotez testi yöntemleri kullanılmaktadır.Parametrik olmayan testler çok fazla koşul gerektirmediği için kullanım alanlarıoldukça geniştir (Göktolga, 2015).

Verilerin normal dağılıma sahip olup olmadıklarınıgörebilmek için Kolmogorov-Smirnov ve Shapiro-Wilk testleri kullanılmıştır.Verilerin normal dağılımgöstermediği tespit edildikten sonra parametrik olmayan testlerin kullanılmasına karar verilmiştir. Khi kare, Kruskal-Wallis ve Mann-Whitney U testlerikullanılarak veriler analiz edilmiştir.

3. Bulgular ve Tartışma

Yetiştiricilerin %66'sı ilköğretim mezunu olarak görülmektedir. Hiç eğitimi olmayanların oranı %3.5'tir, üniversite mezunlarının oranı ise %6.5'tir.

Bilginturan ve Ayhan'ın (2009), Burdur İlinde yaptıkları çalışmada, koyun yetiştiricilerinin % 90,3'ünün ilkokul, % 7.7'sinin lise, % 0.5'inin yüksekokul mezunu olduğu görülürken %1.5'inin ise okuryazar olmadığı görülmektedir. Eğitimi olmayanların oranı Sivas'taki çalışmada daha yüksek bulunmuş buna karşın lise ve yüksekokul mezunu olan koyun yetiştiricilerinin oranı da Sivas'ta yüksek çıkmıştır.

Ege ve Orta Anadolu Bölgesindeki Damızlık Sığır Yetiştiricileri Birliklerine bağlı süt sığırcılık işletmelerine yönelik yapılan çalışmada işletme sahiplerinin % 0.9'unun okuma yazma bilmediği % 11.4'ünün okuryazar, % 63'ünün ilköğretim, % 20.9'unun lise, %1.6'sının da lisans düzeyinde mezun olduğu tespit edilmiştir (Murat, 2011). Edirne'de yapılan çalışmada, işletme sahiplerinin % 75.4'ü ilkokul mezunu, %21.1'i ortaokul mezunu, %3.5'i lise mezunu olup yüksekokul mezunu bulunmadığı belirlenmiştir (Önal ve Özder, 2008). Samsun'da yapılan çalışmada, üretici örgütüne üye olanlardan, eğitim durumu okuryazar olmayan, ilkokul ve ortaokul mezunlarının toplamı %91.3'ü bulmaktadır (Aydoğan ve Yulafçı, 2014). Uşak ilinde tarımsal üretici örgütleri üyelerine yönelik yapılan çalışmada ise ilköğretim mezunu %55.3, orta öğretim mezunu %38.3 ve yükseköğretim mezunu %6.4'tür (Sağlam, 2013). Edirne DSYB üyeleri ile ilgili yapılan çalışmada işletme sahiplerinin %70'i lise, %19'u ortaokul, %7'si ilkokul ve %4'ü yüksekokul mezunudur (Karaturhan ve ark., 2014).

Yetiştiricilerin yaş gruplarına göre dağılımlarına bakıldığında 40-60 yaş arası grup %60'a yakın bir oranı oluşturmaktadır. Çalışma bölgesindeki yetiştiricilerin yaş ortalaması 49.3 olarak bulunmuştur.

Samsun'da yapılan çalışmada üreticilerin ortalama yaşları 51.5 olarak tespit edilmiştir (Aydoğan ve Yulafçı, 2014). Van'da yapılan bir çalışmada tarımsal üretici örgütüne üye olan üreticilerin % 12.2'sinin 22-30, % 15.3'ünün 31-40, % 37.8'inin 40-50 ve % 34.7'sinin 51 ve üzeri yaş grubunda oldukları belirlenmiştir (Terin ve Ateş, 2010). Sivas'ta 50 yaş üzeri yetiştiricilerin oranı %51 olarak bulunmuştur.

Yine Uşak'ta yapılan çalışmada 20-30 yaş grubunda %11.9, 31-40 yaş grubunda %26.1, 41-50 yaş grubunda %31.1, 51-60 yaş grubunda %20.8 ve 61 yaş ve üzeri yaş grubunda oran ise %10 dur. Uşak'ta 30 ile 50 yaş arası grup % 57.2 iken Sivas'ta %44.1'dir (Sağlam, 2013).

Yetiştiricilerin yaklaşık %5'i sosyal güvenlikten mahrumdur. Sosyal güvenliği olmayanların çok büyük bir çoğunluğu (%78.9) DKKYB üyesidir. Emekli sandığına bağlı olanların ise %77.1'i AYB üyesidir. Yetiştiricilerin yarısından fazlası (%54.5) Bağ-Kurludur. SSK ve Emekli sandığına kayıtlı olduğunu belirten %40'ın üzerindeki yetiştiricinin başka bir gelir kaynağına sahip olduğu söylenebilir. Arıcılık faaliyetinin kamu çalışanları tarafından da yapılabilecek ek bir faaliyettir. Bu nedenle AYB üyelerinin emekli sandığı üyelik oranları diğer faaliyet alanlarındaki yetiştiricilere göre daha yüksek çıkmaktadır.

Gelir açısından bakıldığında, DKKYB üyelerinin düzeltilmiş ortalama geliri diğer birlik üyelerinden yüksektir. En düşük gelir ise AYB üyelerine aittir. AYB üyelerinin önemli bir kısmı arıcılık faaliyetini ek gelir getirici bir faaliyet olarak ve birincil işlerini aksatmamaya çalışarak yapmaktadır.

Farklı birliklerin üyeleri arasında faaliyet gelirleri açısından istatistiksel olarak anlamlı bir farklılık olduğu görülmüştür. Farklılığın kaynağını tespit edebilmek için ikili gruplar halinde birliklere Mann-Whitney U testi uygulanmıştır. Tüm gruplar açısından istatistiksel olarak bir fark vardır ancak en büyük fark DKKYB ile AYB üyeleri arasındadır.

Yetiştiricilerin mesleki deneyim durumları ve 49.3 olan yaş ortalamaları birlikte değerlendirildiğinde son yıllarda çalışma kapsamına giren yetiştiricilik faaliyetlerine gençlerin ilgi göstermediği söylenebilir. 5 yıldan daha az mesleki deneyimi olanların oranı %7.6'dır. Samsun'da yapılan çalışmada tarımsal üretici örgütüne üye olan üreticilerin ortalama tarımsal deneyimi 22.6 yıl bulunmuştur (Aydoğan ve Yulafçı, 2014). Van'da ise üreticilerin %71.2'sinin 21 yıl ve üzeri deneyime sahip olduğu ve ortalama deneyim süresinin 30 yıl olduğu saptanmıştır (Terin ve Ateş, 2010).

Birlik aracılığı ile ürünlerini pazarlayanların %77.5'i DSYB üyeleridir. Bu oran DKKYB' inde %17.5, AYB de ise sadece %5'tir.DSYB'nin araştırma bölgesinde bir süt toplama organizasyonunun olması ürünlerin birlik aracılığı ile pazarlanması üzerinde oldukça etkilidir denebilir. Ancak AYB üyelerinin %92.5'i, DSYB üyelerinin %62.8'i ve DKKYB üyelerinin ise %60.7'si ürünlerini kendi olanakları ile pazarladığını bildirmiştir. Pazarlama ile ilgili durum Tablo1'de verilmiştir.

Tablo 1. Yetiştiricilerin Ürünleri Pazarlama Durumu

Ürün Pazarlama Durumu		**Yetiştirici Birlikleri**			**TOPLAM**
		DSYB	**DKKYB**	**AYB**	
Birlik aracılığı ile	Sayı	31	7	2	40
	Grup içindeki %	77.5	17.5	5.0	100.0
	Birlik içindeki %	33.0	4.2	1.9	10.8
Kendi olanaklarım ile	Sayı	59	102	99	260
	Grup içindeki %	22.7	39.2	38.1	100.0
	Birlik içindeki %	62.8	60.7	92.5	70.5
Aracılara/Toptancılara	Sayı	4	59	6	69
	Grup içindeki %	5.8	85.5	8.7	100.0
	Birlik içindeki %	4.3	35.1	5.6	18.7
Genel	Sayı	94	168	107	369
	Toplam %	25.5	45.5	29.0	100.0
x^2= 112.311 SD= 4 p =0,000					

Genel olarak birliklerin pazarlama organizasyonları konusunda yetersiz kaldığı söylenebilir. Toplamda yetiştiricilerin %18.7'si ürünlerini aracılara/toptancılara verdiğini belirtmiştir ve bu grubun içerisinde ise DKKYB üyeleri %85.5 gibi yüksek bir orandadır. Samsunda yapılan çalışmada üyesi olduğunuz tarımsal üretici örgütü ürünlerinize pazar bulma çalışması yapıyor mu sorusuna üyelerin % 44.2'si evet, % 55.8'i ise hayır yanıtını vermiştir. Tarımsal örgüte üye olan üreticilere, tarımsal örgütün başarılı olması için neler yapılması gerektiği sorulduğunda üreticilerin büyük bölümü, tarımsal örgütlerin pazarlama ve ucuz girdi sağlama konusunda daha aktif olmasını istediklerini belirtmişlerdir (Aydoğan ve Yulafçı, 2014).

Erzurum'da yapılan bir çalışmada üretici örgütlerine üye olanların %57.14'ü birliklerin etkin bir pazarlama yapmadığını, %28.57'si etkin pazarlama yaptığını belirtirken %14.29'u ise kararsız olduğunu beyan etmiştir. Üyelerin %60.71'i birliklerin ürünlerine katma değer kazandırmadığını dile getirmiştir (Sarı, 2016).Uşak'ta yapılan çalışmada, sadece tüccarlar aracılığıyla ürün pazarlayan üreticiler %53.4'dür. Ürünlerini pazarda sattığını söyleyenlerin oranı ise %11.3'tür. Örgütler aracılığıyla pazarlayan üyelerin oranı %19.7'dir (Sağlam, 2013).

Tablo 2. Yetiştiricilerin Birliklere Üye Olmasında Etkili Faktörler

Etkili Faktör		Yetiştirici Birlikleri			TOPLAM
		DSYB	DKKYB	AYB	
Aile	Sayı	3	7	5	15
	Grup içindeki %	20.0	46.7	33.3	100.0
	Birlik içindeki %	3.2	4.2	4.7	4.1
	Genel %	0.8	1.9	1.4	4.1
Arkadaş	Sayı	18	31	9	58
	Grup içindeki %	31.0	53.4	15.5	100.0
	Birlik içindeki %	19.1	18.5	8.4	15.7
	Genel %	4.9	8.4	2.4	15.7
Birlik Kurucuları	Sayı	16	24	18	58
	Grup içindeki %	27.6	41.4	31.0	100.0
	Birlik içindeki %	17.0	14.3	16.8	15.7
	Genel %	4.3	6.5	4.9	15.7
Danışman	Sayı	11	37	6	54
	Grup içindeki %	20.4	68.5	11.1	100.0
	Birlik içindeki %	11.7	22.0	5.6	14.6
	Genel %	3.0	10.0	1.6	14.6
Destekleme için Yasal zorunluluk	Sayı	26	59	58	143
	Grup içindeki %	18.2	41.3	40.6	100.0
	Birlik içindeki %	27.7	35.1	54.2	38.8
	Genel %	7.0	16.0	15.7	38.8
Diğer	Sayı	20	10	11	41
	Grup içindeki %	48.8	24.4	26.8	100.0
	Birlik içindeki %	21.3	6.0	10.3	11.1
	Genel %	5.4	2.7	3.0	11.1
x^2= 41.581		SD= 10			p =0.000

İstatistiksel olarak, üye olunan örgüt ile pazarlama durumu arasındaki ilişki tüm pazarlama yolları için farklılaşmaktadır. Her birlik üretim şekline, yetiştirme tekniğine göre kendine has bir pazarlama yönteminde yoğunlaşmış görünmektedir.

Toplamda üye olmadan önce birliklerden haberdarım diyenlerin oranı %34.7 haberdar değilim diyenlerin oranı ise % 65.3'tür. Bir başka deyişle birlik üyelerin yarısından fazlası birliklerden ancak üye olma aşamasında haberdar olmuşlardır. Ancak bu oran %72 ile DKKYB üyeleri için oldukça fazladır.DSYB üyelerinin %47.9'u, AYB üyelerinin %33.6, DKKYB üyelerinin ise %28'i üye olmadan önce birlikler ile ilgili bilgi sahibidir. Birlikler ile üye olmadan önce birliklerden haberdar olma durumu üye olunan birlikten bağımsız değildir. Bu bağımlılık halinin DSYB üyelerinin durumundan kaynaklandığı söylenebilir.

Yetiştiricilerin birlikler ile ilgili bilgi kaynaklarına bakıldığında sırasıyla İl/İlçe Tarım ve Orman Müdürlüklerinden bilgi alma konusunda AYB üyeleri %45.7 ile ilk sırada görülmektedir. Bilgi kaynağı danışman olan üyeler açısından ise DKKYB üyeleri %66.2 ile en yüksek dilimi oluşturmaktadır. Yine AYB üyeleri %87.5 ile bilgi kaynağı İnternet/TV olan grup içerisinde çok büyük bir çoğunluğu oluşturmaktadır. Genel toplamda ise yetiştiricilerin bilgi kaynaklarında ilk sırayı %42.3 ile başka bir çiftçi/çevre seçeneği almaktadır, %35 ile il/ilçe müdürlükleri ise ikinci sırada yer almaktadır. Genel toplam içerisinde en düşük payın ise %2.2 ile internet/tv seçeneği olduğu görülmektedir.

Farklı birliklere üye yetiştiricilerin bilgi kaynakları açısından aralarında istatistiksel olarak anlamlı bir farklılık olduğu görülmüştür.AYB üyelerinin eğitim seviyelerin yüksekliği, kamu kuruluşlarında çalışıyor olmaları internet ile bilgiye erişim oranını bu gurup için artırmaktadır. Bu grup aynı zamanda

diğer yetiştirici gruplarına göre faaliyetin dönemsel olması nedeniyle kurumları ziyaret edecek daha çok vakit bulmaktadırlar.

Üye olma aşamasında ikna edici faktör ile ilgili soruya verilen yanıtlar Çizelge 3.2'de verilmiştir. Birliklerin kurucuları ve yetiştiricinin arkadaş çevresinin etkisi ile üye olanların oranı %15.7 ile eşit görülmektedir. Danışmanların en etkili olduğu birlik DKKYB'dir. Danışmanlar aynı zamanda DKKYB üyeleri için halk elinde ıslah projesinin de yürütücüleri konumunda olduklarından etkili oldukları söylenebilir. Birlik kurucuları ise %41.4 ile DSYB üyeleri üzerinde en çok etkili olan faktördür.

Bakanlık tarafından yetiştiricilere ödenen desteklemelerden yararlanabilmek için üye olduğunu belirtenler %38.8 ile ilk sırayı almaktadır. Samsun ilinde yapılan araştırmada, üreticilerin %59.3 desteklemelerden yararlanmak için bir tarımsal örgüte üye olduklarını belirtmişlerdir (Aydoğan ve Yulafçı, 2014).

Üye olunan birlik ile üye olma aşamasında etkili olan faktörler arasında istatistiksel açıdan %5 anlamlılık düzeyinde bir fark olduğu görülmektedir. DKKYB üyeleri arasında danışman etkisi ile üye olma oranı %68.5 ile oldukça yüksektir. Birliklere üye olma aşamasında etkili faktör konusunda DKKYB'nin diğer birliklerden ayrıldığı söylenebilir. Desteklemelerden yararlanmak için üye olma seçeneği ise AYB üyeleri için fark yaratacak kadar öne çıkmaktadır.

Yetiştiricilerin üye oldukları birliklerin genel kurullarına katılımlarına bakıldığında tamamına katılıyorum diyenlerin %47.1'ini AYB üyelerinin oluşturduğu görülmektedir. Hiçbirine katılmadığını beyan edenlerin içerisinde ise DKKYB üyeleri %42.8 ile ilk sıradadır. Bu yetiştiricilerin önemli bir bölümü yüz yüze anket esnasında aynı zamanda sürü bakıcısı oldukları için genel kurullara katılamadıklarını iletmişlerdir. Genel duruma bakıldığında ise tamamına katılıyorum diyenlerin oranı %18.4, hiçbirine katılmıyorum diyenlerin oranı ise neredeyse %40'tır (39.3).

Samsun'da yapılan çalışmada farklı üretici örgütlerinin genel kurullarına katılım konusunda % 74.4 gibi olumlu bir sonuç çıkmıştır. Uşak'ta yapılan çalışmada ise "Hepsine Katılıyorum" diyenlerin oranı %10,.ile Sivas'taki orandan daha düşüktür. "Çoğuna Katılıyorum" diyenler %11.1 ile yine Sivas'taki orandan (%21.4) çok daha düşüktür. "Hiç Katılmıyorum" diyenlerin oranı ise Uşak'ta %27.5dir. %13.1'lik bir oran ise soruyu yanıtsız bırakmıştır (Sağlam, 2013).

Üye olunan birlik ile üyelerin genel kurullara katılım oranları arasında istatistiksel açıdan %5 anlamlılık düzeyinde bir ilişki olduğunu görülmektedir. AYB üyelerinin %29.9'u genel kurulların tamamına katılırken diğer birlik üyelerinde bu oran sırasıyla %13.7 ve 13.8 ile birbirine oldukça yakındır. AYB üyelerinin diğer birlik üyelerine göre iki kattan daha fazla katılım gösterdikleri görülmektedir. Genel kurulların çoğuna ve çok azına katılıyorum diyenler içerisinde DKKYB üyeleri sırasıyla %50.6 ve %55.8 ile diğer iki birlik üyelerinden oldukça yüksek orandadır.

Yetiştiricilerin birlik yönetimlerinde görev alma durumları Tablo 3.3'de verilmiştir.

Tablo 3. Yetiştiricilerin Birlik Yönetimlerinde Görev Alma Durumu

Yönetimde Görev Alma		**Yetiştirici Birlikleri**			**TOPLAM**
		DSYB	DKKYB	AYB	
Evet	Sayı	15	16	20	51
	Grup içindeki %	29.4	31.4	39.2	100.0
	Birlik içindeki %	16.0	9.5	18.7	13.8
	Genel %	4.1	4.3	5.4	13.8
Hayır	Sayı	79	152	87	318
	Grup içindeki %	24.8	47.8	27.4	100.0
	Birlik içindeki %	84.0	90.5	81.3	86.2
	Genel %	21.4	41.2	23.6	86.2
x^2= 5.096		SD= 2			p =0.078

Üye olunan birliklerin yönetim kurullarında görev alma durumları incelendiğinde yetiştiricilerin %13.8'i görev aldığını ifade ederken %86.2'si görev almadığını belirtmiştir. Görev almayanların içerisinde DKKYB üyeleri %47.8 ile en büyük oranı oluşturmaktadır. Samsundaki araştırmada üyelerin tarımsal örgütün yönetiminde %9.4 oranında görev aldıkları tespit edilmiştir (Aydoğan ve Yulafçı, 2014). Uşak'ta yapılan çalışmada ise araştırma kapsamındaki işletmelerin yönetimlerde görev alma oranı %11.9 olarak bulunmuştur (Sağlam, 2013).

Üye olunan birlik ile yetiştiricilerin birlik yönetim kurullarında görev almaları arasında bir farklılık olmadığı görülmektedir. Tüm birlikler içerisinde yönetim kurullarında görev almayanların oranı %81.3 ile %90.5 arasında değişmektedir ve çok ciddi farklılıklar görülmemektedir.

Birliklerin görev ve sorumluluklarını biliyorum diyenlerin oranı sadece %23.6'dır. Birliklerin görev ve sorumluluklarını bilmeyen veya kısmen bilen yetiştiricilerin oranı ise %76.4'tür. Evet, biliyorum diyenlerin içerisinde DSYB üyeleri %28.7 ile en düşük oranı oluştururken, Hayır diyenlerin içerisinde DKKYB üyeleri % 37.4 ile en yüksek oranı oluşturmaktadır. Üyelerin büyük çoğunluğunun görev ve sorumlulukları tam olarak bilmediği söylenebilir. Yetiştiricilerin önemli bir kısmı Bakanlık desteklemelerinden yaralanmak için zorunlu olarak üye olmakta ve bunun sonucunda görev ve sorumlulukları öğrenmeye ihtiyaç duymamaktadır. Ayrıca yönetim kurullarında görev alma oranlarının düşüklüğü de bu sonucun sebeplerinden biri olarak sayılabilir. Ancak eğitim seviyesi daha yüksek olan yetiştiricilerin üye oldukları birliklerin görev ve sorumlulukları ile ilgili bilgi düzeyi diğer yetiştiricilerden daha yüksek görülmektedir.

Uşakta yapılan çalışmada ise üreticilere üye ya da ortak oldukları tarımsal üretici örgütünün ana sözleşmesini okuyup okumadıkları sorulmuştur. Bu tür örgütleri tanımlayan, çalışma konularını, hak ve yetkilerini belirleyen temel belge ana sözleşme ya da tüzüktür. Üreticilerden sadece % 20.3'lük kısmı ana sözleşmeyi okuduğunu bildirmiştir (Sağlam, 2013).

Üye olunan birlik ile üyelerin birliklerin görev ve yetkilerini bilme durumları arasında bir ilişki olduğunu, farklı birlikler ile üyelerin bilgi durumlarının birbirinden bağımsız olmadığı görülmektedir.

Birliklerin üyelerine yönelik eğitim verme durumlarına bakıldığında AYB üyelerinin eğitim alanlar içerisinde %44.2 ile ilk sırada yer aldığı görülmektedir. DKKYB üyelerinin %75'i, DSYB üyelerinin ise %77.7'si birliklerinden herhangi bir eğitim almadıklarını belirtmiştir.

Tarımsal işletmelerin örgütlenme durumu ve buna etki eden faktörlerin belirlenmesi amacıyla Erzurum'da yapılan çalışmada, tarımsal örgütlere üye olanların %67.85'i birliklerin tarımsal yenilikler hakkında kendilerine bilgilendirme yapmadıklarını ifade etmiştir. Sadece %25'i birliklerin üyelere bilgilendirme yaptığını belirtmiştir. Aynı çalışmada üreticiler %60.71 gibi yüksek bir oranla üye oldukları birliklerin kendilerine yeni politikalar hakkında bilgilendirme yapmadığını beyan etmişlerdir. Yeni politikalar ile ilgili örgütlerden bilgilendirme yapıldığını beyan edenlerin oranı ise %32.14 olmuştur. Konu ile ilgili beyanda bulunmayanlar ise %7.14'tür (Sarı, 2016).

Ki-kare analizi sonucu üye olunan birlik ile üyelerin birliklerden eğitim alma durumları arasındaki farklılığın istatistiksel olarak anlamlı olduğu belirlenmiştir. Eğitim alanlar içerisinde en yüksek oran AYB üyelerine aittir. Arıcılığın sezonluk bir faaliyet olduğu değerlendirildiğinde AYB üyelerinin arıcılık faaliyetleri açısından ölü sezon olarak nitelendirilecek sezonda birlikler tarafından eğitime tabi tutulabilmeleri için daha fazla zamana sahip oldukları bilinmektedir. Özellikle küçükbaş hayvan yetiştiriciliğinin çok daha fazla zaman gerektirdiği ve yetiştiricilik faaliyetinin tüm yıla yayıldığı düşünüldüğünde hem birliklerin eğitim organizasyonu hem de yetiştiricilerin katılımı açısından kısıtlayıcı bir etkisi olduğunu kabul etmek gerekir.

Birlikleri çok başarılı bulan üyelerin oranı oldukça düşüktür (%0.8). Başarılı bulanların oranı %32.8, başarısız diyenler ise %37.7'dir. Üye oldukları birlikleri başarısız bulanların içerisinde DSYB üyeleri %48.9 ve çok başarısız diyenler içerisinde de %13.8 ile ilk sıradadır. Yetiştiricilerin üye oldukları birliklerin başarı durumlarını değerlendirmeleri arasında bir farklılık olduğu Khi Kare analizi sonucu tespit edilmiştir.

Birliklerini başarılı bulan grup içerisinde DKKYB üyesi yetiştiriciler %49.6 ile ilk sırda yer almaktadır ve diğer iki birlik üyelerinin toplamına yakın bir orandır. Bu sonuç DKKYB'nin Bakanlık desteği ile çalışma bölgesinde yürüttüğü 'Halk Elinde Islah' projesinden kaynaklandığı yüz yüze anket çalışmaları esnasında yetiştiriciler tarafından ifade edilmiştir. Yetiştiriciler çalışma alanında bu proje ile DKKYB'ni özdeşleştirmiş durumdadır. Fikir beyan etmeyen grup içerisinde de DKKYB üyeleri %61.5 ile çok yüksek bir orana sahiptir. Aynı şekilde projede yer alamayanlar ile birlik faaliyetlerine uzak olan yetiştiricilerin yanıtları nedeniyle bu oranın bu kadar yüksek çıktığı söylenebilir. Fikir beyan

etmeyenler içerisinde DSYB üyeleri %6.4 ile diğer birliklere göre çok düşük bir orandadır. DSYB üyelerinin %48.9'u birliklerini başarısız bulduklarını beyan ederek diğer birliklerden ayrılmışlardır. DSYB'den beklenen hizmetlerin, süt toplama ve suni tohumlama gibi, günlük yerine getirilmesi gereken hizmetler olması yetiştirici memnuniyetlerini ciddi şekilde etkilemektedir.

Isparta'da yapılan bir çalışmada, ildeki DSYB üyelerinin %68.22'sinin verilen hizmetlerinden memnun olmadığı için üyelikten istifa ettiğini görülmüştür. Aynı çalışmada üyelerin %59.4'ü beklentilerinin karşılanmadığını, %20.3'ü ise beklentilerinin karşılandığını belirtmiştir (Akkurt ve Köknaroğlu, 2016). Aydoğan ve Yulafçı (2014) tarafından Samsun'da yapılan çalışmada, tarımsal örgüt size göre başarılı mıdır sorusuna evet diyenlerin oranı %51.8 olarak bulunmuştur.

Uşak'ta yapılan çalışmada damızlık yetiştirici birliklerini başarılı ve çok başarılı bulanların oranı %6.6, başarısız ve çok başarısız bulanların oranı ise %25.7'dir (Sağlam, 2013). Üreticilerin tarımsal üretici örgütlerine üye (ortak) olmaktan doğan memnuniyet dereceleri incelendiğinde çok memnunum diyenler %6.9, memnunum diyenler %32.2, kısmen memnunum diyenler %24.4, memnun değilim diyenler %11.4 ve hiç memnun değilim diyenler ise %12.8 oranındadır (Sağlam, 2013).

Edirne'de yapılan çalışmada ise birliğin genel faaliyetleri hakkında üyelerin %63'ü memnuniyet ifade etmiştir (Karaturhan ve ark., 2014). Farklı illerde yapılan çalışmalarda üretici örgütlerinin başarıları ile ilgili olarak üreticilerin çok farklı düşüncelere sahip oldukları görülmektedir (Akkurt ve Köknaroğlu, 2016. Aydoğan ve Yulafçı, 2014. Sağlam, 2013. Karaturhan ve ark., 2014).

Yetiştiricilerin %52.6'sı faaliyet alanları ile ilgili yatırım yapmayı düşündüklerini %37.1'i yatırım yapmayacaklarını, % 10.3'ü ise yatırım konusunda kararsız olduklarını bildirmiştir. Yatırım kararları ile üye olunan birlikler arasında istatistiksel olarak bir farklılık görülmemiştir.

Çizelge incelendiğinde eğitimi olmayan üyelerin birlik yönetimlerinin ve gelecek dönemde yapılması planlanan çalışmaların belirlendiği genel kurullara katılım konusunda diğer üyelere göre çok geride kaldıkları görülmektedir. Bu grupta genel kurulların hepsine veya çoğuna katılıyorum diyen hiçbir üyenin bulunmadığı görülmektedir.

Tablo 4. Yetiştiricilerin Eğitim Durumlarına göre Genel Kurullara Katılım Durumu

Eğitim Durumu		Hepsine	Çoğuna	Çok Azına	Hiçbirine	Toplam
Eğitimi Yok	Sayı	0	0	3	10	13
	Grup içindeki %	0.0	0.0	23.1	76.9	100.0
	Katılım durumu %	0.0	0.0	3.9	6.9	3.5
	Genel %	0.0	0.0	0.8	2.7	3.5
İlköğretim	Sayı	43	59	44	98	244
	Grup içindeki %	17.6	24.2	18.0	40.2	100.0
	Katılım durumu %	63.2	74.7	57.1	67.6	66.1
	Genel %	11.7	16.0	11.9	26.6	66.1
Lise	Sayı	17	14	25	32	88
	Grup içindeki %	19.3	15.9	28.4	36.4	100.0
	Katılım durumu %	25.0	17.7	32.5	22.1	23.8
	Genel %	4.6	3.8	6.8	8.7	23.8
Yüksek Öğretim	Sayı	8	6	5	5	24
	Grup içindeki %	33.3	25.0	20.8	20.8	100.0
	Katılım durumu %	11.8	7.6	6.5	3.4	6.5
	Genel %	2.2	1.6	1.4	1.4	6.5

Genel kurulların tamamına katılanların %33.3'üyükseköğretim mezunlarıdır.Hiçbirine katılmıyorum diyenlerin oranının yetiştiricilerin eğitim seviyeleri arttıkça azaldığı görülmektedir (sırasıyla %76.9, 40.2, 36.4, ve 20.8 dir). Eş deyişle, eğitim seviyesinin yüksekliği genel kurullara katılımı olumlu yönde etkilediği söylenebilir.Uşak'ta yapılan çalışmada genel kurullara hiç katılmayanların çoğunlukta olduğu görülmektedir. Genel kurulların hepsine katılanlardan ortaöğretim mezunu üreticilerin oranı diğerlerine göre bir miktar daha fazladır (Sağlam, 2013).

Eğitim durumları ile yetiştiricilerin genel kurullara katılımları arasında anlamlı bir farklılık olduğu görülmüştür.

Farklılığın hangi eğitim gruplarından kaynaklandığını görebilmek için yetiştiriciler eğitim durumlarına göre ikişerli olarak Mann-Whitney U testi yapılmıştır. Yapılan testin sonuçları Çizelge 5'de verilmiştir.Gruplar arasında eğitim seviyesine bağlı farklılık arttıkça genel kurullara katılım oranı eğitimliler lehine değişmektedir.

Gelir durumlarına göre bakıldığında 50.000 TL den aşağı gelir olanların %50'den fazlası genel kurulların hiçbirine katılmadığını belirtmektedir. Toplamda ise yetiştiricilerin %39.3'ü genel kurulların hiçbirine katılmamaktadır.Genel kurulların tamamına katıldığını beyan edenlerin oranı %18.4'tür ve bunun içerisinde en yüksek oranı %47'1 ile 50.000 TL'den az geliri olanlardır.

Ki- kare analizi yetiştiricilerin gelir grubu ile genel kurullara katılım arasında bir ilişki olduğunugöstermektedir. Daha az gelire sahip yetiştiricilerin genel kurullara katılımı daha yoğundur. Yetiştiricilerin gelirleri arttıkça genel kurullara katılım oranlarının düştüğü görülmektedir. Bu yetiştiricilerin işletmeleri daha küçüktür ve büyük işletme sahibi yetiştiricilere göre başka bir gelir kaynağına sahip değildirler. Bu nedenle tek gelir kaynakları olan faaliyetleri ile daha çok ilgili oldukları söylenebilir.Büyük işletme sahiplerinin iş yoğunluğunun fazla olduğu ve yetiştiricilik faaliyetleri dışında uğraşlarının da olduğu çalışma sahasında gözlemlenmiştir.

Tablo 5. Yetiştiricilerin Eğitim Durumları ve Genel Kurullara Katılımları Mann Whitney U Testi

Genel Kurul Katılım	Birlik	N	Sıra Sayıları		Mann-Whitney U	Wilcoxon W	Z	P
			Ortalama	Toplam				
Grup 1	Eğitimi yok	13	185,62	2413,00	850,000	30740,000	-2,966	,003
	İlköğretim	24	125,98	30740,00				
Grup 2	Eğitimi yok	13	72,42	941,50	293,500	4209,500	-2,978	,003
	Lise	88	47,84	4209,50				
Grup 3	Eğitimi yok	13	27,35	355,50	47,500	347,500	-3,619	,000
	Yükseköğretim	24	14,48	347,50				
Grup 4	İlköğretim	24	166,56	40641,50	10720,500	14636,500	-,021	,983
	Lise	88	166,32	14636,50				
Grup 5	İlköğretim	24	137,48	33544,00	2202,000	2502,000	-2,094	,036
	Yükseköğretim	24	104,25	2502,00				
Grup 6	Lise	88	59,53	5238,50	789,500	1089,500	-1,962	,050
	Yükseköğretim	24	45,40	1089,50				

Yetiştiricilerin mesleki deneyimlerine göre üye oldukları birliklerin genel kurullarına katılımları karşılaştırılmıştır. sonuçlara bakıldığında, deneyim arttıkça genel kurullara katılımın arttığı aynı zamanda yetiştiricilerin mesleki deneyimi ile genel kurullara katılımları arasında bir farklılık olduğu görülmektedir.Yetiştiricinin genel kurula katılımı mesleki deneyiminden bağımsız değildir. Bu durum en yüksek katılım oranı olan 26 yıl ve üzeri mesleki deneyime sahip yetiştiricilerden kaynaklandığı söylenebilir. Bu yetiştirici grubu hayatının önemli bir bölümünü mevcut yetiştiricilik faaliyeti ile geçirmiştir ve bu faaliyetini meslek olarak benimsemiş olduğu görülmektedir.

Birliklere üye yetiştiricilerin eğitim durumlarına göre birlik yönetim kurullarında görev alma durumları Çizelge 6'da verilmiştir. Birliklerin yönetimlerinde görev alanların büyük çoğunluğu (%62.7) ilköğretim mezunlarından oluşmaktadır. Eğitimi olmayanların ise hiç görev almadıkları görülmektedir.

Yükseköğretim mezunlarının içerisinde de birliklerin yönetimlerinde görev almayanların oranının (%87.5) oldukça yüksek olduğu söylenebilir. Bu gurup içerisinde tam zamanlı olarak başka bir işte çalışanların oranı oldukça yüksektir. Lise mezunu olanların içerisinde birliklerin yönetimlerinde görev almayanların oranı da %81.8'dir. Toplam üyelerin % 86.2'si birlik yönetimlerinde görev almamışlardır.

Kruskal-Wallis testine göre eğitim durumu ile birliklerin yönetimlerinde görev alma durumlarına arasında istatistiksel olarak bir fark olmadığı görülmektedir. Ancak eğitim seviyesi yüksek olanların düşük olanlara oranla yönetim kurullarında daha az yer aldıkları yönetimdeki işlerin daha çok ilköğretim mezunları tarafından yerine getirildiği söylenebilir.

Genel kurullara katılım açısından gelir grupları arasında anlamlı bir farklılık görünmemektedir. Genel olarak birliklerin yönetimlerinde görev alma oranı ise %13.8 olarak tespit edilmiştir. Ki- kare analiz sonuçlarına göre yetiştiricilerin gelirleri ile birliklerin yönetim kurullarında görev alma arasında bir farklılık yoktur. Ancak geliri yüksek olan grubun yönetim kurullarında görev alma oranlarının daha az gelire sahip gruplara göre biraz daha düşük olduğu söylenebilir. Bu durum büyük işletme sahiplerinin iş yoğunluğu ile açıklanabilir.

Tablo 6. Yetiştiricilerin Eğitimlerine göre Yönetimde Görev Alma Durumu

Eğitim Durumu		**Yönetimde Görev Alma**		**Toplam**
		Evet	Hayır	
Eğitimi yok	Sayı	0	13	13
	Grup içindeki %	0.0	100.0	100.0
	Görev alma %	0.0	4.1	3.5
	Toplam %	0.0	3.5	3.5
İlköğretim	Sayı	32	212	244
	Grup içindeki %	13.1	86.9	100.0
	Görev alma %	62.7	66.7	66.1
	Toplam %	8.7	57.5	66.1
Lise	Sayı	16	72	88
	Grup içindeki %	18.2	81.8	100.0
	Görev alma %	31.4	22.6	23.8
	Toplam %	4.3	19.5	23.8
Yükseköğretim	Sayı	3	21	24
	Grup içindeki %	12.5	87.5	100.0
	Görev alma %	5.9	6.6	6.5
	Toplam %	0.8	5.7	6.5

Anketin son sorusu yetiştiricilerin ucu açık olarak hazırlanmış ve yetiştiricilerden faaliyet alanlarına göre sorunlarını sıralamaları istenmiştir. Burada yetiştiricilerin belirtikleri ve genel olarak tüm yetiştiricileri etkilediği düşünülen sorunlar 3 farklı birlik üyeleri için ayrı ayrı ele alınmıştır.

DSYB üyeleri tarafından dile getirilen sığır yetiştiricilerinin sorunları;

- Kesif yem, mazot, gübre ve veterinerlik hizmetleri başta olmak üzere girdilerin çok pahalı olması buna karşın başta süt olmak üzere ürünlerinin hak ettiği değeri bulamaması.
- Hayvancılık piyasasındaki istikrarsızlık, damızlık materyal bulma ve suni tohumlama hizmetlerinden etkin olarak yararlanamamak.
- Koruyucu sağlık hizmetlerinin düzensiz olması, aşılama çalışmalarına rağmen salgın ve bulaşıcı hastalıklarla mücadelede istenen sonuçlara ulaşılamaması, desteklemelerin yetersizliği ve birlikler aracılığı ile dağıtıldığı dönemlerde yetiştiricilerin eline tam olarak ulaşmaması.
- Yörede etkin ve yaygın pazarlama organizasyonlarının olmaması, birliklerin bu anlamda yeterince çaba sarf etmemesi. Ürünlerin çiftlik avlusundaki fiyatları ile marketlerin raflarındaki fiyatları arasındaki fark. Ayrıca birliklerin çiftçi örgütü olmasına karşın kar amacı güden şirketler gibi faaliyet göstermesi ve işletme sermayesi bulma konusunda zorluklar.

DKKYB üyelerinin dile getirdiği küçükbaş hayvan yetiştiricilerinin sorunları;

- Çoban bulunmaması, meraların yetersiz ve kalitesiz olması ve farklı amaçlar için kullanıma açılması.
- Mevcut barınakların yeterli hava ve ışıktan yoksun olması, köy yerleşim alanları içerisinde bulunması.
- Mazot ve gübre gibi girdilerin yanı sıra veterinerlik hizmetlerinin pahalı olması.
- Desteklerin yetersiz olması, piyasalardaki istikrarsızlık,
- Koruyucu hayvan sağlığı hizmetlerinin yetersizliği ve salgın ve bulaşıcı hastalıklarla mücadelede yaşanan problemler.
- Yapağının herhangi bir ekonomik değerinin olmaması.

Arı yetiştiricilerinin dile getirdikleri problemler;

- AYB üyelerinin hemen tamamı ürettikleri balın kalitesini ispat edememek, analiz ücretlerinin yüksekliği, sahte bal probleminin çözülememesi.
- Birliklerin pazarlama organizasyonu yapmaması, kaliteli ve güvenli temel petek ve döllenmiş ana arı başta olmak üzere girdi temini
- Pestisitlerin bilinçsiz ve fazla miktarda kullanımının kolonileri ve bal üretimini olumsuz etkilemesi, çevre kirliliğine sebep olması.
- Hem gezginci hem de sabit arıcılık yapan yetiştiricilerin konaklama sorunu, kapasite hesaplamada yanlışlar, konaklama bölgelerinde altyapı eksikliği ve rant olarak görülmesi,
- Devlet desteklerinin ve arı hastalıkları ile mücadelenin yetersiz olması.

4. Sonuç ve Öneriler

Güçlü bir üretici örgütlenmesi, tarım sektörünün diğer bileşenleri üzerinde de olumlu etkiye sahip olabilecektir. Tarımsal sanayinin motive edilmesi, araştırma geliştirme faaliyetlerinin üreticilerin talepleri ile ve üretimle doğrudan bağlantılı olarak gelişmesi ve en önemlisi tüketiciler açısında güvenilir gıdaya erişim bu olumlu etkilerden birkaçı olabilir.Örgütsüzlüğün getirdiği yalnız kalma duygusu, korumasız ve dayanışmadan yoksun üreticiler açısından güçlü bir örgütlülüğün birçok sosyal sorunun giderilmesi hiç olmazsa azaltılmasına da katkıda bulunacağı kaçınılmazdır.

Farklı birliklerin üyeleri arasında eğitim seviyeleri açısından ciddi farklılıklar göze çarpmaktadır. Birlikler üzerinden yetiştiriciler için hazırlanacak tüm proje, eğitim ve yayım programları vb. faaliyetler birlik üyelerinin eğitim düzeyleri göz önüne alınarak dizayn edilmeli ve yetiştiriciler açısından anlaşılır olmalıdır.

Kırsal alanda gençlerin istihdamına katkı sağlayacak ve genç yetiştiricileri hayvancılık sektöründe tutacak düzenlemelere ihtiyaç vardır. İş yükünün ağır olduğu kırsal alanda gençlerin evlilik konusunda zorluk yaşadıkları gözlenmektedir. Evli gençlerin bir kısmının ise okul çağına gelen çocuklarına daha iyi bir eğitim sağlamak veya eğitim hayatlarında çocuklarının yanlarında olabilmek için hayvancılık faaliyetlerinden vazgeçerek şehir merkezlerine göç ettikleri bilinmektedir. Tüm bunlar göz önüne alındığında genç yetiştiricilerin hayvancılık faaliyetlerini sürdürebilmeleri çok daha geniş çapta bir planlama ve entegre bir yaklaşım ile ancak olasıdır.

Genel olarak yetiştiricilerin mesleki deneyimlerinin oldukça iyi olduğu söylenebilir. Yetiştiricilerin deneyimlerini paylaşabileceği ve aralarında mesleki dayanışmayı artırabilecekleri organizasyonların birlikler tarafından hayata geçirilmesinin başta genç ve deneyimsiz üyeler olmak üzere tüm yetiştiriciler için olumlu sonuçlar doğuracağı söylenebilir. Dışarıdan bir yayımcı müdahalesi ile kabul edilmesi daha çok zaman alacak yeniliklerin, deneyim paylaşımı ile daha kısa sürede kabul edilebileceği düşünülmektedir. Yine yetiştiriciler için hazırlanacak yayım programları bu deneyimlerden yararlanılarak geliştirilmelidir.

Birlikler tarafından bir pazarlama organizasyonu yapıldığında üyelerin ilgi gösterdiği söylenebilir.Birliklerin, yetiştiricilerden ürünleri sadece toplama ve pazarlama değil, katma değer yaratacak süreçleri hayata geçirmeleri gerekmektedir. Çeşitli hibe, eş finansman kaynakları hem araştırma bölgesi için hem de tüm iller için erişilebilir durumdadır. Birlikler bu programlardan yararlanma açısından kapasitelerini artırmalı ve çaba sarf etmelidir.

Çiftçi örgütleri, üye olabilecek hedef kitleye ulaşmak için yapacakları çalışmalarda faaliyet alanının özelliğine uygun programlar ortaya koymalıdır. Bu tür çalışmalar yaygın üretim tekniğine ve iş yükünün azaldığı dönemlere göre hayata geçirilmelidir.

Çevresinden bilgi edinen yetiştiricinin doğru bilgiye ulaşması konusunda problemler olabilmektedir. Yetiştiricilerin temas kurduğu diğer yetiştiricilerin bakış açısıyla çiftçi örgütleri hakkında ilk bilgilerini edinmelerinin olumsuz sonuçlar doğurması olasıdır. Birliklerde görevli tarım danışmanlarının ve il/ilçe müdürlüklerinin örgütlenmenin önemi ve birliklerin varlık amaçları ile ilgili doğru ve eksiksiz bilgiyi yetiştiricilere ulaştırmak için daha fazla inisiyatif almaları gerekmektedir.

Çiftçi örgütleri açısından esas olan kamudan tamamen bağımsız ve kendi ayakları üzerinde durabilen, sürdürülebilir yapılar olmalarıdır. Ancak özellikle Türkiye'de ve benzer durumdaki, çiftçi örgütlenmesinin zayıf olduğu gelişmekte olan ülkelerde yetiştiricilerin çiftçi örgütlerine üye olmalarını özendirecek politika araçlarının kullanılması doğrudur. Bunun yanı sıra çiftçi örgütlerinin kurucularının ve tarım danışmanlarının üreticilere ulaşma ve ikna etme süreçlerinde daha aktif rol almaları gerekmektedir.

Yetiştiricilerin, üye oldukları birliklerin geleceğini planlayan ve yönetecek olan kurulun seçildiği süreçlere dahil olmaları son derece önemlidir. Tüm yetiştiricilerin bu süreçlere dahil olabileceği yollar oluşturulmalıdır. Bu çalışmada olduğu gibi faaliyet alanı son derece geniş olan birlikler/çiftçi örgütleri başta olmak üzere, üyelerin tamamına genel kurul kararını, yerini ve tarihini bildirmek zorunlu hale getirilmelidir. Dolayısıyla genel kurulların zamanı belirlenirken faaliyet alanına göre görece daha az iş yükünün olduğu dönemlerin dikkate alınması genel kurullara katılımı olumlu yönde etkileyecektir.

Demokratik örgütlerde üyelerin çoğunluğunun yönetime aktif olarak katılması beklenmektedir. Daha fazla üyenin yönetim kurullarına gönüllü katılımı için teşvik edici önlemler alınmalıdır.

Birlik tarafından sağlanan herhangi bir eğitim programına katılmış olmak birlik ile bir temas anlamına gelmektedir ve üyenin birliğini tanıması açısından oldukça önemlidir. Birlikler üyeleri ile teması artıracak çalışmaları organize etmeli ve kendilerini öncelikle üyelere anlatarak işe koyulmalıdır.

Birlikler, üyeleri için en önemli yayım organizasyonlarından biri olmak durumundadır. Çalıştıkları alanı, üyeleri ve yöreyi çok iyi tanıması beklenen birliklerin/çiftçi örgütlerinin bu özellikleri ile öne çıkmaları beklenirken üyeler için eğitim ve yayım programlarında geri kalmış olmaları çok ciddi bir eksikliktir. Kendi faaliyet alanlarında yapılan bilimsel çalışmaların, araştırmaların ve üyeleri ilgilendiren her türlü politik ve ekonomik kararın üyelere ulaştırılması için birliklerin daha fazla sorumluluk almaları gerekmektedir.

Birlikler üyelerin düşüncelerini ve taleplerini dönem dönem küçük çaplı anket çalışmaları ile belirlemeli ve çalışma programlarında bu taleplere yer vermelidir.

Birlikler, yatırım konusunda üyelerin önlerini açacak çalışmaları hayata geçirmelidir. Gerek pazar araştırmaları ile gerekse teknik olarak yetiştiricileri rahatlatacak ve doğru karar vermelerini sağlayacak çalışmalar yaparak üyelerine sunmalıdır.

Özellikle eğitimi olmayan üyelerin genel kurullara daha az katılım gösterdiği görülmektedir. Daha az eğitimli üyelerinde kendilerini ifade edebilmeleri ve birliklerin yönetim mekanizmalarına katılabilmeleri için gerekli önlemler alınmalıdır. Tüm kesimlerin mesleki bilgi birikiminden yararlanılmalı, daha katılımcı ve yenilikçi yöntemler hayata geçirilmelidir. Bunun için resmi organlarda görev almasalar bile düzenli olarak üyelerin görüşlerini paylaşabilecekleri ve önerilerini sunacakları toplantılar organize edilmelidir.Aynı durum üye yetiştiricilerin gelir grupları için de söz konusudur ve bu alanda da gerekli önlemler alınmalıdır.

Girdi temin etme çabasının, diğer tüm ekonomik durumlardan bağımsız olarak girdi fiyatlarında küçük de olsa bir düşüş oluşturacağı açıktır. Damızlık materyal bulma konusunda üyelerin yaşadığı problemleri çözebilmek adına en azından birlikler kendi içerisinde bir organizasyona gitmeli ve ihtiyaç sahipleri ile satıcıları buluşturmalıdır. Birlikler katma değer yaratacak faaliyetlere yönelerek çiftlik fiyatı ile raf fiyatı arasındaki farkın üreticinin hesabına yazılabilmesi için gerekli önlemleri almalıdır.

Koyun yetiştiricileri arasında dile getirilen en büyük problemlerden birisi çoban bulunamamasıdır. Çobanlara yönelik kamunun dönem dönem bazı destekleri olmuş ancak dönemsel desteklemeler kalıcı bir sonuç yaratmamıştır. Bunlardan en önemlisi çobanlar için uygulanan sigorta desteğidir. Bu desteğin sürekli hale getirilmesi, aylık ücretlerin bir kısmının devlet tarafından karşılanması gibi kapsamı genişletilmiş desteklemeler sorunun çözümüne katkı sunacaktır.

Mera alanlarının amaç dışı kullanıma açılması, yetersiz ve kalitesiz olması en çok koyun yetiştiricilerini olumsuz etkilemektedir. Mevcut mera ıslah projeleri beklenilen sonucu vermemiştir. Mera ıslah projelerinin yeni bir anlayışla ele alınması gerekmektedir. Yetiştiricilerin sürülerini meralar için kritik dönemlerde meralardan uzak tutabilmesi için ilave kaba yem desteklemelerinin yapılması meralar üzerindeki baskıyı azaltacak ve meraların toparlanmasına katkı sağlayacaktır. Mera kapasitelerinin hesaplamaları daha özenli yapılmalıdır.

Koruyucu hayvan sağlığı hizmetleri ve programlı aşılamaların takibi yapılmalı ve bu hizmetlerin zamanında yerine getirilmesi sağlanmalıdır. Birlikler bu konularda ilgili kamu kurumları ile işbirliği içinde olmalıdır.

Bal konusunda gelişmiş analizleri daha uygun ücretlerle yapabilecek laboratuvarların kurulumu veya üyelerin ballarının analizinin daha uygun koşullarda anlaşmalı laboratuvarlar aracılığı ile yaptırabilmeleri için birlikler inisiyatif alabilirler.

Değişen iklim koşullarına göre bölgelerin koloni kapasiteleri yeniden hesaplanmalıdır. Birlikler bu konuda daha bilimsel ve uyarıcı faaliyetlerde bulunmalı, ilgili kurumlar ile işbirliği içinde olmalıdır.

Bitkisel üretim yapılan alanlarda bitki zararlıları ile mücadelede doğa dostu yöntemler denenmelidir. Zorunlu olarak pestisit kullanımı gerekli ise kontrollü şekilde ve yöredeki arı yetiştiricileri ile iletişim halinde kullanımı sağlanmalıdır.

Kaynaklar

Akkurt, M. ve Köknaroğlu, H., 2016. Isparta İli Damızlık Sığır Yetiştiricileri Birliğine Üye Olan ve Olmayan İşletmelerin Performanslarının Karşılaştırılması ve Üreticilerin Damızlık Sığır Yetiştiricileri Birliği İle İlişkilerinin İncelenmesi. Süleyman Demirel Üniversitesi Ziraat Fakültesi Dergisi 11 (2):79-90, 2016

Aydoğan, M. ve Yulafçı, A., 2014. Samsun İlindeki Tarımsal Üretici Örgütlerinin Yapısal Sorunları ve Çözüm Önerileri. 11. Tarım Ekonomisi Kongresi, 3-5 Eylül, 2014, Samsun.

Bilginturan, S. ve Ayhan, V., 2009. Burdur İli Damızlık Koyun ve Keçi Yetiştiriciler Birliği Üyesi Koyunculuk İşletmelerinin Yapısal Özellikleri ve Sorunları Üzerine Bir Araştırma. Hayvansal Üretim Dergisi, 50 (1), 1-8.

Çetin, H., 2013. Kamu Ekonomisi Yönünden Türkiye'de Kırsal kalkınma Sürecinde Kooperatifçiliğin Rolü Tariş Zeytin ve Zeytinyağı Birliği Örneği . (Doktora Tezi), Dokuz Eylül Üniversitesi Sosyal Bilimleri Enstitüsü, Maliye Anabilim Dalı, İzmir.

Falkowski, J. Ve Ciaian, P., 2016. FactorsSupportingthe Development of Producer OrganizationsandtheirImpacts in theLight of OngoingChanges in FoodSupplyChains. EUR 27929 EN; doi:10.2791/21346.

Göktolga, Z, G., 2015. İktisadi ve İdari Bilimler için İstatistik. Seçkin Yayıncılık, 376 s, Ankara.

İnan, İ.H.,Gülçubuk, B., Ertuğrul, C.,Kantürer, E., Baran, E.A. ve Dilmen. Ö. 2000.Türkiyede Tarımda Kırsal Kesim Örgütlenmesi. http://www.zmo.org.tr/resimler/ekler/00c563bfd2c48c1_ek.pdf?tipi=14&sube=(Erişim Tarihi: (25.12.2016).

Karaturhan, B.,Şevik, T. ve Yıldız, Ö., 2014. Yetiştirici Birliklerinin Tarımsal Kalkınmaya Etkileri Üzerine Bir Araştırma: Edirne Damızlık Sığır Yetiştiricileri Birliği Örnek Olayı. Ege Üniversitesi Ziraat Fakültesi Dergisi, 51 (2): 175-184.

Murat, B., 2011. Eğe ve Orta Anadolu Bölgesi Damızlık Sığır Yetiştiricileri Birliğine Bağlı Süt Sığırcılık İşletmelerinin Ekonomik Analizi. (Doktora Tezi), Ankara Üniversitesi Sağlık Bilimleri Enstitüsü, Hayvan Sağlığı Ekonomisi ve İşletmeciliği Anabilim Dalı, Ankara.

Önal, R, A. ve Özder, M., 2008. Edirne İli Damızlık Sığır Yetiştiricileri Birliğine Üye İşletmelerin Yapısal Özellikleri. Tekirdağ Ziraat Fak Der Dergisi, 5 (2): 197-203.

Sağlam, U., 2013. Uşak İlinde Tarımsal Üretici Örgütlenmesi ve Yapısal Sorunlar. (Doktora Tezi), Namık Kemal Üniversitesi Fen Bilimleri Enstitüsü, Tarım Ekonomisi Anabilim Dalı, Tekirdağ.

Sarı, M.M., 2016. Tarım İşletmelerinin Örgütlenme Durumu ve Buna Etki Eden Faktörlerin Belirlenmesi: Erzurum ili Örneği. (Yüksek LisansTezi), Atatürk Üniversitesi Fen Bilimleri Enstitüsü, Tarım Ekonomisi Anabilim Dalı, Erzurum.

Terin, M. ve Ateş, Ç,H., 2010. Çiftçilerin Örgütlenme Düzeyi ve Örgütlerden Beklentileri Üzerine Bir Araştırma: Van İli Örneği. Ege Üniversitesi Ziraat Fakültesi Dergisi, 47 (3): 265-274.

Yamane, T., 2006. Temel Örnekleme Yöntemleri. Nobel Yayınları, 509 s, Ankara.

DEMOGRAFIC TRANSITION IN TURKEY, RURAL POPULATION AND ANALYSING OF DEMOGRAFIC PROJECTION OF 2080

Özlem Sertkaya Doğan
İstanbul University, Geography Department, Turkey, Email: srtkydgn @istanbul.edu.tr

Abstract

Turkey has a total population of 82 million 3 thousand 882 in 2018. Rural population is 6 million 337 thousand 385 and 7.7% of our population. Contribution to the agricultural economy and rural population in Turkey's economy plays a primary role. Demographic projection is a method to help us prepare prudential economic and social policies. These projections provide useful predictions about, current population structure, it's vocations and also helps us to determine if the current behaviour of the population keeps having the same vocation, what kind of population would appear in near future, population density, migrations, sex and age pattern of the population and sociocultural changes. Demographic Projections not only suggest that Turkey's young and constantly growing population pattern is changing but it also shows that it's fertility rates and structures showing some changes as well. Changes through Low Death and Fertilty Rates from higher rates ,what we can define as "Demographic Change Process", affects on population's age structure as well. What we gathered from recent projection researchs indicates that there will be constant fall on young population levels, there will be rise in the number of population in working till 2040 but then there will be fall on the number in the same population group afterwards. Based on these informations, elderly population in Turkey constantly growing. These changes on both age and demographic structures makes impact in direct or indirect ways on both Social and Ekonomic live in Turkey. Demographic changes brought some positive outcomes(having a peak on population in working age level) along with the risks that Turkey never have been faced before(aging population). This situation requires taking measures for many sectors, especially the agricultural economy. Therefore, our study of the demographic transformation of Turkey, the rural population and population projections to 2080 are analyzed.
Keywords: Turkey, Demografic Transition, Rural Population

TÜRKİYE'DE DEMOGRAFİK DÖNÜŞÜM, KIRSAL NÜFUS VE 2080 NÜFUS PROJEKSİYONU ANALİZİ[1]

Özet

Türkiye 2018 nüfus verilerine göre toplam nüfus 82 milyon 3 bin 882 kişidir. Bunun 6 milyon 337 bin 385'i kırsal nüfusu oluşturmaktadır. Başka bir ifadeyle nüfusumuzun % 7.7'si kırsal nüfustur. Kırsal nüfus ve zirai ekonomiye katkısı Türkiye ekonomisinde primer rol oynamaktadır.

Nüfus projeksiyonları, geleceğe yönelik ekonomik ve sosyal politikaların oluşturulmasına yardımcı olan demografik yöntemlerdir. Bu yöntemler, mevcut nüfus yapısının ortaya çıkarılması, eğilimlerinin tespit edilmesi ve bu eğilimlerin devamı halinde gelecekteki nüfus miktarı, nüfus yoğunluğu, göçler, nüfusun yaş grupları ve cinse göre dağılımı ile sosyo kültürel değişimler hakkında öngörülerde bulunulmasına yardımcı olur. Nüfus projeksiyonları Türkiye'nin genç ve sürekli büyüyen nüfus yapısının değişmekte olduğunu ve özellikle doğurganlık ve yaş yapısı itibarıyla gelişmiş ülkelere benzemeye başladığını göstermektedir. Yüksek doğurganlık ve yüksek ölümlülük düzeyinden düşük doğurganlık ve düşük ölümlülük düzeyine geçiş anlamına gelen demografik değişim süreci yaş yapısını etkilemektedir. Yapılan projeksiyon çalışmalarında Türkiye'de, genç yaş gruplarında sürekli olarak azalma, çalışma çağı nüfusta ise 2040'a kadar artış ve daha sonra düşme eğilimi öngörülmektedir. Buna istinaden, yaşlı nüfus ise sürekli olarak artmaktadır. Yaş yapısındaki ve demografik yapıdaki bu değişimler ekonomik ve sosyal alanları doğrudan ve dolaylı olarak etkilemektedir. Demografik değişim

[1] Bu çalışma İstanbul Üniversitesi Bilimsel Araştırma Projeleri Koordinasyon Birimi tarafından desteklenmiştir. Proje numarası:29240

bazı fırsatlar yarattığı gibi (çalışma çağının en yüksek düzeyine ulaşması gibi) Türkiye'nin daha önce karşılaşmadığı bazı riskleri de (nüfusun yaşlanması gibi) ortaya çıkarmaktadır.

Bu durum başta tarım ekonomisi olmak üzere pek çok sektör için önlem almayı gerektirmektedir. Bu nedenle çalışmamızda Türkiye'nin demografik dönüşümü, kırsal nüfus ve 2080 nüfus projeksiyonu birlikte değerlendirilmiştir.

Anahtar Kelimeler: Türkiye, Demografik Dönüşüm, Kırsal Nüfus

1. Giriş

Nüfus, ülkelerin geçmişten günümüze üzerinde çalıştığı, ekonomik ve sosyal planlamalarda temel kriterlerden birini oluşturan dinamik olgulardandır. Önceleri savaş ve vergi gibi konularda yükümlü olan kişilerin verisine ulaşmada basit ölçümlerle nüfus bilgileri kontrol edilirken günümüzde ekonomi, istihdam, eğitim ve sağlık hizmetleriyle ilgili yatırımların planlanması nüfus verileriyle yakın ilişikli bir şekilde ele alınmaktadır. Planlı gelişim sürecinde, dengeli ve sürdürülebilir kalkınma hedefi ile uyumlu bir nüfus yapısına ulaşmak amacıyla nüfusun eğitim, sağlık ve insan gücü yönünden niteliklerinin iyileştirilmesi, yaşam kalitesinin yükseltilmesi ve bu alanlarda bölgeler ve yerleşim yerleri arasındaki farklılıkların giderilmesi temel ilkedir (Doğan, 2011:303).

Türkiye demografik yapısındaki değişimleri incelediğimizde ilk nüfus sayımının yapıldığı 1927 yılından günümüze nicelik ve nitelik bakımından önemli değişimlerin yaşandığı kırılma noktalarının varlığından söz etmemiz mümkündür. Bu konuda özellikle nüfusun sosyal ve kültürel yapısında yaşanan değişimlerde, uygulanan dönemsel politikaların (pronatalist ve antinatalist nüfus politikaları) etkisi yadsınamaz. Türkiye nüfus profili çok genel hatlarıyla incelendiğinde dikkat çeken önemli noktalardan biri 1985 yılı sayım sonuçlarıdır. Buna göre 1927'den itibaren toplam nüfus içinde oransal olarak daima kırsal nüfus ağırlıklı iken, ilk defa 1985 sayımında şehirsel nüfus kırsal nüfustan fazla bir nispete sahip olmuştur. Bu dönemle birlikte Türkiye nüfusu kırsal karakterden şehirsel karaktere doğru hızlı bir ivme kazanmıştır. Günümüz verilerini (2018) değerlendirdiğimizde ise kırsal nüfusun toplam nüfus içindeki oranı % 7,7 iken şehirsel nüfus oranı ise, % 92,3'dür. Geçen süreçte ülke içinde kırdan kente yaşanan nüfus hareketleriyle birlikte 2012 yılı itibariyle uygulanan Büyükşehir kanunu da bu oransal değişimde oldukça etkili olmuştur. Şehirleşmeyle birlikte yaşanan toplumsal değişim, eğitim seviyesinin artması, kadınların aktif iş yaşamına daha fazla katılması ve aile birliklerinin daha geç kurulması, kadın ve erkeklerde evlilik yaşının ötelenmesi yıllar bazında doğum hızının ve dolayısıyla nüfus artış hızının da düşmesine sebep olmuştur. Aynı zamanda sağlık ve beslenme koşullarının iyileşmesi toplam nüfus içinde 65 ve üstü yaş grubunun oransal olarak artmasına sebep olmuştur. Bu duruma istinaden medyan yaş yükselmiş ve 2018 verilerine göre (erkeklerde 31,4 ve kadınlarda ise 32,7) 32 olarak hesaplanmıştır. Nüfusun niceliği ve niteliği, ülkelerin sosyal ve ekonomik bağlamda tüm planlama çalışmalarında önemli dinamiklerdendir. Bu nedenle nüfusun mevcut durumunun yanı sıra, gelecekte nasıl bir şekilde gelişeceği de göz önünde bulundurulmalıdır. Her ülke planlama çalışmaları için ihtiyaç duyduğu projeksiyon çalışmalarını yaparak geleceğe yönelik öngörülerde bulunur. Bununla birlikte 2017 yılı itibariyle 193 üye ülkeden oluşan Birleşmiş Milletler de dünya nüfusuyla ilgili olarak ülkeler bazında projeksiyon çalışmaları yapmaktadır.

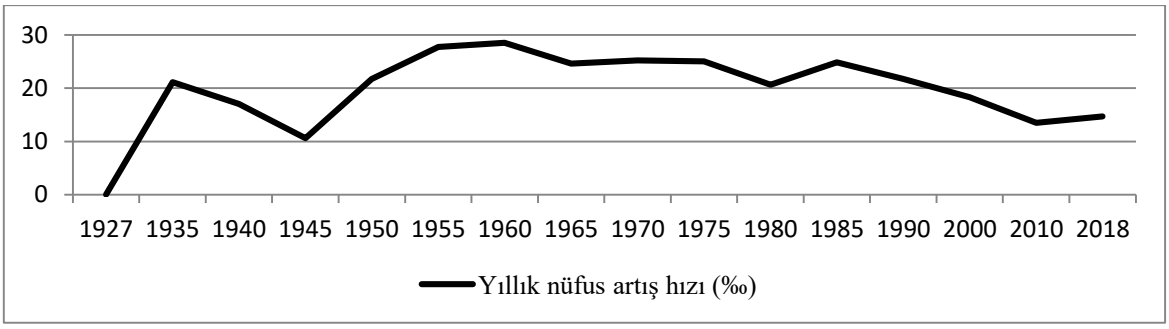
Türkiye'de 1963-67 yıllarını içeren 1. Kalkınma planı döneminden itibaren nüfus projeksiyon çalışmaları yapılmaktadır. Buna göre nüfus artış hızı ve uluslararası göçler dikkate alınarak çeşitli senaryolara göre varsayımlarda bulunulur. 2075 nüfus projeksiyonu için benzer senaryo yöntemi uygulanarak üç aşamalı çalışma gerçekleştirilmiştir. Buna göre ana senaryo, projeksiyonlarda kullanılmış olan temel senaryodur. Toplam doğurganlık hızının doğal akışı içinde azalıp, 2050 yılında 1,65'e düştüğü ve 2050 yılından sonra artışa geçerek 2075 yılında 1,85 değerine ulaştığı doğurganlık senaryosudur. Yüksek senaryo olarak da nitelendirilen senaryo 2, toplam doğurganlık hızının kademeli olarak artacağı; 2020 yılında 2,11'e, 2050 yılında ise 2,50 seviyesine yükseleceğini, 2050 yılından sonra da 2075 yılına kadar sabit kalacağını varsayan doğurganlık senaryosudur. Düşük senaryo olarak tabir edilen senaryo 3 ise, toplam doğurganlık hızının aratarak 2050 yılında 3'e ulaşacağını ve 2075 yılına kadar sabit kalacağını varsayan doğurganlık senaryosudur.

Bu itibarla çalışmamızda Türkiye'de demografik değişim süreci, kırsal nüfus ve Türkiye'nin çeşitli varsayımlara göre 2080 nüfus projeksiyonu ele alınmıştır. Toplam nüfus miktarında doğum ve ölüm oranları arasındaki farklılaşmalar, değişimde etkili olan sosyo kültürel unsurlar ve sonuçları

irdelenmiştir. Çalışmamızın esasını TÜİK verilerinden elde ettiğimiz datalar oluşturmaktadır. Sayısal veriler tablo ve grafik haline dönüştürülmüş ve coğrafi bakış açısıyla yorumlanmıştır.

1.1 Türkiye'de Demografik Dönüşüm

Demografik geçiş kuramına göre bütün toplumlar doğurganlık ve ölümlülük hızlarının yüksek olduğu bir evreden, her iki unsurun da çok düşük olacağı bir evreye geçiş sürecini yaşayacaklardır. Avrupa ülkelerinde doğum ve ölüm hızları arasındaki değişimden esinlenerek oluşturulan kuram farklı kaynaklarda üç, dört veya beş aşamalı olarak tanımlanmaktadır (Cillov,1974:8). Türkiye demografik dönüşümünde, dört aşamalı gelişim evresinin, süreci irdeleyebilmemiz açısından daha uygun olduğu kanaatindeyim. Her toplumun nüfus özellikleri sahip olunan ekonomik ve sosyal şartlar neticesinde dönemsel olarak farklı özellikler gösterir. Demografik döngüde belirleyici unsur gelişmişlik seviyesidir. Yüksek doğurganlık ve yüksek ölüm oranlarıyla nitelenen bir demografik rejimden, doğum ve ölüm oranlarının düşük olduğu bir rejime geçiş olarak tanımlanan demografik dönüşümün ilk aşamasında, doğum ve ölüm oranları oldukça yüksektir. Geçiş öncesi (http://papp.iussp.org) olarak da tanımlanan bu dönem ortalama yaşam süresinin kısa olduğu genç nüfuslu bir zaman aralığıdır. İkinci aşama olan erken geçiş evresi; gelişme seviyesinin nispeten arttığı, beslenme imkânlarıyla birlikte tıbbi ve farmakolojik desteğin daha ulaşılabilir olduğu, ölüm oranının düştüğü, ancak doğum oranlarının hala yüksek olduğu dönemdir. Bu aşamada doğum oranları yüksek olduğu için toplumların nüfusları da hızlı bir büyüme sürecindedir. Demografik döngüde üçüncü aşama geç geçiş evresidir. Bu süreçte ölüm oranlarıyla birlikte doğum oranlarının da azalma eğilimindedir. Daha dengeli nüfus artışının yaşandığı bu evre, genel olarak sosyal ve ekonomik bakımdan hızlı gelişme aşamasında olan ülkelere özgü profili yansıtmaktadır. Dördüncü ve son proses ise doğum ve ölüm oranlarının çok düşük olduğu geçiş sonrası evreyi temsil etmektedir. Sanayide ilerlemiş, ekonomik bakımdan güçlü gelişmiş toplumlar, yüksek yaşlı nüfus (toplam nüfusun minumun %10'u kadar) ve düşük doğum hızına (< ‰2) sahip nüfus özelliği sergilemektedirler. Doğal nüfus artış hızı sıfır düzeyindedir (Şahin,2007:59). Bugüne kadar birçok alanda Türkiye'nin genç nüfusu üzerine vurgu yapılmasına rağmen, TUİK verilerinden derlenen nüfus bilgilerine göre Türkiye'de yukarıda bahsi geçen demografik dönüşüm aşamalarından üçüncüsünün yaşanmakta olduğu görülmektedir.



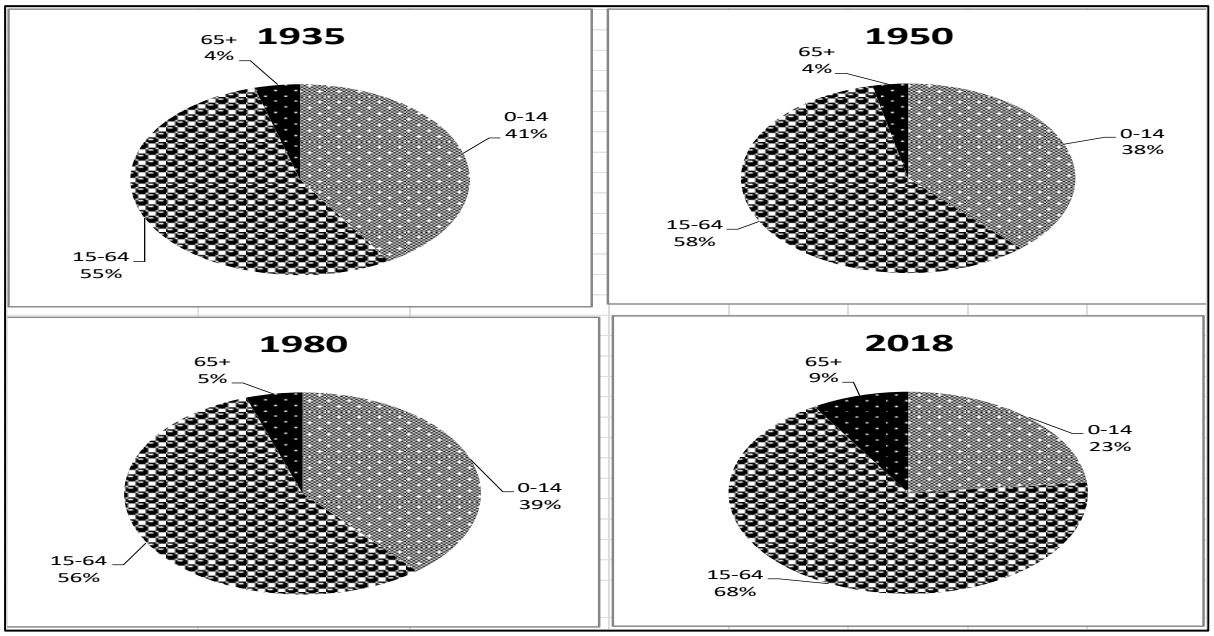
Grafik 1. Türkiye Yıllık Nüfus Artış Hızı1927- 2018 (‰)

Tablo 1. Türkiye Yaş Gruplarına göre Nüfus Değişimi (1927- 2018)

		Yaş grubu		
Sayım yılı	Toplam Nüfus	Genç Bağımlı Nüfus	Faal Nüfus	Yaşlı Bağımlı Nüfus
1927	13 648 270	0	0	0
1935	16 158 018	6 662 593	8 795 512	699 913
1940	17 820 950	7 503 326	9 668 796	648 828
1950	20 947 188	8 018 479	12 211 300	717 409
1960	27 754 820	11 427 006	15 299 311	1 028 503
1970	35 605 176	14 878 187	19 152 564	1 574 425
1980	44 736 957	17 433 912	25 022 358	2 280 687
1990	56 473 035	19 745 352	34 265 838	2 461 845
2000	67 803 927	20 220 095	43 701 502	3 882 330
2010	73 722 988	18 878 582	49 516 670	5 327 736
2018	82 003 882	19 184 329	55 633 349	7 186 204

Kaynak: http://www.tuik.gov.tr/

Sayım yılları itibariyle yaş grupları incelendiğinde 65 yaş ve üstü nüfus miktarının ilk defa 1960 yılında 1 milyonun üzerinde olduğu görülmektedir. 1980 yılında 2 milyonu, 2000 yılında 5 milyonu ve 2018 verilerine göre de 7 milyonu aşan yaşlı nüfus miktarına göre toplam nüfusun % 9'u 65 yaş ve üstündedir. Birleşmiş Milletler'in tanımına göre bir ülkedeki yaşlı nüfusun toplam nüfus içindeki oranının % 8 ile %10 arasında olması o ülke nüfusunun "yaşlı", %10'un üzerinde olması ise "çok yaşlı" olduğu anlamına gelmektedir. BM nüfus projeksiyonuna göre Türkiye'nin yaşlı nüfus oranının 2023 yılında %10,2'ye yükseleceği ve "çok yaşlı" nüfuslu ülkeler arasında yer alacağı tahmin edilmektedir. TÜİK tarafından yapılmış olan 2023 nüfus projeksiyonuna göre ise, toplam nüfus içinde 65 yaş ve üstü nüfusun oranı % 9,1 olarak öngörülmektedir. Ayrıca 2040 projeksiyonuna göre % 10, 2060 projeksiyonuna göre % 18 ve 2080 projeksiyonuna göre ise, % 20 seviyesine ulaşacaktır.



Grafik 2. Yaş Gruplarının Oransal Değişimi (1935-1950-1980 ve 2018)

1 Şubat 2018 verilerine göre, yaşlı nüfus olarak tabir edilen 65 yaş ve üzerindeki nüfus 7 186 204 kişi, bunların toplam nüfusa (82 003 882) oranı % 9'dur. Yıllar bazında oransal değerlendirmelerin ifade edildiği Şekilde'de belirtildiği üzere 0-14 yaş grubu nüfusun 2018 yılında % 23 seviyesine inmiş olması doğum oranlarındaki düşüşün bir göstergesidir.

1.1.1 Ölüm Sayısı ve Hızının Değişimi

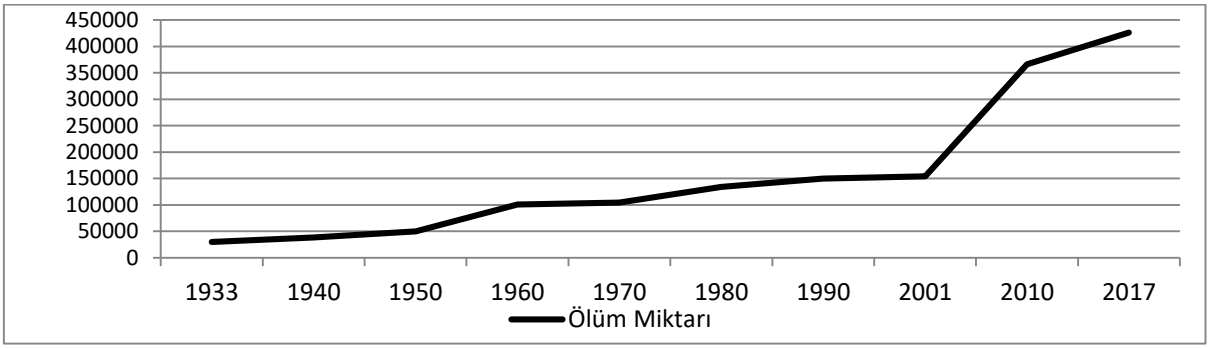
Türkiye'de ölüm olaylarıyla ilgili veriler 1949 yılı sonuna kadar bütün il merkezlerinde derlenmekte ve önemli görülen 25 il merkezi için yayınlanmakta idi. 1950 yılından başlayarak bu veriler bütün il merkezleri itibariyle yayınlanmaktadır. 1 Mart 1957 tarihi itibariyle ölüm olaylarıyla ilgili istatistiki veriler bütün il ve ilçe merkezlerinden toplanmaya başlanmıştır (DİE,1973). Ancak yaş gruplarına ve cinsiyete göre ayrıntılı verilere 1980 yılı itibariyle ulaşılmaktadır. Bu nedenle Tablo 2'de 1950 sayımına kadar olan toplam ölüm miktarına dair veriler 25 il merkezi, 1960 sayım yılına ait değerler ise, 67 il ve 570 ilçe merkezi verilerinden oluşmaktadır. 1980 yılı itibariyle 67 il, 575 ilçe merkezi, 1990 yılında 73 il ve 828 ilçe merkezi, 2000 yılında 81 il ve 850 ile merkezi, 2010 yılında 81 il, 892 ilçe merkezi ile 2017 yılında 81 il, 921 ilçe merkezi verileri kullanılmıştır.

Tablo 2. Yaş Grubu ve Cinsiyete göre Ölümler (1933-2017)

Yıl	Cinsi	Topla	Yaş grubu						
			0-11	1-4	5-	15-	35-	55-74	75+
1933	Topla	29	-	-	-	-	-	-	-
	Erkek	16	-	-	-	-	-	-	-
	Kadın	13	-	-	-	-	-	-	-
	Erkek	58	-	-	-	-	-	-	-
	Kadın	46	-	-	-	-	-	-	-
1980	Topla	133	33	7	3	7	15	38	1933
	Erkek	74	18	3	1	4	10	23	11
	Kadın	59	15	3	1	2	4	15	16
1990	Topla	149	21	3	2	7	19	51	42
	Erkek	84	12	1	1	5	13	32	18
	Kadın	64	9	1	1	2	6	19	23
2001	Topla	15375	15	2	2	8515	2384	72035	49
	Erkek	98	8	1	1	5	16	43	21
	Kadın	71	6	1	857	3	7491	28392	28053
2010	Topla	366	15	4	5	14	39	123	163
	Erkek	200	8	2	2	9	26	76	74
	Kadın	166	6	2	2	4	13	46	89
2017	Topla	425	11	2	2	13	38	141	215
	Erkek	233	6	1	1	9	25	91	97
	Kadın	192	5	1	1	3	12	50	118

Kaynak: http://www.tuik.gov.tr/

Not: 1933-1949 yıllarında 25 il merkezindeki ölümler kapsanmıştır. (Adana, A.Karahisar, Ankara, Antalya, Aydın, Balıkesir, Bursa, Çanakkale, Çankırı, Çorum, Denizli, Diyarbakır, Eskişehir, (1934 yılından itibaren Gaziantep), İstanbul, İzmir, Isparta, Kırklareli, Kocaeli, Konya, Kütahya, Manisa, Mersin, Samsun, Tekirdağ.)

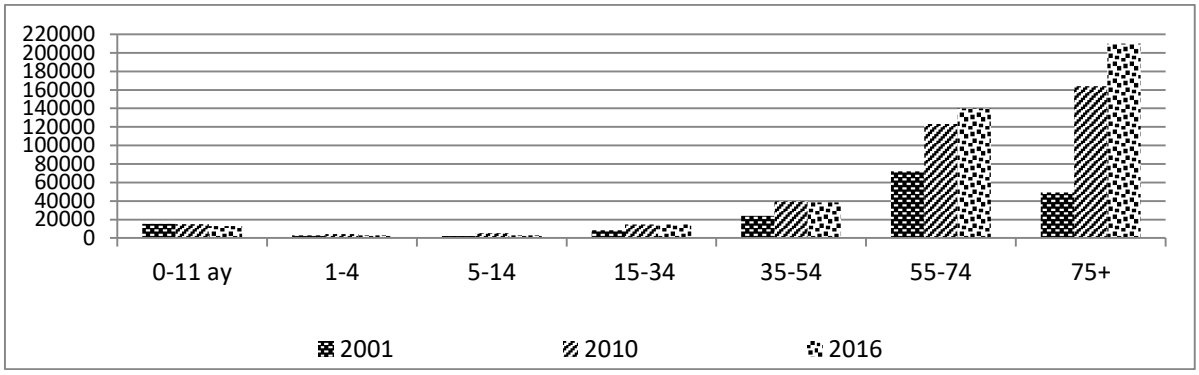


Kaynak: http://www.tuik.gov.tr/ verilerinden faydalanılarak hazırlanmıştır.

Grafik 3. Türkiye Ölüm Sayısındaki Değişimi (1933-2017)

Türkiye ölüm miktarlarındaki değişim incelendiğinde 2001 yılından itibaren dikkat çekici bir artış olduğu görülmektedir. 2001 yılında 153 757 olan toplam ölüm miktarı 2010 yılından % 138,2 oranında artarak 366 357'e ulaşmış, 2017 yılında ise bu değer % 16 oranında artış göstererek 425 781'e çıkmıştır.

Söz konusu yıllar yaş grupları bazında değerlendirildiğinde; 0-11 ay bebek ölümleri 2001-2010 yıllarında %2,5, 2010- 2016 yıllarında ise % 14,1 artmıştır. 1-4 yaş ölümler 2001- 2010 yıllarında %48,2 ve 2010-2016 yıllarında ise %35,2 oranında; 5-14 yaş ölümler 2001-2010 yıllarında % 15 artmış, 2010-2016 yıllarında %20,8 oranında azalmıştır. 15-34 yaş ölümler 2001- 2010 yıllarında %72,6 oranında artmış, 2010-2016 yılarında ise %3 oranında azalmıştır. 55-74 yaş grubunda ölümler 2001- 2010 yıllarında % 71, 2010- 2016 yıllarında ise % 13,5 artış göstermiştir. 75 yaş ve üstü grup ölümler ise, 2001- 2010 yılarında %232,1 oranında, 2010- 2016 yıllarında ise %28,1 oranında artmıştır. Ölüm miktarındaki artışa karşın kaba ölüm hızı ise 2001 yılında ‰ 6,8, 2010 yılında ‰ 5,0 ve 2016 yılında ise ‰ 5,3 oranındadır.



Kaynak: http://www.tuik.gov.tr/ verilerinden faydalanılarak hazırlanmıştır

Grafik 4. Türkiye Ölüm Sayısındaki Değişimi (2001- 2010-2016)

.

2001 yılından itibaren ölüm sayısındaki artışın nispeten yüksek oranlarda seyretmesinde Türkiye nüfusunun mutlak artışıyla birlikte yaşlanma eğilimi de etkili olmaktadır. 2000 yılında 24,8 olan medyan yaş, 2010 yılında 29,2 ve 2016 yılında ise 31,4'e ulaşmıştır. Toplam nüfus içinde 65 yaş ve üstü grup 2000 yılında %5, 2010 yılında %7 ve 2016 yılında ise % 8 oranına ulaşmıştır. Yaşlı (65 ve üstü) nüfus oranı nüfus projeksiyonlarına göre 2023 yılında %10,2, 2050 yılında %20,8, 2080 yılında ise %25,5'e yükseleceği tahmin edilmektedir.

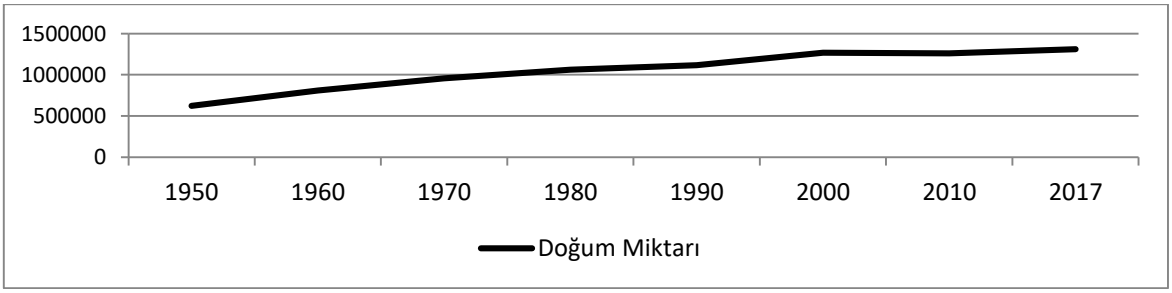
1.1.2 Doğum Sayısı ve Hızının Değişimi

Tablo 3. Cinsiyete göre Doğumlar (1935-2017)

	19	19	195	196	197	1980	1990	2000	2010	2017
Erk	0	0	331	422	470	5418	5726	6514	6478	6629
Kız	0	0	291	388	485	5183	5438	6153	6133	6281
Top	0	0	623	810	956	1060	1116	1266	1261	1291

Kaynak: http://www.tuik.gov.tr/ verilerinden faydalanılarak hazırlanmıştır.

Türkiye'de toplam doğum sayısı 1950- 1980 yıllarında % 70, 1980-2010 yılları arasında % 19 ve 2010- 2017 yılları arasında ise % 2,3 oranında artmıştır. TÜİK 31 mart 2017 temel doğurganlık göstergeleri verilerine göre; 2001 yılında ‰ 20,3 olan kaba doğum hızı 2010 yılında ‰ 17,2 ve 2016 yılında ise ‰ 16,5'e düşmüştür. Benzer şekilde genel doğurganlık hızı 2001 yılında ‰ 82,7 iken 2010 yılında ‰ 72,8 ve 2017 yılında ise, 69,5'e düşmüştür.



Grafik 5. Türkiye'de Doğum Sayısındaki Değişimi (1950-2017)

Bir kadının doğurgan olduğu dönemi kapsayan 15-49 yaş arası yaşa özel doğurganlık hızına bağlı olarak sahip olabileceği ortalama çocuk sayısını ifade eden toplam doğurganlık hızı değişimleri de benzer şekilde değişim göstermektedir. Buna göre 2001 yılında 2,3, 2010 yılında 2,08 ve 2017 yılında ise 2,07 olarak hesaplanmıştır. TÜİK tarafından yapılan projeksiyon çalışmalarında toplam doğurganlık hızının 2023 yılında 1,85'e düşeceği varsayılmaktadır. Bu değerin 2,1'in altına düşmesi, nüfusun kendisini yenileyememesi anlamına gelmektedir. 2012 yılında yapılmış olan 2023 nüfus projeksiyon çalışmasıyla ortaya çıkan öngörüler sebebiyle, 2014 yılı itibariyle Türkiye nüfus politikasının da tekrar pronatalist yönde değişmesine karar verilmiştir.

Tablo 4. Annenin Yaş Grubuna göre Doğumlar (2001-2017)

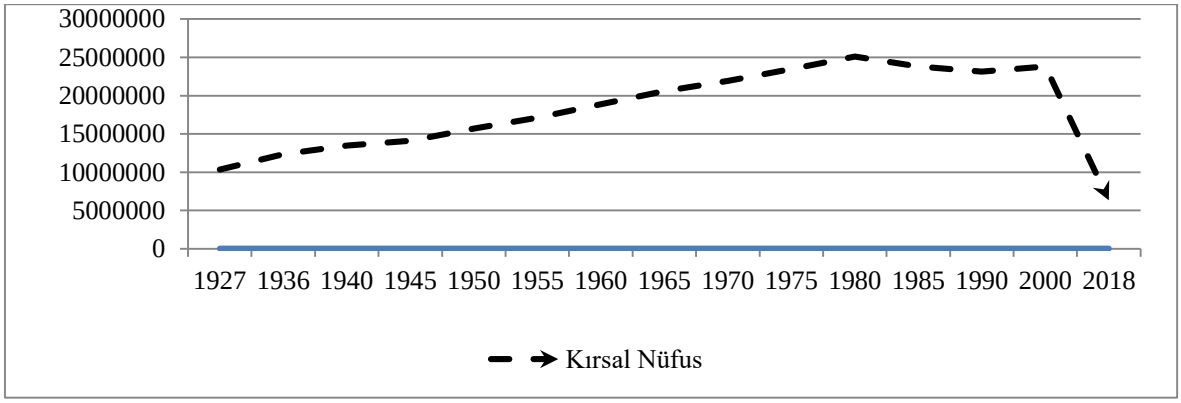
Yıl	Toplam	<15	15-17	18-19	20-24	25-29	30-34	35-39	40-44	45-	50+	Bilinme
200	1 323	2	50	103	436	373	197	113	29	8	2	4 708
200	1 244	1	34	88	391	367	229	90	30	5	1	2 257
201	1 261	716	29	72	344	396	261	117	24	4	624	8 839
201	1 291	227	69003		30119	40181	30817	16526	3311	234	377	9541

Tablo 4 incelendiğinde yıllar itibariyle yaşa özel doğum sayısında da önemli farklılıklar yaşandığı dikkat çekmektedir. Buna göre en hassas kırılım 15 yaş altı ve 30- 34 yaş gruplarına ait doğum sayılarındaki değişimlerdir. 2001- 2016 yılları arasında 15 yaş altı doğum miktarlarında % 91,4 oranında azalma olurken, 30-34 yaş grubunda ise, % 58,8 nispetinde artış yaşanmıştır. Bu durum geçen 15 senede eğitim seviyesinin artması, kadınların aktif iş hayatına daha yüksek oranlarda katılması ve bunlarla eş güdümlü olarak demografik yapıda yaşanan sosyo-kültürel değişimin en önemli göstergelerinden biridir.

1.2 Türkiye Kırsal Nüfusu

Tablo 5. Türkiye'nin 1927-2018 Yılları Arası Toplam Nüfus, Kır Nüfus Miktarı ve Toplam Nüfusun Kır Nüfusuna Oranı (%)

Yıllar	Toplam Nüfus	Kır Nüfusu	TN/ KN (%)
1927	13648270	10342391	75,78
1935	16158018	12355376	76,47
1940	17820950	13474701	75,61
1950	20947188	15702851	74,96
1960	27754820	18895089	68,08
1970	35605176	21914075	61,55
1980	44736957	25091950	56,09
1990	56473035	23146684	40,99
2000	67803927	23797653	35,10
2018	82003882	6337385	7,7



Grafik 6. Türkiye'de Kırsal Nüfus Değişimi (1927-2018)

Tablo 5 ve Grafik 6'da belirtildiği üzere; 1927'de kır nüfusu % 75.78 iken 2000'de bu oran % 35.10'e yükselmiş, 2018 yılında ise, % 7.7'ye düşmüştür. Kır nüfusu 91 yılda % 61.2 oranında azalmıştır.

Kır nüfusunun doğurganlık oranı kent nüfusundan daha fazla olmasına rağmen, oran olarak azalması kırdan kentlere doğru kuvvetli göç olgusunun varlığını göstermektedir.

Türkiye'de iç göçler 1950 yılına kadar fazla etkili olmamış ve kır - kent nüfus oranlarında önemli bir değişiklik yaşanmamıştır. İç göçler esas itibariyle 1950'li yıllarla birlikte, yurdumuzda sanayi faaliyetlerinde yaşanan gelişmeler neticesinde önem kazanmıştır. Bunun yanısıra ulaşım sistemlerinin gelişmesi, tarımda makineleşmenin artması ve buna bağlı olarak tarımsal işgücünün duyulan ihtiyacın azalması, miras yoluyla tarım alanlarının parçalanması, daralması ve ailelerin geçimini karşılamaması, eğitim ve sağlık hizmetlerinin yetersizliği, kentlerde sanayinin gelişmiş olmasından dolayı iş

imkânlarının fazlalığı ile kentlerde eğitim ve sağlık hizmetlerinin yaygınlığı kırdan kente göçü hızlandıran sebeplerdendir.

1927'den itibaren kırsal karakter arz eden Türkiye nüfusunda ilk defa 1985 sayımında şehir nüfusu oransal üstünlüğe sahip olmuştur. Bu değer Büyükşehir Kanunu'yla adeta bir sıçrama yaşamıştır. 12.11.2012 tarih ve 6360 no.lu kanunda belirtilen kararla: *Madde-1 (3) Büyükşehir olan illere bağlı ilçelerin mülki sınırları içerisinde yer alan köy ve belde belediyelerinin tüzel kişiliği kaldırılmış, köyler mahalle olarak, belediyeler ise belde ismiyle tek mahalle olarak bağlı bulundukları ilçenin belediyesine katılmıştır.* Bu kararla Büyükşehirin bulunduğu tüm il nüfusu şehir nüfusu kapsamına alınmıştır. 2018 verilerine istinaden 81 ilin 30'u büyükşehir kapsamındadır. Bu şehirlerin toplam nüfusu (63.495.314) Türkiye nüfusunun (82.003.882) % 77'sini oluşturmaktadır. Başka bir ifadeyle 30 büyük şehrin nüfusu 51 ilin toplam nüfusundan yaklaşık 3.3 kat fazladır.

Şekil 1. Türkiye Kırsal Nüfus Haritası 2018

Türkiye'de kırsal nüfus dağılımını incelediğimizde Afyonkarahisar (300 901), Ağrı (235 114), Zonguldak (234 029), Muş (227 898), Tokat (226 427), Çanakkale (214 636), Adıyaman (202 624), Şırnak (195 284), Giresun (176 238) ve Sivas (176 019) kırsal nüfus varlığıyla ilk on sıradaki illerimizi oluşturmaktadır. Bölgesel ve ülke genelini kapsayan kırsal kalkınma projelerinde bu illerimiz mevcut potansiyellerinin geliştirilmesi hususunda dikkatle incelenmelidir. Var olan kırsal nüfusun refah seviyesinin yükseltilmesine yönelik çalışmalar kapsamlı bir şekilde ele alınmalı, kentlere göç etme sebepleri ortadan kaldırılmalıdır. Kırsal faaliyetlerin geliştirilmesine yönelik projelere odaklanılmalı tarımsal istihdam kapasiteleri arttırılmalıdır.

1.3 Türkiye 2080 Nüfus Projeksiyonu

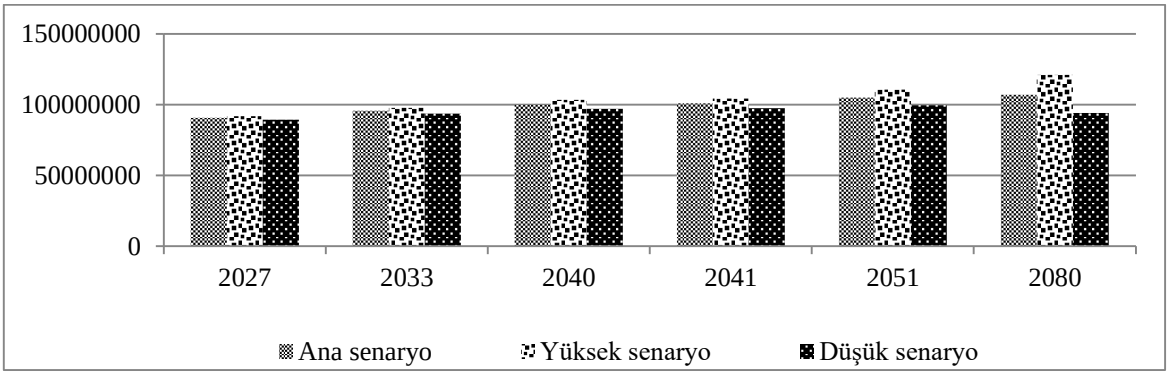
Doğum, ölüm ve göç hareketlerinin gelecek dönemlere ilişkin eğilimleriyle ilgili belli varsayımlara dayanarak nüfusun gelişimi hakkında tahminlerin yapılması olarak tanımlanan nüfus projeksiyonları, ülkeler için önemli demografik göstergelerdir. 1961 yılında Devlet Planlama Teşkilatının kurulması ve akabinde 5 yıllık Kalkınma Planlarının hazırlandığı (1. Beş Yıllık Kalkınma Planı 1963- 1967) süreçle birlikte mevcut nüfusumuz ve geleceğe yönelik tahminler kalkınma hedeflerimiz doğrultusunda önem kazanmıştır. Bu itibarla çeşitli dönemler için projeksiyon çalışmaları yapılmıştır. Planlı dönemin başından bu yana kalkınma planlarının hazırlanmasında kullanılmak üzere nüfus projeksiyonları yapılmaktadır (DPT,2002:1). Nüfus projeksiyonları, sosyo-ekonomik politikaların uygulanmasında ve sektörler için gerekli olan üretici ve tüketici kitlenin yaş ve cinsiyete göre tespitinde yardımcı bir araç niteliği taşımaktadır. Buna göre Türkiye'de ana senaryo, yüksek senaryo ve düşük senaryo olarak tanımlanan üç farklı tipte çalışmalar yapılmaktadır. Ana senaryo, nüfus projeksiyonlarında kullanılmış olan temel senaryodur. Yüksek senaryo, ana senaryodan daha yüksek, düşük senaryo ise ana senaryodan daha düşük doğurganlık varsayımlarına sahiptir. Her iki senaryoda da aynı zamanda uluslararası net göç varsayımları da kullanılmıştır.

Tablo 6. Senaryolara göre Nüfus, 2027-2080

Yıl	Ana senaryo	Yüksek senaryo	Düşük senaryo
2027	90 703 600	91 985 451	89 427 718
2033	95 721 347	97 831 770	93 625 521
2041	100 882 655	104 302 326	97 501 188
2051	105 064 635	110 668 451	99 598 341
2080	107 100 904	121 099 912	94 153 500

Kaynak: http://www.tuik.gov.tr/ verilerinden faydalanılarak hazırlanmıştır.

1 Şubat 2018 tarihinde yayınlanan nüfus verilerimize göre toplam nüfus miktarımız 82 milyon 003 bin 882'dir. Ana senaryoya göre yapılan projeksiyon çalışmaları neticesinde; Tabloda da belirtildiği üzere toplam nüfusumuzun 2027 yılında 90 milyonu, 2040 yılında 100 milyonu, 2051 yılında ise 105 milyonu aşması ön görülmektedir. 2080 yılı için tahmin edilen nüfus ise 107 milyon civarındadır. Buna göre 2080 yılında toplam nüfusumuzun yaklaşık % 33 oranında artacağı öngörülmektedir.



Grafik 7. Türkiye'de Farklı Senaryolara göre Nüfus Değişimi (2027- 2080)

Her ülke ulusal veri kaynaklarından faydalanarak nüfus varsayımları oluşturmaktadır. Ancak BM'de dünya nüfus eğilimini ortaya çıkarabilmek amacıyla üye ülkeler için projeksiyon çalışmaları hazırlamaktadır.

Tablo 7. Birleşmiş Milletler Türkiye Nüfus Projeksiyonu, 2020-2080

Yıl	Toplam Nüfus
2020	83 835 750
2030	88 416 609
2040	92 980 818
2050	95 626 879
2060	96 221 010
2070	94 969 861
2080	85 426 000

Kaynak: http://www.un.org/

BM tarafından oluşturulan (World Population Prospects The 2010 Revision Volume II: Demographic Profiles) projeksiyona göre Türkiye nüfusu 2080 yılında 85 milyon 426 bin olacaktır. Her iki projeksiyon çalışması Türkiye yıllık nüfus artış hızı (2018 yılı için ‰ 14,7) göz önüne alınarak karşılaştırıldığında TÜİK tarafından yapılan çalışmanın gerçeğe daha yakın olduğu ifade edilebilir.

Türkiye sosyal ve kültürel özellikler itibariyle hızlı bir değişim sürecindedir. Bu süreç, çok genel tabirle geleneksel aile yapısından çekirdek aile yapısına geçişle ifade edilebileceği gibi, toplam nüfusun artış hızı, yaşa özel doğum hızı, yaş gruplarına göre nüfusun oransal dağılımı ve medyan yaş gibi pek çok demografik unsurla da takip edilebilir. Eğitim seviyesinin her geçen yıl yükselmesi, istihdam oranlarında kadın- erkek nispetinin kadınlar lehine artması ve hızlı şehirleşmeyle birlikte demografik yapıda yaşanan değişimler, ülke nüfus profilinin demografik döngünün dördüncü aşaması olan düşük doğum ve ölüm oranlarıyla tanımlanan ve gelişmiş ülkelere ait nüfus yapısına doğru bir eğilim içinde olduğumuzu göstermektedir. Ancak Türkiye'nin yaşadığı demografik dönüşüm süreci heterojen karakterdedir. Başka bir ifadeyle doğudan batıya doğru dönüşümün daha rasyonel yaşandığını

belirtebiliriz. TÜİK tarafından ana senaryoya göre yapılmış olan projeksiyon çalışmalarında 0-14 yaş grubu nüfusun toplam nüfus içindeki oranı 2018 yılı için 23,5, 2040 yılı için 19,3 ve 2080 yılı için ise 15,7 olarak ön görülmektedir. Başka bir ifadeyle 0-14 yaş grubu 2018-2080 yılları arasında nispi olarak % 66,8 azalacağı varsayılmaktadır. Buna karşılık 65 yaş ve üstü nüfus ise, 2018 yılında toplam nüfus içinde % 8,7, 2040 yılında % 16,3 ve 2080 yılında ise, % 25,6 oranına ulaşacağı projekte edilmiştir. 2018- 2080 yılları arasındaki artış oranının % 294,2 olacağı tahmin edilmektedir. Toplam nüfus içinde yaşlı nüfus oranının hızlı artış halinde olması, buna karşılık 0-14 yaş grubu nüfusun oransal olarak azalma eğiliminde olması Türkiye nüfus politikasında da tekrar pronatalist politikaya geçişe zemin hazırlamıştır.

Kaynaklar

Cillov, H. (1974). 'Türkiye Nüfusundaki Gelişmeler ve Bu Gelişmeye Etken Olan Amiller', Hacettepe Sosyal ve Beşeri İlimler Dergisi, 6(1-2): 2-13.

Devlet Planlama Teşkilatı. (2002). Plan Nüfus Projeksiyon Yöntemleri, Ankara.

Devlet Planlama Teşkilatı.(2013). Onuncu Beş Yıllık Kalkınma Planı, Ankara.

DİE, Genel Nüfus Sayımları.(1935). Ankara.

DİE, Genel Nüfus Sayımları.(1940). Ankara.

DİE, Genel Nüfus Sayımları.(1945).Ankara.

DİE, Genel Nüfus Sayımları.(1950). Ankara.

DİE, Genel Nüfus Sayımları.(1955).Ankara.

DİE, Genel Nüfus Sayımları.(1960). Ankara.

DİE, Genel Nüfus Sayımları.(1965)Ankara.

Doğan, M. (2011). "Türkiye'de Uygulanan Nüfus Politikalarına Genel Bakış', Marmara Coğrafya Dergisi, S. 23, s.293-307.

Doğan, M. (2013). 'Nüfus Politikalarının Dünyada ve Türkiye'de Uygulanma Süreçleri', Dernekler Dergisi , s.20-29.

Doğan, M. (2018). 'Türkiye'de Kentsel Dönüşüm ve Sosyo-Ekonomik Yapı Üzerindeki Etkiler', Türk İslam Dünyası Sosyal Araştırmalar Dergisi,S.18, pp.1-8.

Gürtan, K.(1966). Türkiye'de Nüfus Problemi ve İktisadi Kalkınma ile İlgisi, İstanbul Üniv. Yay. No. 1166, İstanbul.

Hacettepe Üniversitesi Nüfus Etütleri Enstitüsü. (2009). 2008 Türkiye Nüfus ve Sağlık Araştırması, Ankara.

Hacettepe Üniversitesi Nüfus Etütleri Enstitüsü. (2008). Türkiye'nin Demografik Dönüşümü, Ankara.

Özgür, E. M. (1998). Türkiye Nüfus Coğrafyası, GMC Basın Yayın Ltd.Şti., Ankara.

Sağlam, S. (2006). Türkiye'de İç Göç Olgusu ve Kentleşme. Türkiyat Araştırmaları, 34-44.

Sergün, Ü. (1993-1996). 'Türkiye'de Kır Nüfusunun Yükselti Kademelerine Göre Dağılışı' İstanbul Üniv. Coğrafya Dergisi, S.4, s.7-17, İstanbul.

Sergün, Ü. (1977). 'Türkiye'de Nüfus Artışı ve Sorunları' İstanbul Üniv. Coğrafya Ens. Dergisi, S.20-21, s. 211- 222, İstanbul.

Sertkaya Doğan, Ö. (2013). 'Growth of Population and Population Policies Implemented in Turkey Between 1965 and 2014' International Journal of Science and Research (IJSR), no. 4, pp. 1907-1911.

Sertkaya Doğan, Ö. (2015).'Population Movements In Turkey: International Migrations' International Journal of Liberal Arts and Social Science, no. 3, pp.102- 110.

Sertkaya Doğan, Ö. (2015). Biga Yarımadası Nüfus Coğrafyası, Yeni Anadolu Yayıncılık, İstanbul.

Şahin, S. (2007). Geçmiş, Günümüz ve Gelecekte Nüfus Gerçeği, Gazi Kitabevi, Ankara.

Tandoğan, A. (1998). Demografik Temel Kavramlar ve Türkiye Nüfusu, Lega Kitabevi, Trabzon.

Tanoğlu, A. (1969). Nüfus ve Yerleşme, İstanbul Üniversitesi Yayın No:1183, İstanbul.

Tunçdilek, N. (1998). Dünya Nüfus Dinamiği, İstanbul Üniversitesi Yayın No.3501, 1998.

Tümertekin, E. (1968). Türkiye'de İç Göçler, İstanbul Üniversitesi Yayınları, İstanbul.

Tümertekin, E. (1973). Türkiye'de Şehirleşme ve Şehirsel Fonksiyonlar, İstanbul Üniversitesi Yayın No 1840, İstanbul.

Yılmaz, M. (2016). Türkiye'nin Değişen Nüfus Yapısı nedenler, Değişim, Sonuçlar ve Gelecek, Çantay Kitabevi, İstanbul.

Yüceşahin, M. (2009). 'Türkiye'nin Demografik Geçiş Sürecine Coğrafi Bir Yaklaşım' Coğrafi Bilimler Dergisi, CBD 7, s.1-25, Ankara.
http://www.ebso.org.tr
http://www.tuik.gov.tr
http://www.sbb.gov.tr/kalkinma-planlari/
http://www.goc.gov.tr/
https://mirekoc.ku.edu.tr/tr/
http://www.hips.hacettepe.edu.tr/

HONEY PRODUCTION AND MARKETING IN TOKAT PROVINCE

Figen Çukur
Muğla Sıtkı Koçman University, Department of Management and Organization, Turkey
Email: figenc @mu.edu.tr

Nuray Kızılaslan
Tokat Gaziosmanpaşa University, Department of Agricultural Economics, Turkey

Halil Kızılaslan
Tokat Gaziosmanpaşa University, Department of Agricultural Economics, Turkey

Abstract

In recent years, the effects of bee keeping production activity in rural development have been increasing day by day and at the same time it is the locomotive of rural development.The province of Tokat has a favorable position for bee keeping production in terms of both flora and climate. Moreover, bee keeping activity in Tokat is a production activity that brings additional income in rural areas. For this reason, determining the current status and future position of bee keeping production activity is important in terms of directing the policies that will be produced in order to determine and contribute to the local economy.The most important output of bee keeping production activity is honey production. In this context, the population of thestudy consists of producers producing honey in Tokat province. In Tokat province, 497 quarter registered to Tokat Directorate of Provincial Agriculture and Forestry and 959 producers from these quarter were included in the study. The surveys were conducted by face-to-face interviews with a total of 96 producers, with a 95% degree of significance and a 10% margin of error, based on the aggregated single-stage random probability sampling method based on the main population ratios. The surveys consisted of 2017-2018 production period. In this study, the production and marketing status of honey produced in Tokat province is discussed. At the next stage, problems related to the subject and solutions to these problems have been developed. In the light of the findings of this research, measures and strategies to be taken in honey production and marketing in Tokat province, which is on the way to becoming an important honey production center in the future, have been put forward.
Keywords: Rural Development, Economy, Honey, Bee Keeping, Marketing.

TOKAT İLİNDE BAL ÜRETİMİ VE PAZARLAMASI

Özet

Son yıllarda kırsal kalkınmada arıcılık üretim faaliyetinin etkileri gün geçtikçe artış göstermekte ve aynı zamanda kırsal kalkınmada lokomotif görevi üstlenmektedir. Tokat ili gerek florası gerekse iklimi açısından arıcılık üretim faaliyeti için elverişli bir konumdadır. Ayrıca Tokat'ta arıcılık faaliyeti kırsal alanda ek gelir getiren bir üretim faaliyeti durumundadır. Bu nedenle arıcılık üretim faaliyetinin gerek mevcut durumunun gerekse gelecekteki konumunun belirlenmesi, yöre ekonomisine katkılarının belirlenip, geliştirilmesi için üretilecek politikalara yön göstermesi açısından önem arz etmektedir. Arıcılık üretim faaliyetinin en önemli çıktısı bal üretimidir. Bu bağlamda, araştırmanın popülasyonunu, Tokat ilinde bal üretimi yapan üreticiler oluşturmaktadır. Tokat ilinde bal üretimi yapan Tokat İl Tarım ve Orman Müdürlüğüne kayıtlı 497 mahalle ve bu mahallelerden toplam 959 üretici araştırmaya dâhil edilmiştir. Araştırmada anketler, ana kitle oranlarına dayalı kümelendirilmiş tek aşamalı tesadüfi olasılık örnekleme yöntemi ile %95 önem derecesi ve %10 hata payı ile toplam 96 üretici ile yüz yüze görüşülerek yapılmıştır. Araştırmanın anketleri 2017-2018 üretim dönemini kapsamaktadır. Bu araştırmada öncelikle mevcut durumda Tokat ilinde üretilen balın üretim ve pazarlama durumu ele alınmıştır. Daha sonraki aşamada konu ile ilgili sorunlar ve bu sorunlara ilişkin

çözüm önerileri geliştirilmiştir. Bu araştırmanın sonucunda elde edilecek bulgular doğrultusunda gelecekte önemli bir bal üretim merkezi olma yolunda ilerleyen Tokat ilinde bal üretimi ve pazarlaması konusunda alınacak tedbirler ve stratejiler ortaya konmuştur.
Anahtar Kelimeler: Kırsal Kalkınma, Ekonomi, Bal, Arıcılık, Pazarlama

1.Giriş

Arıcılık gerek dünyada gerekse Türkiye'de kırsal alanda birçok ailenin geliri durumunda olan önemli bir tarımsal üretim faaliyetidir. Ayrıca arıcılığın kırsal alanda katma değer yaratma rolü de oldukça önem taşımaktadır. İnsan beslenmesi ve sağlığındaki rolü dolayısıyla sadece bal değil, polen, propolis, arı sütü gibi arıcılık ürünleri de bal üretimi kadar önem taşımaktadır. Türkiye gerek kovan varlığı gerekse arı ve arı ürünleri üretimi açısından dünyada ilk sıralarda yer almaktadır. Türkiye'de2018 yılı verilerine göre 8108424 adet kovan varlığıile 107920 ton bal üretimi iledünya bal üretiminin %6.34'üne ve dünya kovan varlığının yaklaşık %1'ine sahip durumdadır. Geleceğin en önemli sürdürülebilir tarımsal faaliyetlerinden biri arıcılık faaliyetidir. Bu nedenle arıcılık faaliyetinin sürdürülebilirliğinin sağlanmasına yönelik yapılan çalışmalar önem taşımaktadır (Çukur, 2014). Araştırma kapsamında olan Tokat ili ise Türkiye kovan varlığının %0.54'ünü (44369 adet) ve bal üretiminin (421.41ton) ise %0.40'ını oluşturmaktadır. Bu araştırmada, gelecekte bal üretim potansiyeli açısından önemli görülenTokat ilinde üretilen balın üretim ve pazarlaması ile sorunları ortaya konulmuştur. Ayrıca araştırmada ortaya çıkan sorunlarailişkin çözüm önerileri sunulmuştur.

2. Materyal ve Yöntem

Araştırmanın ana materyalini yüz yüze anket yöntemiyle elde edilen birincil veriler oluşturmaktadır. Araştırmanın ikincil verilerini ise konu ile ilgili daha önce yapılmış araştırma, rapor, makale vb. oluşturmaktadır. Araştırma popülasyonunu, Tokat ilinde bal üretimi yapan üreticiler oluşturmaktadır. Bal üretimi yapan Tokat İl Tarım ve Orman Müdürlüğüne kayıtlı 497 mahalle bulunmaktadır. Bu mahallelerdenTokat İl Tarım ve Orman Müdürlüğüne kayıtlı toplam 959 üretici araştırmaya dâhil edilmiştir. Araştırmada ana kitle oranlarına dayalı kümelendirilmiş tek aşamalı tesadüfi olasılık örnekleme yöntemiile %95 önem derecesi ve %10hata payı ile toplam 96 anket arıcılar ile yüz yüze görüşülerek yapılmıştır.Örnek hacminin belirlenmesinde aşağıdaki formül kullanılmıştır (Collins,1986).

Araştırma örneklemesinde kullanılan formül:

$n = t^2 * [1+(0.02)\ (b–1)]* (p * q) / e^2$

Formülde:

n: Örnek Hacmi

t: %95 önem derecesine karşılık gelen tablo değeri

b: Örnekleme aşaması (Tek aşamalı olduğu için 1 alınmıştır)

p: İncelenen olayın ana kitle içinde gerçekleşme olasılığı %50 olarak alınmıştır.

q: İncelenen olayın gerçekleşmeme olasılığı (1-p)

e: Kabul edilen hata payı (Hata payı %10 olarak alınmıştır) olarak yer almaktadır.

Denklemde, b=1 olarak alındığında,eşitlik aşağıdaki forma dönüşmektedir:

$n = t^2 * (p*q)/e^2$

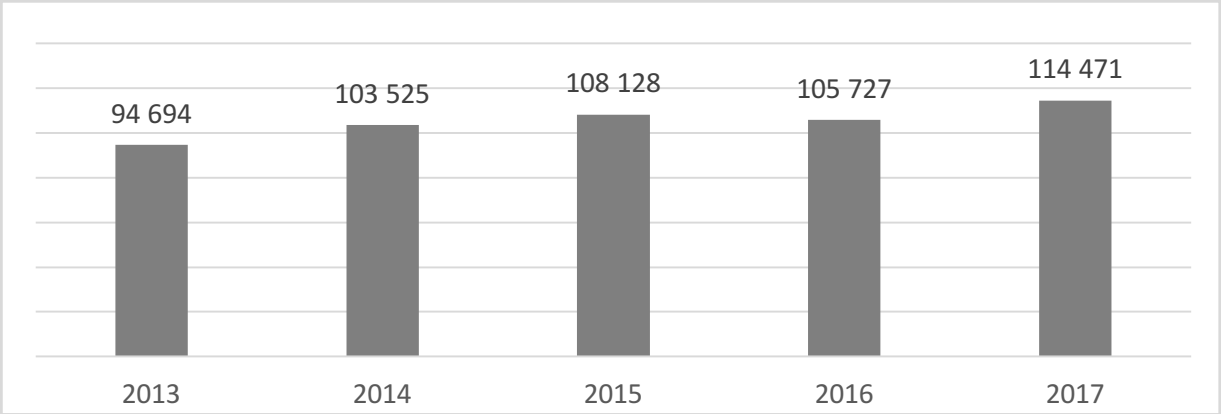
Bu formüle göre araştırmanın örnekleme hacmi;

$n = 1.96^2 *(0.50 * 0.50)/0.10^2 \rightarrow n = 96$

olarak belirlenmiştir.

3. Dünya'da ve Türkiye'de Bal Üretimi

Günümüzde arıcılık, tüm dünyada yaygın olarak yapılan tarımsal faaliyetlerden birisidir. Bugün dünyada 90 milyon dolayında arı kovanı bulunmakta ve 1.8 milyon ton bal üretilmektedir. Üretilen balın yaklaşık %25'i ticarete konu olmakta ve dış satımın %90'ı 20 dolayındaki bal üreticisi ülkeden yapılmaktadır (TAGEM, 2018). Dünyanın en çok kovan varlığına sahip ve bal üreten (543 bin ton) ülkesi Çin'dir. Ülkeler bazında bal üretimi açısından Çin'i 114471 ton ile ikinci sırada Türkiye ve 76379 ton ile Arjantin izlemektedir (FAO, 2017).



Kaynak: TÜİK, 2018.

Şekil 1. Türkiye'de Yıllar İtibariyle Bal Üretimi (ton)

Tablo 1. Türkiye'de Bal Üretiminde Önemli Bazı İller İtibariyle Bal Üretimi

İller	**Bal Üretimi (Ton)**	**Pay(%)**
Ordu	16993	15.75
Muğla	14777	13.69
Adana	10941	10.14
Aydın	4227	3.92
Mersin	2416	2.24
Balıkesir	2618	2.43
Sivas	5048	4.68
İzmir	2777	2.57
Van	1652	1.53
Tokat	**421.41**	**0.39**
Toplam	**61870.41**	**57.34**
TÜRKİYE	**107920**	

Kaynak: TÜİK, 2018.

Türkiye'de arıcılık, çok eski yıllardan beri bir gelenek olarak yapıla gelen sosyoekonomik bir faaliyettir. Türkiye sahip olduğu 8 milyon dolayındaki kovan varlığı ve 108 bin ton dolayındaki bal üretimi ile dünyada 2. sırada yer alarak hem kovan varlığı hem de bal üretimi bakımından dünyanın en önemli ülkeleri arasındadır(TÜİK, 2018). Ancak bu önemli gelişmeye karşın, Türkiye'de kovan başına ortalama bal verimi 14.7 kg dolayında olup dünya ortalaması olan 20 kg'ın altındadır (FAO, 2017).Bununla birlikte, Türkiye'nin dünya bal ticaretinde %1.87'lik bir payla 10. sırada yer alışı sahip olunan kovan varlığı ve bal üretimiyle uyum sağlamamaktadır (ATB, 2017). Türkiye'de arıcılık faaliyetinde yıllar itibariyle yaşanan gelişmeler ışığında sektör sürekli gelişme göstermektedir. Ancak gerek yetiştiricilikte yapılan hatalar gerekse global bir sorun olan çevre sorunları ve iklim değişikliği nedeniyle, üretimde artış gözlense bile bu yükseliş kovan sayısındaki artışın gerisinde kalmaktadır (TAGEM,2018).

Türkiye'de illere göre bal üretim miktarı verilmiştir. Buna göre bal üretiminde Ordu ili %15.75 pay ile ilk sırayı alırken bunu Muğla ili %13.69 ile izlemektedir (Tablo 1). Adana ise %10.14'lük pay ile 3.sırada yer almaktadır. Tokat ili 421.41 ton bal üretimi ile Türkiye bal üretiminin %0.39'unuoluşturmaktadır. Türkiye'nin hem dünya bal ticaretindeki payı hem de koloni başına bal üretimi dikkate alındığında, ülkenin sahip olduğu mevcut arıcılık potansiyelinden yeteri kadar faydalanamadığı ortaya çıkmaktadır.

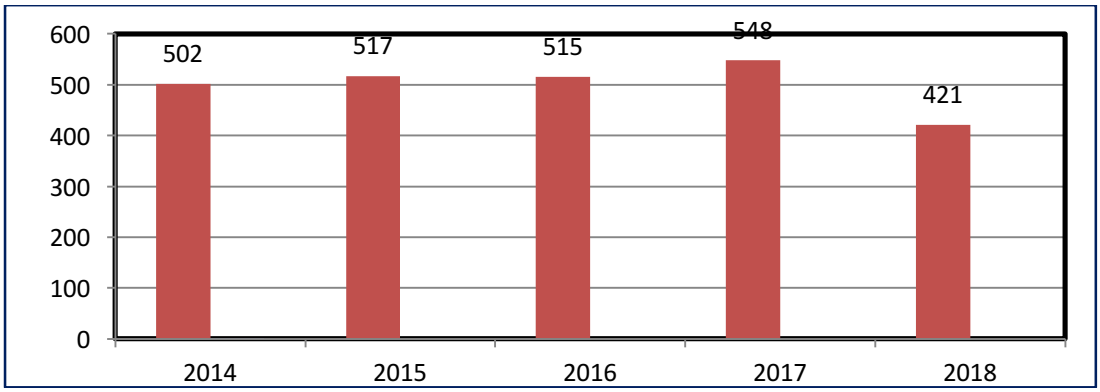
4.Tokat İlinde Bal Üretimi

Tokat ili arıcılık için uygun iklim, zengin flora yapısına sahiptir. Ancak yörede arıcılığın yapısına, mevcut durumuna ve arıcılığın gelişmesi için alınabilecek önlemlere yönelik yeterli bilgi yoktur. Yapılacak çalışmalar, arıcılığın; yöre ekonomisine katkılarının belirlenip, geliştirilmesi için üretilecek politikalara yön göstermesi açısından önem arz etmektedir(Parlakayvd., 2005). 2018 yılı verilerine göre Tokat İli bal üretimi 421.41tondur. Bu üretim söz konusu yılda Türkiye üretiminin %0.49'unuoluşturmaktadır. 2018 yılı itibariyle Tokat ilinde 548 adet arıcılık işletmesi bulunmaktadır. Tokat'ta arıcılık aileye ek gelir getiren bir üretim faaliyeti olup ikinci bir iş olarak yapılmaktadır. Tokat ilinde arıcılık yapılan köy sayısı 497, arıcılıkla uğraşan aile sayısı 548, mevcut kovan sayısı 44369, il dışından gelen gezginci arıcılara ait kovan sayısı ise 103955 olduğu görülmektedir (Tablo 2). Tokat'ın son beş yıllık bal üretimi incelendiğinde genel olarak bal üretiminde dalgalanmalar olduğu görülmektedir (Şekil 2).

Tablo 2.Tokat İli Arıcılık Verileri

Arıcılık yapılan köy sayısı	497
Arıcılıkla uğraşan işletme sayısı	548
Kovan sayısı	44369
Bal üretimi(ton)	421.41
İl dışından gelen gezginci arıcılara ait kovan sayısı	103955

Kaynak: Tokat İl Tarım ve Orman Müdürlüğü, 2018; TÜİK, 2018.



Kaynak: TÜİK, 2018.

Şekil 2. Tokat İli Bal Üretimi (ton)

Tablo 3.Tokat İli İlçeleri İtibariyleArıcılık Verileri

İlçe Adı	İşletme Sayısı	Kovan Sayısı	Bal Üretimi(Ton)
Almus	28	2064	22.58
Artova	13	662	6.21
Baştçiftlik	8	514	6.78
Erbaa	148 (1)	6774 (3)	60.96 (3)
Niksar	30	2714	54.7
Pazar	18	1981	13.45
Reşadiye	75 (3)	8577 (2)	105 (1)
Sulusaray	9	465	3
Turhal	50	4454	26.72
Yeşilyurt	10	790	3.82
Zile	55	6730	40.39
Merkez	104 (2)	8644 (1)	77.80 (2)
TOPLAM	548	44369	421.41

Kaynak: TÜİK, 2018.

Tokat ilçeleri itibariyle işletme sayısı, kovan sayısı ve bal üretimi incelendiğinde arıcılık üretim faaliyetine her ilçede yer verildiği dikkati çekmektedir. Bu durum gerek Türkiye gerekse Tokat ili arıcılığı açısından istenen bir durumdur. Tokat'ın arıcılık işletme sayısı açısından Erbaa ilk sırayı alırken, bunu Merkez ilçe ve Reşadiye ilçeleri izlemektedir. Kovan sayısının ise en yüksek olduğu ilçeler sırasıyla Merkez, Reşadiye ve Erbaa ilçeleridir. Bal üretiminin en çok olduğu ilçeler ise Reşadiye, Merkez ve Erbaa'dır (Tablo 3).

5. Araştırma Bulguları

5.1. İşletmelerin Sosyo-DemografikYapısı

Araştırma alanında üreticilerin %34.38'i 48-59 yaş, %33.33'ü 36-47 yaş, %19.79'u 60 ve üzeri ve %12.50'si ise 24-35 yaş aralığında bulunmakta olup yaş ortalaması 49'dur. Akay vd. (1997) tarafından Tokat ilinde yapılan araştırmada üreticilerin ortalama yaşının 49.48 olduğu belirlenmiştir. Üreticilerin %95.83'ü erkek, %4.17'si kadındır. Üreticilerin öğrenim durumuna bakıldığında %38.54'ü fakülte, %19.80'i lise mezunu olduğu görülmektedir. Tokat ilinde yapılan bir araştırmada, üreticilerin % 46,55'inin lisans veya lisansüstü eğitimli olduğu belirlenmiştir (Yalçın ve Büyükbay, 2015). Demir vd. (2017) tarafından yapılan araştırmada üreticilerin %60.70'inin eğitim seviyesinin lise ve üstü olduğu belirlenmiştir. Üreticilerin eğitim düzeylerinin yüksek olması arıcılık faaliyeti uygulamaları açısından önem taşımaktadır. Araştırma alanında arıcılık yapılan köyler incelendiğinde ilk sırayı %32.30 ile yamaç köyleri almakta,bunu %30.20 ile ova köyleri ve %19.80 ile dağ köyleri izlemektedir.(Tablo 4).Araştırma alanında üreticilerin aylık ortalama 3409TL,yıllık ortalama 41710TL gelire sahip oldukları belirlenmiştir.Tokat ilinde yapılan bir diğer araştırmada, gelir ortalaması aylık olarak 3117.35 TL olup araştırma sonucuna yakın bir sonuç elde edilmiştir (Yalçın ve Büyükbay, 2015). Üreticiler ortalama 18 yıldır arıcılık yaptıklarını ifade etmiştir. Akay vd. (1997), üreticilerin deneyim sürelerinin 13.68 yıl olduğunu belirlemiştir. Yalçın ve Büyükbay, (2015), Tokat ilinde yapılan araştırmada, görüşülen üreticilerin arıcılık konusundaki ortalama deneyim sürelerinin 16.95 yıl olduğu belirlenmiş olupyapılan araştırmanınsonuçlarına benzer bir sonuç elde edilmiştir.

Tablo 4. İşletmelerin Sosyo-Demografik Özellikleri

Üretici yaşı	Frekans	(%)
24-35	12	12.50
36-47	32	33.33
48-59	33	34.38
60 ve üzeri	19	19.79
Toplam	96	100.00
Cinsiyet durumu	Frekans	
Erkek	92	95.83
Kadın	4	4.17
Toplam	96	100.00
Öğrenim durumu	Frekans	
İlkokul	13	13.54
Ortaokul	16	16.66
Lise	19	19.80
Yüksekokul	11	11.46
Fakülte	37	38.54
Toplam	96	100.00
Köyün durumu	Frekans	(%)
Ova	29	30.20
Orman	17	17.70
Dağ	19	19.80
Yamaç	31	32.30
Toplam	96	100.00
Yıllık ortalama gelir	41710 TL	

İncelenen işletmelerde üreticilerin arıcılığa başlama nedenleri arasında ilk sırayı %45.83 ile hobi olması almaktadır. Bunu sırasıyla ek gelir ve babadan kalma izlemektedir. Bu durum araştırma alanında arıcılığın ana gelir kaynağı değil yan gelir kaynağı olduğunu göstermektedir (Tablo 5).

Tablo 5. Üreticilerin Arıcılığa Başlama Nedenleri

	Frekans*	**(%)**
Babadan kalma	29	30.21
Hobi	44	45.83
Ek gelir	30	31.25

Not:*Üreticilerden birden fazla cevap alınmıştır.

5.2. Arı Ürünleri Üretimi ve Pazarlaması

Araştırma alanında incelenen işletmelerin %94.94'ü arı ürünleri üretimi, %5.06'sı ise ana arı üretimi yapmaktadır. Bal üretimi dışında üreticilerin %69.79'u polen,%45.83 ile oğul, %34.37'si propolis üretmektedir. Bu durum araştırma alanında üreticilerin ürün çeşitliliğine önem verdiklerinin bir göstergesidir. Üreticilerin %88.54'ü arılarını güçlü kolonileri bölerek çoğaltmakta,%20.83'ü oğul yoluyla çoğaltmaktadır. Araştırma alanında üreticilerin %91.66'sı bir kez bal hasadı yapmakta olup iki kez bal hasadı yapan üreticilerin oranı ise %8.34'dür. Üreticilerin ortalama arılı kovan sayısı 108,boş kovan sayısı 37, ortalama kovan sayısının145 olduğu görülmektedir. Ankete katılan üreticilerin ortalama yıllık bal üretim miktarı 1062 kg'dır. Kovan başına ortalama bal verimi 10.18 kg olup Türkiye'nin kovan başına bal verimi olan 14.7 kg'ın altındadır(Tablo 6).

Tablo 6. Arı Ürünleri Üretimi ile İlgili Bilgiler

*İşletme tipi**	Frekans	(%)
Arı ürünleri üretimi	94	94.94
Ana arı üretimi	5	5.06
*Arı ürünleri üretimi**	Frekans	(%)
Polen	67	69.79
Propolis	33	34.37
Arı sütü	8	8.33
Oğul	44	45.83
Arı zehiri	3	3.12
Balmumu	31	32.29
Ana arı	14	14.58
Yok	5	5.20
*Çoğaltma şekli**	Frekans	(%)
Oğul yoluyla	20	20.83
Güçlü kolonileri bölerek	85	88.54
Satın alarak	2	2.08
Diğer(suni bölme)	2	2.08
Hasad sayısı	Frekans	(%)
Bir kere	88	91.66
İki kere	8	8.34
TOPLAM	96	100.00
Ortalama kovan sayısı	145	
Ortalama Arılı kovan varlığı	108	
Ortalama Boş kovan varlığı	37	
Kovan başına ortalama verim	10.18 kg	

Not:*Üreticilerden birden fazla cevap alınmıştır.

Arı ürünleri ortalama üretim miktarı; balmumu 30kg,ana arı 41 adet, polen 15 kg olduğu görülmektedir (Tablo 7). Bunun yanında araştırma alanında arı sütü, propolis, arı zehiri vb. arı ürünlerinin de üretim miktarının artırılması arıcılık üretim faaliyeti açısından önemli görülmektedir.

Tablo 7. Arı Ürünleri Üretim Miktarı

	Ortalama
Polen(kg)	15
Propolis(kg)	12
Arı sütü(gr)	0.65
Oğul(adet)	29
Arı zehiri(kg)	12
Balmumu(kg)	30
Ana arı(adet)	41

Araştırma alanında incelenen işletmelerde hastalık ve zararlıların görülme durumu incelendiğinde, ilk sırayı %92.70ilevarroa paraziti almaktadır. Bunu sırasıyla %28.13 ile petek güvesi, %25.00 ile yavru çürüklüğü, %14.00 ile kireç hastalığı, %12.50 ilenosema ve %3.13 ile arı felciizlemektedir.

"Arılarınızı yılda kaç kez taşıyorsunuz?" sorusuna üreticilerin; %39.58'i bir kez taşıyorum, % 34.38'i taşımıyorum, %22.92'si iki kez taşıyorum, %3.12'si üç kez yanıtını vermiştir."Devletin verdiği teşviklerden haberdar mısınız?" sorusuna üreticilerin; %93.75'i evet, %6.25'i hayır yanıtını vermiştir. Cevabı evet olanların %91.67'si kovan başına, %45.83'ü ana arı desteği aldığını beyan etmişlerdir.Üreticilerin kayıt tutma durumuna bakıldığında, %13.54'ünün düzenli kayıt tuttuğu, %26.04'ünün kovan üstüne yazdığını, %23.96'sının deftere yazdığını diğer taraftan %36.46'sının ise kayıt tutmadığı belirlenmiştir. Üreticilerin konaklama yeri tercih sebepleri sırasında ilk sırayı ballı bitki çeşitleri açısından uygunluk almakta (%59.38), bunu sırasıyla iklim açısından elverişlilik (%43.75) ve arazi koşullarının uygunluğu (%27.08) izlemektedir (Tablo 8).

Tablo 8. Üreticilerin Konaklama Yeri Tercih Sebepleri

	Frekans*	**%**
Ballı bitki çeşitleri açısından uygunluğu	57	59.38 (1)
İklim açısından elverişliliği	42	43.75 (2)
Arazi koşullarının uygunluğu	26	27.08 (3)
Evine yakınlığı	2	2.08
Kendi arazisi	19	19.80
Ulaşım kolaylığı	1	1.04

Not:*Üreticilerden birden fazla cevap alınmıştır.

Üreticiler %89.58 oranında ürettiği balı kendi imkanları ile pazarlamaktadır. Üreticiler çok az da olsa bunun dışında tüccar ve Arı Yetiştiricileri Birliğiaracılığı ile de bal satışlarını gerçekleştirmektedir(Tablo 9).Akay vd. (1997), arıcıların ürünlerini %20.00oranında toptancı tüccar, %40.00 oranında perakendeci, %28.00 oranında doğrudan tüketici ve %12.00 oranında karışık olarak pazarladığını belirtmiştir. Burucu ve Bal, (2018), örgütlenmenin yöre üreticilerinin pazarda güç kazanması açısından fayda sağlayacağını belirtmiştir. Engindeniz vd.(2014), arıcıların özellikle kooperatif ve birlik çatısı altında örgütlenmelerinin teşvik edilmesini ortaya koymuştur. Seven ve Akkılıç, (2005), üreticilerin bir araya gelmeleri ve kendi ürünlerini pazarlayacak örgütlenmeyi sağlamaları ile fiyat konusunun çözüme ulaşacağını belirtmiştir. Araştırma alanında üreticilerin %68.00'i ürettiği balı aynı yerde, %32.00'si ise farklı yerlerde pazarlamayı tercih etmektedir.

Tablo 9. Üretilen Balın Satış Yerleri

	Frekans*	%
Tüccar	9	9.37
Arı Yetiştiricileri Birliği	4	4.16
Kendisi	86	89.58

Not:*Üreticilerden birden fazla cevap alınmıştır.

Üreticiler %96.25 oranında petek halinde balı satmaktadır. Ayrıca %78.12 oranında kavanoz ile bal satışlarını gerçekleştirmektedir. Teneke ve açık halde satış ise oldukça azdır (Tablo 10).

Kadirhanoğulları, (2016) yaptığı araştırmada, fiyat dalgalanmalarını önlemek amacıyla balların uygun ambalajlarda ve uygun şartlarda depolanması ve muhafaza edilmesinin sağlanması gerektiğini ortaya koymuştur.

Tablo 10. Üretilen Balın Pazarlanmasında Kullanılan Ambalaj Çeşitleri

	Frekans	%
Teneke	6	6.25
Kavanoz	75	78.12
Petek	77	96.25
Açık	2	2.08

Not:*Üreticilerden birden fazla cevap alınmıştır.

5.3. Arıcılık Geliri

Üreticilerin %45.83'ü arıcılığı geçim kaynaklarından birisi olarak belirtirken, %42.71'i ise gelirin küçük bir kısmını ve %11.46'sının ise tek veya en önemli geçim kaynağını oluşturduğunu belirtmiştir. Üreticilerin %87.50'sinin arıcılık dışında gelirinin olduğunu %12.50'sinin ise olmadığı belirlenmiştir. Arıcılık dışında geliri olan üreticilerin %32.14'ünün emekli,%30.95'inin memur, %16.67'sinin çiftçi, %11.90'ının işçi ve %8.34'ünün ise esnaf olduğu belirlenmiştir(Tablo 11). Demir vd. (2017) tarafından yapılan araştırmada üreticilerin %93,5'inin arıcılık faaliyeti dışında başka işlerle de uğraştıkları belirlenmiştir. Tokat ilinde yapılan bir diğer araştırmada üreticilerin %46.36'sının arıcılığı aileden gelen bir iş olarak yürütmekte olduğu, merak ya da hobi olarak arıcılık yapanların oranının ise %34.55 olduğunu belirtmiştir (Yalçın ve Büyükbay, 2019).

Tablo 11. Arıcılık Geliri ile İlgili Bilgiler

Geçim kaynağı şekli	Frekans	(%)
Tek veya en önemli geçim kaynağı	11	11.46
Geçim kaynaklarından birisi	44	45.83
Gelirin küçük bir kısmı	41	42.71
TOPLAM	96	100.00
Arıcılık dışı gelir	Frekans	
Evet	84	87.50
Hayır	12	12.50
TOPLAM	96	100.00
Arıcılık dışı gelir çeşidi	Frekans	(%)
Esnaf	7	8.34
İşçi	10	11.90
Çiftçi	14	16.67
Memur	26	30.95
Emekli	27	32.14
TOPLAM	84	100.00

Çukur, (2014) tarafından yapılan çalışmada, Muğla ili Milas ilçesinde tarımsal faaliyetler arasında ön planda olan arıcılık faaliyetinin birçok ailenin temel geçim kaynağı durumunda olduğu belirtilmiştir. Yapılan bir diğer araştırmada ise, orta ve büyük ölçekli, sabit ve ek gelir amaçlı arıcılık yapan işletmeler, ekonomik olarak diğerlerinden daha başarılı olduğu belirlenmiştir. Aynı araştırmada Türkiye'de küçük ve orta ölçekli arıcılık işletmelerinde arıcılık ek gelir amaçlı olarak sürdürmek ve büyük ölçekli işletmelerde karma üretim sistemini benimsemek ekonomik performansı arttırabileceği vurgulanmaktadır (Ceyhan ve Canan, 2017).

6. Sorunlar

6.1. Üretim ile İlgili Sorunlar

Araştırma alanında arıcılık üretim faaliyeti ile ilgili üretime yönelik sorunların belirlenmesi amacıyla "Arıcı olarak karşılaştığınız üretime yönelik sorunlar nelerdir?" sorusu üreticilere yöneltilmiş olup, üreticilerin %51.04 oranında zirai ilaç kullanımını sorunlar arasında ilk sırada gösterdiği belirlenmiştir. Bunu %28.12 ile yer ve yer kirası ve %25.00 ile yaban hayvanları sorunu izlemektedir (Tablo 12). Uzundumlu vd. (2011) yaptıkları araştırmada, üreticilerin bal üretimini etkileyen olumsuz şartların başında sırasıyla olumsuz iklim şartları, hastalık ve kışlama kayıpları ve teknik donanım eksikliğinin geldiğini belirtmiştir. Demir vd. (2017) tarafından yapılan araştırmada, arıcıların karşılaştıkları sorunların başında, kaliteli ana arı temini, arı hastalıkları ve zararları ve arı ırklarının verim düşüklüğünün olduğunu belirlemiştir.

Tablo 12. Balın Üretiminde Karşılaşılan Sorunlar

	Frekans*	%
Hırsızlık	9	9.38
Yaban hayvanları	24	25.00 (3)
Zirai ilaç	49	51.04 (1)
Yer/Yer kirası	27	28.12 (2)
Ulaşım	9	9.37
Yerli arıcı/Gezginci arıcı	9	9.36
Diğer	9	9.37
Sorun yok	13	13.54

Not:*Üreticilerden birden fazla cevap alınmıştır.

6.2. Pazarlama ile İlgili Sorunlar

Araştırma alanında arıcılık üretim faaliyeti ile ilgili pazarlamaya yönelik sorunların belirlenmesi amacıyla "Arıcı olarak karşılaştığınız pazarlamaya yönelik sorunlar nelerdir?" sorusu üreticilere yöneltilmiş olup, üreticiler %87.50 ile ilk sırada balın hak ettiği değerden satılamamasını bal pazarlamasında en önemli sorun olarak belirlemiştir. Bunu sırasıyla %66.67 ile ürünlerin kontrolsüz olarak piyasaya girmesi ikinci sırada ve %53.13 ileürünlerin doğallığı konusundaki tereddüt ise üçüncü sırada izlemektedir (Tablo 13).

Tablo 13. Balın Pazarlanmasında Karşılaşılan Sorunlar

	Frekans*	%
Balın hak ettiği değerden satılamaması	84	87.50 (1)
Ürünlerin kontrolsüz olarak piyasaya girmesi	64	66.67 (2)
Ürünlerin doğallığı konusundaki tereddüt	51	53.13 (3)
Pazarlamada etkili olacak kooperatiflerin olmaması	26	27.08
Ürünlerde fiyat standardının oluşmaması	39	40.63
Üretilen yerde pazarlama şansının olmaması	5	5.21
Diğer(balın sınıflandırılması,gıda değerinin bilinmemesi)	3	3.13

Not: *Üreticilerden birden fazla cevap alınmıştır.

Parlakay ve Esengün, (2005), Tokat ilinde yapılan araştırmada arıcılık işletmelerinde pazarlama sorunları arasında, pazar bulma zorluğu, ambalajlama, bilinçsiz tüketici ve piyasada sahte bal bulunması olduğunu belirtmiştir. Akay vd.(1997), Tokat ili Artova ilçesinde yaptıkları araştırmada, bilgi yetersizliği, kredi yetersizliği, şeker fiyatının yüksekliği, bal fiyatının düşüklüğü, arıcılıkla ilgili bir kooperatif bulunmaması, kovan sayısının yetersizliği ve arıcılığın öneminin kavranamamasını

arıcılığın en önemli sorunları olduğunu ortaya koymuştur. Çiçek vd.(1993), Tokat ilinde yaptıkları araştırmada, üreticilerin yetiştirme teknikleri, eğitim yetersizliği, fiyat belirsizliği, pazarlama sorunları ve gezginci arıcılıkla ilgili sorunların olduğunu saptamıştır.Burucu ve Bal (2018) ise arıcıların, yaklaşık %39'unun pazar ve alıcı bulmada sıkıntı çektiklerini belirlemiştir. Araştırmadan elde edilen sonuçların özellikle Tokat ilinde gerçekleştirilen diğer çalışmaların sonuçları ile benzerlik göstermesi, Tokat ili arıcılık sektöründe pazarlama sorunlarının halen devam ettiğinin göstergesi olarak değerlendirilebilir.

Bunun yanında üreticilerin enformasyon kaynakları arasında ilk sırayı %44.79 ile Arı Yetiştiricileri Birliğialmakta, bunu %39.58 ile Tarım ve Orman Bakanlığına bağlı ve ilgili kurumlar izlemektedir (Tablo 14).

Tablo 14.Üreticilerin Enformasyon Kaynakları

	Frekans*	Oran
Tarım ve Orman Bakanlığı	38	39.58 (2)
Tecrübeli arıcılar	22	22.92 (3)
Arı YetiştiricileriBirliği	43	44.79 (1)
Hiçbiri	12	12.50

Not:*Üreticilerden birden fazla cevap alınmıştır.

7. Sonuç ve Öneriler

Araştırma sonuçları itibariyle görüşülen üreticilerin eğitim durumunun oldukça yüksek olduğu belirlenmiştir. Özellikle bu durum arıcılık ile ilgili yeni uygulamaların üreticiye aktarılıp uygulatılması açısından da önem taşımaktadır. Ayrıca üreticilerin eğitim düzeylerinin yüksek olması ve asıl mesleği çiftçilik olmayan arıcıların bulunması bu faaliyet dalını mesleği çiftçilik olmayan insanlarında tercih ettiğini göstermektedir.

Bu çalışmada da görüldüğü gibi arıcılık ana gelir kaynağı olma durumundan uzaktır. Tokat'ta arıcılık aileye ek gelir getiren bir üretim faaliyetidir. Arıcılık ikinci bir iş olarak yapılmaktadır. Bunun nedeni olarak yılık üretim dalgalanmalarının aile bütçesine olan olumsuz yansımaları olduğu düşüncesi yatmaktadır.Arıcılık üretim faaliyetine işletmelerde yer verilmesini teşvik edecek devlet destekleri artırılmalıdır.

Hastalık ve zararlıları en az seviyelere indirmek için arıcıların arı hastalık ve zararlılarıyla mücadele konusunda eğitilmesi gerekmektedir. Ayrıca hastalık ve zararı önlemek için kimyasal içerikli ilaçlar yerine organik kökenli ilaçlar kullanmaları sağlanmalıdır.

Genç ana arı yetersizliği, teknik arıcılık için gerekli alet ve malzeme eksikliği, arıcılığın istenilen ve uygun düzeyde yapılamamasının en önemli nedenleri arasında yer almaktadır. Bu bakımdan arıcılara ilgili kurum ve kuruluşlar tarafından olan mevcut teknik destek artırılmalıdır.

Üreticilere gerek girdi temininde gerekse ürün pazarlamasındakatkı sağlamak amacıyla Arı Yetiştirici Birliğinin etkinliğinin artırılmasıönem taşımaktadır.

Tokat ilinde sadece bal değil arı sütü, propolis ve polen gibi diğer önemli arı ürünlerinin de üretimi yaygınlaşmalıdır. Bu amaç ile arıcıların bilinçlendirilmesi ve eğitilmesi için çiftçi eğitim ve yayım uzmanları ile yapılacak işbirliği ve koordinasyon ile eğitim faaliyetlerinin yapılması gerekmektedir.

Balın marka değeri kazanmasının yanı sıra gıda güvenliği ve hijyeni kriterlerinin de korunması açısından bal şişeleme ve paketleme tesisleri kurulabilir. Bu amaçla paketlenen balı yurt içi ve yurt dışında pazarlayabilecek kooperatif ve müteşebbisler kredilerle teşvik edilebilir. Böylece pazarlama sorununa bir çözüm sağlanabilir.

Tokat ilinde bal üretim ve pazarlamasında belli başlı sorunlara çözüm getirmesi açısından hazırlanan Tokat ili 2018-2023 Tarım ve Kırsal Kalkınma Eylem Planı bu aşamada önem taşımaktadır. Tokat ili 2018-2023 Tarım ve Kırsal Kalkınma Eylem Planında yer alan arıcılık üretim faaliyetinin problemlerine yönelik hedef analizinde, en önemli problemler; arıcılıkta yerli bal arılarının koloni gelişiminin zayıf olması, koloni başına verim düşüklüğü, doğal ortamın kirlenmesi ve balın pazarlanması şeklinde belirlenmiştir. Arıcılığın geliştirilmesi için, hedefe yönelik araçlar arasında ise ana arı üretim işletmesi kurmak, modern kovan yapım atölyesi kurmak, temel petek üretim işletmesi kurmak, bal ormanı oluşturmak, arı ekotipini ıslah etmek, arı kolonilerinin zehirlenmesinin önlenmesi

için tanıtım ve bilgilendirme yapmak, bal kalitesini artıracak tedbirler almak, arıcılık ve arı ürünlerinin üretimi ve pazarlanması hakkında eğitimler vermek, bal markasının tanıtımını yapmak ve internet satış mağazası oluşturmak yer almaktadır. Eylem planında yer alan arıcılık üretim faaliyetine ilişkin performans göstergeleri modern kovan yapım atölyesi, temel petek üretim işletmesi, bal ormanı oluşturulması olarak yer almaktadır.Buna karşın Tokat ilinde mevcut durum incelendiğinde arıcılık araç gereçleri üretimi bulunmamakta ve ballı bitki yetiştirilmemektedir. Tokat ilinde planlanan hedef ise, her yıl 4000 modern kovan ve 20000 temel petek üretimi ve arı ormanının (otsu bitkiler, çalı ve ağaçlar)kurulması planlanmaktadır (OKA, 2018). Alınacak tedbirler sonucunda arıcılık için gerekli potansiyeli bulunan Tokat ilinde, arıcılık gelişerek Tokat ili ve Türkiye ekonomisine önemli katkılar sağlayabilecektir.Tokat ili arıcılık için uygun iklim ve zengin flora yapısına sahiptir. Ancak yörede arıcılığın yapısına, mevcut durumuna ve arıcılığın gelişmesi için alınabilecek önlemlere yönelik üreticilerin yeterli bilgi düzeyine sahip olmadığı ortaya çıkmaktadır. Arıcılığın; yöre ekonomisine katkılarının belirlenip, geliştirilmesi arıcılık faaliyetine gelecekte yön vermesi açısından önem taşımaktadır.

Kaynaklar

Akay, M.,Esengün, K., &Baykal, G. (1997). Tokat İli Artova İlçesinde arıcılık faaliyetinin ekonomik analizi, Gaziosmanpaşa Üniversitesi,Ziraat Fakültesi Dergisi, (1): 231-242.

Ankara Ticaret Borsası (ATB).(2017). (www.ankaratb.org.tr), (Erişim Tarihi:12.02.2017).

Burucu, V.,&Bal, S.G.(2018). Arıcılık işletmelerinin pazarlama olanakları: Kastamonu İli Azdavay İlçesi Örneği, TEAD, 4(1); 23-35.

Ceyhan, V.,&Canan, S.(2017). Türkiye arıcılarının koloni yönetim sistemleri itibariyle ekonomik performansı, Türk Tarım ve Doğa Bilimleri Dergisi 4(4): 516–522.

Collins M.,(1986). Sampling, Consumer Market ResearchHandbook Country of OriginLabeling, Journal of AgricultureandAppliedEconomics, 37.1(April 2005):49-63pp.

Çiçek, A.,Yücer, A.A.,&Karakoyun, H. (1993). Tokat ilinde arıcılığın yeri, ekonomik önemi ve sorunları üzerine bir araştırma, Gaziosmanpaşa Üniversitesi Ziraat Fakültesi Dergisi, 10:150-160, Tokat.

Çukur, F. (2014). Muğla İli Milas İlçesinde arıcılık faaliyetinin sürdürülebilirliliği üzerine bir değerlendirme, XI. Ulusal Tarım Ekonomisi Kongresi, Konya,s.40-47.

Demir, P.A., Aydın, E., Yazıcı, K., &Kırmızıbayrak, T.(2017). Ardahan İlinde arıcılık işletmelerinin sorunları ve beklentileri, EurasianJournalVeterinaryScience, 33 (4),260-267.

Engindeniz, S., Uçar, K., &Başaran, C.(2014). İzmir İlinde Arıcılığın ekonomik yönleri ve sorunları,Tarım Ekonomisi Dergisi 2014; 20(2): 113-120.

FAOSTAT, (2017). http://www.fao.org/faostat/en/#data/QI, (Erişim tarihi: 29.04.2019).

Kadirhanoğulları, İ, H.,(2016). Iğdır İli'nde arıcılığın ekonomik analizi, Iğdır Üniversitesi, Fen Bilimleri Enstitüsü,Tarım Ekonomisi Anabilim Dalı, Yüksek Lisans Tezi, Şubat, 82 Sayfa.

Parlakay, O.,&Esengün, K. (2005). Tokat İli Merkez İlçede arıcılık faaliyetinin ekonomik analizi ve işletmecilik sorunları, Gaziosmanpaşa Üniversitesi Ziraat Fakültesi Dergisi, 22 (1), 21-30.

Seven, İ.,&Akkılıç, M. E. (2005). Elazığ'daki arıcılık işletmelerinin üretim ve pazarlama problemlerinin tespiti ve çözüm önerileri, Lalahan Hayvancılık Araştırma Enstitüsü Dergisi, 45 (2) 41- 52.

TAGEM, (2018). Arıcılık, Tarımsal Ekonomi ve Politika Geliştirme Enstitüsü, Ocak 2018, Ürün No: 26, Ankara.

Tokat İl Tarım ve Orman Müdürlüğü. (2018). Arıcılık Birimi Çeşitli İstatistikler, Tokat, (Erişim Tarihi: 12.12.2017).

OKA (Orta Karadeniz Kalkınma Ajansı). (2018). Tokat İli Tarım ve Kırsal Kalkınma Eylem Planı, 2018-2023, 76 sayfa.

TÜİK, (2018). Çeşitli İstatistikler, (Erişim tarihi: 29.04.2019).

Uzundumlu, A.S., Aksoy, A.,& Işık, H.B.(2011). Arıcılık işletmelerinde mevcut yapı ve temel sorunlar; Bingöl İli Örneği, Atatürk Üniversitesi,Ziraat Fakültesi Dergisi,42 (1): 49-55.

Yalçın, F.Ç.,&Büyükbay, E.O. (2015). Tokat İli Merkez İlçede arıcılık yapan işletmelerde bal ve diğer arı ürünlerinin organik üretim potansiyeli, Gaziosmanpaşa Üniversitesi Ziraat Fakültesi Dergisi, 32 (2), 14-23.

FARM LOAN USING, LOAN PREFERENCES AND PRODUCTION STRUCTURE OF FARMERS: CASE OF MANISA PROVINCE

Onur Terzi
Turkish Economy Bank, Istanbul, Turkey
Email:onurterzi@gmail.com

Fazıl Akın Olgun
Ege University, Department of Agricultural Economics, Turkey

Abstract

The aim of this study is to determine the credit usage amounts of farmers in Manisa province and to examine the factors that play a role in the reasons of credit preference. At the same time farmers' agricultural production structures and the use of loans are also put forward. The statistics, survey data and credit data of Saruhanlı and Gölmarmara, (two districts of Manisa province), are examined. Within the scope of this review, important factors such as production capacity, input supply and points of sale of the farmers are put forward, the factors that cause farmers' indebtedness, reasons of credit preference and the need for credit are examined and the problems that arise during the credit usage process are grouped and explained. The Saruhanli and Golmarmara districts, whose data have been analyzed, are important agricultural production centers in Manisa and have low, middle and high income producers. Also land and climate structure suitable for growing a wide variety of agricultural products of both districts. There is a significant level of producer organization throughout the district. A total of 172 farmers were interviewed. While the average land size of the farmers is 10,6 Ha in Saruhanli, this figure is 7,6 Ha in Gölmarmara. In Saruhanlı district, the average agricultural gross income is calculated as 185.000 TL and in Gölmarmara it is 125.000 TL. Some of the farmers have non-agricultural income and non-agricultural income is about 5 to 10 percent of the total income in terms of land size. It was determined that a large part of the interviewed producers needed credit, and that the most demand for loans arose for production inputs. Interest rates, fees/commission rates and collaterals are considered to be the most important factors in loan preferences, and the high or low interest rates are the most influential factors. As the credit source of the farmers, the choice of loan applications between public banks and private banks, which are generally easy on their preferences, the demand for less documents and the possession of a familiar staff at the bank play a role. The borrowing status of the surveyed farmers is very high in the ones with low land size and it is understood that the borrowing rates change depending on the production pattern rather than the land size. It is observed that farmers are also financed by dealers selling inputs outside of credit. Some production inputs are provided by agricultural credit cooperatives, which means that farmers use in-kind loans. Farmers usually sell their products to merchants in advance, regardless of the size of the land. A small number of producers sell their products to agricultural sales cooperatives organized in the region. Within the scope of the study, the saving habits of farmers, except for the use of credit, were also examined. An average of 15-16 percent of the interviewed farmers can save. Savings are usually made by taking gold or land, while some producers use structured savings such as private pension. Farmers' agricultural gross income levels are high and profitability levels are low thanks to the agricultural potential of the region and the diversity of the product pattern. Annual gross agricultural profits of producers, especially between 0-5 Ha, are realized as 32.000 TL. It can be said that small-scale producers earn almost as little as a minimum wage employee when the interest rates paid to the loans are deducted. The credit demand of the producers, where both borrowing is high and the level of benefit from the scale economy is low, is increasing day by day. In this respect, it is thought that the producers who are mentioned in this group should be directed to non-credit resources and supported in different ways for the continuation of production.
Keywords: Agribusiness, Finance, Banking, Agriculture.

ÇİFTÇİLERİN TARIM KREDİSİ KULLANIM DURUMU, KREDİ TERCİH NEDENLERİ VE ÜRETİM YAPILARI: MANİSA İLİ ÖRNEĞİ

Özet

Çalışmanın amacı, son dönemde Manisa ilinde çiftçilerin kredi kullanım miktarlarının ortaya koyulması ve kredi tercih nedenleri konusunda rol oynayan faktörlerin incelenmesidir. Aynı zamanda çiftçilerin tarımsal üretim yapıları ile kredilerin kullanım durumları da ortaya koyulmaktadır. İnceleme kapsamındaki Manisa iline ait 2 ilçe olan Saruhanlı ve Gölmarmara'ya ait istatistikler, anket verileri ve kredi verileri incelenmektedir. Bu inceleme kapsamında çiftçilerin üretim kapasitesi, girdi tedariki, ürün satış noktaları gibi önemli unsurlar ortaya koyulmakta, bu unsurlar ile çiftçilerin borçluluk durumları, kredi tercih nedenleri ve krediye ihtiyaç duymalarına neden olan temel hususlar incelenmekte ve kredi kullanım sürecinde ortaya çıkan sorunlar gruplanarak açıklanmaktadır. Verileri incelenen Saruhanlı ve Gölmarmara ilçeleri, Manisa ili içerisinde yer alan önemli tarımsal üretim merkezleri olmakla birlikte, düşük, orta ve yüksek gelirli üreticileri bir arada barındıran yapıya sahiptir. Bunun bir başka nedeni ise her iki ilçenin çok çeşitli tarım ürünleri yetiştirmeye uygun arazi ve iklim yapısıdır. Ayrıca ilçe genelinde önemli sayılabilecek düzeyde üretici örgütlenmesi bulunmaktadır. İnceleme toplam 12 köy genelinde yapılmış olup, toplam 172 çiftçi ile görüşülmüştür. Çiftçilerin ortalama arazi büyüklüğü Saruhanlı 'da 106 dekar iken, Gölmarmara'da bu rakam 76 dekardır. Saruhanlı ilçesinde ortalama tarımsal brüt gelir 185 bin TL, Gölmarmara'da ise 125 bin TL olarak hesaplanmıştır. Çiftçilerin bir kısmı tarım dışı gelirlere sahip olup, tarım dışı gelirler arazi büyüklüğüne b ağlı olarak toplam gelirin ortalama yüzde 5'i ila 10'u kadardır. Görüşme yapılan üreticilerin çok büyük bir kısmının krediye ihtiyaç duymakta olduğu, en fazla kredi ihtiyacının üretim girdileri için ortaya çıktığı tespit edilmiştir. Kredi tercihlerinde faiz oranı, dosya ücreti/komisyon oranları ve teminatlar önemli birer tercih nedeni olarak görülmekte olup, faiz oranının yüksek ya da düşük olması tercihleri en fazla etkileyen unsur olarak bulunmakta, buna karşın kredi için istenilen teminatlar ise en az etkileyen unsur olarak görülmektedir. Çiftçilerin kredi kaynağı olarak kamu bankaları ve özel bankalar arasında tercihlerinde genellikle kolay yürüyen kredi başvuru süreçleri, az evrak istenmesi ve bankada tanıdık bir personele sahip olunması gibi unsurlar rol oynamaktadır. Anket yapılan çiftçilerin borçlanma durumu ise düşük arazi büyüklüğüne sahip olanlarda çok yüksek seyretmekte olup, borçlanma oranlarının arazi büyüklüğünden ziyade üretim desenine bağlı olarak değişim gösterdiği anlaşılmaktadır. Çiftçilerin kredi kullanma dışında, girdi satan bayiler tarafından da finanse edildikleri gözlemlenmektedir. Bazı üretim girdileri tarım kredi kooperatifleri tarafından sağlanmakta olup bu sayede çiftçilerin ayni kredi kullandığı tespit edilmiştir. Çiftçiler ürettikleri ürünleri arazi büyüklüğünden bağımsız olarak genelde peşin olarak tüccarlara satmaktadır. Az miktarda üretici ise yörede örgütlü olan tarım satış kooperatiflerine ürün satışı yapmaktadır. Çalışma kapsamında çiftçilerin kredi kullanımı dışında tasarruf edebilme alışkanlıkları da incelenmiştir. Görüşme yapılan çiftçilerin ortalama %15-16 'sı tasarruf edebilmektedir. Tasarruflar genellikle ziynet altın yada arazi alarak yapılmakta iken bir kısım üretici ise bireysel emeklilik gibi yapılandırılmış tasarruf araçlarına başvurmaktadır. Gerek yörenin tarımsal potansiyeli gerekse çeşitlilik arz eden ürün deseni sayesinde çiftçilerin tarımsal brüt gelir seviyeleri yüksek olmakla birlikte karlılık seviyelerinin düşük olduğu görülmektedir. Özellikle 0-50 dekar arası üreticilerin yıllık brüt tarımsal karları 32 bin TL seviyesinde gerçekleşmektedir. Kredilere ödenen faiz rakamları düşüldüğü zaman küçük ölçekli üreticilerin nerdeyse asgari ücretli bir çalışan kadar para kazandığı söylenebilir. Hem borçlanmanın yüksek olduğu hem de ölçek ekonomisinden fayda sağlama seviyesinin düşük olduğu üreticilerin kredi talebi günden güne artış göstermektedir. Bu itibarla, sözü edilen gruba giren üreticilerin kredi harici kaynaklara yönlendirilmesi ve üretimin devamı için farklı şekillerde desteklenmesi gerektiği düşünülmektedir.

Anahtar Kelimeler: Tarımsal Finansman, Bankacılık, Tarımsal İşletmeler

1. Giriş

Günümüzde bankacılık sektörünün tarıma yönelik geniş kredi ürünleri sunması sayesinde birçok çiftçi kredi ve diğer finans ürünleri ile tanışma fırsatı bulmuştur. Özellikle kredi talebinin sürekli artış gösterdiği ve devamlı olarak çiftçilerin finanse edilmesinde bir araç haline geldiği gözlemlenmektedir. Artan tarım kredi hacimleri bir yandan sektörü finanse ederken, çiftçilerin ödeme güçlüğü çektiği ve bu nedenle batık kredilerin artış gösterdiği bilinmektedir. Özellikle son bir yıl içerisinde batık kredi oranı çok yüksek seviyelere ulaşmıştır. (BDDK, Fintürk Verileri). Bu suretle kredilerin amacına uygun ya da geri ödenebilecek tutarlarda kullanılması, krediye ihtiyaç duyulan nedenlerin anlaşılması önemli hale gelmektedir. Bu araştırma kapsamında Manisa ilindeki çiftçilerle yapılan görüşmeler incelenerek kredi kullanım durumları, kredi ihtiyaçları ve çiftçilerin tarımsal üretim yapıları ile kredi borcu ilişkileri ortaya koyulmaya çalışılmıştır.

2. Materyal ve Metot

Araştırmanın ana verisini Manisa iline bağlı Saruhanlı ve Gölmarmara ilçelerinde faaliyet gösteren çiftçilerle yapılan anket verileri oluşturmaktadır. Anket yapılacak çiftçiler belirlenirken her iki ilçede bulunan çiftçi sayısı ana kitle olarak ele alınıp örneklem hesaplanmış sonrasında nispi temsil ilkesine dayalı olarak Saruhanlı'da 133, Gölmarmara'da ise 37 üretici olmak üzere toplam 170 üretici ile anket yapılmıştır. Anket yapılan üreticiler seçilirken yüksek, orta ve düşük gelirli köylerden eşit miktarda üretici çalışmaya dahil edilmiştir. Anket çalışması kapsamında çiftçilerin üretim tipleri, arazi varlıkları, kredi borçları ve tarımsal üretime olan bakış açılarının değerlendirildiği çok sayıda soruya cevap aranmıştır. Özellikle kredi borcu ve arazi varlığı gibi kişisel veri içeren konularda cevap vermekte imtina eden çiftçilerle karşılaşılmıştır. Bu nedenle bazı verilere ilişkin analizlerin tüm örneklem üzerinden yapılması mümkün olamamıştır. Çiftçilerin kredi tercih nedenleri ve değerlendirmeleri konularında 10'lu likert ölçeği ile hassas veri toplanmaya çalışılmıştır. Çiftçilerin tarımsal gelir ve gider rakamları hesaplanırken çeşitli bankaların kredi limit hesaplaması esnasında kullandıkları gelir/gider cetvellerinden faydalanılmış ve görüşmeler 2018 yılında yapıldığı için gelir hesaplarında 2018 parametreleri kullanılmıştır.

3. Literatür Özeti

Arslanbey (2011), Bankacılık Sektörü Ve Tarım Kredileri Türkiye'de Tarımın Finansmanı Ve T.C.Ziraat Bankası isimli çalışmasında ağırlıklı olarak Ziraat Bankası'nın sektördeki rolünün anlatılmakta olup, Ziraat Bankasının temel kredi konuları, kredi politikaları konularında bilgi verilmektedir. Diğer yandan sadece Ziraat Bankası'nın kullandırdığı indirimli faiz oranına sahip (sübvansiyonlu krediler) tarımsal kredilerle ilgili yaşanan sorunlara dikkat çekilmektedir. Verilen kredilerin bir kısmının atıl yatırımlara dönüştüğü ve kredi geri ödemelerinde meydana gelen aksaklıklar nedeniyle bir çok işletmenin el değiştireceği öngörülmektedir. Ayrıca tarım sektöründeki temsilcilerin indirimli faiz oranlı kredilerin sektörün bazı kesimlerine zarar verdiği yönünde ifadelerinin olduğu belirtilmektedir. Bollaşan kredi kaynağı nedeniyle bir takım tarımsal girdilere olan talep artmış bu da fiyatlar da yukarı yönlü bir harekete neden olduğu ifade edilmektedir.

Kandemir (2010), Dünya Ve Türkiye'de Tarımın Finansmanı adlı çalışmada, T.C. Ziraat Bankası'nın Türkiye Tarımının Finansmanındaki Rolü Tarımın finansman ihtiyacı ve tarımsal finansmanın özelliklerini incelemiş, Ziraat Bankasının sektörün finanse edilmesinde oynadığı rol ortaya koyulmuştur. Son yıllarda indirimli faiz oranlı tarım kredilerinin kullandırımına aracılık eden Ziraat Bankası'nın önemli bir finans kaynağı olduğuna vurgu yapılmaktadır. Diğer yandan başta Almanya olmak üzere tarım sektörü gelişmiş ülkelerdeki tarımsal finansman uygulamalarına yer verilen çalışmada, Amerika 'daki Farm Credit System (FCS), Hollanda'daki Rabobank, Japonya'daki kooperatif bankacılığı örnekleri ile Fransa'daki Credit Agricole gibi finansman kuruluşları incelenmiş ve bunlara ilişkin işleyiş hakkında bilgiler verilmiştir. Türkiye'de tarım sektörü ile finans kuruluşları arasındaki entegrasyonun para, mal ve sermaye piyasasındaki sorunların çözülmesinden geçtiğine vurgu yapılmaktadır. Fiyat belirsizlikleri, ürünlerin karlılık oranları, ürün talebindeki belirsizlikler ve plansız üretim gibi hususların üreticinin gelir seviyesini olumsuz etkilediği varsayılmakta ve bunların çözümü ile tarım sektörü ile finans sektörü arasındaki entegrasyonun güçleneceği belirtilmektedir.

Yılmaz (2008), Dünya'da ve Türkiye'de Tarımsal Finansman-Türkiye İçin Model Önerisi isimli çalışmasındatarım sektöründe finansman ihtiyacını oluşturan etkenleri ortaya koymakta, çalışma içerisinde özellikle Almanya, Hollanda ve A.B.D.' de tarımsal finansman konusundaki örnekler anlatılmaktadır. Türkiye'deki tarımsal finansman kaynaklarının tanıtıldığı çalışmanın sonuç bölümünde ise Türkiye için uygulanabilecek bir model önerisinde bulunulmuştur. Türkiye'de uygulanabilecek iyi bir tarımsal finansman sisteminde, kısa dönemde küçük aile işletmelerinin birleştirilmesi yoluyla işletmelerin daha sağlıklı bir finansal yapıya kavuşturulması, uzun dönemde bu tarımsal işletmelerin tarımsal hammadde ile mamul üreten sanayi kuruluşlarına girdi sağlama konusundaki başarısının artması ve buna bağlı olarak sanayi ürünlerinde iç ve dış pazarlarda rekabet edilebilir bir konuma getirilmesi hedeflenmesi gerektiğine vurgu yapılmaktadır. Ayrıca devlet, üreticiler, finansal kuruluşlar, üretici örgütleri, tarımsal sanayi kuruluşları, hane halkları arasında hızlı bilgi akışı oluşturabilecek işlevsel bir yapının kurulması gerektiği ifade edilmektedir. Ayrıca devletin faiz sübvansiyonu uygulamasının daha da genişletilerek tüm finans kurumlarına teşmil edilmesi gerektiği önerilmektedir. Tüm bunların sonunda Tarım Finansmanı Merkez Kurumu adı verilen bir merkez kurum kurulması gündeme getirilmektedir.

4. Bulgular

4.1. Tarımsal Gelir ve Kredi Kullanım Durumu

Ankete katılan üreticilerin ortalama tarımsal net geliri 80 bin TL seviyesinde olup, bunların 97 tanesinin tarım dışı geliri bulunmaktadır. Toplam net gelir içerisinde tarım dışı gelir oranı arazi büyüklüğü artış gösterdikçe azalmaktadır. Bunun en temel nedeni ise özellikle küçük çiftçilerin emekli maaşı geliri ya da belediye veya benzeri kurumlardan maaş geliri elde etmesidir. Yeterince büyük arazi sahibi olmayan çiftçiler bu şekilde ek gelir sağlamaktadır. Arazi büyüklüğüne bağlı olarak çiftçi başına ortalama net tarımsal gelir 31 bin TL'den 400 bin TL seviyelerine kadar çıkmaktadır. Buna karşın dekar başına gelir arazi büyüklüğü ile ters orantılı şekilde değişim göstermekte olup, daha düşük araziye sahip üreticilerin dekar başına gelirleri daha yüksek seyretmektedir. Bunun temel nedeni ise araştırma bölgesinde küçük ölçekli bağ, meyve ve sebze üretiminin yaygın olması ve bu ürünlerin hububata oranla daha karlı ürünler olmasıdır. (Tablo 1 ve 2)

Tablo 1. Anket Yapılan Üreticilerin Ortalama Gelir Seviyeleri (Çiftçi Başına, TL)

Arazi Segmenti (Da)	Çiftçi Sayısı	Ortalama Tarımsal Brüt Gelir	Ortalama Tarımsal Net Gelir	Ortalama Tarım Dışı Gelir	Ortalama Toplam Net Gelir
0-50	87	56.534	31.677	7.996	39.672
50-100	50	162.645	89.776	8.990	98.766
100-250	27	291.089	161.247	11.333	172.581
250-500	5	631.858	346.924	10.360	357.284
500+	1	733.132	403.055	15.600	418.655
Toplam	**170**	**145.897**	**80.800**	**8.933**	**89.733**

Tablo 2. Anket Yapılan Üreticilerin Dekar Başına Tarımsal Net Gelirleri (TL)

Arazi Segmenti(Da)	Çiftçi Sayısı	Toplam Arazi (Da)	Dekar Başına Tarımsal Net Gelir
0-50	87	2.192	1.257
50-100	50	3.606	1.245
100-250	27	4.250	1.024
250-500	5	1.832	947
500+	1	641	629
Toplam	**170**	**12.521**	1.097

Çiftçilerin gelir seviyeleri ve arazi büyüklüğü üzerinden bankalara olan kredi borçları incelendiğinde özellikle düşük ölçekteki üreticilerin kredi borçlarının brüt ve net gelirlerine oranla yüksek olduğu görülmektedir. Özellikle 100 dekara kadar olan üreticilerde net gelirin tamamı kadar borçlanma göze çarpmaktadır. Benzer şekilde kredi borçlarının brüt gelire olan oranı da çok yüksektir. Özellikle kısa vadeli olan işletme sermayesi niteliğindeki krediler için tarımsal brüt gelirin yetersiz kalacağı söylenebilir.

Tablo 3. Ankete Katılıp Borç Bilgisi Alınan Çiftçilerin Gelir ve Kredi Borcu Durumu (Çiftçi Başına, TL)

Arazi Segmenti (Da)	Çiftçi Sayısı	Ortalama Tarımsal Brüt Gelir	Ortalama Tarımsal Net Gelir	Ortalama Toplam Borç	Borç/Brüt Gelir Oranı	Borç/ Net Gelir Oranı
0-50	29	54.414	30.612	27.754	51,0%	90,7%
50-100	28	167.101	92.243	111.002	66,4%	120,3%
100-250	18	291.201	160.340	72.199	24,8%	45,0%
250-500	4	699.624	383.945	207.664	29,7%	54,1%
500+	1	733.132	403.055	148.643	20,3%	36,9%
Toplam	80	187.876	103.694	77.397	41,2%	74,6%

Kredi borçlarının itfa edilebilmesi net gelir ile yakından ilişkilidir. Özellikle uzun vadeli kredilerin ödenmesi için net gelir seviyesinin sürdürülmesi gerekmektedir. Diğer yandan toplam kredi borçları içerisinde kısa ve uzun vadeli kredilerin dengesinin korunması büyük önem taşımaktadır. Çünkü kısa vadeli borçlar özellikle tarımsal brüt gelir ile geri ödenebilirken, uzun vadeli borçlar net gelir ile geri ödenebilmektedir. Eğer kredi borçlarında vade dengesi uzun vadeli krediler lehine değişirse net gelirin o seviyede yükselmesi beklenir. Ancak araştırma esnasında bunun tersi olduğu görülmektedir. Çiftçilerin kredi borçları içerisinde son 5 yılda kısa vadeli borçların oranı azalmış, uzun vadeli borçların ise oranı artmıştır. Bunun nedeni yukarıdaki gelir ve kredi borcu dengesizliği nedeniyle ortaya çıkan ödeme güçlükleridir.

Tablo 4. Ankete Katılan Çiftçilerin Kısa Vadeli Kredi Borç Oranı ve Tarımsal Gelir Değişimleri

Arazi Segmenti (Da)	Çiftçi Sayısı	Kısa Vade Borç Oranı 2013	Kısa Vade Borç Oranı 2018	Tarımsal Gelir Değişim (2015-2018)
0-50	29	50,1%	38,9%	0,79%
50-100	28	35,5%	24,6%	9,64%
100-250	18	47,9%	18,1%	1,87%
250-500	4	27,8%	53,2%	17,21%
500+	1		45,4%	83,82%
Toplam	80	**42,7%**	**30,4%**	**6,26%**

Çiftçiler kredi taksitlerini ödeme güçlüğü çektiği zaman kredileri yapılandırma ve vadesini uzatma yoluna gitmektedir. Bu durumda uzun vadeli borç oranı yükselmektedir. Ancak araştırma kapsamında uzun vadeli borç oranı artan üreticilerin gelirlerindeki artış çok düşük seyretmektedir. Özellikle düşük arazi büyüklüğüne sahip üreticilerin gelir seviyeleri neredeyse hiç değişmemiştir. Aynı şekilde 50-100 ve 100-250 dekar arasındaki üreticilerin gelirlerinde de değişim çok küçüktür. Bu durum, ilerleyen dönemde çiftçilerin kredi geri ödemelerinde problemler yaşayacağını göstermektedir. (Tablo 4)

4.2. Kredi Tercih Sebepleri

Çiftçilerin birçok ihtiyaç için banka kredilerine başvurduğu bilinmektedir. Gerek işletme sermayesi nitelikli krediler, gerekse yatırım amaçlı krediler her zaman çiftçilerin talep ettikleri dış finansman kaynaklarıdır. Çiftçilerin kredi kullanımında nasıl tercihler yaptıkları, kredileri ne amaçla kullandıkları ve tasarruf edip edemedikleri ise bu alandaki önemli soruları oluşturmaktadır.

Araştırma kapsamında çiftçilerin krediye ihtiyaç duydukları alanlar sorulmuş ve en fazla ihtiyacın tarımsal girdi için olduğu ortaya çıkmıştır. Ankete katılan çiftçilerin %92,4 'lük kesimi tarımsal girdi yani üretimi yapabilmek için gerekli maddeleri temin için krediye ihtiyaç duyduğunu ifade etmiştir. Sadece % 5'lik katılımcı ise traktör alımı için krediye ihtiyaç duyduğunu ifade etmektedir.

Tablo 5. Ankete Katılan Üreticilerin Krediye En Fazla İhtiyaç Duydukları Konuların Yüzdesel Dağılımı

Tarımsal Girdi (mazot, gübre, ilaç vb.)	92,4%
Traktör	5,3%
Arazi	0,6%
Canlı Hayvan	1,2%
Diğer	0,0%

Tarımsal girdilerin krediye en çok ihtiyaç duyulan başlık olmasının çiftçilerin ilk etapta üretimlerini sürdürme düşüncesiyle ağırlıklı şekilde bu seçeneğe evet cevabı vermiş olmaları ihtimaline karşılık bir başka soru daha yönetilmiş ve bugün harcayabilecekleri 100 bin TL paraları olması durumunda ne şekilde bir tercih yapacakları sorulmuştur. Bu soru yatırım anlamındaki ihtiyacın anlaşılması için büyük önem taşımakta ve çiftçilerin kredi ile ilgili ihtiyaçlarının ortaya koyulmasına yardımcı olmaktadır. Buna göre en fazla ihtiyacın arazi alımı ve traktör alımı olduğu tespit edilmiştir. Ankete katılan çiftçilerin yarısından fazlası 100 bin TL'lik nakit para ile arazi alacaklarını, %31,2 'lik kesim ise traktör almayı tercih edeceğini beyan etmiştir.

Tablo 6. "100 Bin TL Nakit Paranız Olsa Nasıl Harcardınız" Sorusuna İlişkin Cevapların Yüzdesel Dağılımı

Traktör alımı	31,2%
Arazi alımı	55,3%
Her türlü hayvan alımı	5,9%
Konut (mesken) alımı	11,8%
Binek taşıt alımı	1,8%
Makine ve ekipman alımı	7,1%
Sünnet / Evlilik Düğün	2,4%
Hacca Gitmek	0,6%
Diğer	7,1%

Tablo 7. Çiftçilerin Özel Banka Kredilerini Tercih Etme Nedenlerinin Yüzdesel Dağılımı *(Borç Bilgisi Alınan 80 Üreticinin Cevapları)*

Daha hızlı hizmet alabiliyorum	16,3%
İlgili bankada akraba/tanıdık personel var	3,8%
Daha fazla kredi limiti tahsis edilebiliyor	35,0%
Daha az evrak ile kredi başvurusu yapabiliyorum	21,3%
İşlemlerimde sorun yaşadığım zaman hızla çözebiliyorlar	3,8%

Çiftçilerin geneli Ziraat Bankasından sürekli kredi kullanmaktadır. Ayrıca faiz sübvansiyonlu kredilerin tamamı Ziraat Bankası tarafından kullandırılmakta olduğu için çiftçilerin Ziraat Bankası haricinde farklı bir kaynağı tercih etme nedenleri önemli hale gelmektedir. Araştırma kapsamında çiftçilerin özel bankalardan neden kredi kullandıklarına yönelik bilgiler alınmaya çalışılmıştır. Çiftçilerin özel bankalardan kredi kullanımı ile ilgili tercihlerde en yüksek sebep daha fazla kredi limiti tahsis edilebiliyor olmasıdır. Gerçekten de saha gözlemleri Ziraat Bankası'ndaki limitlerini dolduran çiftçilerin özel bankalara kredi başvurusu yaptığını göstermektedir. Diğer iki güçlü neden ise daha az evrak ile başvuru yapabilme ve hızlı hizmet alabilme olduğu görülmektedir. Çiftçilerin hızlı hizmeti yada az evrakla işlem yapabilme avantajını önemli görmelerinin temel nedeni banka şubelerinin şehir merkezinde olması ve çiftçinin banka işlemleri için köyden şehir merkezine

gelmesinin zorluklarıdır. Hızlı ve az evrakla yapılan işlemler sayesinde çiftçiler sık sık şehir merkezine gelmek zorunda kalmamaktadır.

Bir diğer önemli konu ise çiftçilerin kredi kullanımı esnasında dikkat ettikleri ya da göz önünde bulundurdukları unsurlardır. Bilindiği üzere kredi kullanımında, faiz ve komisyon oranı ile istenilen teminat yapısı çok önemlidir. Ancak zaman zaman çiftçilerin önem sıralaması değişebilmektedir. Araştırmaya katılan çiftçilerin tamamına yakını için faiz oranı çok önemlidir. Dosya masrafı ve komisyon oranları ise en az faiz oranı kadar önemli olmakla birlikte faiz oranı kadar önemli olmadığı sonucuna varılmaktadır. İstenilen teminatlar da benzer şekilde çok önemli ancak faiz oranı kadar önemli değildir. Kabaca bir sıralama yapmak gerekirse sırasıyla en önemli unsur faiz oranı olmakta, bunu istenilen teminatlar ve dosya masrafı ile komisyonlar izlemektedir. (Tablo 8)

Tablo 8. Çiftçilerin Kredi Kullanımı Esnasında Önem Verdikleri Unsurlar

	Faiz Oranı	Dosya Masrafı ve Komisyon Oranları	İstenilen Teminatlar
Çok Önemli	97,2%	59,8%	62,0%
Önemli	1,6%	37,7%	36,0%
Oldukça Önemli	0,7%	0,8%	2,0%
Biraz Önemli	0,5%	1,0%	0,0%
Önemli değil	0,0%	0,0%	0,0%

Araştırma kapsamında çiftçilerin krediye ihtiyaç duydukları konuları ve kredi kullanımı esnasında önem vermeleri gereken unsurları bildiği düşünülmektedir. Bu bilgiler ışığında çiftçilerin doğru kredi miktarını alması, bir başka deyişle geri ödeyebilecekleri krediyi kullanması beklenmektedir. Fakat yine de sahadaki gözlemler ve anket verileri kredi geri ödeme konusunda sorunlar yaşanabileceğini göstermektedir. Anket çalışması kapsamında çiftçilere banka borcunu vadesinde ödeyememe durumunda hangi şekillerde ödedikleri konusunda soru sorulmuştur. Ancak, çiftçiler arasında borç ödeyememe durumu hassas bir konu olduğu için birçok çiftçi bu konuda görüş beyan etmekten imtina etmiştir. Bu soruya cevap veren 23 kişinin %70'i bu gibi durumlarda başka kişilerden borç alma yoluna gittiklerini, % 30'u ise borcu başka bankaya taşıyıp vade uzatarak çözüm bulduğunu beyan etmiştir. Bulgular daha önce yukarıda sözü edilen uzun vadeli kredilerin toplam kredi borcu içerisinde oransal olarak daha fazla yer almasını destekler nitelik taşımaktadır.

4.3. Tarımsal Üretim Yapısı ve Kredi Kullanım İlişkisi

Çiftçilerin tarımsal üretim yapısı hem gelir gider dengesi hem de kredi kullanımına ilişkin kararları doğrudan etkilemektedir. Tek yıllık ya da çok yıllık bitkilerin üretim maliyetleri ve kar oranlarının farklı olması çiftçilerin nakit döngülerini doğrudan etkileyen unsurlardır. Çiftçilerin tarımsal gelirlerinin deseni yani ektikleri ürünlerden elde ettikleri gelirin dağılımı kredi kullanımı ile ilgili tercihler açısından önem taşımaktadır.

Anket yapılan çiftçiler içerisinde toplam tarımsal brüt gelir içerisinde meyve yada sebze üretiminden kaynaklanan gelir oranları araştırılmış ve borçlanma ile arazi büyüklüğü ilişkisi incelenmiştir. Öncelikle meyve ya da sebze gelirinin toplam gelir içerisinde %50'den fazla ya da az olması arazisi küçük olan üreticiler için önemli ölçüde değişim göstermektedir. 0-50 dekar arasında olup toplam tarımsal gelirlerinin %50'sinden fazlası meyve-sebze kaynaklı üreticilerin borçlanma tutarı, %50'den az meyve-sebze geliri elde eden gruba göre çok yüksek görünmektedir. Aslında bunun tam tersi olması beklenmekte ve tek yıllık bitkileri üreten çiftçilerin daha fazla işletme sermayesi ihtiyacına sahip olması gözleminden hareketle bu tip üreticilerin gelirlerine göre borç oranlarının daha yüksek olması gerektiği düşünülmektedir. Bu nedenle Çizelge 9'daki üçüncü tablo eklenmiş ve kısa vadeli borç oranı çıkarılmıştır. Görüldüğü üzere gelir deseni ağırlıklı meyve-sebze üzerinden olan çiftçilerde uzun vadeli kredi borçlarının daha fazla ağırlıkta olduğu, diğer üreticilerde ise kısa vadeli borç oranının yüksek olduğu anlaşılmaktadır. Bu durumda 0-50 dekar arası araziye sahip olan ve gelirinin %50'sinden fazlası meyve-sebze 'den gelen üreticilerin dekar başına daha fazla gelir elde etmesine karşın daha fazla borçlanma içerisinde oldukları ve borçlarının ağırlıklı olarak uzun vadeli olduğu sonucu çıkmaktadır. Bunun temel nedeni olarak bu tip üreticilerin bahçelerin bakımı, sulama sistemlerinin yenilenmesi gibi yatırımlara dönük kredi kullanmış olmaları ya da tarım dışı ihtiyaçları

için kredi kullanmış olabilecekleri varsayılabilir. Arazi büyüklüğünün artışı ile borç/gelir oranında hissedilir bir düşüş olduğu görülmektedir. 100-250 dekar arasındaki çiftçilerde tarımsal geliri ağırlıklı tarla bitkileri olan grupta borçlanma oranının nispeten daha yüksek olduğu görülmektedir. Ancak bu üreticilerin sayısı çok az olduğu için doğrudan bir tespit yapmak zorlaşmaktadır. (Tablo 9)

Tablo 9. Çiftçi Başına Toplam Gelir İçerisinde Meyve-Sebze Gelir Oranı ve Arazi Büyüklüğüne göre Borçların Gelirlere Oranı, Aynı Gruplara Ait Kısa Vadeli Borçların Toplam Borç İçerisinde Oranı *(Borç Bilgisi Alınan 80 Çiftçi İçerisinde Üretim Deseni Bilgisi Alınan 77 Çiftçi Üzerinden)*

Borç Bilgisi Bilinen Çiftçilerin Adetsel Dağılımı

Meyve Sebze Gelir Oranı	0-50	50-100	100-250	250-500	500+	Grand Total
%50'den az	6		3		1	10
%50'den fazla	20	28	15	4		67
Grand Total	**26**	**28**	**18**	**4**	**1**	**77**

Borç/ Tarımsal Brüt Gelir Oranları

Meyve Sebze Gelir Oranı	0-50	50-100	100-250	250-500	500+	Toplam
%50'den az	17,5%	N/A	27,5%	N/A	20,3%	23,2%
%50'den fazla	60,7%	66,4%	24,3%	29,7%	N/A	43,8%
Toplam	**54,6%**	**66,4%**	**24,8%**	**29,7%**	**20,3%**	**41,5%**

Borç/ Tarımsal Net Gelir Oranları

Meyve Sebze Gelir Oranı	0-50	50-100	100-250	250-500	500+	Toplam
%50'den az	30,7%	N/A	49,8%	N/A	36,9%	41,9%
%50'den fazla	110,1%	120,3%	44,2%	54,1%	N/A	79,6%
Toplam	**98,6%**	**120,3%**	**45,0%**	**54,1%**	**36,9%**	**75,3%**

Kısa Vadeli Borç Oranları

Meyve Sebze Gelir Oranı	0-50	50-100	100-250	250-500	500+	Toplam
%50'den az	60,6%	N/A	6,9%	N/A	45,4%	43,4%
%50'den fazla	33,9%	24,6%	19,7%	53,2%	N/A	28,2%
Toplam	**36,6%**	**24,6%**	**18,1%**	**53,2%**	**45,4%**	**29,3%**

Gelir deseni ile kredi borcu ilişkisinin yanı sıra ürün çeşitliliğinin de çiftçilerin nakit akış döngüsünü etkilediği bilinmektedir. Özellikle tarla bitkileri ile meyve-sebze gibi çok yıllık bitkileri aynı anda üreten çiftçiler yada hasat zamanları birbirinden farklı ürünler üreten çiftçilerin kredi gereksinimi farklı hale gelmektedir. Ürün çeşitliliği açısından borçların gelire oranları incelendiğinde ürün çeşitliliği arttıkça borç/gelir oranlarının iyileştiği görülmektedir. Arazi büyüklüğünün artışı da bu oranlara olumlu yönde etki yapmaktadır. Örneğin aynı ürün çeşidi sayısına sahip çiftçilerde arazi büyüklüğünün artışı borç/gelir oranını düşürücü etki yapmaktadır. (Tablo 10)

Elbette tarımsal üretim yapısı sadece ürün deseni ya da ürün çeşidi ile kısıtlı değildir. Ancak bu iki unsur nakit akışını büyük ölçüde etkileyen niteliktedir. Bu nedenle araştırmanın bu kısmında öncelikle bu iki unsur değerlendirilerek çıkarımlar yapılmıştır.

Tablo 10. Çiftçi Başına Toplam Gelir İçerisinde Ürün Çeşidi ve Arazi Büyüklüğüne göre Borçların Gelirlere Oranı, Aynı Gruplara Ait Kısa Vadeli Borçların Toplam Borç İçerisinde Oranı *(Borç Bilgisi Alınan 80 Çiftçi Üzerinden)*

Borç Bilgisi Bilinen Çiftçilerin Adetsel Dağılımı

Ürün Çeşidi Segment	0-50	50-100	100-250	250-500	500+	Grand Total
0-1	8	2				10
2-3	20	14	2			36
4-5	1	10	14	2	1	28
5 ve Üzeri		2	2	2		6
Grand Total	**29**	**28**	**18**	**4**	**1**	**80**

Borç/ Tarımsal Brüt Gelir Oranları

Ürün Çeşidi Segment	0-50	50-100	100-250	250-500	500+	Grand Total
0-1	21,6%	185,4%*				116,8%
2-3	58,4%	53,4%	73,0%			58,0%
4-5	42,7%	60,3%	13,4%	21,4%	20,3%	24,9%
5 ve Üzeri		39,4%	43,3%	36,9%		38,7%
Grand Total	**51,0%**	**66,4%**	**24,8%**	**29,7%**	**20,3%**	**41,2%**

Borç/ Tarımsal Net Gelir Oranları

Ürün Çeşidi Segment	0-50	50-100	100-250	250-500	500+	Grand Total
0-1	36,0%	337,0%				204,6%
2-3	105,4%	96,9%	132,7%			105,2%
4-5	77,6%	108,7%	24,3%	39,8%	36,9%	45,3%
5 ve Üzeri		71,6%	78,1%	66,1%		69,5%
Grand Total	**90,7%**	**120,3%**	**45,0%**	**54,1%**	**36,9%**	**74,6%**

Kısa Vadeli Borç Oranları

Ürün Çeşidi Segment	0-50	50-100	100-250	250-500	500+	Grand Total
0-1	48,9%	32,1%				44,1%
2-3	35,0%	20,7%	27,8%			28,8%
4-5	51,2%	28,7%	22,0%	92,7%	45,4%	32,5%
5 ve Üzeri		20,7%	3,4%	13,8%		12,4%
Grand Total	**38,9%**	**24,6%**	**18,1%**	**53,2%**	**45,4%**	**30,4%**

5. Sonuç ve Değerlendirme

Kredi kullanan çiftçilerin verileri üzerinden yapılan genel değerlendirmede özellikle küçük ölçekli üreticilerin yüksek borçlanma içerisinde oldukları göze çarpmaktadır. Bu durum aynı zamanda bu grup başta olmak üzere incelenen çiftçilerin kredi taleplerinin yüksek olduğunu da göstermektedir. Çiftçilerin toplam borçları içerisinde uzun vadeli borçların oranı önemli oranda artış göstermiştir. Bu durum özellikle ödeme güçlüğü çeken çiftçilerin bankalara giderek kredi vadelerinde uzatma talebinden kaynaklanmaktadır denilebilir. Çiftçilerin uzun vadeli kredi borçlarının artmasına karşın gelirlerinde çok düşük artışlar ortaya çıkmakta ve bu durum geri ödeme problemlerinin devam edeceğini göstermektedir. Çiftçilerin krediye ihtiyaç duydukları 3 temel alan olduğu görülmektedir. İhtiyaçların başında üretimi devam ettirmek amacıyla tarımsal girdiler gelirken, arazi alım ve traktör gibi önemli üretim unsurları da kredi ihtiyaçları olarak sıralanabilir. Son yıllarda özel bankaların tarım sektörüne ilgisinin artması ile çiftçilerin özel bankalardan kredi talebi de artış göstermiştir. Özellikle daha fazla kredi limiti tahsis edilmesi ve hızlı sonuçlanan kredi süreçleri çiftçilerin özel bankaları tercih etmesinde büyük rol oynamaktadır. Diğer yandan kredi kullanımı için faiz oranı seviyesinin en önemli faktör olabileceği tespit edilmiştir. Bu durumda çiftçiler özel bankalar arasında tercih yaparken

öncelikle faiz oranı üzerinden tercih yapmakta ve düşük faizli kredileri tercih etmektedir. Kredi için istenilen teminatlar da bir başka önemli unsur olmakta ancak faiz oranı kadar önemli görülmemektedir. Çiftçilerin tarımsal üretim deseni ve ürün çeşidi de kredi kullanımında rol oynamaktadır. Özellikle meyve-sebze gibi dekar başına yüksek gelir sahibi çiftçilerin içerisinde arazi büyüklüğü küçük olanların yüksek borçlanma içerisinde olduğu ortaya çıkmaktadır. Bu beklenmeyen bir durum olmakla birlikte çiftçilerin bireysel ihtiyaçları için kredi kullandığı yada küçük arazi nedeniyle sabit maliyetlerin yüksek olması sonucu düşük gelir elde ettiklerini akla getirmektedir. Araştırmada incelenen kitle içerisinde küçük üreticiler katma değerli ürün üretseler dahi yüksek borçlanma ile karşı karşıya kalmaktadır. Benzer şekilde tarımsal ürün çeşitliliği de küçük çiftçiler için fazla olumlu katkı yapmamaktadır. Ürün çeşidi artsa dahi arazi büyüklüğü küçük olduğu sürece çiftçilerin borçlanma oranları yüksek seyretmektedir.

Çiftçilerin kredi talebinin yüksek olması ve gelirlerine oranla yüksek borçlara sahip olmalarının çok fazla nedeni olabilir. Ancak araştırma kapsamında temel unsurlar incelenerek bu durumun ana nedenleri ortaya koyulmaya çalışılmıştır. Bu noktada girdi maliyetlerinin yüksek olması ve özellikle küçük arazi sahibi çiftçilerin yüksek üretim maliyetleri ile karşı karşıya kalması temel nedenlerden sayılabilir. Aynı zamanda çiftçilerin ürünleri değer fiyata satamayışı net gelir seviyesini düşürmekte ve elde edilen kısıtlı net gelirin önemli kısmı finansman maliyetlerine harcanmak durumunda kalınmaktadır. Bu durum çiftçilerin sürdürülebilir sabit sermayelerine olumsuz etki yapmakta başta traktör ve ekipman olmak üzere kaliteli ve verimli üretim için gerekli üretim faktörlerinin satın alınması yada yenilenmesi önünde engel oluşturmaktadır. Bu bilgiler ışığında özellikle küçük çiftçilerin mutlak suretle organize hareket etmesi, sözleşmeli tarım gibi girdi finansman yükü nispeten paylaşılmış üretim modellerini tercih etmesi, ürünü doğrudan tüketiciye ulaştırma yollarını araştırması gerekmektedir denilebilir. Bu tedbirler alındığında bile ilk birkaç üretim sezonunda çiftçilerin borçlanması azalış göstermeyebilir. Çünkümevcut borçlanmanın yüksek seviyede olması söz konusu borçların ödeme sürelerini uzatmaktadır. Bu alanda alınan tedbirlerin sabırla uygulanması ve çok taraflı (alıcı, işleyici, finansör vb.) düşünülerek hayata geçirilmesinin çok büyük önem taşıdığı açıktır.

Kaynaklar

Finansal Türkiye Haritası, http://ebulten.bddk.org.tr/finturk, Çeşitli Yıllar, 13.04.2019.

Çeşitli Bankaların Yayınlanmamış Tarım Kredi Politikası Verileri, 2018.

Memzuç Veritabanı, T.C.Merkez Bankası Kredi Limit ve Risk Verileri, 2018.

Arslanbey, S. (2011), Bankacılık Sektörü Ve Tarım Kredileri Türkiye'de Tarımın Finansmanı Ve T.C.Ziraat Bankası, Doktora Tezi, Balıkesir Üniversitesi Sosyal Bilimler Enstitüsü, Balıkesir.

Kandemir, F. (2010), Dünya Ve Türkiye'de Tarımın Finansmanı, Yüksek Lisans Tezi, Kocaeli Üniversitesi Sosyal Bilimler Enstitüsü, Kocaeli.

Yılmaz, M.K. (2008), Dünya'da ve Türkiye'de Tarımsal Finansman-Türkiye İçin Model Önerisi, Yüksek Lisans Tezi, Kadir Has Üniversitesi Sosyal Bilimler Enstitüsü, İstanbul.

ECONOMIC ANALYSIS OF CASSAVA PROCESSING UNDER VALUE CHAIN DEVELOPMENT PROGRAMME (VCDP) IN WUSHISHI LOCAL GOVERNMENT AREA OF NIGER STATE, NIGERIA

Abigail John Jirgi
Federal University of Technology, Department of Agricultural Economics and Farm Management, Nigeria, Email:jirgi.abigail97 @gmail.com; abigail.jirgi @futminna.edu.ng

Bose Rebecca Edwin
Federal University of Technology, Department of Agricultural Economics and Farm Management, Nigeria

Agatha Itohan Oseghale
Federal University of Technology, Department of Agricultural Economics and Farm Management, Nigeria

Ayodeji Alexander Ajibola Coker
Federal University of Technology, Department of Agricultural Economics and Farm Management, Nigeria

Faith Debaniyu Ibrahim
Federal University of Technology, Department of Agricultural Economics and Farm Management, Nigeria

Ramatu Usman Bako
Federal University of Technology, Department of Agricultural Economics and Farm Management, Nigeria

Abstract

This study was carried out to analyse the economics of cassava processing under value chain development program in Wushishi Local Government area of Niger State, Nigeria. The research described the socio-economic characteristics of the cassava processors, identified methods used by the cassava processors, estimated the cost and returns to cassava processing as well as analysed the determinants of income of cassava processors. The study utilized multistage sampling technique in selecting 100 processors from the study area. Data were obtained through the use of structured questionnaire and interview schedule. The data were analysed using descriptive statistics, farm budgeting technique and regression model. The farm budgeting analysis revealed that cassava processing into garri was profitable with a net income of ₦103,485.33. Labour intensity, high cost of cassava tubers and time consumption were the major constraints faced by the farmers. The regression analysis showed that 67% of the variation of the output was explained by the variables included in the model. Age ($p<0.05$), processing experience ($p<0.01$), transportation cost ($p<0.05$), storage cost ($p<0.01$) and packaging cost ($p<0.01$) were significant factors that influenced the income of cassava farmers under VCDP in the study area.The study recommendsthat the VCDP/Government should introduce innovative equipment that will reduce the stress in processing and ensure timeliness in processing operations.

Keywords: Cassava, Processing, Value Chain, Processors, VCDP.

1. Introduction

Value chain is the actors (private and public, including service providers) and the sequence of value-adding activities involved in bringing a product from production to the end-consumer. In agriculture they can be thought of as a "farm-to-fork" set of inputs, processes and flow (Miller and de Silva, 2007). The value chain of a product describes the full range of activities which are required to bring a product or service from conception, through the different actors involved in the production, processing, and delivery to the final consumers (Adekunle*et al*., 2012).

The value chain development program is a Federal government programme inaugurated by international fund for Agricultural development (IFAD). It is a programme for rice and cassava in some middle belts states of Nigeria: Niger, Ogun, Anambra, Ebonyi, Taraba and Benue state. It is a programme put in place by the government to support rice and cassava value chains and hoping to take smallholder farmers to a different level of profit. This programme, aimed at boosting the economic status of smallholder farmers in rural areas, is implemented over a period of six years. The programme will strengthen farmer organization by building their capacity to take advantage of existing market, opportunities and overcome constraints along the value chain (VC). The programme will also improve rural infrastructure such as roads and water facilities. More than 200,000 poor rural households will benefit directly from the programme, which will have a particular focus on women and youth (Value Chain Development Programme (VCDP), 2015). The goal of the programme is to reduce rural poverty, increase food security and achieve accelerated economic growth on a sustainable basis.

Despite Nigeria's position as the world largest producer of cassava, Nigeria is yet to tap the full potential embedded in cassava. Before the inception of VCDP, cassava processing was done using traditional methods and rudimentary tools. Cassava processing using traditional methods and tools is tasking, ineffective, time- consuming and also inefficient. Also, lack of improved processing and storage technologies resulting in high rate of perishability in cassava tubers; non-availability of efficient processing equipment which raises unit of processing and marketing cost, and unreliable power supply to power the storage equipment compel most processors to depend on the expensive alternative use of generating sets thereby making them incur very high processing cost (Ezedimma*et al*, 2003). The VCDP is meant to improve cassava processing by providing modern equipment, sensitization, training, cassava processing centres to enhance cassava processing. Improved methods of processing are required to reduce cost and to minimize waste. It is therefore important to analyse the economics of cassava processing under the VCDP.

It is against this backdrop that this study seeks to analyse the economics of cassava processing under value chain development programme(VCDP) in Wushishi LGA in Niger State, Nigeria and to achieve this study, the research specifically:

i. describe the socio-economic characteristics of cassava processors under the value chain development program;
ii. identify the methods used by cassava processors in the study area;
iii. estimate the cost and returns on cassava processing in the study area and;
iv. analyse the determinants of income of cassava processors in the study area.

2. Methodology

The study was conducted inWushishi, Local Government Area in Niger State, Nigeria.It has a population of about 3,950,249 people (National Population Census, 2006). The projected population of the State for 2017 is 5,514,946 people at 3.2% growth according to (United Nations Funds for Population Activities (UNFPA), 2009).The State cover a total land area of 83,266,779 square kilometres.

Primary data were used for this study. These were collected with the aid of a well-structured questionnaire and interview schedule.A multi-stage sampling technique was used to select the processors in the study area. At the first stage, Wushishi local government area was purposively selected because it is one of the beneficiaries of the Value chain development programme (VCDP) under the International fund for Agricultural development (IFAD) project. At the second stage, all the four villages with five clusters that have benefited from VCDP were purposively selected. Finally a

simple random sampling was employed to select twenty of the twenty five cassava processors from each of the clusters giving a total of hundred cassava processors in the study area.

Descriptive statistics such as frequency distribution, percentage, mean were used to analyse objectives*i* and *ii*while objectives *iii* and *iv* were achieved using farm budgetary techniques and multiple regression analysis.

2.1 Model Specifications

2.1.1 Farm Budgetary Technique

NP = (TR-TVC) –TFC (1)

Where

NP = Net Income (₦)

TR = Total Revenue (₦)

TVC = Total Variable Cost (₦)

TR-TVC = Gross Margin (₦)

TFC = Total Fixed Cost

TC = TFC + TVC (2)

Where;

TC = Total Cost (₦)

T0FC = Total Amount on Depreciation on Fixed Assets (₦)

TVC= Total Variable Cost (₦)

TR = TP x P (3)

Where TR = Total Revenue (₦)

TP = Total Output of Cassava processed (₦)

P = Price (Kg) of Cassava processed (₦)

The profitability index measures the profitability of a proposed business or project. It attempts to identify the relationship between costs and benefits of the business.

PI = Profitability Index = NI/TR

Where,

NI = Net income

TR = Total revenue

Rate of return on investment is the ratio of the profit and loss from an investment to the initial investment amount.

RRI = Rate of Return on Investment= (NI/TC) X 100

2.1.2 Multiple Regression Analysis

The model is specified in its implicit form as;

$Y = f(X_1, X_2, X_3, X_4\text{--------}X_{10}, e)$ (4)

Where Y = the income obtained from cassava processing (₦)

X_1 = Age (years)

X_2 = Household size (number of people in the household)

X_3 = Educational qualification (number of years spent in school)

X_4 =Processing experience (years)

X_5 = Labour cost (₦)

X_6 = Transportation cost (₦)

X_7 = Storage cost (₦)

X_8 = Maintenance cost (₦)

X_9= Packaging cost (₦)

X_{10} = Access to credit (yes=1, 0=otherwise)

Ui = Error term.

The explicit form of this equation in its functional form is expressed in equations 5 to 8 where Y and $X^{'S}$ are as defined in the explicit form. All the variables are as previously defined.

Linear: $Y = a + b_1x_1 + b_2x_2 + \cdots \ldots b_{10}x_{10} + e$ (5)

$$\text{Semi} - \text{Log: } Y = a + b_1 logx_1 + b_2 logx_2 + \cdots \ldots b_{10} logx_{10} + loge \quad (6)$$

$$\text{Cobb-Douglas: } \text{Log}Y = a + b_1 logx_1 + b_2 logx_2 + \cdots \ldots b_{10} logx_{10} + loge \quad (7)$$

$$\text{Exponential: Log Y} = a + b_1 x_1 + b_2 x_2 + \cdots \ldots b_{10} x_{10} + e \quad (8)$$

Where:
a = constant
b_1 - b_{10} = Regression coefficient of $X_1 - X_{10}$

2.1.3 Likert Scale

Three point Likert scale was used to examine the severity of constraints faced. Where;
Non severe = 1
Severe = 2
Very Severe = 3.
The cutoff point was 2 implying that a constraint that scored below 2 was not severe while any constraint that scored above 2 was severe.

3. Results and Discussion

3.1 Socio-Economic Characteristics of the Respondents

The socio-economic characteristics as presented in Table 1 shows thatthe mean age of the processors in thestudy area was 33 years. This suggests that they belong to the economically active population category; they can therefore put more effort into cassava processing in order to increase their output. This agreed with the research carried out by Muhammed *et.al* (2013) who also reported that cassava processors in Kwara state fell within that age. 100% of the cassava processors in the study area were females. This result indicates that female dominated cassava processing under VCDP.This could be because cassava processing maybe less tedious than the farming activities. More so, males often engage in other production activities such as, land preparation, weeding, harvesting while the females take care of the processing and marketing activities. This finding is in agreement with the findings ofOluwashola (2012), who revealed that women constituted 90% of processors in Oyo State.

The average household size of the processors in the study area was 6.All the respondents(100%) have had contact with extension agents. This shows the tendency of the cassava processors to be aware of new innovations in cassava processing.The mean years of experience of the processor was 15 years. This is \n indication that the respondents under study were relatively experienced in cassava processing.

The majority (91.0%) of the respondents have their source of capital from personal saving. This shows that majority of the firms depends largely on their own personal savings which limit their investment to small investments. This result agrees with Becvarova and Nahanga (2014) who stated that farmers in their study area had limited access to credit facilities.

Table 1. Summary of Socio-Economic Characteristics of the Respondents

Variables	**Mean**
Age (Years)	33
Household size (Number)	6
Processing experience(Years)	15
Other Variables	**Percentage**
Gender	100% female
Extension contact	100% had contact with extension agents
Source of capital	91% from personal savings
Educational qualification	75% had non-formal education
Marital status	96% were married

Source: Field survey, 2017

3.2 Processing Methods Used by the Processors

Processing of cassava has been done from time immemorial but the method used will determine the time, cost and quality of the by-products. From Table 2, 57.0% of the processors still used traditional method for their processing activities which is laborious and time consuming. It was observed that processors always receive sensitization and training from VCDP but due to the high level of illiteracy, understanding the relevance of modern methods of processing might be difficult to comprehend. However since about 22.0% of the processors used modern method and 21.0% used both traditional and modern method, it is believed that the processors were gradually migrating from this traditional method to a modern method of processing.

Table 2. Distribution of Processors Based on Processing Methods

Method	Frequency	Percentage
Traditional	57	57.0
Modern	22	22.0
Both	21	21.0
Total	100	100.0

Source: Field survey, 2017

Furthermore, Table 3 revealed that there was provision of equipment for the cassava processors in the study area as reported by 99.0% and 85.0% of the processors that VCDP provided Jack (Figure 1) and sieve.This indicates that the project wassupporting the processors with better technology to enhance theprocessing of cassava and hence income. There was an on-going building of an office and a cassava processing centre constructed by IFAD/FGN/VCDP and Niger State Government (Figure 2). The processors attested to the fact that even with the little that had been done by VCDP, the quality of their product increased, the processing cost reduced and processing activities became less tedious. This finding corroborates that of Odunaya (2013)who attested that provision of processing equipment increased the volume of cassava processed and lead to reduction in processing cost.

Figure 1. A Jack Given by VCDP in One of the Clusters in the Study Area, 2017

Figure 2.On-going Building by FGN/IFAD Value Chain Programme in Lokogoma Village in Wushishi Local Area, 2017

Table 3. Distribution of Processors Based on the Provision of Equipment by the VCDP

Equipment	*Frequency	Percentage
Jack	99	99.0
Sieve	85	85.0

Source: Field Survey, 2017
Note:*Multiple response were allowed

3.3 Cost and Returns to Cassava Processing in the Study Area

The costs structure and returns in garri, cassava flour and starch processing among cassava processors under VCDP is presented in Table 4. Findings indicate that variable cost items constitute the bulk (96.6%, 96.9% and 97.0% for garri, cassava flour and starch respectively) of the total cost in cassava processing. Therefore, the variable costs are crucial to the success ofgarri, cassava flour and starch processing in the study area.

Table 4. Cost and Returns to Cassava Processing

Items	Garri(₦)	Cassava flour(₦)	Starch (₦)
Cost of cassava	90,000	30,685	20,155
Cost of labour	10,000	3,420.23	2,461.87
Transportation cost	5,133.73	1,554.38	938.88
Storage cost	2,167.38	656.24	396.38
Packaging cost	2,396.24	725.53	438.24
Maintenance cost (for jack)	1,985.65	601.21	363.15
Firewood	5,000	_	_
Nylon spread	3,000	1,500	1,500
Water	1,000	353.08	213.27
Miscellaneous	500	300	200
A. Total Variable cost	121,183.00	39,795.67	25,666.73
B. Total Fixed cost (Depreciation on mortar, frying pan, basins, knives, sieve, grating machine.)	4,263.15	1,290.79	779.66
C. Total cost(A + B)	125,446.15	41,086.46	26,446.39
D. Total Revenue	228,931.48	69,334.02	41,874.82
E. Gross Margin(D-A)	107,748.48	29,538.35	16,208.09
F. Net income(D-C)	103,485.33	28,247.56	15,428.43
G. Profitability Index (F/TR)	0.45	0.41	0.37
H. Return on Investment (F/TC*100)	82.49	68.75	58.33

Source: Field Survey, 2017

Similarly, on the average, garri, cassava flour and starch processors made a net farm income of ₦103,485.33, ₦28,247.56 and ₦15,428.43 respectively in the study area, with gross margin of ₦107,748.48, ₦29,538.35 and ₦16,208.09 for garri, cassava flour and starch respectively. The rate of returns on investment for garri, cassava flour and starch were 82.5%, 68.8% and 58.3% respectively. This shows that for every ₦1 invested in garri, cassava flour and starch processing, a return of 82.50, 68.80 and 58.30 kobo was earned respectively. This also is an indication that garri, cassava flour and starch processing were profitable and viable enterprises in the study area.Garri gave the highest gross margin, net farm income, profitability index and rate of return on investment followed by cassava flour and starch respectively.This is in disagreement with Mohammed *et al*. (2013) who reported lower rate of return on investment of 30.8%, 41.3% and 20.9% on garri, cassava flour and starch respectively in Kwarra State. However, the finding is in line with the findings of Achoja (2015) who recorded a rate of return on investment of 89% and 81% for garri and fufu respectively in Delta State.

3.4 Determinants of Income of Cassava Processors in the Study Area

Four functional forms were estimated Linear, Double log, Semi log and Exponential, based on economic, statistical and econometric criteria, the Linear functional form was chosen as the best fit. As revealed in Table 5, the linear function was chosen as the lead equation based on the number and signs of the significant variables. The coefficient of determination (R^2) was 0.671. This implies that 67.10% of the variations observed in income level of the processors was explained by the included explanatory variableswhile the remaining 32.90% not explained may be due to variables not included in the model as well as errors in the estimation. The F-statistic (18.15) was significant at 1% and confirms the significance of the entire model.

Processing experience, storage cost and packaging cost were significant at 1% while age and transportation cost were significant at 5%. The positive regression coefficient of experience, packaging cost and storage cost showed that an increase in these variables will lead to an increase in the income of the processors whereas an increase in the transportation cost and age will reduce the income of processors in the study area. This conforms to the study of Oluwasola (2010) and Afolabi (2009). The coefficient of processing experience which was positively signed and statistically significant at 1% implies that the longer a processor stays in the business, the more experienced and efficient she becomes in handling the operations. Also, the more the experience the lesser the risk encountered and this will lead to greater profit which will automatically increase the income. This conforms to the study of Amao*et al.* (2007) that revealed that years of experience of garri processors showed a positive and significant relationshipwith income.

The coefficient for storage cost was positive and significant at 1%. This indicated that increase in storage cost brought about a corresponding increase in the income of the cassava processors. Proper storage increases the lifespan of a product preventing it from spoilage. This is also in line with the study of Afolabi (2009), who revealed that storage cost of garri marketers showed a positive relationship and was significant.

The coefficient of packaging cost was positively signed and significant at 1%. This indicated that an increase in this variable will lead to a corresponding increase in the income of the processors. Packaging adds value to a product and also increase the lifespan thereby leading to increase in the selling price which also increase the income of the cassava processors.

3.5 Constraints Encountered by the Processors

Table 6 shows the various constraints encountered by cassava processors in the study area. The study revealed that labour intensity (2.68) was the major constraint faced by the processors which ranked first followed by stress involved in cassava processing (2.67), high cost of cassava tubers (2.65), weather problems (2.52), inadequate supply of electricity (2.35), inadequate supply of water (2.24) and high labour cost (2.15), ranked 2nd, 3rd, 4th, 5th, 6th and 7th respectively.

Table 5. Determinants of Income of Cassava Processors under VCDP in Wushishi LGA

Explanatory Variables	Linear	Semi log	Exponential	Double log
Constant	164802.20 (4.76)***	- 920973.1 (- 3.93)***	12.1657 (103.75)***	8.7054 (11.51)***
Age	-3529.99 (-2.58)**	-87921.95 (-1.87)*	-0.0119 (-2.55)**	-0.2914 (-1.92)**
Household size	1159.49 (0.42)	5141.55 (0.33)	0.0091 (0.98)	0.0436 (0 .86)
Education	986.53 (0.71)	3361.04 (1.04)	0.0029 (0.61)	0.0102 (0.98)
Processing Experience	8765.63 (4.13)***	114077.3 (3.53)***	0.0279 (3.87)***	0.3633 (3.49)***
Labour	3.1810 (0.41)	-4127.25 (0.18)	3.93e-06 (0.12)	-0.0632 (-0.87)
Transportation cost	-2.4709 (-2.00)**	-28895.37 (-3.65)***	-5.78e-06 (-1.38)	-0.7615 (-2.99)***
Storage cost	25.24 (3.40)***	45683.51 (1.84)*	0.00008 (3.31)***	0.1899 (2.38)**
Maintenance cost	2.47906 (0.38)	35300.92 (1.80)*	3.46e-06 (0.15)	0.1135 (1.80) *
Packaging cost	21.38 (3.68)***	99840.38 (5.37)***	0.00005 (2.79) ***	0.2869 (4.78) ***
Access to credit	-18371.13 (-1.12)	-4798.96 (-0.68)	-0.0611 (-1.09)	-0.0140 (0.62)
R^2	0.671	0.665	0.604	0.635
F-value	18.15	17.63	13.56	15.46

Source: Field survey, 2017

Notes:* indicate significant at 10% level, ** indicate significant at 5% level, *** indicate significant at 1% level

Table 6. Constraints Encountered by the Processors

Constraints	NS F (%)	SV F (%)	VS F (%)	WS	MS	Rank	Remarks
Labour intensive	7(7)	18(18)	75(75)	268	2.68	1st	Severe
Time consuming	1(1)	31(31)	68(68)	267	2.67	2nd	Severe
Cost of tubers	2(2)	21(21)	67(67)	2.65	2.65	3rd	Severe
Weather problem	12(12)	24(24)	64(64)	252	2.52	4th	Severe
Electricity	16(16)	33(33)	51(51)	235	2.35	5th	Severe
Water	20(20)	36(36)	44(44)	224	2.24	6th	Severe
High labour cost	10(10)	65(65)	25(25)	215	2.15	7th	Severe
Transportation	40(40)	25(25)	35(35)	195	1.95	8th	Not severe
Perishability	43(43)	28(28)	29(29)	186	1.86	9th	Not severe
Processing technology	45(45)	32(32)	23(23)	178	1.78	10th	Not severe
Storage facilities	40(40)	42(42)	18(18)	178	1.78	10th	Not severe
Access to credit	48(48)	35(35)	17(17)	169	1.69	12th	Not severe
Poor market accessibility	37(37)	57(57)	6(6)	169	1.69	13th	Not severe
Lack of readily available market	76(76)	15(15)	9(9)	133	1.33	14th	Not severe
Poor demand for processed cassava	48(48)	45(45)	7(7)	116	1.16	15th	Not severe
High tax payment	96(96)	4(4)	0(0)	104	1.04	16th	Not severe
Training and sensitization	96(96)	4(4)	0(0)	104	1.04	16th	Not severe
Extension service	100(100)	0(0)	0(0)	100	1.00	18th	Not severe

Source: Field Survey, 2017

4. Conclusion and Recommendations

Cassava processing in the study area was a female dominated agro-enterprise that was operated mostly by the youthful and middle aged women which is the target of VCDP. Majority of the processors still use traditional method of processing but it is believed that the processors were gradually migrating from this traditional method to modern method of processing. The study revealed that there were variations in the gross margins to the various products of cassava processing in the study area butgarri was highest. Socio-economic attributes of the processors such as age, processing experience, plus other variables such as cost of transportation, storage and packaging cost significantly influence the income of the processors. The result also showed that the processors in the study area were constrained by labour intensity, stress involved in cassava processing, high cost of cassava tubers, weather problem, inadequate supply of electricity, inadequate supply of water and high labour cost.

It is therefore recommended that: The VCDP with the assistance of the Government should enhance support schemes through the provision of basic infrastructure such as water, electricity and storage facilities to cassava processors particularly in the study area, VCDP should identify more access and network the credible buyers or off-takers in the programme. The income of the processors was significantly and statistically affected by their socio-economic characteristics, therefore there should be more capacity building for the processors to improve their social wellbeing for profitable cassava processing in the study area and the cassava processors should be willing to participate.

References

Achoja, F. O. (2015). Impact of Cassava Value Chain Intensification Intervention on Nigerian Economy: Evidence from Delta State, Nigeria, *Turkish Journal of Agricultural and Natural Sciences*2(1):18–25

Adekunle A. A. (2012), Analysis of Maize Value Chain in Nigeria*, Agricultural Digest*, 3(1) 55-56.

Afolabi, J.A. (2009). An Assessment of Gari Marketing in South-Western Nigeria. *Journal of Social Sciences*, 21(1):33-38.

Amao, J.O., Adesiyan, O.I. &Sakako B.A. (2007). Economic analysis of cassava processing into garri in Ogo Oluwa Local Government Area of Oyo State, Nigeria. *Pakistan Journal of Social Sciences*, 4(2): 266-270.

Becvarova, V. and Nahanga, V. (2014). Yam production as pillar of Food Security in Logo Local Government area of Benue State, Nigeria. *European Scientific Journal.* (10)31. 27-42.

Ezedinma C.I., (2003), Post-harvest potentials for root and tuber crops. Book of Abstract for 13th Symposium of international society for tropical root crop held Arusha Tanzania Nov. 10-14

Miller, C. & de Silva, C. (2007). "Value chain financing in agriculture." *Enterprise Development and Microfinance*. 13 (2-3): 95-108.

Muhammed L. A., O.A. Omotesho, & F.A. Oyedemi (2013). An Assessment of the Economics of Cassava Processing in Kwara State, Nigeria. 4th International Conference of the African Association of Agricultural Economics, pp. 1 – 17.

NPC (National Population Commission). 2006. *Population Census Data Niger State, Nigeria*: "Official Gazette, National and State Provisional Totals Census". Federal Republic of Nigeria. Printed and Published in 2007.

Odunaya, A.A. (2013). Contribution of the Cassava adding value for Africa (C:AVA) project to income generation in Nigeria: the case of Cassava farmers and processors in Ewekoro area of Ogun State. Journal of Agricultural Extension and Rural Development 5(9):189-200.

Oluwasola, O. (2010). Stimulating rural employment and income for cassava (Manihot sp.) processing farming households in Oyo State, Nigeria through policy initiatives. *Journal of Development and Agricultural Economics,* 2(2):18-25.

United Nations Funds for Population Activities (UNFPA), (2009). World Population Report.

Value Chain Development Programme (VCDP) – FGN/IFAD 1st Joint Supervision/Implementation Support Mission (2015). Supervision Report. Pg. 1-4

CREDIT FUNGIBILITY AND ITS IMPACT ON WHEAT PRODUCTIVITY IN FAISALABAD, PAKISTAN

Muhammad Shees-ur-Rehman
Institute of Agricultural and Resource Economics, University of Agriculture, Pakistan

Muhammad Khalid Bashir
Institute of Agricultural and Resource Economics, University of Agriculture, Pakistan
E-Mail: khalid450@uaf.edu.pk

Muhammad Ashfaq
Institute of Agricultural and Resource Economics, University of Agriculture, Pakistan

Ghaffar Ali
College of Management, Shenzhen University, China

Shabbir Ahmad
Business School, The University of Queensland, Australia

Abstract

Agricultural credit plays a crucial role in improving farm productivity by enabling the farmers'community to buy the inputs (such as fertilizers) timely. This study identifies the extent of credit fungibility and its impact on crop productivity. By using a multistage sampling technique 120 wheat growing farmers data have been collected, who obtained the loan from ZaraiTaraqiati Bank Limited (ZTBL) of Pakistan. Only 15% of the farmers have utilized the loan for wheat production, while the remaining 85% of the borrowers use the credit for domestic consumption, completely or partially.The reasons for the misappropriation of the loan include i) dowry (marriage expenditures), ii) repayment of previous loans, iii) personal consumption to meet family expenditures, iv) non-farm economic activities (such as retail shop, bakery, handicraft, etc.), v) court issues, and vi) construction at the farm/ house. Empirical results show a positive impact of credit on wheat production, however, this effect is reduced as farmer divert the amount of loan on other non-farm activities. Another interesting finding reveal that adoption of appropriate technologies (e.g., the use of recommended doses of seed; fertilizer; and irrigation especially on critical times) have contributed to the wheat production positively. These findings suggest that the credit schemes bundled with advisory and training services program may be helpful to realize higher agricultural productivity.
Keywords: Credit Fungibility, Misuse, Agricultural Credit, Wheat, Productivity.

FACTORIES INFLUENCE THE VALUE OF AGRICULTURAL REAL ESTATE

Dorota Koziol–Kaczorek
Warsaw University of Life Sciences - SGGW, Faculty of Economic Sciences, Poland
Email:dorota_koziol@ sggw.pl

Agnieszka Parlinska
Warsaw University of Life Sciences - SGGW, Faculty of Economic Sciences, Poland

Abstract

Factors determining the value (usable, marketable) of agricultural real estate are the features of this property, including legal, physical and location parameters of agricultural real estate as well as factors related to its use. They show consistency with the parameters of the valued property and reflect the conditions prevailing in the market to which the property should be valued.The problem of identifying market characteristics is related to the establishment of a catalog of significant and irrelevant features for clients in the real estate market. Properties of real estate depend on the type of market. One of the methods of dividing the characteristics of agricultural real estate distinguishes complex features, features concerning the surroundings of the object and features concerning the real estate itself. Another division of features based on the possibilities of their evaluation and measurement distinguishes features easy to measure, features difficult to measure, features whose states are determined in the following way: adjective and linear, features whose names suggest a positive impact on value (eg prestige) , and features suggesting a negative impact on value (eg noise) and featureswith names that do not have such suggestions.

The aim of this paper is to identify factors determining the value of an agricultural property. They were presented depending on the value of the property, and depending on the approach and method used in the valuation of agricultural property.Authors pointed out the 3 main questions:

- What is the definition of agricultural real estate?
- What is the value of agricultural real estate?
- What are the factors determining the valueof agricultural real estate?

The overview of the literature and legal acts was used. Authors focused on the example of Polish legal acts and national valuation standard.

Despite the fact that the Standards of Property Appraisers determine to a large extent the "typical" characteristics of agricultural real estate, the selection of features (other than obligatory) is not explicit and notional. Just as there is no unequivocal and equal effect of these characteristics on the value of the property. It is determined by the conditions on the local market, the demand and supply situation on this market, as well as the economic situation of the country, individual preferences of buyers and fashion. The factor that can multiply the market value of land is the potential for other than agricultural use. This applies in particular to land located on the outskirts of major cities, close to important transport routes or water reservoirs. Prices of such lands exceed the prices of typical agricultural land many times. Location is then the decisive factor affecting the value of real estate, and the sale indirectly affects the increase in the prices of other agricultural land.

The prices of agricultural land are also influenced by the possibility of using direct payments and other forms of aid for agriculture from European Union funds and the state budget as well as the prospect of increasing this support in the future. The observed increase in the profitability of some agricultural production trends and the export of domestic agri-food products also has an impact on the situation on the agricultural land market. The availability (or lack of) of land located in the State Treasury Agricultural Property Stock (ZSRWP) is also important.

Keywords: Agricultural Real Estate, Value of the Agricultural Real Estate, Market Value, Cadastral Value, Usable Value.

THE EFFECT OF SPIRULINA PLATENSIS (GOMONT) GEITLER EXTRACTS ON SEED GERMINATION OF CAPSICUM ANNUUM L.

Füsun Akgül
Mehmet Akif Ersoy University, Department of Molecular Biology and Genetic, Turkey
Email: fakgul@ mehmetakif.edu.tr

Rıza Akgül
Mehmet Akif Ersoy University, Department of Vegetable and Animal Production, Turkey

Abstract

World population and their nutrient requirement increase day by day. Farmers try to obtain much more crop per area and for this reason they use abundant artificial fertilizer, and also spend a lot of money for fertilization. But these fertilizers create a serious pollution in the nature. So, nowadays the scientist study to develop a new formula biofertilizer or biostimulant that consists organic substances. For this aim they use microorganisms. Cyanobacteria has a highly diversity group that consists of photosynthetic prokaryotic microorganisms. Cyanobacteria that produce lots of metabolites such as amino acids, proteins, vitamins etc. have a wide spread. In this study, the effects of different concentrations of *Spirulina platensis* (Gomont) Geitler extracts on the germination of *Capsicum annuum* L.seeds and root-stem length, lateral root number and wet-dry weight were investigated. The application of S5 (100% cell extract) showed an inhibitory effect on seed germination. S2 (25% cell extract) and S3 (50% cell extract) applications had a positive effect on germination and seedling development in pepper. As a result; cyanobacterial extract has positive effects on seed germination and plant growth-development and it is possible to produce a commercial and ecological biostimulant by developing different extract concentrations.
Keywords: Biostimulant, Cyanobacteria, Pepper, Seed Germination, *Spirulina Platensis*.

1. Introduction

The increase in the world population forced the agricultural countries to take more products per unit area and made it necessary to carry out studies to increase this. However, while carrying out such studies, applications that cause serious damage to the aquatic and terrestrial ecosystems. The amount of artificial fertilizers that the most harmful of these applications is increasing day by day and unconscious usingthese chemicals cause irreversible damage to ecosystem. Scientists who take these effects into consideration, have started to work on the production of nature friendly, biofertilizer-biostimulant and its use. For this purpose, bacteria, cyanobacteria and algae have been used extensively and effectively.

In recent years, many studies have been conducted in which cyanobacteria and microalgae are used as biofertilizer-biostimulants and promising results have been obtained from these studies.Mogor et al. (2017); used *Arthrospira platensis* (*Spirulina platensis*) hydrosilats and found cytokinin-like effect in lettuce seedlings. Grzesik et al. (2017) tested foliar applications of *Microcystis aeruginosa*, *Anabaena* sp., and*Chlorella* sp. cultures on willow and detected increasing plant growth.

S. platensis is a filamentous cyanobacteria and is used as a food additive for its high protein content and nutritional properties. *Spirulina* spp. it generally shows a natural distribution in alkaline environment, which prevents its easy contamination. (Olguín et al., 1997).In addition, *Spirulina* spp. is a good protein supplement in animal nutrition as well as an alternative to chemical fertilizers (Habib et al., 2008).

In this study; a continuous culture of *S. platensis* was made and the biomass was extracted and prepared in different concentrations solutions and researched effects of this extracts on seedgermination and seedling growth on pepper.

2. Material and Methods

2.1 Cultivation and Harvesting

S. platensis, obtained from Mehmet Akif Ersoy University, Algal Biotechnology Laboratory, was cultivated flasks using standard Zarrouk culture medium (Zarrouk, 1966), bubbled with air. The biomass was harvested by centrifugation at day 20 of cultivation. The biomass dried in an oven at 45°C for 24 hours and then powdered with a grinder and stored at +4°C.

2.2. Cell Extract

Dried biomass was suspended in distilled water (DIW)at a concentration of 150 g L^{-1}. For obtaining the intracellular extracts, the suspension was extracted with a sonicator. The suspension centrifuged at 22°C, 6000×g for 6 minutes for removing biomass residue. To minimize potential degradation, the resulting extract supernatant was collected in a flask covered with aluminum foil and stored in a cold room at 4 °C. Five different concentration solution were prepared with cell extract. S1, Control, %0 extract (10 mL DIW); S2, %25 (2,5 mL extract, 7,5mL DIW); S3, %50 (5 mL extract, 5mL DIW); S4, %75 (7,5 mL extract, 2,5mL DIW); S5, %100 (10 mL extract). The biomass residue was also stored in the cold room for potential future use.

2.3. Seed Experiment

All solutions were replicated three times with ten seeds per replicate. The seeds were sterilized with 10 mL of 5 % solution of sodium hypochlorite for 10 min, rinsed twice with DIW, transferred to sterile Petri plates, and soaked in 10 mL of the S1, S2, S3, S4, S5 solutions for 24 h. Following the 24-h soaking period, the seeds were placed between two 42.5-mm Whatman no. 1 filter papers and allowed to dry for 24 h at room temperature (21 °C). Then, the seeds were transferred to a sterile 100-mm Petri plate containing a moist 75-mm Whatman no. 1 filter, which was soaked with 3 mL of DIW. The plates were incubated at 21 °C under a 16-h light/8-h dark cycle. Seed germination was checked at 24-h intervals for 10 days and counted as germinated if at least 2 mm of the radicle had emerged. The filter paper for all treatments was saturated as needed with 3 mL of DIW to maintain moisture. Root, shoot, and leaf lengths (mm) were measured with a caliper. And also number of lateral roots measured and germination percentage (GP), and germination energy (GE) were calculated.

Germination percentage (GP) was calculated as
GP=(number of germinated seeds/total number of seeds)×100
Germination energy (GE) was calculated according to HernándezHerrera et al. (2013),
GE= (number of germinating seeds on X. day/number of total seeds) ×100
In this research GE of 3., 5., 7., 9., 11. and 13. days were calculated.

2.4. Statistical Analysis

Each application concentration was analyzed on three biological replicates. The reported values are the means ± standard deviation of three values. Data were analyzed using two-way analysis of variance (ANOVA) using Microsoft Office Excel 2007. A significant difference was considered at level of $p < 0,0001$.

3. Results and Discussion

The seeds incubated for a long time as 20 days for late germination. And it is clearly seen that in Figure 1; S1 application cause earlier germination than the other applications. But S3 application has the highest germination rate, then S2 is more effective on germination. Same results of S2 and S3 are valid for germination rate (Figure 2).The longest root length was observed in S2 applications and then S3 and S1, respectively. And similar to these results; S2 caused to longest shoot length (Figure 3). It means %25 cell extract is effective both root and shoot length. S2 application causes to increase the

lateral root number, then S1 and S3; respectively (Figure 4). In according to Figure 5; the highest dried and fresh weight were observed on S2 application. All figures show that S2 application the most effective for all parameters. It is understood from these results clearly that *S. platensis* extract has beneficial impact to seed germination and seedling growth of pepper. But the concentration must be adjusted because ofS5(%100 cell extract) has inhibitory effect.

Similarly, Yohannes (2013) reported that the application of dried cyanobacteria increased the leaf number of the pepper over the control.Beneficial effects of cyanobacterial inoculation were reported, not only for rice, but for other crops such as wheat (*Triticum aestivum* L.), soybean [*Glycine max* (L.) Merr.], oat (*Avena sativa* L.), tomato (*Solanum lycopersicum* L.), radish (*Raphanus sativus* L.), cotton (*Gossypium hirsutum* L.), sugarcane (*Saccharum* sp.), maize (*Zea mays* L.), chili (*Capsicum annuum* L.), bean (*Phaseolus vulgaris* L.), muskmelon (*Cucumis melo* L.) and lettuce (*Lactuca sativa* L.) (Venkataraman 1972; Rodgers et al. 1979; Singh 1988; Arif et al. 1995; Thajuddin and Subramanian 2005; Karthikeyan et al. 2007; Maqubela et al. 2008; Saadatnia and Riahi 2009).

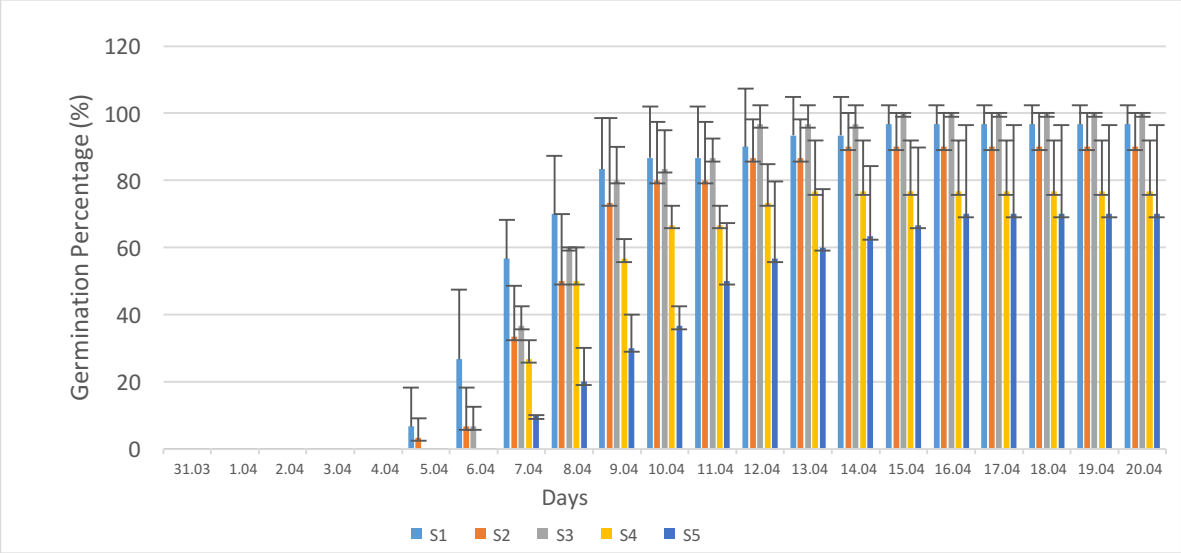


Figure 1. Germination Percentage of Pepper Seeds According to the Applications and Days (%).

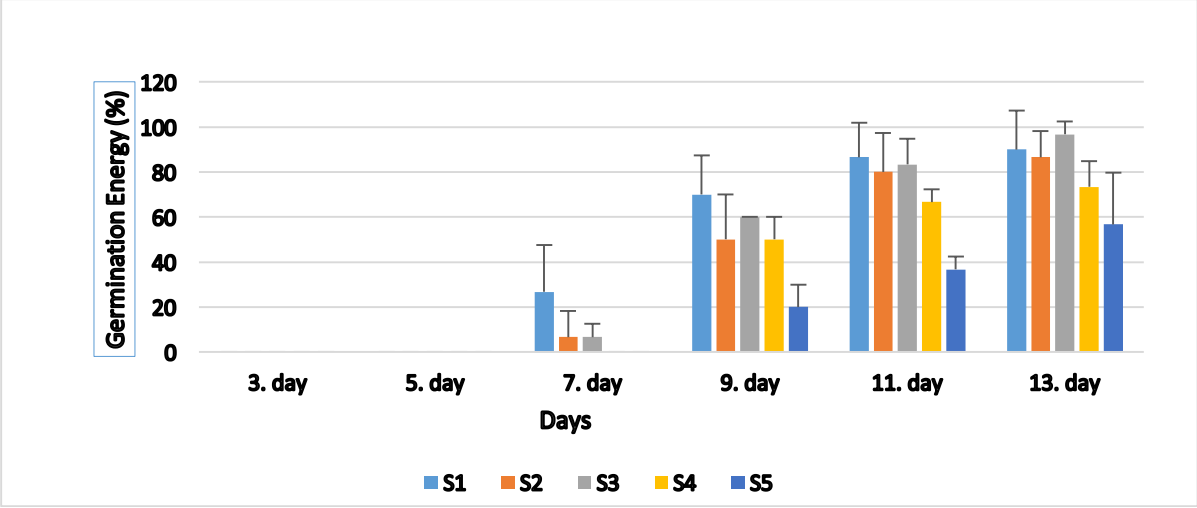


Figure 2. Germination Energies of Pepper Seeds on the 3th, 5th, 7th, 9th,11th, 13th Days according to the Applications(%)

All these results show that *S. platensis* extract is highly effective for pepper seed germination and seedling growth. According to this study S2 concentration is the best but in future works different

concentrations may be created and it may be more effective and also this researches must maintain under field environment conditions. Because of synthetic fertilizers have long-term negative effects in natural ecosystem and using ratios of this fertilizer are increasing; eco-friendly, organic and biodegradable fertilizer must produce alternatively. Otherwise; death of benefit microorganisms, changing pH of soil, polluting groundwater and increasing its toxicity will continue and finally aquatic system and the all ecosystem will be damaged. In this respect; the studies that aim to create alternative biostimulant or biofertilizer like this study are very valuable for the natural life because of affecting all living things.

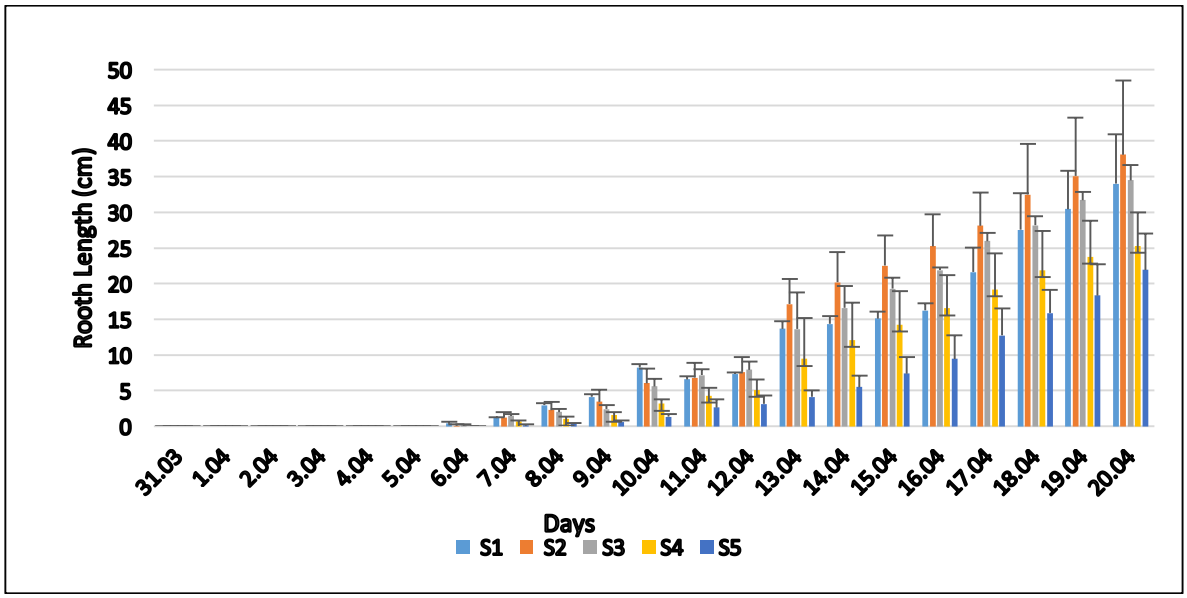


Figure 3.The Root Length of Pepper Seedlings According to the Applications and Days (cm)

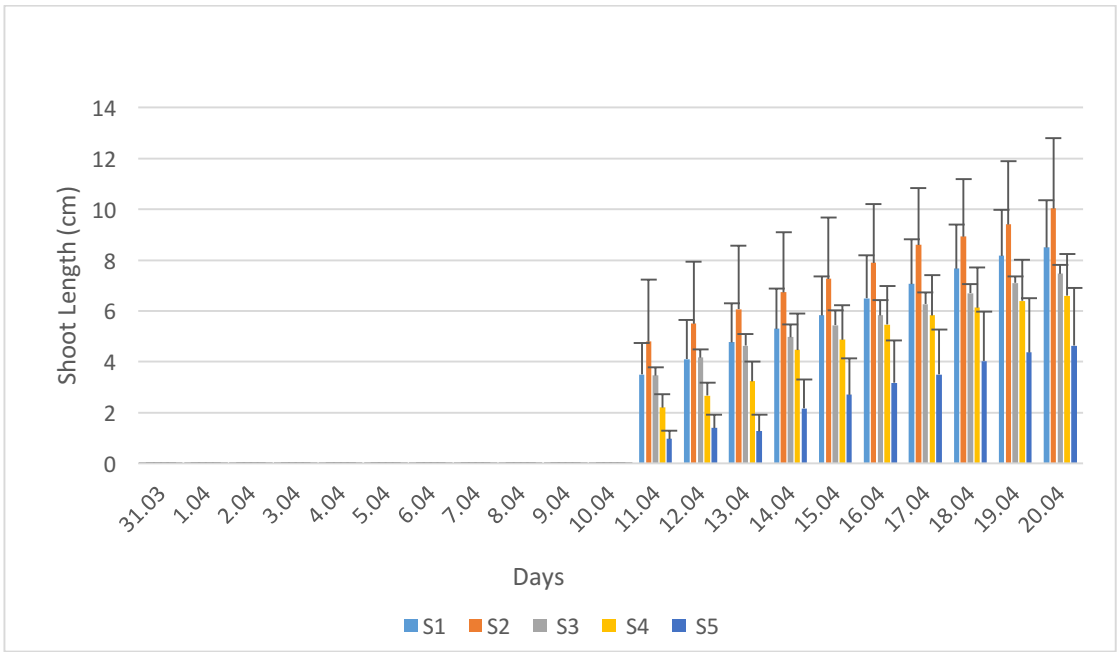


Figure 4. The Shoot Length of Pepper Seedlings According to the Applications and Days (cm).

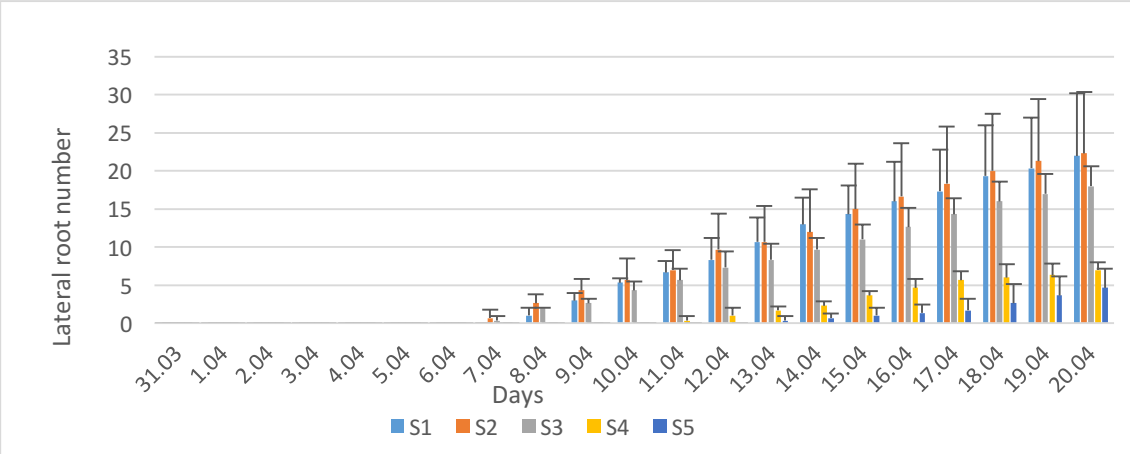


Figure 5.Number of Lateral Roots of Pepper Seedlings According to the Applications and Days (Piece)

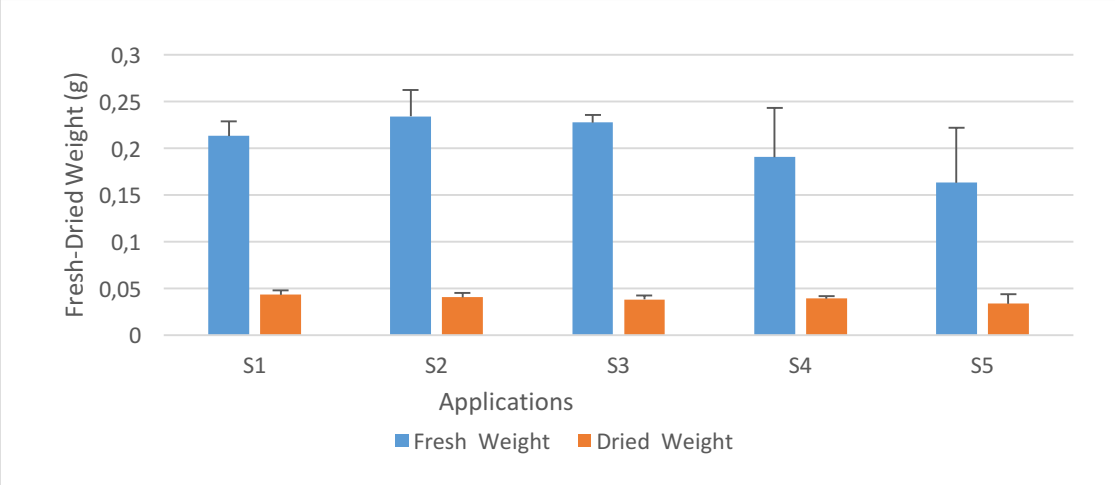


Figure 6.Fresh and Dried Weights of Pepper Seedlings According to Applications (g).

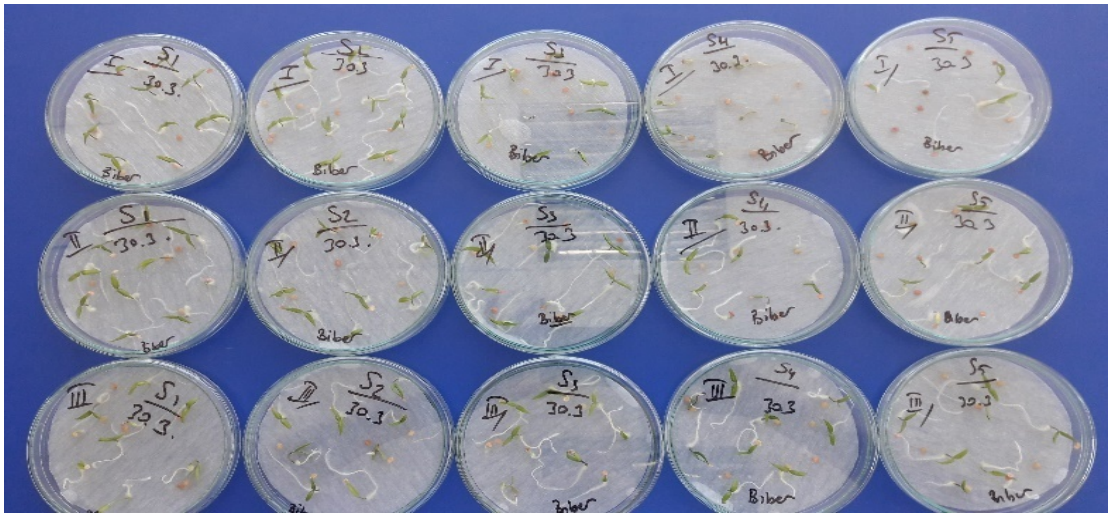


Figure 7. PepperSeeds and Seedling Development on the Last Day of Incubation

4. Conclusion

Fertilizers are very important for obtaining much more crops per area and all farmer use fertilizer for this reason. But none of them care about negative effects of these fertilizer to ecosystem. Whereas chemical fertilizers are expensive, non-eco-friendly, cause eutrophication, reduce organic matter and microbiotic activity in soil and are hazardous to health. So instead of chemical fertilizer; biofertilizer should be selected. Because, biofertilizers increase the quality of the soil by providing nutrients. And the micro-organisms present in biofertilizers are important because they produce nitrogen, potassium, phosphorus and other nutrients required for benefit of the plants. When these facts and all results of this study evaluated; the negative effects of artificial biofertilizer and money spent for fertilization considered; more ecofriendly and cheaper product should be provided to farmer. In this way; both the nature and money will be saved; besides sustainable environment and economy will be ensured.

Acknowledgement: This research was supported by BAKA (West Mediterranean Development Agency) project number TR61/16/CEVRE/0027.

References

Arif M, Gupta R, Joshi MC 1995: Studies on the use of cyanobacteria as biofertilizer for vegetable cultivation in hydroponic system. In Schirmacher Oasis Region, East Antarctica. Eleventh Indian Expedition to Antarctica. Scientific Report, Ed. Dhar, A, pp. 243–246. Department of Ocean Development, Technical Publication 9, New Delhi, India.

Grzesik M, Romanowska-Duda Z, 2014. Improvements in Germination, Growth and Metabolic Activity of Corn Seedlings by Grain Conditioning and Root Application with Cyanobacteria and Microalgae. *Pol. J. Environ. Stud.* 23(4):1147-1153.

Habib MAB, Parvin M, Huntington TC, Hasan MR, 2008. A review on culture, production and use of *Spirulina* as food for humans and feeds for domestic animals and fish, FAO Fish. Aquac. Circ. (2008) (No. 1034).

Hernandez-Herrera RM, Santacruz-Ruvalcaba F, Ruiz-López MA, Norrie J, Hernández-Carmona G, 2013. Effect of liquid seaweed extracts on growth of tomato seedlings (Solanum lycopersicum L.). J Appl Phycol 26:619–628.

Karthikeyan N 2006: Characterization of cyanobacteria from the rhizoshere of wheat (M.Sc thesis). Division of Microbiology, Post Graduate School, Indian Agricultural. Research Institute, New Delhi, India.

Maqubela MP, Mnkeni PNS, Malam Issa O, Pardo MT, Acqui LPD 2008: Nostoc cyanobacterial inoculation in South African agricultural soils enhances soil structure, fertility and maize growth. Plant Soil, 315, 79–92.

Mógor ÁF, Ördög V, Lima GPP, Molnár Z ve Mógor G, 2017. Biostimulant properties of cyanobacterial hydrolysate related to polyamines. J Appl Phycol., DOI 10.1007/s10811-017-1242-z.

Olguín EJ, Galicia S, Camacho R, Mercado G, Peŕez T, 1997. Production of *Spirulina* sp. in sea water supplemented with anaerobic effluents in outdoor raceways under temperate climatic conditions. Appl. Microbiol. Biotechnol. 48:242–247.

Rodgers GA, Bergman B, Henriksson E, Udris N 1979: Utilization of blue-green algae as biofertilizers. Plant Soil, 52, 99–107.

Saadatnia H, Riahi H 2009: Cyanobacteria from paddy fields in Iran as a biofertilizer in rice plants. Plant Soil Environ., 55, 207–212.

Singh PK 1988: Biofertilization of rice crop. In Biofertilization Potentialities and Problems, Eds. Sena SP, Palit PC, pp. 109–114. Plant Physiology Forum, Calcutta, India

Thajuddin N, Subramanian G 2005: Cyanobacterial biodiversity and potential application in biotechnology. Cur. Sci., 89, 47–57.

Yohannes M., 2013. Effect of cyanobacteria biofertilizer on growth of hot pepper on soils from Ziway and Yirgalem, Ethiopia. MSc. Thesis submitted to Graduate study of Hawassa University, Hawassa, Ethiopia. 85pp.

Venkataraman GS 1972: Algal Biofertilizer and Rice Cultivation, Today and Tomorrows Printer and Publishers, New Delhi, India

Zarrouk C, 1966 Contribution a l'etude d'une cyanobacterie: influence de divers facteurs physiques et chimiques sur la croissance et la photosynthese de *Spirulina maxima* (Setchell *et* Gardner) Geitler. Ph.D. thesis, University of Paris, France.

DETERMINATION OF THE FACTORS AFFECTING MEMBERSHIP OF BREEDERS' ASSOCIATIONS BY STRUCTURAL EQUATION MODELLING

Murat Demirbük
United Nations Development Programme, GöksuTaşeli Watershed Development Project, Turkey,
Email: mdemirbuk@ hotmail.com

Nuray Kızılaslan
Gaziosmanpaşa University, Faculty of Agriculture, Department of Agricultural Economics, Turkey

Abstract

Effective organization of producers is one of the most important factors to increase agricultural production, to obtain quality products and to raise the living standards of farmers. In this research it was studied to determine the factors affecting membership of the Breeders Association, which was one of the most important components of the producer organization, by using structural equation modelling (SEM). The scope of the work was constituted of 3 Breeders Association members organized in the Sivas province of Turkey. A survey was conducted with 369 breeders to collect primary data.The questionnaires were formed of 5 likert type questions for testing SEM. Due to the nature of the SEM, it was based on the theory. First, a theoretical model was created. Factors affecting membership in the model were Economic, Professional, Union activities, Democracy and Organization Awareness and Social and Environmental factors. There were a total of29 variablesunder 5 factors. Confirmatory factor analyses (CFA) was performed for each factor separately. Then first level CFA and path analysis were conducted.The model was not initially confirmed by the data. Therefore, a new model was obtained by modifying the first one.Modifications were made after each analysis conducted. The confirmed model consisted of 16 variables. It was found that all of the identified factors were in the same direction and strong relationship with each other. It was determined that the ways drawn from union activity and social and environmental factors to membership were statistically significant and had a direct impact on membership.It is the first study using SEM on producer organization.It could be used by adapting in different geographical regions and cultures.
Keywords: Breeders' Association, Factor, Member, Organization, Structural Equation Modelling.

Özet

Üreticilerin etkili bir biçimde örgütlenmesi tarımsal üretimi arttırmanın, kaliteli ürün elde etmenin ve tarım ile uğraşanların yaşam düzeylerini yükseltmenin en önemli yollarından biridir. Bu araştırmada Türkiye'de üretici örgütlenmesinin en önemli ayaklarından biri olan Yetiştirici Birliklerine üye olmayı etkileyen faktörlerin yapısal eşitlik modeli (YEM) ile belirlenmesine çalışılmıştır. Çalışmanın kapsamını Sivas ilinde örgütlü bulunan 3 Yetiştirici Birliği üyeleri oluşturmaktadır. Birincil verilerin elde edilmesi için birliklere üye 369 yetiştirici ile anket yapılmıştır. Anket formu 5'li likert tipi olarak hazırlanmıştır. YEM yapısı gereği teoriye dayalıdır. Bu nedenle ilk olarak teorik bir model oluşturulmuştur. Modeli oluşturan faktörler; Ekonomik, Mesleki, Birlik faaliyetleri, Demokrasi ve Örgütlenme Bilinci ve Sosyal ve Çevresel faktörler olarak tanımlanmıştır.5 faktör altında toplam 26 değişken bulunmaktadır. Her bir faktör için ayrı ayrı Doğrulayıcı Faktör Analizi (DFA) yapılmıştır. Daha sonra birinci seviye DFA ve yol analizi yapılmıştır. İlk aşamada model veri tarafından doğrulanmamıştır. Bu nedenle ilk halinden modifikasyon yapılarak yeni bir model elde edilmiştir. Modifikasyonlar her bir analizin ardından yapılmıştır. Doğrulanmış modelin son hali birliklerde üyeliği etkileyen 16 değişkenden oluşmaktadır.Araştırma sonucu belirlenen faktörlerin tamamının birbirleri ile aynı yönlü ve güçlü bir ilişkisinin olduğu görülmüştür. Birlik faaliyetleri faktörü ile sosyal ve çevresel faktörlerden üyeliğe çizilen yolların istatistiksel olarak anlamlı ve üyelik üzerinde

doğrudan etkisi olduğu tespit edilmiştir. Model üretici örgütlenmesi konusunda yapısal eşitlik modeli kullanılarak yapılan ilk çalışmadır. Farklı coğrafi bölgeler ve kültürlerde adapte edilerek kullanılabilir.
Anahtar Kelimeler: Yetiştirici Birliği, Faktör, Üye, Örgütlenme, Yapısal Eşitlik Modeli.

1. Giriş

Tarım sektörü çok sayıda alıcı ve satıcının bir arada olduğu tam rekabet piyasalarına örnek olarak gösterilmektedir. Taşımacılık sektöründeki gelişmeler tarımsal ürünleri küresel ticaretin bir parçası haline getirmiştir. Bu durum yerel üreticilerin devletler tarafından korunması kadar kendi kendilerini koruyacak yapılar oluşturmasını da gerektirmektedir. Dünya Ticaret Örgütü (DTÖ) Tarım Anlaşması sonucu koruyucu politikaların uygulanmasına kısıtlamalar getirilmiştir. Tüm bunlar yerel üreticileri piyasa karşısında her zamankinden daha korumasız ve zayıf duruma getirmiştir. Bu gelişmeler nedeniyle tarımda üretici örgütlenmesi çok daha önemli hale gelmiştir.

Üreticilerin etkili bir biçimde örgütlenmesi tarımsal üretimi arttırmanın, kaliteli ürün elde etmenin ve tarım ile uğraşanların yaşam düzeylerini yükseltmenin en önemli yollarından biridir(İnan ve Ark, 2000).

Küçük üreticileri, tanınmış ve yasal bir tüzel kişilik olarak ticarileştirmek, ihtiyaçları için seslerini duyurmaları, lobi faaliyetleri ve ölçek ekonomilerinin avantajlarından yararlanmaları için oldukça önemlidir. En yaygın görülen ortak eylem girdinin birlikte satın alınması ve ürünlerin birlikte pazarlanmasıdır. Alıcılar için cazip görünmenin ve pazarlık gücünü artırmanın asgari gerekliliği toplu halde ürünleri pazarlayabilmektir (Rwelamira, 2015).

Üretici örgütleri ana hatlarıyla mesleki örgütler ve ekonomik amaçlı örgütler olarak ikiye ayrılmaktadır. Mesleki örgütlerin başında ziraat odaları gelmektedir. Bunların yanında birlik, dernek, vakıf ve sendika gibi örgütlenmeler de söz konusudur. Ekonomik amaçlı örgütlerden en yaygın olanı ise kooperatiflerdir. Ekonomik amaçlı örgütler olan birlikler de üretici birlikleri, yetiştirici birlikleri ve hizmet götürme birlikleri gibi farklı isimlerle anılmaktadır (Vural, 2014).

Islah amaçlı yetiştirici birlikleri her türden hayvanın verimliliğini yükseltmek üzere belirli bir ıslah programı kapsamında soy kütüğü ve ön soy kütüğü kayıtlarını tutan, üretimin ekonomik olmasını sağlayan bu amaca yönelik çalışmaları yürüten örgütlenme modelidir (Everest ve Yercan, 2014).

Üreticilerin mevcut örgütlere katılımı veya ihtiyaçları doğrultusunda yeni örgütlenmeler oluşturmaları çeşitli nedenlerle istenilen hızda ilerlememekte ve çeşitli faktörler tarafından etkilenmektedir.

Bu araştırmanın amacı; yetiştirici örgütlenmesine ve yetiştiricilerin birlikte kalmasına etki eden faktörlerin bir model olarak ortaya konulmasıdır.

2. Materyal ve Yöntem

2.1 Örneklem Hacminin Belirlenmesinde Kullanılan Yöntem

Birincil verileri Sivas'ta örgütlü yetiştirici birliklerinin üyelerinden anket yolu ile elde edilen bilgilerden oluşmaktadır. Örneklem sayısının tespitinde, ana kütlenin varyansı ve ana kütledeki birim sayısı bilindiği için;

$n = \frac{N*(Z\alpha/2)^2*\sigma^2}{(N-1)d^2+\left(\frac{Z\alpha}{2}\right)^2*\sigma^2}$ Formülü kullanılmıştır (Yamane, 2006).

Örneklem sayıları Damızlık Sığır Yetiştiricileri Birliği (DSYB) için 94, Damızlık Koyun-Keçi Yetiştiricileri Birliği (DKKYB) için 168 ve Arı Yetiştiricileri Birliği (AYB) için ise 107 olarak bulunmuştur.

Araştırmanın materyalini oluşturan ikincil veriler ise tarım sektöründeki örgütlenme modelleri ve bu örgütlenmeler ile ilgili yapılmış çalışmalara dair literatür taraması sonucu elde edilen bilgilerden oluşmaktadır.

2.2 Veri Analizinde Kullanılan Yapısal Eşitlik Modeli

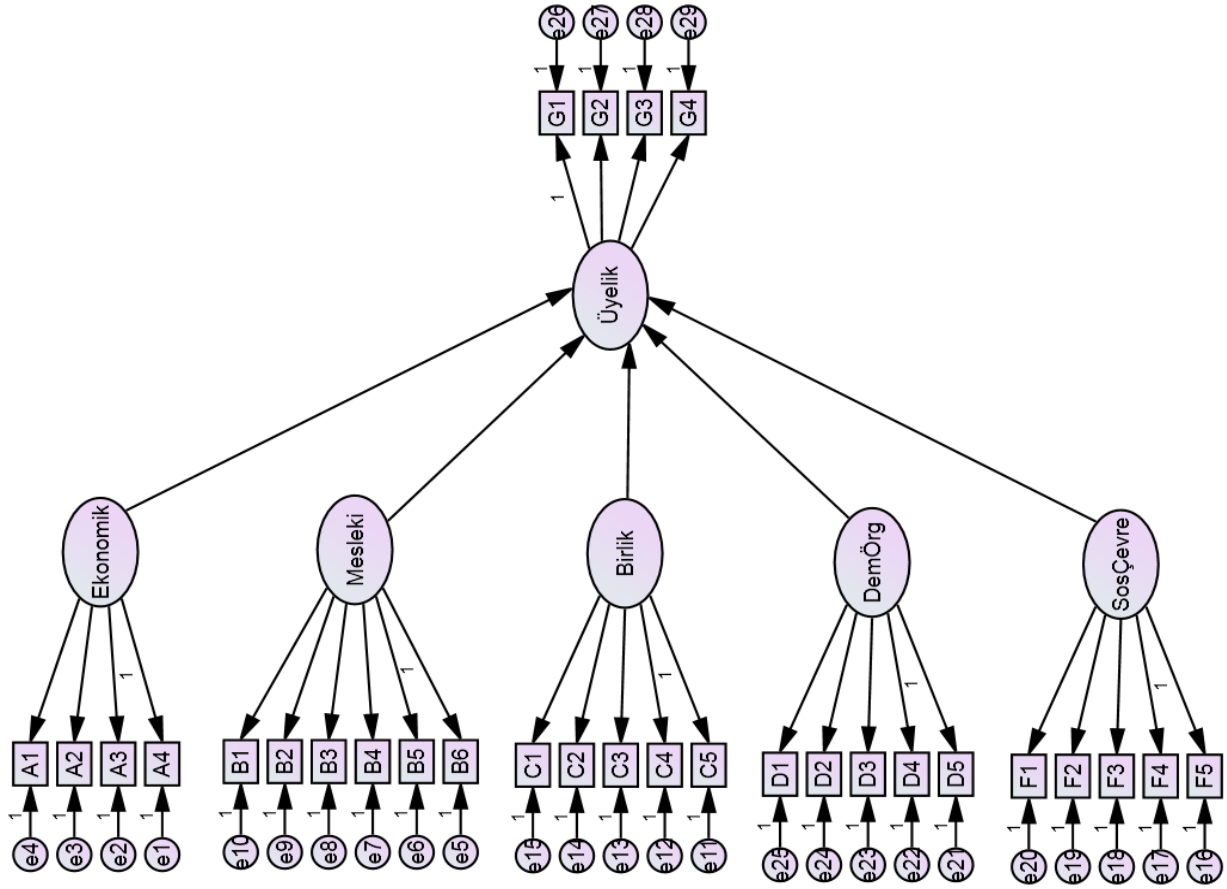
Yapısal Eşitlik Modeli (YEM) oluşturulan teorik modeldeki faktörlerin birbirleri ile ilişkisini tek bir analiz ile ortaya koyabilme avantajına sahiptir. Aynı zamanda model üzerinde modifikasyona

olanak vererek veri tarafından doğrulanmış bir model ortay çıkmasına katkı sağlayacağı için bu çalışmada YEM kullanılmıştır.

YEM doğrulayıcı bir teknik olduğu için modeli doğrulayan analiz tipini temel alır. Bu yüzden model doğru belirlenmelidir (Bayram, 2013). Modelin test edilmesi aşamasında, doğrulayıcı faktör analizi (DFA), yol analizi, yapısal regresyon analizi ya da değişim modeli analizleri uygulanır.

Araştırmadayetiştiricilerin birliklere üye olmasını etkileyen faktörleri gösteren teorik bir model oluşturulmuştur.Üyeliği etkileyen 5 faktör ve her bir faktör için farklı sayılarda gözlenen değişkenler belirlenmiştir. Gözlenen değişkenler, Ekonomik faktörü için 4, Mesleki faktörler için 6, Birlik faktörü için 5, Demokrasi ve Örgütlenme bilinci için 5, Sosyal ve Çevresel faktörler için 5 ve Üyelik faktörü için 4 olmak üzere toplam 29 değişkenden oluşmuştur. Her bir gözlenen değişkene bir hata terimi atanmış ve her bir değişkenden üyelik faktörüne doğrusal bir yol çizimi ile teorik model şekilsel olarak tarif edilmiştir.

DFA ile önce her bir faktör ayrı ayrı analiz edilmiş model için uyum iyiliği değerlerine ulaşıldığında modele bir bütün olarak yol analizi yapılmış ve sonuçlar yorumlanmıştır.



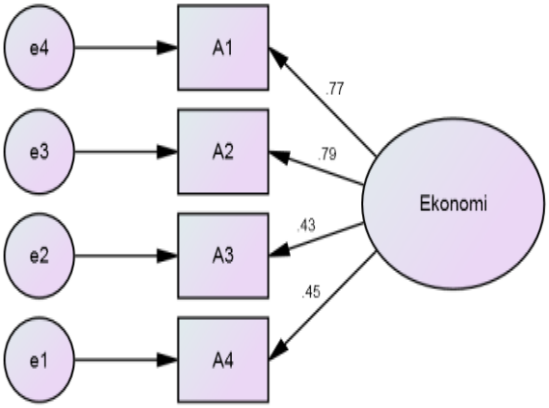
Şekil 1.Yetiştirici Birliklerine Üye Olmayı Etkileyen Faktörlere Ait Teorik Model

3. Bulgular ve Tartışma

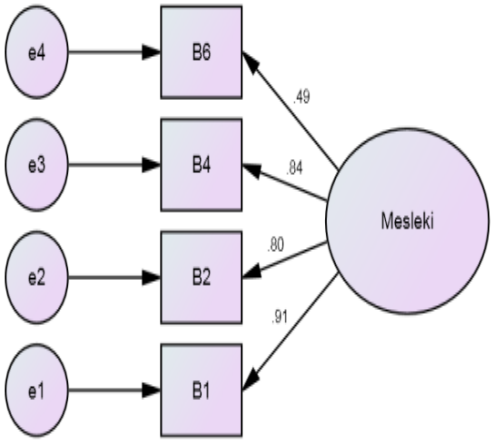
3.1 Tek Faktörlü Doğrulayıcı Faktör Analizleri

İlk olarak Ekonomi faktörüne ait DFA yapılmıştır. Yetiştiricilerin pazarlama ve girdi temini başta olmak üzere ekonomik anlamda kendilerine katkı sağlayacağını düşündükleri organizasyonlarda yer almaları beklenmektedir. Ekonomi faktörüne ait 4 gözlenen değişkenin Croncbach's Alpha değeri

0,671 bulunmuştur. Modele ait uyum iyiliği değerlerinin yanı sıra DFA sonucu görülen tüm yollar istatistiksel olarak anlamlı ve güvenilirdir. Oluşturulan tek faktörlü model DFA sonucu kabul edilmiştir. Pazarlama faaliyetlerinin, girdi temininin, devletin doğrudan desteklerinin ve örgütlülük halinin üretimle ilgili riskleri azaltmaya katkı sağlayacağı inancının ekonomi faktörü ile ilgili olduğu ve bu faktör altında toplanabileceği görülmektedir.



Şekil 2. Ekonomi Faktörüne Ait DFA



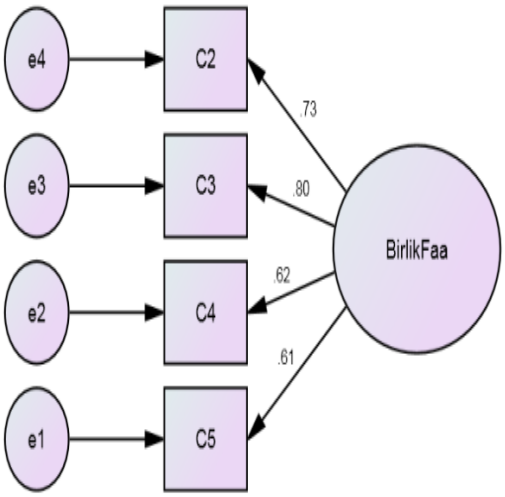
Şekil 3. Meslek Faktörüne Ait DFA

Yetiştirici birlikleri ekonomik olduğu kadar mesleki birlikler olarak da kabul edilmelidir. Bu ön kabul ile bir meslek örgütünden beklenen faaliyetler meslek faktörü altında toplanmıştır.

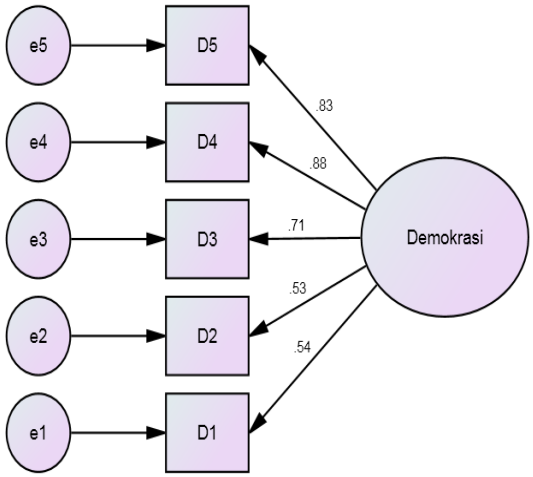
Meslek faktörüne ait 6 gözlenen değişkenin Croncbach's Alpha değeri 0.908 bulunmuştur. Ancak 6 gözlenen değişken ile yapılan DFA'nın model uyum iyiliği değerleri kabul edilebilir sınırların dışındadır. Bu nedenle B3-Birliğin sunduğu danışmanlık ve yayım hizmetlerinden yararlanıyorum ve B5-Birlik işletme bilgilerim düzenli olarak tutuluyor, gözlenen değişkenleri analizden çıkarılarak analiz tekrar edilmiştir.

Kalan 4 gözlenebilen değişkene ait Croncbach's Alpha değeri 0,845 bulunmuştur ve bu değer ölçek güvenilirliğinin yüksek olduğunu göstermektedir (İslamoğlu ve Alnıaçık, 2014).Meslek faktörü için faktör yükleri 0.49 ile 0.91 arasındadır. Uyum iyiliği değerlerinin yanı sıra DFA sonucu görülen tüm yollar istatistiksel olarak anlamlı ve güvenilirdir.

Güçlü ve organize bir tüzel kişiliğin varlığının üyelik ve örgütlenme üzerinde olumlu etkisi olacağı savıyla Birlik Faktörü adı altında bir faktör oluşturulmuştur.



Şekil 4. Birlik Faktörüne Ait DFA



Şekil 5. Demokrasi ve Örgütlenme Faktörüne Ait DF

Birlik faktörüne ait 5 gözlenen değişkenin Croncbach's Alpha değeri 0.826 bulunmuştur. Ancak 5 gözlenen değişken ile yapılan DFA'nın uyum iyiliği değerleri kabul edilebilir sınırların dışındadır. Bu nedenle C1-Birlik personelinin üreticilere olumlu yaklaşımı üye olmamda etkili oldu, gözlenen değişkeni analizden çıkarılarak analizler tekrarlanmıştır. Birlik Faaliyetleri faktörünün yükleri 0.61 ile 0.80 arasındadır. Modele ait uyum iyiliği değerlerinin yanı sıra DFA sonucu birlik faaliyetleri değişkenine ait görülen tüm yolların istatistiksel olarak anlamlı ve güvenilirdir.

Yetiştiricilerin tüzel kişiliğin kendisini ve yöneticilerini ön plana aldıkları söylenebilir. Birlik çalışanları bu noktada istatistiksel olarak bir farklılık oluşturmamaktadır. C1 ifadesi ile ilgili olarak, birlik personeli ile üyelerin üye olma aşamasına kadar çok fazla karşılaşmadıklarıgözlemlenmiştir. Aynı zamanda danışmanlık yapan birlik çalışanlarının da varlığı bu ifadenin dışında değerlendirilmelidir.

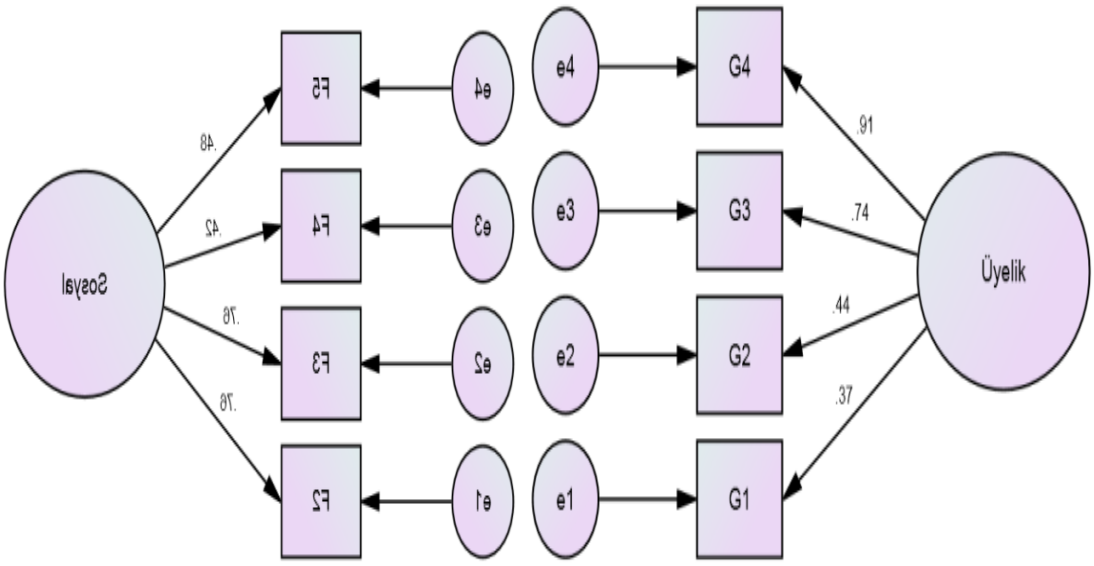
Kitle iletişim araçlarındaki gelişmeye ve eğitim düzeyindeki artışa paralel olarak demokrasi ve örgütlenme bilincinin artmış olduğu düşünülmektedir. Bu bilincinüretici örgütlenmesine etkisini görebilmek için demokrasi ve örgütlenme bilincini bir faktör olarak modele dâhil edilmiştir.

Şekil 3.4'te demokrasi ve örgütlenme faktörünün yükleri 0.53 ile 0.88 arasındadır. Modele ait uyum iyiliği değerlerinin yanı sıra DFA sonucu faktöre ait tüm yolların istatistiksel olarak anlamlı ve güvenilir olduğu görülmektedir .Faktöre ait 5 gözlenen değişkenin Croncbach's Alpha değeri 0,830 bulunmuştur ve bu ölçek güvenilirliğinin yüksek olduğunu göstermektedir.Model veri tarafından doğrulanmıştır. Çalışma alnındaki yetiştiriciler birliğin, kendilerini aracı ve tefecilerden koruyabileceğine ve birlik aracılığı ile seslerini duyurarak kendilerini ifade edebileceklerine inanmaktadır denilebilir.

İnsan sosyal bir canlıdır ve belirli bir çevrede var olmaktadır. Çevresi ile etkileşim halindedir. Bu nedenle sosyal ve çevresel değişkenleri barındıran bir faktör oluşturulmuştur.

Sosyal ve Çevresel faktöre ait 5 gözlenen değişkenin Croncbach's Alpha değeri 0.775 bulunmuştur. Ancak 5 gözlenen değişken ile yapılan DFA'nın model uyum iyiliği değerleri kabul edilebilir sınırların dışındadır. Bu nedenle F1-Ailem üretici örgütlenmesi konusunda beni teşvik ediyor, gözlenen değişkeni analizden çıkarılarak DFA ve güvenilirlik analizleri tekrarlanmıştır.F1 değişkeni çıkarılarak yapılan analizde Croncbach's Alpha değeri 0.701 bulunmuştur ve bu güvenilirliğinin kabul edilebilir seviyede olduğunu göstermektedir.

Şekil 5'te faktöre ait faktör yükleri 0.42 ile 0.76 arasındadır. Uyum iyiliği değerleri ve DFA sonucu faktöre ait görülen tüm yollar istatistiksel olarak anlamlı ve güvenilirdir.



Şekil 6. Sosyal ve Çevresel Faktörüne Ait DFA **Şekil 7. Üyelik Faktörüne Ait DFA**

Üyelik faktörüne ait 4 gözlenen değişkenin Croncbach's Alpha değeri 0,682'dir ve bu değer ölçek güvenilirliği açısından kabul edilebilir seviyedir. Şekil 6'da verilen faktöre ait yüklerin 0.37 ile 0.91

arasında olduğu görülmektedir. Modele ait uyum iyiliği değerleri ve DFA üyelik değişkenine ait tüm yolların istatistiksel olarak anlamlı ve güvenilir olduğunu göstermektedir.

Tablo 1. Standart Uyum İyiliği Ölçütleri (Schermelleh-Engel-Moosbrugger, 2003)

Uyum Ölçüleri	İyi Uyum	Kabul Edilebilir Uyum
χ^2	$0 \leq \chi^2 \leq 2sd$	$2sd \leq \chi^2 \leq 3sd$
P değeri	$0.05 \leq p \leq 1$	$0.01 \leq p \leq 0.05$
χ^2/sd	$0 \leq \chi^2/sd \leq 3$	$2 \leq \chi^2/sd \leq 5$
RMSEA	$0 \leq RMSEA \leq 0.05$	$0.05 \leq RMSEA \leq 0.08$
SRMR	$0 \leq SRMR \leq 0.05$	$0.05 \leq SRMR \leq 0.10$
NFI	$0.95 \leq NFI \leq 1.00$	$0.90 \leq NFI \leq 0.95$
NNFI	$0.97 \leq NNFI \leq 1.00$	$0.95 \leq NNFI \leq 0.97$
CFI	$0.97 \leq CFI \leq 1.00$	$0.95 \leq CFI \leq 0.97$
GFI	$0.95 \leq GFI \leq 1.00$	$0.90 \leq GFI \leq 0.95$
AGFI	$0.90 \leq AGFI \leq 1.00$	$0.85 \leq AGFI \leq 0.90$

Kaynak: Aydın, 2010., Meydan ve Şeşen, 2015.

İyi uyum ve kabul edilebilir uyum iyiliği değerleri Çizelge 3.1'de verilmiştir. Tüm faktörler için DFA sonucu elde edilen veriler çizelgede verilen iyiuyum, kabul edilebilir uyum aralıklarına gelinceye kadar analizler tekrarlanmıştır. Standardize edilmiş regresyon katsayıları içerisinde en düşük değerli değişken ilgili faktörden çıkarılmıştır. Bu işlem her bir faktör için ayrı ayrı uyum iyiliği değerleri yakalanıncaya kadar devam etmiştir.

Tablo 2. Faktörlere Ait Uyum İyiliği Değerleri

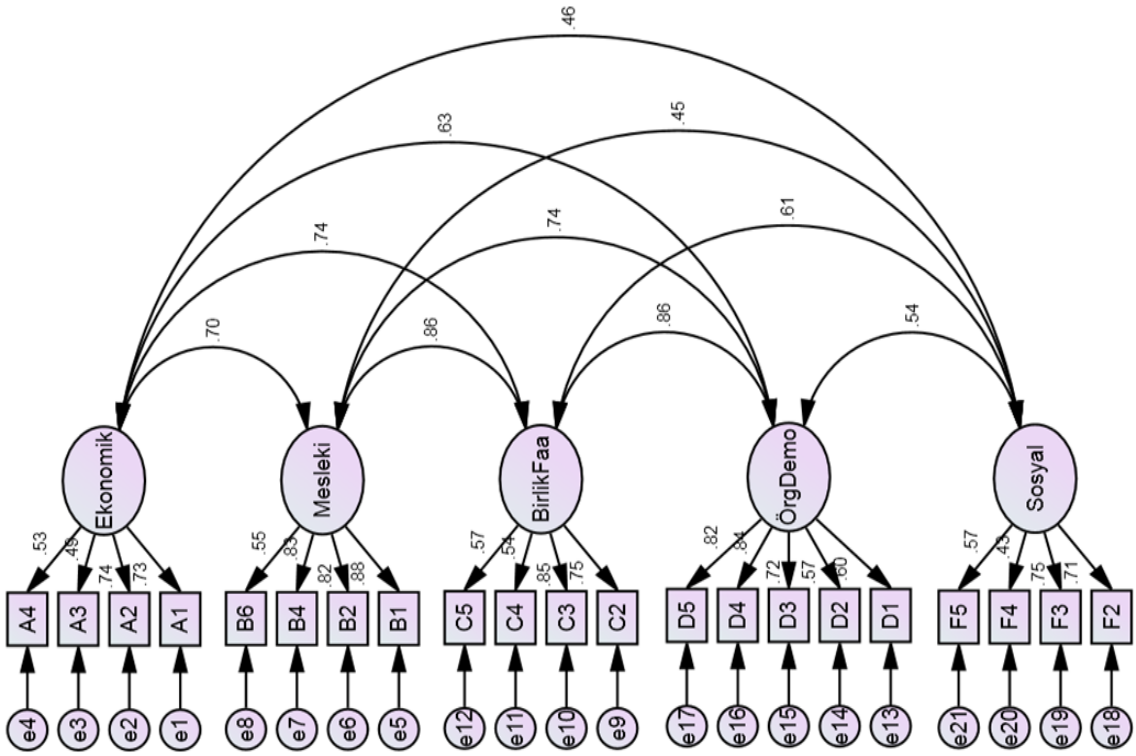
Uyum Ölçüleri	Ekonomi	Meslek	Birlik	Demokrasi veÖrgütlenme	Sosyal ve Çevre	Üyelik
χ^2	2.429	8.456	4.024	12.505	2.735	8.612
P değeri	0.297	0.015	0.134	0.028	0.255	0.013
χ^2/sd	1.215	4.228	2.012	2.501	1.368	4.306
RMSEA	0.024	0.094 (orta)	0.052	0.064	0.032	0.095
SRMR	0.0145	0.0209	0.0191	0.0263	0.0191	0.0345
NFI	0.992	0.988	0.990	0.983	0.990	0.975
CFI	0.998	0.991	0.995	0.989	0.997	0.980
GFI	0.997	0.989	0.994	0.987	0.996	0.988
AGFI	0.984	0.946	0.972	0.961	0.982	0.940

DFA sonucu her bir faktör için erişilen iyi uyum/kabul edilebilir uyum değerleri tek bir çizelgede verilmiştir.

3.2 Birincil Seviye Faktör Analizi

Modeldeki faktörlerin tek tek DFA'ları yapıldıktan sonra tüm faktörlerin birbirleri ile ilişkilerini gösterecek olan birincil seviye faktör analizi için ulaşılan model aşağıda verilmiştir. Modelin ilk hali 21 gözlenebilen değişkenden oluşmaktadır. Bu değişkenler ile yapılan güvenilirlik analizinde Croncbach's Alpha değeri 0.922 ile yüksek ölçek güvenilirliğini vermektedir.

Değişkenler arasındaki çift yönlü oklar üzerindeki pozitif değerler ilişkinin aynı yönlü olduğunu ve 1'e yaklaşan değerlerde var olan ilişkinin gücünü göstermektedir.DFA'nın model uyumuna ilişkin sonuçları, modelin Şekil 3.7'de görüldüğü hali ile GFI, CFI, RMSEA gibi değerler açısından iyi uyum ya da kabul edilebilir uyum değerleri arasında değildir. Bu aşamada standardize edilmiş regresyon katsayıları içerisinde en düşük olan değişkenden başlayarak maddeler modelden tek tek çıkarılmış ve analizler tekrarlanmıştır.



Şekil 7. Birincil Seviye Faktör Analizi

Tablo 3. Birincil Seviye Faktör Analizi Uyum İyiliği Değerleri

Uyum Ölçüleri	İyi Uyum	Kabul Edilebilir Uyum	Modelin uyumu
χ^2	$0 \leq \chi^2 \leq 2sd$	$2sd \leq \chi^2 \leq 3sd$	206.561
P değeri	$0.05 \leq p \leq 1$	$0.01 \leq p \leq 0.05$	0.000
χ^2/sd (CMIN/DF)	$0 \leq \chi^2$ /sd ≤ 3	$2 \leq \chi^2$/sd ≤ 5	3.756
RMSEA	$0 \leq$ RMSEA ≤ 0.05	$0.05 \leq$ RMSEA ≤ 0.08	0.087
SRMR	$0 \leq$ SRMR ≤ 0.05	$0.05 \leq$ SRMR ≤ 0.10	0.0563
NFI	$0.95 \leq$ NFI ≤ 1.00	$0.90 \leq$ NFI ≤ 0.95	0.923
CFI	$0.97 \leq$ CFI ≤ 1.00	$0.95 \leq$ CFI ≤ 0.97	0.942
GFI	$0.95 \leq$ GFI ≤ 1.00	$0.90 \leq$ GFI ≤ 0.95	0.921
AGFI	$0.90 \leq$A GFI ≤ 1.00	$0.85 \leq$ AGFI ≤ 0.90	0.870

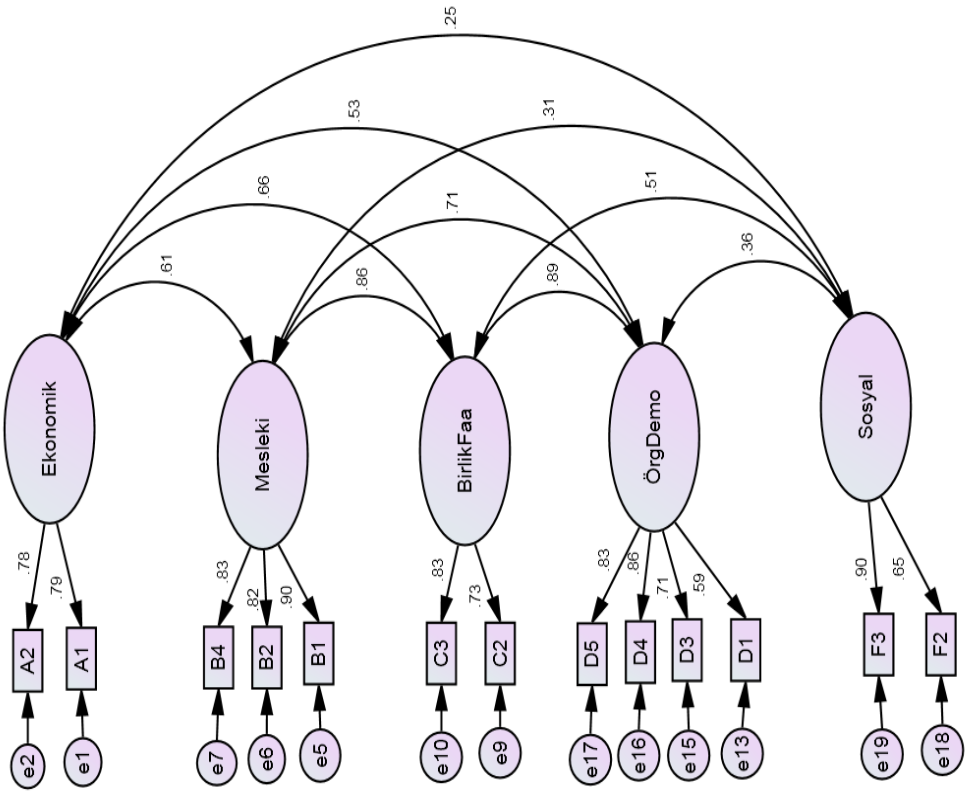
Çizelge 3.3'de modelin revize edildikten sonraki uyum iyiliği değerleri yer almaktadır.Modelin uyum iyiliği değerleri kabul edilebilir seviyeye gelinceye kadar toplam 8 gözlemlenebilen değişken modelden çıkarılmıştır.

Modelden çıkarılan değişkenler ve sonucu etki ettiği düşünülen mevcut duruma dair değerlendirmeler modelden çıkarılma sırasına göre aşağıda verilmiştir.

F4; Birliğe üye olmamda kitle iletişim araçları (TV, İnternet, Gazete vb.) etkili oldu, ifadesi için faktör yükü 0.42'dir. Araştırma bölgesindeki yetiştiriciler üzerinde genel olarak medyanın beklenen derecede etkisi olmadığı söylenebilir. Yetiştiricilerin bilgi kaynakları arasında da medya çok düşük bir oranla son sırada yer almaktadır.

A3-Birliğe üye olduğum içim üye olmayanlara göre daha fazla maddi destek alıyorum.A4- Birlik üyeliğim sayesinde üretim ve pazarlama ile ilgili riskleri azaltacağıma inanıyorum şeklinde ifade edilmiştir. Tek faktörlü DFA'da A3 0,43, A4 ise 0,45 ile bu faktördeki en düşük faktör yüküne sahip ifadelerdir.A3'e bakıldığında Tarım Bakanlığı tarafından yapılan destekleme ödemelerinin bir şekilde tüm yetiştiricilere ulaşıyor olması nedeniyle, birlikler üzerinden destekleme ödemesinin bir politika

aracı olarak kullanılmasının yetiştirici birliklerine üyelik konusunda beklenen etkiyi sağlamadığı sonucuna ulaşılabilir. Ayrıca A4'te ifade edildiği şekli ile üretim ve pazarlama ile ilgili riskleri azaltma konusunda birliklerden beklentiler karşılanmamıştır.



Şekil 8. Düzeltilmiş Birincil Seviye Faktör Analizi

C4-Birlik, kaynakların ortak kullanımını organize ediyor ve C5-Mesleki faaliyet dışında da üye olmanın avantajlarından yararlanıyorum.C4 ifadesinde belirtilmek istenen, özellikle dönemsel olarak işletmeler tarafından ihtiyaç duyulan makine ve ekipmanların (örneğin balya makinesi) kullanımıdır. Birliklerin araştırma bölgesinde bu yönde bir faaliyetine tanık olunmamıştır.C5 ile ifade edilen durumun modelden çıkarılması ise birliklerin, üyelerinin farklı alanlarda ki gereksinimlerine dair hiçbir çalışmada bulunmadıklarının kanıtı olarak değerlendirilebilir.

B6-Birlik, diğer üyeler ile sosyal ilişkiler geliştirme ve dayanışma olanağı sağlıyor. Araştırma süresince birliklerinüyeler arasında sosyal ilişkileri geliştirecek ve dayanışmayı sağlayacak faaliyetlerde bulunmadıkları gözlemlenmiştir.

F5- Birlik üyesi olmak kendimi daha iyi ve güvende hissetmemi sağlıyor. F5'infaktör yükü 0,48 olarak tespit edilmiştir. F5 ifadesinin modelden çıkarılmış olması birliklerin yetiştiricilere güven verememesi şeklinde yorumlanabilir. Birliklerin mevcut durumu ve faaliyetleri yetiştiricilerin kendilerini güvende hissetmelerini sağlayacak oranda değildir.

D2-Birlik, sektörde sesimizi duyurabileceğimiz bir araçtır.D2ifadesinin faktör yükü tek faktörlü DFA sonucu 0.53 ile diğer ifadeler arasındaki en düşük değere sahiptir. Yetiştiriciler, kendi sorunlarını ifade etme konusunda birlikleri yetersiz görmektedirler denilebilir.Tarım sektörü araştırma bölgesinde istihdama en yüksek oranda katkı sağlayan sektördür. Bu yüksek katkıya rağmen sektördeki örgütler aynı derecede görünür olmayı başaramamışlardır.

Tüm bu değişkenler modelden çıkarıldıktan sonra uyum iyiliğinin sağlandığı model Şekil 3.8'de verilmiştir. Bu modeli oluşturan 13 gözlemlenen değişken ile tekrar güvenilirlik analizi yapılmış ve

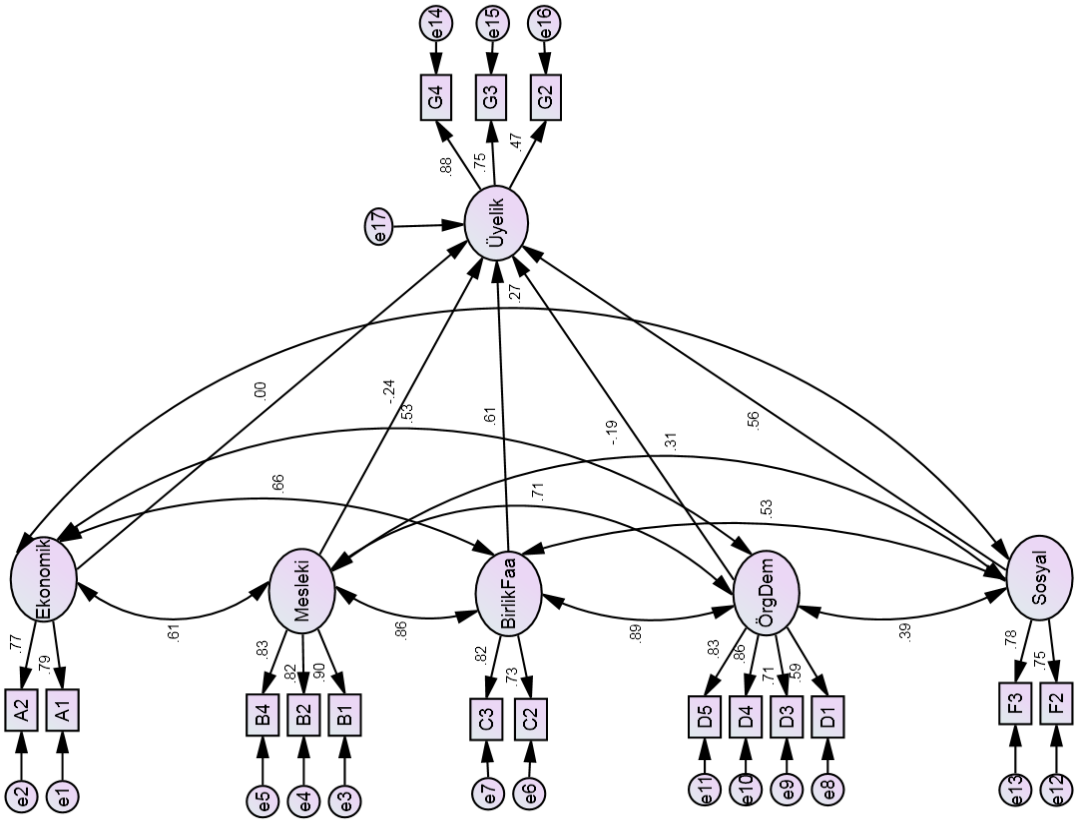
Croncbach's Alpha değeri 0.902 olarak bulunmuştur. Bu değer yüksek ölçek güvenilirliğini ifade etmektedir.

Şekil 8'de ekonomik faktörler, birlik faaliyetleri ile sosyal ve çevresel faktörler ikişer adet indikatöre sahiptir. Mesleki faktörler üç, örgütlenme ve demokrasi faktörü ise dört indikatöre sahiptir.Standart DFA' da tek faktörün en az 3 göstergesi varsa model tanımlanmış, iki ve ikiden fazla faktörün (gizil değişken) olduğu modelde her bir faktör için en az 2 gösterge varsa model yine tanımlanmış olmaktadır. Araştırma modelinde beş gizil değişken bulunmaktadır bu nedenle modelin tanımlanması ile ilgili herhangi bir problem söz konusu değildir (Kline, 2005).

3.3 Yol Analizi

Yol analizi yapılabilmesi için 'Üyelik' faktörü ve gizli değişkenlerinde yer aldığı model oluşturulmuştur. Ancak Üyelik faktöründeki G1-Birlik üyeliğinin kredi alırken olumlu yönde katkısı oluyor, ifadesinin faktör yükünün 0,37 gibi çok düşük çıkması ve modelin uyum iyiliği değerleri üzerindeki olumsuz etkileri nedeniyle modelden çıkarılmıştır. Analiz sonucu regresyon katsayılarının ve yolların anlamlı olup olmadığına bakılmıştır.

Modelin istenen uyumu sağladığı görüldüğünde bile değişkenlerin yordama gücünün istatistiksel olarak anlamlı olup olmadığına da bakmak gerekir (Meydan ve Şeşen, 2015). Regresyon ağırlıklarının yer aldığı tabloya bakıldığında Üyelik← Ekonomik, Üyelik← Mesleki, Üyelik← Birlik Faaliyetleri ve Üyelik← Örgütlenme Demokrasi yollarının anlamlı olmadığı görülmektedir.



Şekil 9. Yol Analizi

Bu aşamada anlamlı olmayan yollar modelden çıkarılarak analiz tekrarlanmıştır. Ancak anlamlı olmayan yolların modelden çıkarılması işi her seferinde bir yol olmak üzere yapılmıştır. Modelden çıkarılan her yol diğer yolların anlamlılık seviyelerini etkilemektedir (Meydan ve Şeşen, 2015).

Tablo 4. Yol Analizine Ait Regresyon Değerleri

			Tahmin	Standart Hata	Kritik Oran	P
Üyelik	<---	Ekonomik	.005	.159	.033	.974
Üyelik	<---	Mesleki	-.199	.247	-.804	.421
Üyelik	<---	BirlikFaa	.631	.744	.848	.397
Üyelik	<---	ÖrgDem	-.295	.558	-.528	.597
Üyelik	<---	Sosyal	.548	.152	3.605	***
A1	<---	Ekonomik	1.000			
A2	<---	Ekonomik	.997	.094	10.642	***
B1	<---	Mesleki	1.000			
B2	<---	Mesleki	.968	.048	20.036	***
B4	<---	Mesleki	.939	.045	20.803	***
C2	<---	BirlikFaa	1.000			
C3	<---	BirlikFaa	1.037	.066	15.621	***
D1	<---	ÖrgDem	1.000			
D3	<---	ÖrgDem	1.437	.135	10.640	***
D4	<---	ÖrgDem	1.694	.142	11.910	***
D5	<---	ÖrgDem	1.699	.146	11.659	***
F2	<---	Sosyal	1.000			
F3	<---	Sosyal	1.038	.092	11.307	***
G4	<---	Üyelik	1.000			
G3	<---	Üyelik	.978	.072	13.533	***
G2	<---	Üyelik	.584	.068	8.639	***

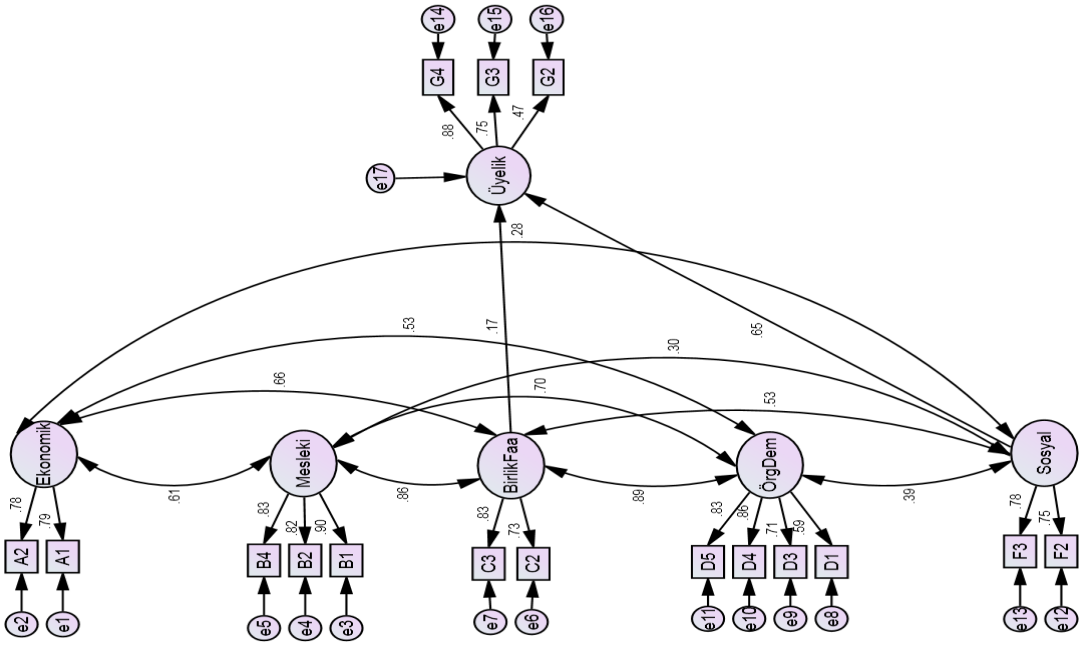
Tablo 5. Modifiye Edilmiş Yol Analizine Ait Regresyon Değerleri

			Tahmin	Standart Hata	Kritik Oran	P
Üyelik	<---	BirlikFaa	.179	.064	2.791	.005
Üyelik	<---	Sosyal	.638	.076	8.351	***
A1	<---	Ekonomik	1.000			
A2	<---	Ekonomik	1.006	.095	10.639	***
B1	<---	Mesleki	1.000			
B2	<---	Mesleki	.968	.048	20.021	***
B4	<---	Mesleki	.939	.045	20.817	***
C2	<---	BirlikFaa	1.000			
C3	<---	BirlikFaa	1.041	.067	15.634	***
D1	<---	ÖrgDem	1.000			
D3	<---	ÖrgDem	1.437	.135	10.638	***
D4	<---	ÖrgDem	1.694	.142	11.911	***
D5	<---	ÖrgDem	1.699	.146	11.659	***
F2	<---	Sosyal	1.000			
F3	<---	Sosyal	1.034	.091	11.384	***
G4	<---	Üyelik	1.000			
G3	<---	Üyelik	.972	.072	13.496	***
G2	<---	Üyelik	.580	.067	8.607	***

İlk olarak anlamlılık düzeyi en düşük olan Üyelik← Ekonomik yolu modelden çıkarılmış ve analiz tekrar edilmiştir. Daha sonra Üyelik← Örgütlenme Demokrasi yolu da modelden çıkarılmıştır. Son olarak Üyelik← Mesleki yolu modelden çıkarılmış ve analiz tekrarlandığında diğer tüm yolların istatistiksel olarak anlamlı olduğu görülmüştür.

İstatistiksel olarak anlamsız olan yollar modelden çıkarıldıktan sonra modelin son hali aşağıdadır.

İstatistiksel olarak anlamsız olan yolların modelden çıkarılması uyum iyiliği değerleri üzerinde olumlu bir etki yapmıştır ve kabul edilen modele ait son uyum iyiliği değerleri Çizelge 3.6'da verilmiştir.



Şekil 10. Anlamsız Yollar Çıkarıldıktan Sonra Modelin Son Hali

Tablo 6. Modifikasyon Sonucu Yol Analizi Uyum İyiliği Değerleri

Uyum Ölçüleri	İyi Uyum	Kabul Edilebilir Uyum	Modelin
χ^2	$0 \leq \chi^2 \leq 2sd$	$2sd \leq \chi^2 \leq 3sd$	296.513
P değeri	$0.05 \leq p \leq 1$	$0.01 \leq p \leq 0.05$	0.000
χ^2/sd (CMIN/DF)	$0 \leq \chi^2/sd \leq 3$	$2 \leq \chi^2/sd \leq 5$	3.223
RMSEA	$0 \leq RMSEA \leq 0.05$	$0.05 \leq RMSEA \leq 0.08$	0.078
SRMR	$0 \leq SRMR \leq 0.05$	$0.05 \leq SRMR \leq 0.10$	0.106
NFI	$0.95 \leq NFI \leq 1.00$	$0.90 \leq NFI \leq 0.95$	0.908
CFI	$0.97 \leq CFI \leq 1.00$	$0.95 \leq CFI \leq 0.97$	0.934
GFI	$0.95 \leq GFI \leq 1.00$	$0.90 \leq GFI \leq 0.95$	0.909
AGFI	$0.90 \leq A\ GFI \leq 1.00$	$0.85 \leq AGFI \leq 0.90$	0.865

Uyum iyiliği değerleri incelendiğinde sadece CFI değerinin 0.934 ile 0.95 değerinden çok az aşağıda olduğu görülmektedir. Ancak modele ait tüm regresyon, korelasyon ve varyans yollarının istatistiksel olarak anlamlı olması göz önüne alındığında bu değer tolere edilebilir bir seviyededir.

Tablo 7. Yol Analizine Ait Standardize Edilmiş Değerler

Toplam Etkiler		**Sosyal**	**Örg Dem**	**Birlik Faa**	**Mesleki**	**Ekonomik**	**Üyelik**
	Üyelik	.648	.000	.172	.000	.000	.000
Direkt Etkiler		**Sosyal**	**ÖrgDem**	**BirlikFaa**	**Mesleki**	**Ekonomik**	**Üyelik**
	Üyelik	.648	.000	.172	.000	.000	.000
Dolaylı Etkiler		**Sosyal**	**ÖrgDem**	**BirlikFaa**	**Mesleki**	**Ekonomik**	**Üyelik**
	Üyelik	.000	.000	.000	.000	.000	.000

Çizelge 3.7'de verilen toplam etkilere ait standardize edilmiş değerlere bakıldığında sosyal faktörlerin üyelik faktörünü toplam yordama (tahmin) gücünün 0,648, Birlik faaliyetlerinin ise üyelik üzerindeki yordama gücünün 0.172 olduğu görülmektedir.Üyelik üzerinde dolaylı etkisi olan herhangi bir faktör olmadığı için toplam etkiler ile direk etkilerin eşit olduğu görülmektedir. Sosyal faktörler ve Birlik faaliyetlerinin yetiştirici birliklerinde üyeliği doğrudan etkilediği sonucuna ulaşılmıştır.

Teorik olarak oluşturulan modelde yer alan ve tüm analizler ve modifikasyonlar sonucunda anlamlılığı istatistiksel olarak kabul edilen ve yetiştirici birliklerine üye olmayı etkileyen değişkenler aşağıda listelenmiştir. Her bir değişken için araştırma alanındaki mevcut durum ve araştırma süresince yapılan gözlemlere dayanılarak modelde kalmalarını sağladığı düşünülen koşullar yorumlanmıştır.

Ekonomi faktörü ile ilgili gözlenen değişkenler,

A1-Birlik sayesinde ürünlerimi daha iyi koşullarda ve daha iyi fiyata pazarlayabiliyorum: çalışma alanında DSYB tarafından kurulan bir süt toplama organizasyonu vardır ve çalışma alanının genişliğine rağmen önemli sayıda yetiştiriciye ulaşmaktadır. Ayrıca süt toplama ağı gelişmeyi sürdürmektedir. DKKYB ise üyelerine zaman zaman pazarlayacakları kuzular için önderlik etmektedir. Ancak bu durum süreklilik göstermemektedir. AYB ise bu konuda en az aktif olan örgütlenmedir ve ürünlerini birlik aracılığı ile pazarlayanların oranı sadece %1.9'dur.

A2-Birlik aracılığı ile daha ucuza girdi temin edebiliyorum: Birlikler üyelerin bazı girdileri temini konusunda çalışmalar yapmaktadırlar. AYB, döllenmiş ana arı, temel petek ve bazı ilaçları toptan temin ederek üyelerine daha ekonomik koşullarda sunmaktadır. DKKYB ise yürütülen halk elinde ıslah projesi kapsamında çeşitli ilaçlar ve veterinerlik hizmetleri sunmaktadır.

Kamu kurumları ile işbirliği halinde damızlık koç temini çalışmaları da mevcuttur. DSYB, çalışma alanında üyelerin büyük çoğunluğuna suni tohumlama hizmeti sunmaktadır. Süt pazarlama organizasyonunun bir parçası olarak dönem dönem buzağı ve süt yemi sağlamak için çalışmalar yapmaktadır.

Mesleki faktörü ile ilgili gözlenen değişkenler;

B1- Birlik, üretim faaliyetlerimizle ilgili her türlü sorunumuza çözüm arıyor ve yol gösteriyor: istenilen düzeyde olmasa da birlikler yetiştiricilerin sorunlarına çözüm bulmak için iletişim kanallarını açık tutmaktadırlar. Tüm birliklerde konu uzmanı teknik personel istihdam edilmektedir.

B2- Birlik üyesi olarak yenilikleri daha kolay takip edebileceğimi düşünüyorum: birlikler iletişim çağının sunduğu olanaklardan yararlanarak üyelerine ulaşmakta ve bilgilendirmektedir. Çalışma alanında örgütlü tüm birlikler kısa mesaj sistemi ile destekleme ödemelerini, önemli tarihleri ve potansiyel başvuru sahibi olabilecekleri hibe programları konusunda üyelerini bilgilendirmektedir.

B4- Birlikten üretime yönelik teknik destek alabiliyorum: daha önce belirtildiği gibi tüm birlikler konu uzmanı teknik personel istihdam etmektedir. Yetiştiricilerin talebine bağlı olarak üretim teknikleri konusunda teknik personel yetiştiricilere talep ettikleri bilgileri sunmaktadır.

Birlik faktörü ile ilgili gözlenen değişkenler,

C2- Birliğin yöneticilerini tanıyorum ve samimiyetlerine güveniyorum: birlik yöneticilerine ve faaliyetlerine güvenin önemine dair tespitlerde bulunan çalışmalar mevcuttur (Xiang ve Sumelius, 2010. Aydoğan ve Yulafçı, 2014., Feng ve ark., 2011). Daha dar ve geleneksel toplumlarda liderlik çok önemli bir rol oynamaktadır dolayısıyla birliklerin yöneticileri yetiştiricilerin üye olması noktasında çok önemlidir. Dürüst ve güvenilir liderlik örgütlenmeyi kolaylaştıran önemli bir faktördür.

C3- Birliğin faaliyetlerini görüyorum ve takdir ediyorum: bu durum bir demonstrasyon faaliyeti gibi de düşünülebilir. Birliklerin üyeler tarafından takdirle karşılanan faaliyetleri yeni üyelerin kazanılmasında ve üyeliklerin devam ettirilmesinde son derecek önemlidir.

Demokrasi ve örgütlenme faktörü ile ilgili gözlenen değişkenler,

D1- Birlik üyesi olduğum için aracı ve tefecilerle karşı karşıya kalmıyorum: küçük ve orta ölçekli işletmeler açısından örgütlü olmak ve piyasadaki aktörlere karşı yalnız olmamak hissi oldukça önemlidir. Üyeler bu bilinçle örgütlere katılmaktadır ve kendilerini yalnız hissetmedikleri oranda üyeliklerini sürdürmektedirler.

D3-Birliğin güç odaklarından (siyaset, mezhep vb.) bağımsız bir örgüt olduğunu düşünüyorum: yetiştiricilerin, mevcut örgütlenmelerin kendi faaliyet alanları için kurulduğunu başka bir güç odağının himayesinde hareket etmediğini gördüklerinde bu tür örgütlere üye olmakta çekince göstermedikleri gözlemlenmiştir ve araştırma boyunca yetiştiriciler tarafından bu durumun önemi dile getirilmiştir.

D4- Birlik içerisinde söz ve karar hakkım var: yetiştiricilerin kendilerini ifade edebilmeleri ve birliklerin bunu sağlayacak zeminleri oluşturmaları önemlidir. Örgütlerinin kendilerine değer verdiği ve dinlendikleri sürece üyeliklerini devam ettirme eğiliminde oldukları gözlemlenmiştir.

D5- Birlik tüm üyelere eşit yaklaşıyor: yetiştiricilerin sorunlarına odaklanma ve bu sorunları üyeler arasında hiçbir ayrım gözetmeden çözme çabası yetiştiricilerden takdir görmektedir.

Sosyal ve çevre faktörü ile ilgili gözlenen değişkenler,

F2- Eğitim düzeyim üyelik kararımda etkili oldu: eğitim arttıkça bilinç ve örgütlenmenin de arttığı bilinmektedir.

F3- Yörede diğer yetiştiricilere öncü olmak için üye oldum: yetiştiricilerin öncü rolü birliklerin örgütlenmesinde ve yayım faaliyetlerinde oldukça önemlidir. Birçok yenilik öncü olabilecek yetiştiriciler üzerinden diğer üyelere ulaşmaktadır.

Üyelik faktörü ile ilgili gözlenen değişkenler,

G2- Örgütlü olmanın üreticileri ekonomik olarak daha güçlü yapacağına inanıyorum: çalışma boyunca yetiştiricilerin örgütlenme konusundaki bilinç düzeyine ve isteklerine tanık olunmuştur. Yetiştiriciler örgütlenmenin, birlikte hareket etmenin kendileri açısından öneminin farkındadır.

G3- Sivil toplum kuruluşlarına üye olmakta bir sakınca görmüyorum: örgütlenmenin önemine dair bilinç burada da görülmektedir. Doğru olduğunu düşündükleri örgütlenmelere katılmalarında herhangi bir engel yoktur. Faaliyet alanları açısından doğru işler yapan birliklerin üye bulma konusunda herhangi bir problemle karşılaşmayacakları düşünülmektedir.

G4- Piyasadaki büyük firmalara karşı örgütlenmek gerekiyor: yetiştiriciler tarım sektörünün yapısı ve kendi durumları hakkında bilgi sahibidirler. Ne yapılması gerektiği konusunda bir fikirleri vardır ve doğru örgütlenme modelleri ve aktif bir yapı gördüklerinde bu tür örgütlenmelere katılmaktan çekinmeyecekleri söylenebilir.

4. Sonuç ve Öneriler

Aktif pazarlama faaliyetlerinin varlığı üyeliği olumlu yönde etkilemektedir. Birlikler var olan pazarlama organizasyonlarını geliştirmeli, olmadığı yerlerde ise pazarlama organizasyonun kurulması için sorumluluk almalıdır.

Girdi temini konusunda birlikler yeterli çabayı göstermelidir. Örgütlü olmanın avantajını kullanarak üyelerine ucuz ve kaliteli girdi temin etmelidirler.

Politika aracı olarak destekleme ödemelerinin kullanılması teorik olarak uygun görülmekle birlikte pratikte diğer yetiştiriciler ile fark yaratacak bir seviyede olmaması bu aracın etkisini azaltmaktadır. Örgütlenme seviyelerinin istenen düzeye gelmesi ve çiftçi örgütlerinin sürdürülebilir bir şekilde var olabilmeleri için bu tür politika araçları kullanılmaya devam edilmelidir.

Birliklerin üyelerini güvende hissedecekleri bir organizasyona ihtiyaç vardır. Risk yönetimi ile ilgili çalışmalar tüm üyelere ulaştırılmalı ve birlikler bu alanda daha aktif rol almalıdır. Piyasadaki riskler başta olmak üzere tüm risk faktörleri ile ilgili üyeleri uyaracak ve önlem almalarına yardımcı olacak düzenlemeler için bakanlık başta olmak üzere kamu ile çalışmak birlikler ve yetiştiriciler açısından olumlu sonuçlar verecektir. Birlikler yetiştiricilerin sorunlarına çözüm geliştirebilmek ve onlara faaliyet alanları ile ilgili yenilikleri zamanında ulaştırabilmek için ihtiyaç duyulan teknik personelin istihdamını sağlamalıdır. Araştırma kuruluşları ve üniversiteler ile işbirliği yapmalı,

konuları ile ilgili yenilikleri üyelerine ulaştırabilmek için gerekli eğitim ve yayım programlarını hazırlamalıdır. Bu yönde gerekli iletişim teknolojilerini kullanmalı ve işletme bilgilerinin düzenli olarak kayıt altına alınması için gerekli organizasyonları yapmalıdır. İşletme bilgilerinin düzenli olarak tutulması karar vericilerin ve yetiştiricilerin doğru adımlar atması konusunda faydalı olacaktır.

Birlikler, yetiştiricilerin birbirleri ve örgütleri ile daha sıkı bağlar geliştirmesi için sosyal faaliyetler organize etmelidir.

Birliklerin personelleri, yetiştiricilerin üye yapılması aşamasında daha aktif olarak kullanılmalıdır. Güvenilir bir yönetim organizasyonu örgütlenmeyi kolaylaştıracak ve yetiştiricilerin güvenini kazanacak önemli bir unsurdur. Herhangi bir gerekçe ile bu güveni sarsacak kişilerin yönetimlerde bulunması olumsuz sonuçlar ortaya çıkaracaktır. Birlik faaliyetleri görünür olmalıdır. Yapılan tüm faaliyetlerin yöredeki tüm yetiştiricilere ulaştırılması için gerekli çaba gösterilmelidir. Hangi faaliyetlerin ne amaçla yapıldığı yetiştiricilere açık bir şekilde ifade edilmelidir.

Yetiştiriciler tarafından dönemsel olarak ihtiyaç duyulan makine ve ekipmanların ortak kullanımı organize edilmelidir. Birlikler üyelerinin ortak kullanımına yönelik makine-ekipman parkları oluşturmalıdır. Bu şekilde küçük ve orta büyüklükteki işletmelerin ihtiyaç duydukları farklı alanlara kaynak ayırmaları sağlanabilir.

Birlikler, mesleki faaliyet dışında da yetiştiricilerin yararlanabilecekleri hizmetleri sunmalıdır. Örneğin; sigorta, düğün, cenaze vb. işlerin organizasyonu konularında yetiştiricilerin yanında olmak birlikler açısından olumlu sonuçlar verecektir.

Yetiştiriciler kendilerini piyasa aktörleri karşısında yalnız ve çaresiz hissetmemelidir. Birlikler, üyelerine ve tüm yetiştiricilere bu güveni verecek şekilde organize olmalıdır. Birlikler, üyelerinin sesi olmak durumundadır. Çalışma alanları ile ilgili lobi faaliyetlerini de içermek üzere, politikaların oluşturulması noktasında inisiyatif almalı ve düşüncelerini hem yetiştiriciler hem de kamuoyu ile paylaşmalıdır.

Birlikler, hiçbir güç odağına bağlı kalmadan, kendi ayakları üzerinde durabilecek bir yapılanmaya gitmeli ve yetiştiricilerin çıkarları ile faaliyet alanlarına odaklanmalıdır. Tüm yetiştiricilerin düşüncelerini ifade edebilecekleri zeminleri hazırlamalıdır. Küçük gruplar halinde yetiştiricilerin bulunduğu köylerde toplantılar yapmalı, onları dinlemeli ve taleplerini ilgili yerlere ulaştırmalıdır. Üyeleri arasında ayrım yapmamalı tüm üyelere eşit yaklaşmalıdır.

Başta ilgili kamu kurumları olmak üzere, birlikler tarafından da yetiştiricilerin örgütlenmeye dair bilincini artıracak çalışmalar yapılmalıdır. Kitle iletişim araçları özellikle internet, birliklerin tanıtımı, örgütlenme ve eğitim faaliyetleri için daha etkin kullanılmalıdır. Birlikler, üyeleri ile güven ilişkisine dayalı bir bağ kurmalıdır.

Küçük ve orta büyüklükteki işletmelerin krediye ulaşımını kolaylaştırmak için yerel bankalarla anlaşma zeminleri aranmalı ve bunun için birlikler kendi organizasyonlarının gücünü kullanmalıdır.

Yetiştiricilerin sahip olduğu örgütlenme bilinci küçümsenmemeli, faaliyet alanları ile ilgili çalışmalara organize bir şekilde katılım arzularına yanıt verebilecek adımlar atılmalıdır. Bu anlamda kamu kuruluşları daha çok inisiyatif alabilmelidir. Gerektiğinde birliklerden bağımsız olarak yetiştiricileri dinlemeli, üyelerin örgütleri hakkındaki düşüncelerini karar verme süreçlerinde dikkate almalıdır.

Çalışma sonunda veri ile doğrulanmış ve daha önce olmayan bir model ortaya konulmuştur. Bu anlamda orijinal bir sonuca ulaşılmıştır. Ortaya konulan model bundan sonraki çalışmalara temel oluşturabilecek niteliktedir. Faklı bölgelerde test edilip geliştirilebilir ve bu şekilde arzu edilen örgütlenme düzeyine kavuşmaya katkıda bulunabilir.

Teorik modelin ve araştırma sonucu modifiye edilerek elde edilen modelin araştırma bölgesinde elde edilen veriler ile test edildiğini bir kez daha vurgulamak önemlidir. Farklı eğitim düzeyleri, sosyal ve ekonomik yapılar içerisinde yetiştiricilerin farklı tutumlar takınmaları doğaldır. Yukarıda belirtilen ifadelerin yetiştiriciler tarafından algılanması da yöreden yöreye değişiklik gösterebilir. Bu konuda çalışma yapmak isteyen araştırmacıların, ifadelerin oluşturulma tarzı başta olmak üzere çalışma alanlarına ve kendilerinin teoriyi yorumlama durumuna göre modelde değişiklikler yaparak çalışmalarında kullanmaları daha doğru sonuçlar verebilir.

Kaynaklar

Aydın, B., 2010. Determination of the Factors Effecting Motivation by Structural Equation Modeling: A Textile Firm Sample. (Master's thesis), Osmangazi University Graduate School of Natural and Applied Sciences,Department of Industrial Engineering, Eskişehir.

Aydoğan, M. and Yulafçı, A., 2014. The Structural Problems of Agricultural Producers' Organizations in Samsun and ProposedSolutions. 11. National Agricultural Economics Congress, 3-5 September, 2014, Samsun.

Bayram, N., 2013. Yapısal Eşitlik Modellemesine Giriş Amos Uygulamaları. Ezgi Kitabevi, 161 s, Bursa.

Everest, B. and Yercan, M., 2014. The Current Situation of Agricultural Organizations Operating in Livestock Sector: The Case of Turkey. 11. National Agricultural Economics Congress, 3-5 September, 2014, Samsun.

Feng, L., Nilsson, J., Ollila, P. and Karantininis, K., 2011. The human values behind farmers' loyalty to their cooperatives. international conference on Economics and Management of Networks, December 1 – 3, 2011, in Limassol, Cyprus.

İnan, İ. H., Gülçubuk, B., Ertuğrul, C., Kantürer, E., Baran, E. A. ve Dilmen. Ö. 2000. Türkiyede Tarımda Kırsal Kesim Örgütlenmesi. http://www.zmo.org.tr/resimler/ekler/00c563bfd 2c48c1_ek.pdf?tipi= 14&sube= (Erişim Tarihi: (25.12.2016).

İslamoğlu, H. A.ve Alnıaçık, Ü. 2014. Sosyal Bilimlerde Araştırma Yöntemleri. Beta Yayıncılık, 495s, İstanbul.

Kline, Rex B., 2005. Principles and Practice of Structural Equation Modeling, Guilford Press, 445 s. New York.

Meydan, H,C.ve Şeşen, H. 2015. Yapısal Eşitlik Modellemesi Amos Uygulamaları. DetayYayıncılık, 138 s, Ankara.

Rwelamira, J., 2015. Strengthening Farmers Organizations and Civil Society Organizations. Feeding Africa, 21-23 October 2015, Dahar, Senegal.

Tezcan, C., 2008. Structural Equation Modeling. (Master's thesis), Hacettepe University, Graduate School of Natural and Applied Sciences, Depertmant of Statistics, Ankara.

Vural, H., 2014. Organization in Agricultural Sector and the Importance of Co-operatives. 11. National Agricultural Economics Congress, 3-5 September, 2014, Samsun.

Xiang, L.Y. ve Sumelius, J., 2010. Analysis of the Factors of Farmers' Participation in the Management of Cooperatives in Finland. Journal of Rural Cooperation, 38 (2): 134-155.

Yamane, T., 2006. Temel Örnekleme Yöntemleri. Nobel Yayınları, 509 s, Ankara.

EVALUATION OF WOMEN FARMERS' PERSPECTIVES ON WOMEN'S ENTREPRENEURSHIP IN BESNI DISTRICT OF ADIYAMAN PROVINCE

Tayfun Çukur
Muğla Sıtkı Koçman University, Department of Marketing and Advertising, Turkey
Email:tayfun.cukur@ hotmail.com

Nuray Kızılaslan
Tokat Gaziosmanpaşa University, Department of Agricultural Economics, Turkey

Halil Kızılaslan
Tokat Gaziosmanpaşa University, Department of Agricultural Economics, Turkey

Abstract

Entrepreneurs are individuals who combine production factors, aim to profit and take risks. Thanks to entrepreneurship, new goods and services are produced, employment is created and economic development can be achieved. Entrepreneurship is among the factors of production. The main task of the entrepreneur is bring together the factors of production and use them in production. The development of new business ideas and the establishment of new businesses are very important for economic development. For this reason, increasing the number of entrepreneurs and educating individuals about entrepreneurship are considered important in terms of contributing to economic development.

In the past, while entrepreneurship activities were leading men, women's entrepreneurship activities have been carried out intensively in recent years. In order to achieve agricultural and rural development, women and men must participate in production and create added value. Entrepreneurship has important contributions to rural women including economic, social and cultural dimensions. Women entrepreneurship contributes to economic development by creating employment. Thanks to women's entrepreneurship women's income increases and women gain economic freedom. By means of entrepreneurship, women's self-confidence and participation in social life are increasing.

The main purpose of this study is to determine the entrepreneurship status of women working in the agricultural sector. In the study, the advantages and disadvantages of the entrepreneurship activities in agriculture were examined and suggestions were made for the development of women's entrepreneurship in agriculture. In this context the survey was carried out with a face to face survey with a total of 110 female farmers living in the Besni district of Adıyaman province.
Keywords: Women Farmers, Entrepreneurship, Women Entrepreneurship, Agriculture.

ADIYAMAN İLİ BESNİ İLÇESİNDE TARIMSAL FAALİYET YÜRÜTEN KADINLARIN KADIN GİRİŞİMCİLİĞİNE YÖNELİK BAKIŞ AÇILARININ DEĞERLENDİRİLMESİ

Özet

Girişimciler, üretim faktörlerini bir araya getiren, kar sağlama amacında olan ve risk alan kişilerdir. Girişimcilik sayesinde yeni mal ve hizmetler üretilmekte, istihdam yaratılmakta, ekonomik kalkınma sağlanabilmektedir. Girişimcilik üretim faktörleri arasında yer almaktadır. Girişimcinin temel görevi üretim faktörlerini bir araya getirerek bunların üretimde kullanılmasını sağlamaktır. Yeni iş fikirlerinin geliştirilmesi ve yeni işletmelerin kurulması ekonomik kalkınma için oldukça önemlidir. Bu nedenle girişimci sayılarının arttırılması ve bireylerin girişimcilik konusunda eğitilmeleri ekonomik gelişmeye katkı sağlaması bakımından önemli görülmektedir.

Geçmişte girişimcilik faaliyetlerinde erkekler ön plana çıkarken son yıllarda kadınların girişimcilik faaliyetlerini yoğun olarak yürüttükleri görülmektedir. Tarımsal ve kırsal kalkınmanın sağlanabilmesi

için kadın ve erkeklerin üretime katılmaları ve katma değer yaratmaları gerekmektedir. Girişimciliğin kırsal kadına ekonomik, soysal ve kültürel olmak üzere önemli katkıları bulunmaktadır. Kadın girişimciliği istihdam yaratarak ekonomik gelişmeye katkı sağlamaktadır. Kadın girişimciliği sayesinde kadınların gelirleri artmakta ve kadınlar ekonomik özgürlüğüne kavuşmaktadır. Girişimcilik sayesinde kadınların kendine güvenleri ve sosyal hayata katılımları artmaktadır.

Bu çalışmanın temel amacı, tarım sektöründe çalışan kadınların girişimcilik faaliyetinde bulunma durumlarının belirlenmesidir. Çalışmada tarımda girişimcilik faaliyetinde bulunmanın avantaj ve dezavantajları incelenmiş, tarımda kadın girişimciliğinin geliştirilmesi için önerilere yer verilmiştir. Bu kapsamda araştırmadaAdıyaman İli Besni ilçesinde yaşayan toplam 110kadın çiftçiyle yüz yüze anket gerçekleştirilmiştir.

Anahtar Kelimeler: Kadın Çiftçiler, Girişimcilik, Kadın Girişimciliği, Tarım

1. Giriş

Geçmiş yıllarda ister gelişmiş, ister gelişmekte, isterse az gelişmiş ülkelerde kadınlarla ilgili algı, evinde oturan, ev işlerini yapan ve çocuklarla ilgilenen bir birey iken günümüzde bu algıda dünya ölçeğinde önemli değişmelerin yaşandığını söylenebilir. Bugün artık kadınlar çalışma hayatında daha aktif rol almakta ve üretime katkı vermektedirler. Kadınların işgücüne katılımının gerek ülke ekonomisine gerekse ev ekonomisine oldukça önemli katkıları bulunmaktadır. Yıllar itibariyle bir değerlendirme yapıldığında, Türkiye'de 2004 yılında kadınların %23.3'ü üretime katılırken, bu oran 2017 yılında %33.6'ya yükselmiştir (Tablo 1).

Tablo 1. Türkiye'de Nüfusun İşgücü Durumu (%)

Yıllar	Toplam	Erkek	Kadın
2004	46.3	70.3	23.3
2005	46.4	70.6	23.3
2006	46.3	69.9	23.6
2007	46.2	69.8	23.6
2008	46.9	70.1	24.5
2009	47.9	70.5	26.0
2010	48.8	70.8	27.6
2011	49.9	71.7	28.8
2012	50.0	71.0	29.5
2013	50.8	71.5	30.8
2014	50.5	71.3	30.3
2015	51.3	71.6	31.5
2016	52.0	72.0	32.5
2017	52.8	72.5	33.6

Kaynak: TÜİK. 2019.

Sektörler itibariyle bir değerlendirme yapıldığında, yıllar itibariyle gerek erkeklerin gerekse kadınların tarımda istihdam edilme oranlarının azaldığı dikkat çekmektedir. 2017 yılı itibariyle kadınların %28.3'ü erkeklerin ise %15.4'ü tarımda istihdam edilmiştir (Tablo 2).

Kadın girişimci, işletmeyi kuran ve işleten, işletmenin en az %50'sine sahip olan ve işletmeyi bir yıl ve daha fazla işleten kadın olarak tanımlanmaktadır (Beqo ve Gehrels, 2014). Bugün kadın girişimciliği ekonomik gelişme için önemlidir. Kadın girişimciliğinin ekonomik ve sosyal yararları küresel ekonomiye pozitif katkı yapmaktadır. Bazı araştırmacılar kadın girişimciliğini ekonomik krizlerin çözümlerinden biri olarak görmektedir (Bouzekraoui ve Ferhane, 2017). Gelişmekte olan ülkelerde işveren olarak kadın işletme sahipleri, istihdamın artmasına ve sosyal gerilimlerin azaltılmasına katkıda bulunmaktadır. Kadın girişimciliğinin yoğun olduğu ülkeler finansal krizlere daha dirençli olmakta ve ekonomik durgunluk olasılığı daha düşük düzeyde olmaktadır (Pinkovetskaia ve Ginzburg, 2018).

Kadın girişimciliği, kadınların ekonomik güçlenmesini sağlamada, istihdam üzerinde çarpan etkisi yaratmada, yoksulluğun ortadan kaldırılması ve ekonomik büyümenin sağlanmasında kilit bir rol

oynamaktadır. İşletme kurup yöneten kadınlar, ekonomik bağımsızlığa kavuşmakta, yoksulluğun üstesinden gelerek kendisi ve ailesinin refah seviyesini yükseltmektedir (UN, 2017). Dünyada eğer kadın istihdamı %1 artarsa GSMH'nın 80 milyar dolar artacağı, 2025 yılına kadar eğer tam olarak cinsiyet eşitliği sağlanabilirse dünya ekonomisine 28 trilyon dolar ek katkı sağlanabileceği tahmin edilmektedir (Kagider, 2018).

Tablo 2. Tarım- Tarım Dışı İstihdamın Dağılımı (%)

Yıllar	Toplam		Erkek		Kadın	
	Tarım	Tarım dışı	Tarım	Tarım dışı	Tarım	Tarım dışı
2004	29.1	70.9	21.6	78.4	50.8	49.2
2005	25.7	74.3	18.6	81.4	46.3	53.7
2006	24.0	76.0	17.2	82.8	43.6	56.4
2007	23.5	76.5	16.8	83.2	42.7	57.3
2008	23.7	76.3	17.1	82.9	42.1	57.9
2009	24.7	75.3	18.2	81.8	41.7	58.3
2010	25.2	74.8	18.3	81.7	42.4	57.6
2011	25.5	74.5	18.7	81.3	42.2	57.8
2012	24.6	75.4	18.4	81.6	39.3	60.7
2013	23.6	76.4	17.8	82.2	37.0	63.0
2014	21.1	78.9	16.1	83.9	32.9	67.1
2015	20.6	79.4	15.9	84.1	31.4	68.6
2016	19.5	80.5	15.5	84.5	28.7	71.3
2017	19.4	80.6	15.4	84.6	28.3	71.7

Kaynak: TÜİK. 2019.

Türkiye'de bireylerin kadının çalışmasıyla ilgili görüşleri incelendiğinde, toplumun %84.9'unun kadının çalışmasına olumlu baktıkları, %15.1'inin ise olumlu bakmadıkları belirlenmiştir. Cinsiyete dayalı bir değerlendirme yapıldığında ise, erkeklerin %78.1'inin, kadınların ise %91.5'inin kadının çalışmasına olumlu baktıkları tespit edilmiştir (TÜİK, 2019).Türkiye'de kadın girişimci oranı %8.8 olarak belirtilmektedir. Türkiye'deki kadın girişimci profili incelendiğinde, %61'inin üniversite ya da yüksek lisans diplomasına sahip olduğu, %84'ünün daha önceden bir iş deneyimine sahip olduğu ve %45'inin 25-34 yaşı arasında, %32.9'unun 35-44 yaşları arasında işini kurduğu belirtilmektedir (Kagider, 2018).

Onuncu Kalkınma Planı'nda (2014-2018) İşgücü Piyasasının Etkinleştirilmesi Programının hedefleri arasında, kadınların işgücüne katılım ve istihdam oranlarının Plan dönemi sonunda sırasıyla %34.9 ve %31'e yükseltilmesi yer almış, kadınlara yönelik istihdam teşviklerinin etkinleştirilmesi ve kadın girişimcilere özel bütüncül bir destek programının uygulanması programın bileşenleri arasında yer almıştır (Kalkınma Bakanlığı, 2013).2015 yılında yayınlanan Kadın Girişimcilik İndeksine göre,Türkiye'nin kadın girişimcilik skoru 39.3 olup, dünya genelinde 45. sırada yer almaktadır (Terjesen ve Lloyd, 2014).Avrupa'da, nüfusun %52'si kadın olmasına rağmen; kendi işletmesinde çalışanların % 34.4'ü ve start-up girişimcilerin %30'u kadındır (Kosgeb, 2019). Türkiye'de son yıllarda kadın girişimciliği ile ilgili olumlu gelişmelerin yaşandığı söylenebilir. Tablo3'de görüldüğü gibi,yönetici pozisyonlarındaki kadınların oranında bir artış gözlemlenmektedir.

Tablo 3.Yönetici Pozisyonlarındaki Kadınların Oranı (%)

Yıllar	Erkek	Kadın	Toplam
2012	85.6	14.4	100.0
2013	83.4	16.6	100.0
2014	84.5	15.5	100.0
2015	85.6	14.4	100.0
2016	83.3	16.7	100.0
2017	82.7	17.3	100.0

Kaynak: TÜİK. 2019.

Bu araştırmanın temel amacı, Adıyaman Besni ilçesinde kırsal kadınların tarımdaki işgücü durumunu ortaya koyarak kadının girişimcilik faaliyetinde bulunma durumlarının belirlenmesidir.

2. Materyal ve Yöntem

Çalışmanın ana materyalini Adıyaman ili Besni ilçesinde yer alan Ziraat Odasına kayıtlı kadınlar oluşturmaktadır. Ayrıca, konu ile ilgili daha önce yapılmış olan araştırmalar, kurum ve kuruluşların yapmış olduğu çalışmalardan da yararlanılmıştır. Araştırmada elde edilenveriler 2018 Ekim-Kasım dönemine aittir. Besni Ziraat Odasından elde edilen veri setinin ışığında, ilçede 1000 kadın çiftçi olduğu belirlenmiştir. Bu 1000 kadın çiftçiden kota örneklemesi yöntemi ile belirlenen 110 çiftçi araştırmanın örnek hacmini oluşturmuştur. Verilerin analizinde yüzde dağılımı ve frekans gibi basit istatistiksel yöntemlerden yararlanılmıştır.

3. Araştırma Bulguları ve Tartışma

3.1. Sosyo Ekonomik Değişkenler

Çalışmada girişimci kadınların önemli bir bölümünün ilkokul ve ortaokul seviyesinde eğitim aldıkları belirlenmiştir. Kadınların %28.18'i ilkokul ve %22.73'ü ise ortaokul mezunudur (Tablo4). Tulan ve Türko (2018) tarafından yapılan araştırmada kadın girişimcilerin %10.5'inin ilkokul, %60'ının ortaokul-lise, %27.5'inin önlisans-lisans, %2'sinin ise yüksek lisans ya da doktora mezunu oldukları belirlenmiştir.

Tablo 4. Eğitim Durumu

	n	%
Okuryazar değil	10	9.09
Okuryazar	19	17.27
İlkokul	31	28.18
Ortaokul	25	22.73
Lise	18	16.36
Üniversite	7	6.37
Toplam	110	100.00

Ankete katılan kadınların yaş ortalamaları 45.32 olarak belirlenmiştir. Kaygın ve Güven (2015) tarafından yapılan araştırmada kadın girişimcilerin %17.8'inin 26-35 yaş arasında, %28.9'unun 36-45 yaş arasında, %44.4'ünün 46-55 yaş arasında ve %8.9'ununda 56 yaş ve üstünde olduğu belirlenmiştir. Araştırmada sekiz yıldan daha fazla tarımsal faaliyet yürüten kadın oranı %72.73, 2-4 yıl tarımsal faaliyet yürüten kadın oranı %11.82 olarak belirlenmiştir. Araştırmada sekiz yıldan daha fazla tarımsal faaliyet yürüten kadınların yaş ortalaması 46.04, 2-4 yıl tarımsal faaliyet yürüten kadınların yaş ortalaması ise 45 olarak hesaplanmıştır (Tablo5). Kutukız ve Özden (2018) tarafından yapılan araştırmada, kadın girişimcilerin %42.5 oranı ile en fazla 3-5 yıl arasında, %11.1 oranı ile en az 9 yıl ve üzeri süredir faaliyette oldukları saptanmıştır.

Tablo 5.Kadınların Yaş Ortalamaları ve Tarımda Geçirilen Süre

	Süre (%)	Yaş ortalaması
1 yıldan az	5.45	39.83
2-4 yıl	11.82	45.00
5-7 yıl	10.00	43.45
8 yıl daha fazla	72.73	46.04

Kadınların sosyal güvenlik durumları incelendiğinde,G kadınların %85.45'inin sosyal güvenliğe sahip oldukları ve bu kadınların aylık ortalama gelirlerinin 2529.79 TL olduğu, %14.55'inin ise sosyal güvencesi bulunmadığı ve bu kadınların aylık ortalama gelirlerinin1912.50 TL

olduğubelirlenmiştir.Araştırmada kadınların %43.64'ünün yeşil kart sahibi olduğu, %10.90'ının da SSK kapsamında sosyal güvenceye sahip olduğu belirlenmiştir (Tablo6).

Tablo 6. Kadınların Sosyal Güvenlik Durumu

	n	%
SSK	12	10.90
Bağ kur	34	30.91
Yeşil kart	48	43.64
Güvencesi olmayan	16	14.55
Toplam	110	100.00

Araştırmaya katılan kadınların medeni durumları incelendiğinde, %95.45'inin evli ve %4.55'inin ise bekar olduğu tespit edilmiştir. Araştırmaya katılan kadınların %64.55'inin ev hanımı olduğu ve %29.09'unun ise çiftçi olduğu belirlenmiştir (Tablo7).

Tablo7. Kadınların Meslek Durumları

	n	%
Çiftçi	32	29.09
Memur	2	1.81
İşçi	5	4.55
Ev hanımı	71	64.55
Toplam	110	100.00

Araştırma kapsamında kadınların eşlerinin meslek durumları incelendiğinde, %70.91'inin çiftçi olduğu belirlenmiştir (Tablo8). Acar (2018) tarafından yapılan araştırmada, girişimci kadınlarının eşlerinin meslekleri ile ilgili olarak, %6.6'sının kamu çalışanı, %66.6'sının emekliliği olduğu ve çiftçilikle uğraştığı, %20'sinin serbest meslek çalışanı olarak daha çok inşaat işçiliği ve şoförlük gibi mesleklerde olduğu, %6.7'sinin ise özel sektör çalışanı oldukları saptanmıştır.

Tablo8. Eşin Meslek Durumu

	n	%
Çiftçi	78	70.91
Memur	7	6.36
İşçi	8	7.27
Esnaf	4	3.64
Emekli	8	7.27
Eşi olmayan	5	4.55
Toplam	110	100.00

Ankete katılan kadınların yaşadıkları yerleşim yeriincelendiğinde, %59.9'unun köyde ve %22.73'ünün ilçede yaşadığı belirlenmiştir (Tablo9).Gürel (2018) tarafından yapılan araştırmadakadın girişimcilerin18 yaşına kadar %10'unun köyde, %45'inin kasabada, %38.5'inin büyükşehirde ve %6'sının da yurt dışında yaşadıkları belirlemiştir.

Tablo 9. Kadınların Yaşadıkları Yerleşim Yeri

	n	%
İl	5	4.54
İlçe	25	22.73
Köy	65	59.09
Kasaba	15	13.64
Toplam	110	100.00

Kadınların çocuk sahibi olma durumları incelendiğinde, kadınların %94.55'inin çocuğu bulunduğu veailedeki ortalama çocuk sayısının3.17 olduğu belirlenmiştir.Aile ortamındaki durum incelendiğinde,

kadınların %43.64'ünün geleneksel (muhafazakar), %40'ının otoriter (koruyucu) ve %16.36'sının ise katılımcı bir aile ortamına sahip olduğu belirlenmiştir.

3.2. Girişimcilik ile İlgili Bulgular

Kadınların tarıma yönelme durumları incelendiğinde, %49.10'unun aile ihtiyacını karşılamak amacıyla, %13.64'ünün ise ekonomik bağımsızlığa kavuşmak amacıyla tarıma yöneldiği belirlenmiştir (Tablo10). Tekin (2018) tarafından kadınların girişimcilik eğilimlerini ölçmek amacıyla yapılan araştırmada, kadınların büyük çoğunluğunun el işi yaparak haneye katkı sağladıkları, iş yeri açmak için yeterli sermayelerinin olmamasına rağmen olanak sağlandığında işyeri açmak için girişimde bulunacağı, girişimcilikle ilgili herhangi bir eğitim almadıkları, çoğunluğunun ailesinde girişimci olmadığı bilgilerine ulaşılmıştır.

Tablo10. Kadınların Tarıma Yönelme Durumları

	n	%
Aile ihtiyacını karşılamak	54	49.10
Ekonomik bağımsızlık	15	13.64
Mesleğini yapmak	17	15.45
Zamanı değerlendirmek	11	10.00
İdealini gerçekleştirmek	7	6.36
Kendini geliştirmek	6	5.45
Toplam	110	100.00

Araştırmaya katılan kadınların%55.45'inin girişimcilik faaliyetinde bulunarak aile ihtiyaçlarını karşıladığı saptanmıştır. Araştırmada kadınları girişimciliğe yönlendiren sebepler incelendiğinde, aile ihtiyacını karşılamanın %59.09'luk bir oranlailk sırada yer aldığı belirlenmiştir. Onu sırasıyla %51.82'lik oranla ekonomik bağımsızlık ve %44.55'lik oranla zamanı değerlendirmek takip etmektedir (Tablo11). Soysal (2010) tarafından yapılan araştırmada kadın girişimcilerin iş kurma fikrini nasıl edindikleri incelenmiş, kadın girişimcilerin %35'inin iş teklifinin gelmesini, %18.3'ünün işinin hazır olmasını, %15'ininseçeneksizliği, %13.4'ünün böyle bir işin en büyük hayali olmasını, %10'unun arkadaş çevresini, %5'inin eşinden etkilenmesini ve %3.3'ünün ise çocuklarının vesile olmasını iş kurmada bir neden olarak gösterdikleri saptanmıştır.

Tablo11. Kadınları Girişimciliğe Yönlendiren Sebepler

	n	%
Aile ihtiyacını karşılamak	65	59.09
Ekonomik bağımsızlık	57	51.82
Zamanı değerlendirmek	49	44.55
İdealini gerçekleştirmek	45	40.91
Kendini geliştirmek	30	27.27
Sosyal ilişkiler kurmak	40	36.36
İnsanlara faydalı olmak	26	23.64

Not: *Birden fazla cevap alınmıştır.

Tablo12. Girişimcilik Faaliyetinde Bulunmama Durumu

	n	%
Kendine güvenmeme	2	1.82
Eşin istememesi	3	2.73
Vaktin olmaması	8	7.27
Sermaye yokluğu	36	32.73
Faaliyette bulunanlar	61	55.45
Toplam	110	100.00

Kadınların girişimcilik faaliyetinde bulunmama nedenleri incelendiğinde, kadınların %32.73'ünün sermaye yetersizliği nedeniyle ve %7.27'sinin ise vaktinin olmaması nedeniyle girişimcilik faaliyetinde bulunmadıkları saptanmıştır (Tablo12).

Evde üretilen ürün durumu incelendiğinde, girişimcilik faaliyetinde bulunan kadınların %55.45'inin evde ürün ürettiği saptanmıştır. Kadınların %11.82'sinin salça, %9.09'unun peynir ve %8.18'inin isekurutmalık incir veüzümürettiği belirlenmiştir (Tablo 13).

Tablo13. Evde Üretilen Ürünler

	n	%
Bal	3	2.73
Kurutmalık incir ve üzüm	9	8.18
Salça	13	11.82
Yoğurt	3	2.73
Zeytinyağı	5	4.55
Tereyağı	6	5.45
Bastık	8	7.26
Yumurta	4	3.64
Peynir	10	9.09
Üretmeyen	49	44.55
Toplam	110	100.00

Kadınların elde edilen geliri değerlendirme durumları incelendiğinde, kadınların %64.55'inin kendi ihtiyacını karşılamada, %37.27'sinin çocuklarının ihtiyacını karşılamada ve %32.73'ünün ise eşine vererek değerlendirdiği saptanmıştır (Tablo14).

Tablo14. Kadınların Elde Edilen Geliri Değerlendirme Durumu

	n	%
Kendi ihtiyacını karşılama	71	64.55
Çocukların ihtiyacını karşılama	41	37.27
Tekrar ürün almak için	14	12.73
Eşine vererek	36	32.73

Not:*Birden fazla cevap alınmıştır.

Kadınların tarım arazilerini temin etme durumları incelendiğinde, %65.55'inin ailesinden miras olarak kaldığı ve %47.27'sinin ise eşinden temin ettiği belirlenmiştir (Tablo 15).

Tablo15. Çiftçilik Yapılan Tarım Arazisi Temin Etme Durumu

	n	%
Kiralama	20	18.18
Aileden kalan	71	65.55
Eşinden	52	47.27
Satın alınan	10	9.09

Not:*Birden fazla cevap alınmıştır.

Kadınların tarımsal üretimde karşılaştığı sorunlar incelendiğinde,kadınların %50.91'inin sermaye temininde ve %43.64'ünün ise uygun materyal temininde problem yaşadığı belirlenmiştir (Tablo 16). Karaturhan vd. (2017) tarafından yapılan araştırmada, girişimcilik faaliyetinde bulunan kadınların en çok karşılaştıkları sorunların sırasıyla,eğitim seviyesinin düşük olması, finansal desteğin yetersizliği ve bilgi eksikliği olduğu tespit edilmiştir.Özyılmaz (2016) tarafından yapılan araştırmada, kadın girişimcilerin büyük çoğunluğunun iş kurarken herhangi bir sorunla karşılaşmadıkları, ancak işlerini yürütürken sorunlarla karşılaştıkları, en çok finansal konularda ve bürokratik işlemlerde sorun yaşadıkları tespit edilmiştir.

Tablo16. Tarımsal Üretimde Karşılaşılan Sorunlar

	n	%
Sermaye temininindeki zorluklar	56	50.91
Deneyimsizlik	30	27.27
Kadın olmanın getirdiği zorluklar	15	13.64
Pazarda tanınmamış olmak	24	21.82
Aile ile ilgili sorunlar	18	16.36
Uygun eleman temininindeki zorluklar	33	30.00
Uygun materyal temininindeki zorluklar	48	43.64

Not: *Birden fazla cevap alınmıştır.

Kadınların daha önce yaptıkları meslekler incelendiğinde, kadınların %92.73'ünündaha önce başka bir meslekle uğraşmadığı, %7.27'sinin ise başka mesleklerle uğraştığı belirlenmiştir. Araştırmaya katılan kadınlara göre, girişimcilik faaliyetinde bulunmanınavantajları arasında ilk sırayı %63.64'lük oranla evin bütçesine katkıda bulunma almaktadır.Onu sırasıyla %54.55'lik bir oranla bir işle meşgul olma ve %51.82'lik oranla maddi özgürlük takip etmektedir (Tablo 17).

Tablo17. Tarımda Girişimcilik Faaliyetinde Bulunmanın Avantajları

	n	%
Başarma duygusu	52	47.27
Bir işle meşgul olma	60	54.55
Maddi özgürlük	57	51.82
Evin bütçesine katkı	70	63.64
Ekonomik bağımsızlık	39	35.45
Kendine güven	23	20.91
İlgi alanının olması	14	12.73
Rahat yaşam standardı	50	45.45
Çok para kazanma	29	26.36

Not:*Birden fazla cevap alınmıştır.

Araştırmaya katılan kadınlara göre, çalışma koşullarının zorluğu %45.45'lik oranla tarımda girişimcilik faaliyetinde bulunmanın dezavantajları arasında ilk sırada yer almış olup,bunu %38.18'lik oranlagelirin yetersizliği takip etmektedir (Tablo 18).

Tablo18. Tarımda Girişimcilik Faaliyetinde Bulunmanın Dezavantajları

	n	%
Aile ile ilgili sorunlar	30	27.27
İş çevresinde erkeklerin çoğunlukta olması	19	17.27
Toplumda kadın rollerinin yarattığı baskı	31	28.18
Toplumun değer yargıları	26	23.64
Pazarın özellikleri	40	36.36
Gelirin yetersizliği	42	38.18
Çalışma koşullarının zorluğu	50	45.45
Ekipman yetersizliği	38	34.55

Not: *Birden fazla cevap alınmıştır.

Ankete katılan kadınların karşılaştıkları güçlükler incelendiğinde, %63.64'ünün işten kaynaklanan teknik güçlükler yaşadığı, %60.91'inin ise fiziksel ve zihinsel yorgunluk yaşadığı saptanmıştır (Tablo19).

Tablo19. Kadınların Karşılaştıkları Güçlükler

	n	%
Düşünceler	32	29.09
Fiziksel, zihinsel yorgunluk	67	60.91
Ev işleri	50	45.45
Çocuk bakımı	19	17.27
Zaman yönetimi	20	18.18
İşten kaynaklanan teknik güçlükler	70	63.64
Sosyal baskılar	13	11.82
Maddi imkansızlık	40	36.36

Not:*Birden fazla cevap alınmıştır.

Araştırmaya katılan kadınların %46.36'sının kendine zaman ayırdığı, %53.64'ünün ise zaman ayıramadığı belirlenmiştir. Ankete katılan kadınların iş ve aileden kaynaklı stres durumları incelendiğinde, %69.09'unun aile ve işten kaynaklı stres yaşadığı, %30.91'inin ise stres yaşamadığı belirlenmiştir.Araştırmaya katılan tüm kadınlar, tarımsal girişimcilik faaliyetlerinin kadınlık rolleri üzerinde olumsuz etkisinin bulunmadığını belirtmiştir.Ankete katılan kadınların %63.64'ü, kadın girişimci olmanın çalışanlar üzerinde herhangi bir olumlu etkisinin bulunmadığını belirtmiştir. Ankete katılan kadınların %36.36'sı ise, kadın girişimci olmanın çalışanlar üzerinde olumlu etkisinin olduğunu belirtmiştir.

3.3. Kadınların Geleceğe İlişkin Planları

Araştırmaya katılan kadınların geleceğe ilişkin planları incelendiğinde %51.82'sinin karlılığı arttırmayı, yine %51.82'sinin ürün ve hizmet çeşidini artırmayı ve %45.45'inin de kaliteyi iyileştirmeyi hedefledikleri belirlenmiştir (Tablo20).

Tablo 20. Geleceğe İlişkin Planlar

	n	%
Kaliteyi iyileştirme	50	45.45
Sektörde kalıcı olma	34	30.91
Mevcut durumu devam ettirme	27	24.55
Karlılığı arttırma	57	51.82
Ürün-hizmet çeşidini artırma	57	51.82
Büyüme	26	23.64
Kurumsallaşma	29	26.36

Not:*Birden fazla cevap alınmıştır.

Tablo 21. Devletten Beklenti Durumları

	1.öncelik	2.öncelik	3.öncelik	4.öncelik	5.öncelik	Toplam
	%	%	%	%	%	
Vergi kolaylıkları getirilmesi	31.82	21.82	24.55	10.00	11.81	100.00
Eğitim olanakları sağlanması	13.64	20.00	20.91	28.18	17.27	100.00
Bürokratik işlemlerin azaltılması	9.10	10.00	17.27	28.28	35.44	100.00
Teknik destek sağlanması	19.10	25.45	20.91	19.09	15.45	100.00
Kredi olanaklarının iyileştirilmesi	28.18	22.72	14.55	14.55	20.00	100.00

Ankete katılan kadınların devletten beklentileri incelendiğinde, %31.82'lik oranla vergi kolaylıklarının getirilmesinin en büyük beklentileri olduğu, bunu kredi olanaklarının iyileştirilmesi ve teknik destek sağlanmasının takip ettiği belirlenmiştir (Tablo 21). Palaz ve Turgut (2009) tarafından yapılan araştırmada kadın girişimcilerin devletten beklentileri, vergi kolaylıkları getirilmesi (%81.2), rekabet koşullarının geliştirilmesi (%70.2), kredi olanaklarının iyileştirilmesi (%67), yaşlı ve çocuk bakım hizmetlerinin sağlanması (%66), bürokratik işlemlerin azaltılması (%63.5) ve eğitim olanaklarının sağlanması (%63) şeklinde sıralanmıştır.

4. Sonuç ve Öneriler

Kadınlar maddi bağımsızlık kazanmak, ideallerini gerçekleştirmek, aile ihtiyacını karşılamak ve sosyal ilişkiler kurmak amacıyla kendiişlerini kurmaya yönelmektedir. Kadınların çalışma hayatında var olması ülkelerin ekonomik kalkınmasınaönemli katkı yapmaktadır. Bu nedenle kadın girişimci sayısı ve kadın girişimci oranının artması ülke ekonomisi açısından oldukça önemlidir.

Öncelikle kadınlar girişimcilik konusunda bilinçlendirilmeli, girişimciliğin avantajları ve önemi konusunda enforme edilmelidir. Bunun için yörede konuyla ilgili kurslar, paneller ve çalıştaylar düzenlenmelidir. Kadınların işletme kurması ve faaliyetlerini sürdürebilmesi için sermaye önemli bir kısıtlayıcı faktördür. Bunun için girişimci kadınlara yönelik mikrofinans ve proje imkanları detaylı bir şekilde anlatılmalıdır .Kuşkusuz kadın girişimcilere verilen teşvik ve desteklerin artırılması, kadın girişimciliğinin gelişmesine katkıda bulunacaktır.Araştırmaya katılan kadınların genel olarak tarımsal girişimcilik faaliyetlerinde bulundukları belirlenmiştir. Kadınların gerek tarımsal konulardaki gerekse ev ekonomisi konularındaki teknik bilgilerini artırmaya yönelik tarımsal yayım çalışmalarının yararlı olacağı düşülmektedir.

Kaynakça

Acar, S. (2018). Kırsal bölge kadın girişimciliği bağlamında Bartın kadınlar pazarı (galla bazarı). İnsan ve Toplum Bilimleri Araştırmaları Dergisi 7(2): 1097-1123.

Beqo, I. veGehrels, S.A. (2014). Women entrepreneurship in developing countries: A European example. Research in Hospitality Management 4(1&2): 97-104.

Bouzekraou, H. ve Ferhane, D. (2017). An exploratory study of women's entrepreneurship in Morocco. Journal of Entrepreneurship: Research & Practice 2017:1-19.

Gürel, P.A. (2018). The factors affecting problems and success in women entrepreneurs: a project examples. Eurasian Academy of Sciences Eurasian Business & Economics Journal 13: 19-33.

Kalkınma Bakanlığı. (2013). Onuncu Kalkınma Planı (2014-2018) Ankara, 199s.

Karaturhan, B., Ünsal, G., Issabek, B. ve Güler, D. (2017). İzmir ilinde kırsal kadın girişimciliği ve bunu etkileyen faktörler. Tarım Ekonomisi Dergisi 23(1): 85-91.

Kaygın, E. ve Güven, B. (2015). Güçlü Kadınlar: Türkiye'de Kadının Girişimciliği. İstanbul: Siyah İnci Akademi.

Kutukız, D. ve Özden, C. (2018). Kadın girişimciliği ve finansal okuryazarlığın kadın girişimciler üzerindeki etkisi. OPUS - Uluslararası Toplum Araştırmaları Dergisi 8(Gençlik Araştırmaları Özel Sayısı):349-365.

Küçük ve Orta Ölçekli İşletmeleri Geliştirme ve Destekleme İdaresi Başkanlığı. (2019). Kadın Girişimciliği (Women Entrepreneurship). Erişim adresi: https://www.kosgeb.gov.tr/site/tr/genel/detay/6057/kadin-girisimciligi-women-entrepreneurship.

Özyılmaz, A.M. (2016). Türkiye'de Kadın Girişimciliği ve Girişimci Kadınların Karşılaştıkları Sorunlar Üzerine Bir Araştırma. Yüksek Lisans Tezi, Nevşehir Hacı Bektaş Veli Üniversitesi Sosyal Bilimler Enstitüsü Sosyoloji Anabilim Dalı, Nevşehir.

Palaz, S. ve Turgut, B. (2009). Kadın girişimcilerin kişisel ve iş yaşamına ilişkin özellikleri, motivasyonları ve beklentileri üzerine bir araştırma: Bandırma örneği. Girişimcilik ve Kalkınma Dergisi 4(1):99-115.

Pinkovetskaia, I. veGinzburg, M. (2018). Women's entrepreneurship in modern Russia. Revista Espacios. Erişim adresi:https://www.revistaespacios.com/a18v39n45/a18v39n45p30.pdf.

Soysal, A. (2010). Kadın girişimcilerin özellikleri, karşılaştıkları sorunlar ve iş kuracak kadınlara öneriler: Kahramanmaraş ilinde bir araştırma.Eskişehir Osmangazi Üniversitesi İİBF Dergisi 5(1):71-95.

Tekin Z. (2018). Muş ilinin kadın girişimcilik eğilimini belirlemeye yönelik bir pilot araştırma. Business & Management Studies: An International Journal 6(1): 149-165.

Terjesen, S. ve Lloyd, A. (2014). The 2015 Female Entrepreneurship Index. Global Entrepreneurship and Development Institute, Washington, D.C.

Tulan, D. ve Türko, E.S. (2018). Kadın girişimciliği: Erzurum ilinde bir uygulama.Finans Ekonomi ve Sosyal Araştırmalar Dergisi 3(1): 285-306.

Türkiye Kadın Girişimciler Derneği. (2018). Kagider Sunum. Erişim adresi: http://www.kagider.org/docs/default-source/kagider-raporlar/kagider_sunum_2018.pdf?sfvrsn=4.

Türkiye İstatistik Kurumu.(2019). Toplumsal Yapı ve Cinsiyet İstatistikleri.Erişim adresi:http://www.tuik.gov.tr/PreTablo.do?alt_id=1068.

United Nations. (2017).Fostering Women's Entrepreneurship in ASEAN: Transforming Prospects, Transforming Societies.Social Development Division Economic and Social Commission for Asia and the Pacific, Bangkok, Thailand.

THE TRANSFORMATION FROM MEMLEKET SANDIKLARI AS AGRICULTURAL DEVELOPMENT PROJECT TO THE LARGEST BANK OF TURKEY: THE ESTABLISHMENT AND ORGANIZATION PROCESS OF ZIRAAT BANK IN OTTOMAN PERIOD

Mehmet Fatih Güner
Alanya Alaaddin Keykubat University, Department of Business Administration
Email: fatihguner01@ gmail.com

Abstract

According to the data of the year 2019, Ziraat Bank, the largest bank in Turkey, was established in 1888. The foundation of the Bank is a summary of the reforms undertaken by the Ottoman state in agriculture and the problems it faced during this period. Memleketsandıkları was an improved solution to enable small farmers to access low-cost financing. Founded by Mithat Pasha in 1863, the memleketsandıklarıis considered as the first example of agricultural cooperatives. It is an organization model that allows farmers live in a specific region to gather funds and use these funds in accordance with certain rules. The project, which was implemented in the Ottoman state for 20 years, was restructured in 1863 due to lack of capital and corruption. In this context, the name of the memleketsandıkları was changed as menafisandıkları, a percentage added to the over ten percent tax from farmers in order to provide capital support and menafisandıkları were subject to the control of the Ministry of Commerce. Although menafisandıkları support agricultural activities and farmers, it was decided to establish Ziraat Bank as a result of the development of banking activities and a national bank search of State administrators. Menafisandıkları are transferred to the bank with their assets and liabilities. Thus, the process started with the memleketsandıklarıwas completed with the establishment of Ziraat Bank. Since its foundation, Ziraat Bank has been an alternative source of funding for farmers and has supported farmers financially. In the bank's contract of association, it was decided to allocate one third of the bank's profits to the capital while two thirds to be used for agricultural reforms. This fund has made significant contributions to the implementation of agricultural reforms in the Ottoman Empire. In addition, Ziraat Bank was institutionalized as a bank and encouraged structural developments in the agricultural sector. The aim of this study is to present the process of establishment of Ziraat Bank, which is shown as the first example of agricultural cooperatives.
Keywords: Ziraat Bank, Agricultural Cooperatives, Agricultural Finance.

TARIMSAL KALKINMA PROJESİ MEMLEKET SANDIKLARINDAN TÜRKİYE'NİN EN BÜYÜK BANKASINA DÖNÜŞÜM: ZİRAAT BANKASININ OSMANLI DÖNEMİ KURULUŞ VE ÖRGÜTLENME SÜRECİ

Özet

2019 yılı verilerine göre Türkiye'nin en büyük bankası olan Ziraat Bankası 1888 yılında kurulmuştur. Bankanın kuruluşu Osmanlı Devleti'nin tarımda yapmaya çalıştığı reform girişimlerinin ve bu süreçte karşılaştığı sorunların da bir özetidir. Tarım kooperatiflerinin ilk örneği olarak gösterilen memleket sandıkları, küçük çiftçilerin düşük maliyetli finansmana erişimini sağlamak için geliştirilmiş bir çözüm idi. 1863 yılında Mithat Paşa tarafından kurulan memleket sandıkları, tarım kooperatifçiliğinin ilk örneği olarak kabul edilmektedir. Memleket sandıkları bir bölgede yaşayan çiftçilerin bir araya gelerek fon toplamalarını ve bu fonları belirli kurallar çerçevesinde o bölgede yaşayan çiftçilerin kullanmasına olanak tanıyan bir örgütlenme modelidir. 20 yıl boyunca Osmanlı Devletinde uygulanan memleket sandıkları projesi, sermaye yetersizliği ve yolsuzluklardan dolayı 1863 yılında yeniden yapılandırılmıştır. Bu bağlamdamemleket sandıklarının ismi menafi sandıkları olarak değiştirilmiş, sandıklara sermaye desteği sağlamak üzere çiftçilerden alınan yüzde onluk aşar vergisine bir puan ilave edilmiş ve menafi sandıkları Ticaret bakanlığı denetimine tabi olmuştur.

Menafi sandıkları tarımsal faaliyetleri ve çiftçiyi desteklese de, o dönemde bankacılık faaliyetlerinin gelişmesi ve devlet yöneticilerinin milli banka arayışları neticesinde Ziraat Bankasının kurulması kararlaştırılmıştır. Menafi sandıkları aktifleri-pasifleri ile bankaya devredilmiştir. Böylelikle memleket sandıkları ile başlayan süreç Ziraat Bankasının kuruluşu ile tamamlanmıştır. Ziraat Bankası kuruluşundan bugüne çiftçiler için alternatif bir finansman kaynağı olmuş ve çiftçileri finansal açıdan desteklemiştir.Banka esas sözleşmesinde banka karının üçte biri sermayeye eklenirken üçte ikisi tarım reformlarında kullanılmak üzere ayrılması kararlaştırılmıştır. Bu fon Osmanlıda tarım reformlarının hayata geçirilmesinde oldukça önemli katkılar sağlamıştır. Ayrıca Ziraat Bankası, banka olarak kurumsallaşırken ziraat sektöründe yapısal gelişmeleri teşvik etmiştir.Bu çalışmanın amacı tarım kooperatiflerinin ilk örneği olarak gösterilen memleket sandıklarından Ziraat Bankasının kuruluşuna geçen süreci ortaya koymaktır.
Anahtar Kelimeler: Ziraat Bankası, Tarımsal Kooperatifler, Tarımsal Finans.

1. Giriş

Osmanlı Devletinde çağdaşlarıyla karşılaştırıldığında ileri düzeyde bir tarım sisteminin varlığından söz etmek mümkün değildir. Daha çok küçük çiftçiler aracılığıyla ve ilkel teknikler kullanılarak tarımsal üretim gerçekleştirilmekteydi. Böyle olmasına karşın tarımdan elde edilen gelirler ülke ekonomisinin önemli gelir kaynaklarından biriydi. Örneğin 1893-94 mali yılında devletin toplam gelirleri1.829.989.845 kuruş olup bu rakamın içinde en yüksek pay 410.645.000kuruşla aşar vergisi gelirlerine aittir. Ağnam ve deve resmi de dikkatealındığında toplam kamu gelirlerinin yaklaşık %32'sini tarımsal vergigelirlerinin oluşturduğu görülmektedir [CITATION Öme18 \p 282 \t \m Tev03 \p 123 \l 1055].

Osmanlı Devletinde tarımın gelişmemesinin çeşitli nedenleri vardır. Bunlardan birincisi tarımsal üretimi gerçekleştiren çiftçinin, toprağın gerçek sahibi olmamasıdır. Gerek tımar (dirlik) sisteminde gerekse iltizam sisteminde çiftçi daha çok toprağın kiracısı konumundadır. İkincisi ulaşım koşullarının yetersiz olmasıdır. Çiftçinin ürünlerini pazarlara götürebileceği ulaşım imkanlarıbulunmamaktaydı. Aralarında 70-80 kilometre mesafe bulunan ilçelerin birinde ürün bolluğu yaşanırken, diğerinde ürün kıtlığı yaşanabilmekteydi. Bu da tarımsal üretimi olumsuz etkilemekteydi. Üçüncüsüilkel ve geleneksel yöntemlerle yapılan tarımsal faaliyetlerin verimsiz olmasıdır. Teknolojik araç kullanımının yetersizliği, çiftçilerin tohum ıslahı, gübreleme gibi yeniliklerden habersiz olması ve sulama olanaklarının kısıtlı olması, tarımsal üretimi iklim koşullarına daha bağımlı hale getirdiğinden özellikle yağışların az olduğu dönemlerde çiftçiler oldukça zorluk çekmekteydi. Ayrıca iki veya üç yıl arka arkaya ekilen tarlalar nadasa bırakıldığından verimli araziler atıl kalmakta ve üretimde azalışa neden olmaktaydı. Dördüncüsü tarımsal faaliyetler üzerindeki ağır vergi yükü, Osmanlı Devletindeki eyalet sisteminden kaynaklı iç gümrüklerin olması, çiftçinin ürettiği ürünü istediği kişiye satamaması veya devletin imtiyaz verdiği kişilere satmak zorunda kalması gibi nedenler tarımın gelişmesini engellediği gibi bazı dönemlerde çiftçilerin tarımsal üretimden ziyade kendilerine yetecek kadar ürün üretmesine neden olmaktaydı. Son olarak çiftçinin ihtiyaç duyduğu finansmanı karşılayabilecek bir kurumun/sistemin olmaması çiftçileri yüksek faizle bor veren tefecilere yönlendirmekteydi. Finansmana erişimde güçlük yaşanması tarımın gelişmesini olumsuz etkilemesinin yanında borç geri ödemeleri gerçekleştirilemediğinde çiftçiler sahip oldukları varlıkları elden çıkarmak zorunda kalmaktaydılar[CITATION Erc05 \p 36-39 \l 1055 \m Yıl08].

Devlet yöneticileri tarımın imparatorluk ekonomisi açısından öneminin farkındaydılar ve tarım sektöründeki bu sorunları çözebilmek amacıyla çeşitli reformları hayata geçirmeye çalıştılar.Tanzimat Fermanından sonraki dönemde siyaset, eğitim, hukuk, ticaret, ziraat gibi alanlarda reform arayışlarının/çalışmalarınınyoğunlaştığı gözlemlenmektedir.Quataert'e[CITATION Don11 \p 463 \n \t \l 1055] göre bu reformların mali altyapısı ağırlıklı olarak tarım ekonomisine dayanmaktaydı. Anadolu sanayileşen dünyaya tarım ürünleri ve hammadde sağlama görevini üstlenmişti. Osmanlı, Avrupa'nın artan tarım ürünleri talebini Anadolu'daki tarımsal üretimi arttırarak karşılayacak ve böylelikle gelirlerini çoğaltarak devletin yeniden yapılanması için gerekli sermayeyi sağlayabilecekti.

Tarımdaki reformların temel amacı tarımsal verimliliği arttırarak toplumun refah düzeyini arttırmaktır. Bunun için zirai ürünlerde çeşitliliğin ve üretimin arttırılması, dış pazarlara satılabilecek

ürünlerin yetiştirilmesi, tarımda kullanılan araçların ve üretim yöntemlerini geliştirilmesi, tarımsal politikaları geliştirecek ve uygulayacak bir ziraat bürokrasisinin oluşturulması gibi konularda reform niteliğinde kararlar alınmıştır. Örneğin ziraat alanındaki çalışmaları düzenlemek ve denetlemek üzere Maliye Nezaretine bağlı olarak Ziraat Meclisleri kurulmuş, bu meclis daha sonra 1846 yılında Ziraat Nezaretine dönüştürülmüştür. Kısa bir süre sonra bu bakanlık tekrar kaldırılarak Ziraat Meclislerinin Ticaret bakanlığı çatısı altında faaliyetlerini sürdürmesi kararlaştırılmıştır.1848 yılında Ziraat Mektebi kurulmuştur. 1880'den itibaren modern tarımın gelişmesine öncülük etmeleri, yeni kurulan zirai kurumların idaresi ve ziraat okullarının eğitim kadrolarını oluşturmaları düşüncesiyle Fransa ve Almanya'ya eğitimiçin öğrenci gönderilmiştir[CITATION Yıl08 \l 1055 \m Gen14 \m Erc05]. Tarımdaki reform alanlarından biri de tarımsal faaliyetlerin finansmanı, çiftçilerin düşük maliyetli kredilere erişimidir.

Dönemin yöneticileri tarafından yaptırılan araştırma sonuçları çiftçilerin karşılaştığı önemli sorunlardan birinin finansman/düşük maliyetli krediye erişim olduğunu ortaya koymuştur. Koç'a göre [CITATION Erc05 \p 57 \n \t \l 1055] imar meclisi komisyonunun yaptığı incelemeler sonucunda Anadolu için 12.7 milyon kuruş, Rumeli için 6 milyon kuruş krediye ihtiyaç olmasına karşın, Osmanlı Devletinin içinde bulunduğu ekonomik koşullardan dolayı çiftçilere bu krediler sağlanamamıştır. Çiftçilerin kredi ihtiyaçlarını arttıran temel nedenlerden biri tarımda makineleşmedir. Güngör [CITATION Gün17 \n \t \l 1055] 19. yüzyılın ilk yarısının sonuna doğru Osmanlı Devletinin tarım merkezlerinde, Avrupa'dan ithal edilen tarım aletleri ve diğer tarım girdilerini pazarlayan görkemli işletmelerin ortaya çıktığını, bu aletleri satın almak isteyen çiftçilerin %40 faiz oranına ulaşan oranlarlatefecilerden kredi emin etmesini örnek göstererek, tarımda makineleşme eğiliminin Osmanlı çiftçisinin finansman ihtiyacını arttırdığını belirtmektedir.

Tarım, tarımsal ürünlerin çeşitliliği, tarımın finansmanı, çiftçilere sermaye/kredi temini Osmanlı kamu yöneticilerinin özellikle ilgilendiği sosyal-ekonomik konulardan biridir. Küçük çiftçilere kredi sağlama üzerine çalışmalar yürüten yetkililerden biri de Mithat Paşadır.1822 yılında doğan ve asıl ismi Ahmet Şefik olan Mithat Paşa, on iki yaşında iken Divan-ı Hümayun Kalemine girerek kariyerine başlamıştır. 1861 yılında Balkanların en sorunlu vilayetlerinden biri olan Niş'e vali olarak atanmıştır. Niş'te valilik yaptığı üç yıllık dönemde alt yapıdan sosyal sorunlara kadar geniş bir alanda hayata geçirdiği projelerle İstanbul Hükümetinin dikkatini çekmiş ve mahalli idareler reform çalışmalarını yürütmek üzere görevlendirilmiştir [CITATION Has09 \l 1055]. Mithat Paşa, Niş vilayetindeki incelemeleri esnasında çiftçilerin özellikle finansman kaynaklı sorunlarından dolayı yaşadıkları zorlukları ve tefecilerle mücadeleleri gözlemlemiş ve çözüm amacıyla memleket sandıkları projesini başlatmıştır.

2. Memleket Sandıkları

Mithat Paşa, Tuna vilayetindeki yöneticiliği esnasında tarımsal faaliyetleri yürüten çiftçilerin kredi temininde karşılaştıkları güçlükleri yerinde görmüş, mevcut kredi sisteminin çiftçileri bir anlamada tefecilere yönlendirdiği sonucuna ulaşmıştır. Bu dönemde bankalar henüz kurulma/başlangıç aşamasında olduğu için çiftçilere kredi verecek kurumsal bir sistem/yapı bulunmamaktadır. Faaliyette olan bankalar da tarımsal kredilere pek rağbet etmemektedirler. Özel sektörden çiftçilere kredi verenler ise yüksek faiz oranları ile çalışmaktaydılar. Mithat Paşa bu sorunun çözülebilmesi için en iyi yöntemin bizzat çiftçiler/köylüler arasında oluşturulacak kooperatif niteliğindeki bir yapılanma olduğuna kanaat getirmiştir[CITATION Tun16 \l 1055 \m Gün17]. Bu çerçevede, memleket sandığı olarak isimlendirdiği projesini ilk defa Tuna vilayetindeki Pirot kasabasında hayata geçirmiştir. İlk memleket sandığı 1863 yılının Kasım ayının sonuna doğru faaliyetlerine başlamıştır [CITATION Tun16 \p 203 \t \l 1055]. Mithat Paşa tarından pilot proje gibi yürütülen memleket sandıkları deneyiminden başarılı sonuçlar elde edilmiş ve 1867 yılında Osmanlı Devletinin diğer vilayetlerinde memleket sandıklarının kurulmasını öngören bir nizamname yayınlanmıştır[CITATION Ero18 \l 1055].

Memleket sandıklarını tarım kooperatiflerinin ilk örneği olarak tanımlamak mümkündür. Özellikle kuruluş sermayesi ve kredi kullandırma koşulları incelendiğinde bankadan ziyade köylülerin imece usulü oluşturdukları ve çalıştırdıkları bir kooperatif gibi çalıştığı görülmektedir. Çünkü memleket sandıkları sadece kendi üyelerinden para toplayarak sermaye oluşturan ve yine sadece kendi üyelerine

kredi veren bir örgütlenmedir[CITATION Tun16 \l 1055 \m Erc05]. Memleket sandıkları için gerekli sermaye o bölgede/kazada yaşayan çiftçilerin çeşitli şekillerdeki katkılarıyla toplanmıştır. Bazı bölgelerde devlete ait olup işletilmeyen arazilerin kiraya verilmesinden elde edilen gelirlersermayeyi oluştururken bazı bölgelerde belirli bir süre için toplanan tarım ürünlerinin satılmasıyla elde edilen para,sermayeyi oluşturmaktadır. Örneğin Midilli'de memleket sandıklarının sermayesi için halkın zeytin ve palamut ürünleri ile elde edilen zeytinyağının onda birini beş yıl boyunca sandığa vermesine, bu ürünlerin satışından elde edilecek paranın ise memleket sandıklarına konulmasına karar verilmiştir[CITATION Osm15 \l 1055].

Memleket sandıklarına "sandık" isminin verilmesinin temel nedeni paranın, senetlerin ve diğer belgelerin fiziki olarak bir sandıkta muhafaza ediliyor olmasıdır. Başlangıçta tahtadan yapılan daha sonra demir sandıklara dönüşen bu sandıklar, büyük ilçelerde, kolluk kuvvetlerinin görebilecekleri mekanlarda bulundurulmaktaydı. Sandıkların idaresi, sandık yönetimi adı verilen bir kurul tarafından yürütülmekteydi. Sandık yönetimi, üyelerin kendi aralarından seçtikleri gönüllüler ile profesyonel (maaşlı) çalışanlardan oluşmaktaydı. Sandık yönetimindeki kişilerin sayısı, seçim usulleri, görevleri, çalışma usul ve esasları, sandığın büyüklüğüne göre değişiklik gösterebiliyordu[CITATION Erc05 \l 1055]. Midilli memleket sandıkları layihasında sandık idare heyetinin(yönetim kurulu) güvenilir ve itibarlı kişiler arasından, köy ve kasabalardan ikişer bin oy ile seçilmiş kişilerden oluşturulacağı belirtilmiştir. Sandık yönetiminde bir başkan, bir katip, bir sandık emini ve on iki üyenin yer aldığı, bunlardan sadece katip ile sandık eminine maaş ödemesinin yapılacağı kayıt altına alınmıştır. Paranın ve diğer kıymetli evrakın demir bir sandıkta korunacağı, bu sandığın zaptiye askerlerinin görebileceği bir yerde tutulacağı, sandığın haftada iki gün yönetim kurulu üyelerinin huzurunda açılacağı, belirtilen günlerin dışında açılacağı takdirde en az yönetim kurulu üyelerinin üçte ikisinin huzurunda açılabileceği gibi hususlar yazılı olarak belirtilmiştir[CITATION Osm15 \l 1055 \m TCZ19].

Memleket sandıklarının temel amacı belirli bir bölgedeki çiftçilerin düşük maliyetli krediye erişmelerini sağlamaktır. Sandık üyeleri, minimum üç ay, maksimum 12 ay vadeli olmak üzere kredi kullanabilmekteydiler. Kredi için aylık yüzde bir faiz işletilirdi. Borç almak isteyen çiftçiler teminat göstermek zorundaydılar. Teminatlar, kıymetli taşların rehni, arazi teminatı ya da kefalet şeklinde olabiliyordu. Elde edilen faiz gelirinin üçte birlik kısmı sandık sermayesine eklenmekte; kalan üçte ikilik kısmı ise o bölgenin imarı, yol, çeşme, okul vb ortak yapıların inşası için kullanılmaktaydı.

Memleket sandıkları her ne kadar uzun bir süre, yirmi yıl boyunca, Osmanlı Devleti sınırları içerisinde çalışsa da çiftçinin kredi sorununu kalıcı olarak çözmede başarılı oldukları söylenemez. Memleket sandıklarının uygulamadaki başarısızlıklarının temelinde iki neden bulunmaktadır: sermaye yetersizlikleri ve usulsüz krediler. Bölgedeki çiftçilerden toplanan sermayeler, aynı bölgedeki kredi ihtiyacının çok küçük bir bölümünü karşılayabiliyordu. Ayrıca sandıklarda toplanan paralar zamanla gerçekten krediye ihtiyacı olan küçük çiftçilerden ziyade varlıklı ve nüfuzlu kişilere kredi olarak verilmeye başlandı. Bütünüyle özerk ve maaşsız bir yönetime sahip olan memleket sandıkları, herhangi bir üst kuruma karşı sorumlu olmayan memurların usulsüz işlemlerine açık bir yapıdaydı[CITATION Don11 \l 1055].Usulsüz kredilere ve yolsuzluklara ek olarak, devlet dahi zora düştüğü durumlarda sandık sermayelerine başvurabiliyordu. Böylece sandıklar çiftçilere kredi sağlayacağına devlete ve zengin üreticilere kaynak aktaran bir yapıya dönüştüler[CITATION Erc05 \l 1055].Memleket sandıklarına sermaye desteği sağlamaya ve yönetimlerini daha kurumsallaştırmaya yönelik çabalar sonucunda memleket sandıkları menafi sandıklarına dönüştürülmüştür.

3. Menafi Sandıkları

Memleket sandıklarının etkin çalışmasının önündeki engeller sermaye yetersizliği ve yolsuzluklardı. 1876 yılında Osmanlı devletinin başına geçen II. Abdülhamit tarımın ülke ekonomisi açısından önemli olduğunu düşünüyordu ve tarım alanındaki yenilikleri ve reformları destekliyordu. Memleket sandıklarının geliştirilmesi ve kurumsallaştırılması amacıyla 1883 yılında yeni bir nizamname yayınlanmıştır. Bu düzenleme üç temel unsuru içermektedir. Birincisi memleket sandıklarındaki en temel eksikliklerden biri olan sermaye yetersizliğini ortadan kaldırmak amacıyla, tarım ürünleri üzerinden alınan aşar vergisine bir puan eklenmiş ve eklenen bu puan menafi ianesi hissesi olarak isimlendirilmiştir. İkincisi müstakil olarak yönetilen sandıkların, denetim ve gözetimi Ticaret Bakanlığına verilmiştir. Bundan sonra sandıklar Bakanlığın denetimine tabi olacağı ve

böylelikle yolsuzlukların engellenebileceği düşünülmüştür. Son olarak memleket sandıklarının ismi menafi sandıkları olarak değiştirilmiştir.

Her ne kadar menafi sandıkları kurulmuş olsa da Osmanlı Devlet yöneticilerinin sandıklar ve tarımın/çiftçinin finansmanı konusundaki revizyon arayışları devam etmektedir. Aşar vergisine eklenen yüzde bir puanlık vergi menafi sandıklarının sermaye gereksinimini karşılamamaktadır. 1880'li yıllar Osmanlı'da özellikle yabancı bankaların da kurulduğu yıllardır. Sadrazam Kamil Paşa, mevcut sandıkların milli banka çatısı altında yeniden yapılandırılması fikri üzerinde çalışmış, Bakanlar Kuruluna ve II. Abdülhamit'e sunduğu mazbatada menafi sandıklarının artık işlevlerini yerine getiremediğini, bundan ötürü sandıkların yerine Ziraat Bankasının kurulmasının gerekliliğini ifade etmiştir[CITATION TCZ19 \l 1055].

4. Ziraat Bankasının Kuruluşu ve Örgütlenmesi

Memleket sandıklarının kuruluşu 1863; menafi sandıklarının kuruluşu ise 1883 yılıdır. Bu dönemler aynı zamanda Osmanlı Devleti sınırları içerisinde modern anlamda bankacılık faaliyetlerinin de başladığı yıllardır. Tanzimat fermanı ile gelen yenilikler ve yasal güvenceler bankacılık girişimlerini teşvik edecek bir iklim oluşturmuştur. Bu tarihten Kırım Savaşı sonrasına kadarki yaklaşık 20 yıllık süreçte banka sözcüğü Osmanlıcaya yerleşmiştir. Fakat Avrupa'daki bankalar benzeyen, anonim şirket şeklinde kurulan, tüccarlara ve sanayicilere kredi veren, finansal hizmetlere aracılık eden bir banka kurulamamıştır [CITATION Ero18 \l 1055]. Osmanlı Devleti sınırları içerisinde bankacılık tarihi 1940'lardan başlatılır. Aslında doğrudan yabancı sermaye temsilcileri ya da Galata bankerleri bu tarihten önce de İstanbul'da banka kurmak için girişimde bulunmuşlardır. Ama konjonktürden dolayı ya da dönemin devlet adamlarının uygun görmemesinden ötürü banka kurulmasına izin verilmemiştir. Örneğin 1942 yılında, farklı milletlerden ortaklar tarafından İzmir'de "The Bank of Smyrna" kurulmuş ama kendilerinden istenen taahhütname imzalanmadığı için banka faaliyetlerine başlamadan kapanmıştı. Bazı kaynaklarda 1847 [CITATION Şev18 \t \l 1055] bazı kaynaklarda ise 1849 [CITATION Öze18 \l 1055] yılında kurulduğu belirtilen Bank-ı Dersaadet ya da İstanbul Bankası, Türk bankacılık tarihindeki ilk banka olarak kabul edilir. Bankanın kuruluşu, özellikle kaimelerden kaynaklanan para piyasasındaki dağınıklığı ve kaosu ortadan kaldırmak ve piyasalarda istikrar sağlamak üzere, Galata'da faaliyet gösteren iki bankerle yapılan sözleşmeye dayanmaktadır. Sözleşmeyi başarılı bir şekilde yerine getiren iki banker ile %60'ı bankerlere, %40'ı devlete ait olmak üzere 200.000 sterlin sermayeli, Bank-ı Dersaadet kurulmasına karar verilir. Bank-ı Dersaadet yönetiminin gerçekleştirdiği/aracılık yaptığı spekülatif işlemler üzerine Osmanlı Hükümeti 1852 yılında bankayı kapatır. 1856 yılında Londra'da İngiliz sermayeli Ottoman Bank (Bank-ı Osmani) kurulur. Banka 1863 yılında Fransız sermayesi ile birleştirilir ve Osmanlı Bankası (Bank-ı Osmani Şahane) ismini alır.

1880'li yıllarda Osmanlı toprakları içerisinden çok sayıda banka faaliyet göstermektedir. Ama bunların neredeyse tamamı yabancı sermayelidir. Osmanlı Devleti yöneticileri milli bir bankanın kurulması gerektiğini düşünmektedirler. Sadrazam Kamil paşa tarafından hazırlanan mazbata II. Abdülhamit tarafından onaylanmış[CITATION TCZ19 \l 1055]19 Zilhicce 1305 (27 Ağustos 1888) tarihinde çıkarılan "Ziraat Bankası Nizamnamesi" (Düstur 1.Tertip Cilt 6:136-142) ile sandıklar Ziraat Bankasına dönüştürülmüştür.Nizamnamenin birinci maddesinde menafi sandıkları yerine geçmek üzere Ziraat Bankasının kurulduğu, menafi sandıklarının görevlerinin bu bankaya devredildiği, banka merkezinin İstanbul'da olacağı, vilayet merkezleri ile tarım ekonomisi açısından önemli ilçelerde şubeler açılacağı ifade edilmiştir[CITATION Tun16 \l 1055]. Yapılan düzenlemeye göre menafi sandıklarının aktifindeki para ve alacaklar bankaya devredilmiştir. Aşar vergisine ilave edilen yüzde birlik verginin, banka sermayesi 10 milyon kuruşa tamamlanıncaya kadar toplanması kararlaştırılmıştır. Böylelikle bankanın sermayesi oluşturulmuştur. Ayrıca bankanın mevduat kabul edeceği ve zirai işlerde kullanma şartıyla yalnızca çiftçiye gayrimenkul rehni veya kefalet karşılığında kredi vereceği düzenlenmiştir. Bankanın yıllık karının giderler düşüldükten sonra üçe ayrılacağı, bir payının sermayeye ekleneceği, geri kalan üçte ikilik kısmın ise tarımsal reformların finansmanında kullanılacağı da nizamnamede belirtilmiştir[CITATION Ero18 \l 1055]. Banka üst yönetimi ile şube yönetimlerinin nasıl oluşturulacağı da detaylı bir şekilde belirlenmiştir. Buna göre Ziraat Bankası merkezde bir idare kurulu tarafından yönetilecek, idare kurulu üyeleri çeşitli bakanlıklardan atanacak

ve Şurayı Devletçe atanan kişi ise idare meclisine başkanlık yapacaktır. Sadece merkezin değil şubelerin de idare meclisi tarafından yönetilmesi kararlaştırılmıştır. Bu çerçevede şube müdürü, ziraat müfettişi, ticaret ve ziraat odalarınca atanan bir üye, belediye meclisince atanan bir üye Ziraat Bankası şube yönetimini oluşturmaktaydı [CITATION Tun16 \l 1055].

Ziraat Bankası kısa süre içerisinde örgütlenmesini tamamlamıştır. Bunda aktifleri ve pasifleri ile devralınan menafi sandıklarının önemli katkısı bulunmaktadır. Her şubede bir müdür ve müdür yardımcısı bulunmaktaydı. Ayrıca şube idare meclisi de şube yönetimine katılmaktaydı. Şube idare meclisinin başkanı, mahalli meclislerden gelen kişiler arasından seçilmekteydi. Böylelikle merkezden atanan şube müdürleri ile mahalli atananlar arasında karşılıklı bir kontrol mekanizması oluşturulmuştu. Genellikle ilçelerdeki şubeler illere raporlama yapar, iller de İstanbul merkeze raporlama yaparlardı. Hacmi büyük olan ilçelerin doğrudan İstanbul merkeze raporlama yaptığı örnekler de bulunmaktadır[CITATION Don11 \l 1055].

Ziraat Bankası örgütlenme aşamasında bir taraftan kendi sistemini oluştururken diğer taraftan tarım sektörünün kurumsallaşmasına da katkıda bulunmuştur. Memleket sandıkları ve daha sonrasında menafi sandıklarında krediler için verilen teminatların değerlemesi çok sağlıklı yapılmamakta, borçlunun borcunu geri ödeyebilme gücüne çok fazla itibar edilmemekteydi. Ziraat Bankası kredi geri ödemelerini sağlayabilmek için teminatlarda belgelendirme ve değerlemeler konusunda çeşitliprosedürler geliştirmiş ve bunları yazılı hale getirerek uygulamaya çalışmıştır. Okuma yazma oranının dahi düşük olduğu ortamda bu belgeleri hazırlayamayan çok sayıda çiftçinin olması normal karşılanmalıdır. Üstelik bankanınsağlıklı değerleme yapmasına esas oluşturacak resmi kayıtların da tam olarak var olduğu söylenemez. Hem kredi verme sistemini oluşturmaya çalışan hem de dönem dönem ortaya çıkan usulsüz kredi kullandırmalarına cevap olarak banka yönetimi sürekli yeni düzenlemeler çıkarmış ve bunları uygulamaya koymuştur.

5. Sonuç

Osmanlı Devletinin 19. yüzyıldaki tarımsal finansman reformu memleket sandıkları ile başlamış sonrasında menafi sandıklarına dönüşmüş ve nihayetinde Ziraat bankasının kuruluşu ile neticelenmiştir. Gerek sandıkların gerekse bankanın kuruluşundaki temel amaç bir taraftan tarım sektörünü bir bütün olarak geliştirmek diğer taraftan tarım sektörünün finansman sorununa çözüm bulmaktı. Özellikle küçük çiftçiler krediye ihtiyaç duyduklarında ya borç para bulamıyorlar ya da yüksek faizlerle borç bulabiliyorlar, bu borçları geri ödeyemediklerinde de mal varlıklarını elden çıkarmak zorunda kalabiliyorlardı. Memleket sandıkları ve menafi sandıkları, iyi niyetle kurulmuş olsa dahi kurumsallaşamamanın olumsuz etkileri sermaye yetersizlikleri ve yolsuzluklar şeklinde zamanla ortaya çıkmıştır. Sandıklardaki sermaye yetersizliği yapısal bir sorun olarak değerlendirilebilir. Oysa yolsuzluklar ve usulsüz kredi kullandırmalar operasyonel eksiklikler olup giderilmesi nispeten daha kolay sorunlardır.

Ziraat Bankası memleket sandıklarının ve menafi sandıklarının sadece maddi varlıklarını devralmamış aynı zamanda çiftçilerin geri ödeme alışkanlıkları, borç ödeme kapasitelerinin değerlendirilmesi, teminat olarak verilen varlıkların değerlemesi gibi bankacılık sektöründe entelektüel sermaye olarak tanımlanabilecek özelliklerini de devralmıştır. Bu yüzden Ziraat Bankasının Osmanlı devleti sınırları içerisinde örgütlenmesi ve şube sayısını hızla arttırması kolay olmuştur. Banka, kendisini dönüştürürken tarım sektörünün diğer paydaşlarını da gelişmeye zorlamıştır. Örneğin bankanın şube yöneticileri çıkarılan yönetmeliklere uygun bir şekilde kredi değerlemeleri yaparken, çiftçiler daha önce hazırlamadıkları belgeleri bankadan kredi temin edebilmek için hazırlamak zorunda kalmışlardır. Özetle bankanın sadece kendisini etkilemediği, tarım sektörünü bir bütün olarak etkilediğini söylemek mümkündür.

Ziraat Bankasının kuruluşundaki amaçlardan en önemlisi çiftçilerin finansman sorununu çözmekti.Banka, tarım sektörünün/çiftçilerin tüm kredi ihtiyaçlarını karşılayamasa da çiftçiler için önemli bir finansman kaynağı alternatifi olarak önemli bir işlevi gerçekleştirmiştir. Ziraat Bankası gibi bir kurumun olmaması durumunda çiftçiler önemli ölçüde tefecilerin sunduğu yüksek faizli kredileri kullanmak durumunda kalacaklardı. Ziraat Bankasının tarım ekonomisine diğer bir katkısı ise yıllık kardan ayrılan paylarla tarım reformlarına finansman kaynağı sağlamasıdır. 1888'den sonra banka karından merkezi hükümete aktarılan tutarlar ile tarım reformları hayat geçirilmiştir. Diğer taraftan

Osmanlı Devletinde kurulan ilk milli banka olan Ziraat Bankası, bankacılık faaliyetleri ile devleti de önemli ölçüde fonlamıştır. Özellikle kısa vadeli nakit ihtiyaçları söz konusu olduğunda kamu yöneticilerinin Ziraat Bankasının kaynaklarına sık sık başvurdukları bilinmektedir. Kuruluşundan günümüze dek tarım sektörünü ve çiftçileri önemli ölçüde destekleyen Banka, günümüzde de devletin ekonomi ve tarım politikaları ışığında çalışmalarını yürütmektedir.

Kaynaklar

Aksakal, H. (2009). Tanzimatın İki Yüzü: İcraatları ve Temsil Ettikleri Değerler Bağlamında Karşılaştırmalı Bir Reformculuk Analizi: Mithat Paşa ile Sultan II: Abdülhamit. Uluslararası Sosyal Araştırmalar Dergisi , 2 (9).

Barış, S., & Özel, U. (2018). Osmanlı Ekonomi ve Finans Sektöründe Banker Bir Aile: Camondolar. Maliye ve Finans Yazıları (109), 107-144.

Doğan, C., & Güngör, F. (2015). Midilli Memleket Sandıkları: Osmanlı Devleti Hâkimiyetindeki Midilli Adası'nda Zirai Kredi Teskilatı Kurma Konusunda İlk Teşebbüs. Elektronik Sosyal Bilimler Dergisi , 14 (53), 298-309.

Gençoğlu, M. (2014). Sultan II. Abdulhamit'in Yurt Dışı Eğitim Politikası. Kırıkkale Üniversitesi Sosyal Bilimler Dergisi , 4 (2), 33-73.

Güngör, F. (2017). Türkiye'de Milli Bankacılığın Doğuşunda Memleket Sandıklarının Yeri ve Önemi. Turan Stratejik Araştırmalar Dergisi , 9 (36), 645-654.

Güran, T. (2003). Osmanlı Mali İstatistikleri, Bütçeler 1841-1918. Ankara: TC Başbakanlık Devlet İstatistik Enstitüsü Tarihi İstatistikler Dizisi Devlet İstatistik Enstitüsü Matbaası.

Koç, E. (2005). 19. Yüzyılda Osmanlıda Tarım. Eskişehir: Anadolu Üniverisitesi Yayınlanmamış Yüksek Lisans Tezi.

Ortabağ, E. (2018). Osmanlı İmparatorluğunda Bankacılığın Gelişimi ve Regülasyon. İstanbul: Türkiye Bankalar Birliği.

Pamuk, Ş. (2018). Osmanlı İmparatorluğu'nda Paranın Tarihi. İstanbul: Türkiye İş Bankası Kültür Yayınları.

Quataert, D. (2011). Gelişim Açmazı:1888-1908 Osmanlı Türkiyesi'nde Ziraat Bankası ve Ziraat Reformu. Selçuk Üniversitesi Türkiyat Araştırmaları Dergisi , 461-482.

TCZB. (2019, 2 22). Bankamız Tarihçesi. Türkiye Cumhuriyeti Ziraat Bankası: https://www.ziraatbank.com.tr/tr/bankamiz/hakkimizda/bankamiz-tarihcesi adresinden alınmıştır

Tunçel, A. K. (2016). Cumhuriyet İdaresinin Mali Konulardaki Hassasiyetine İlişkin Ziraat Bankası Örneği. Journal of Life Economics , 3 (4).

Yazan, Ö. (2018). 19.Yüzyıl Sonlarında Osmanlı Tarım İşletmelerinde Yönetim ve Muhasebe Uygulamaları: "Çiftlik İdaresi" Örneği. Muhasebe ve Finans Tarihi Araştırmaları Dergisi , 281-332.

Yazan, Ö. (2017). Ziraat Bankası'nın İlk Yirmi Yılına Ait Bazı Kayıtların İncelenmesi. Bolu Abant İzzet Baysal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi , 17 (4), 221-237.

Yıldırım, M. A. (2008). Osmanlı'da İlk Çağdaş Zirai Eğitim Kurumu: Ziraat Mektebi (1847-1851). OTAM (Ankara Üniversitesi Osmanlı Tarihi Araştırma ve Uygulama Merkezi Dergisi) , 24, 223-240.

OAT IN HUMAN NUTRITION

Nilüfer Ergül
ETI Food Industry and Trade Inc., Turkey, E-mail**:** nergul@ etigida.com.tr

Ahmet Görgülü
ETI Food Industry and Trade Inc., Turkey

Abstract

Oat is an important grain in human nutrition with the content of about 13% fiber (2-8.5% β-glucan), 11-13% fat, highly unsaturated fatty acids, essential amino acids and phenolic compounds. In Turkey,oat consumption is used in the vastmajority of animal nutrition. The percentage of oats consumed as food is about 27%.Despite the increasing interest and demand for oat farming, the lack of commercially available commercial varieties to meet the needs of producers, high processing yields and low crop yield limit the spread of oat farming. In order to obtain high quality products, the food industrialists demand oats with easy husking, high yield, low ratio of the husk, and also high shelf life of oat based products.

ETI is one of the leading companies that produces original products using agricultural materials and alsohas the most contract farming practices in Turkey.In 2017, ETI had wheat cultivation in 25.000 decaresand white oat cultivation in 47.000decares by using contract farming with 350 farmers. ETI has used whole grain flours in its products under the brandof "Burçak" since 1970, and also "Form" since 1987. ETI has started to process oats in its own plant by using its own developed technology in the early 1990s and also made an important contribution to the use of oat in human consumption by producing "ETI Oatmeal Biscuits" under the brand of "Burçak".

ETİ uses 16.500 tons of processed oat per year in its products and supplies about 10.000 tons of oat by contract farming. ETI uses oats as the form of whole oat flour in biscuitsand also as whole oatmeal in mueslis.

ETI supports farmers by using contract farming and also oat consumption by developingoriginal bakery productswith high bioavailability and nutritional value.

Keywords: Oat, Contract Farming, Sustainability, Sustainable Agriculture.

İNSAN BESLENMESİNDE YULAF

Özet

Yulaf, yaklaşık %13 oranında lif (bunun %2-8,5'i β-glucan), %11-13 oranında yağ, yüksek oranda doymamış yağ asitleri, esansiyel aminoasitler ve fenolik bileşenler içeriği ile insan beslenmesinde önemli bir tahıldır. Türkiye'de yulaf tüketiminin çok büyük kısmı hayvan beslenmesinde kullanılırken;gıda olarak tüketilen yulafın oranı yaklaşık ise %27'dir. Yulaf tarımına ilgi ve talebin artmasına rağmen, üreticilerin ihtiyaçlarına cevap verecek yeterli sayıda geliştirilmiş ticari çeşitlerin bulunmayışı, işleme firelerinin yüksek, tarla veriminin düşük olması yulaf tarımının yaygınlaşmasını kısıtlamaktadır. Gıda sanayicisi kaliteli ürün elde edebilmek için kavuz oranı düşük, kavuzu kolay ayrılabilir ve randımanı yüksek yulaf talep etmektedir. Ayrıca yulaf bazlı gıda maddelerinin raf ömürlerinin de uzun olması istenmektedir.

Tarımsal girdileri kullanarak özgün ürünlere dönüştüren Türkiye'deki lider kuruluşlardan biri olan ETİ, 2017 yılında 350 çiftçi ile sözleşmeli tarım yaparak 25.000 da alanda buğday ve 47.000 da alanda beyaz yulaf ekimi yaptırmıştır. 1970'li yıllarda "Burçak" ve 1987 yılından itibaren de "Form" markası altında tam tahıl unlarını ürünlerinde kullanan ETİ, 1990'lı yılların hemen başında kendi geliştirdiği teknolojiyi kullanarak yulafı kendi tesisinde işlemeye başlamış ve yine "Burçak" markası altında "ETİ Yulaflı Bisküvi"yi tüketicilere sunarak, yulafın insan tüketiminde kullanımına önemli bir katkıda bulunmuştur.

ETİ, yıllık 16.500 ton işlenmiş yulafı ürünlerinde kullanmakta ve ihtiyacının yaklaşık 10.000 tonunu sözleşmeli tarım ile tedarik etmektedir. Yulafın bir kısmını tam yulaf unu halinde yulaflı bisküvilerde ve bir kısmını da tam yulaf ezmesi olarak müsli çeşitlerinde kullanmaktadır.
ETİ; sözleşmeli tarım ile hem çiftçiye destek olmakta hem de yulafı, unlu mamullerde kullanarak biyoyararlılık ve besin öğelerini ön plana çıkaran özgün ürünler geliştirip tüketiciye sunmaktadır.
Anahtar Kelimeler: Yulaf, Sözleşmeli Tarım, Sürdürülebilirlik, Sürdürülebilir Tarım.

AGROTOURISM OF A REGION BETWEEN THE THREE STATES

Behije Ibrahimi
South East European University, Faculty of Business and Ekonomics, Macedonia
Email:b_ibrahimi@ live.com

Abstract

Gora is a geographic region extending into three countries: in the northern part of Albania, in the southern part of Kosovo and northwest Macedonia, including an area of 500 km², with 30 villages and a population of 24,000 (twenty four thousands) .

The main purpose of this paper is to promote the natural potential, the importance of the development of tourism and the challenges and opportunities of development in Agrotourism and a region between the three countries.

The population of Gora has no native language, regardless of the languages of the respective countries, neither the Albanian nor the Macedonian language, yet they have returned to a union bridge between the three states.

Cheese -potatoes and sheep is the pyramid of this population. Folk costumes, songs and weddings are a centuries-old aura. Cultural heritage is the unique treasure of this people.

Women themselves work with loom handcraft of diffrent folk costumes and within a family you will find three types of costumes: for girls, women and ladies.

Competitions with Horses, wrestling, stone throwing, bull fights are activities that have been preserved since pagan times and are practiced every day.At earlier times Gora, is prominent for the master of cuisine in some specialties. Historically, they are known as gourmet and as a craftsman.

The craftsmen of the confectioners have been exercising Gorani in the Ottoman Empire over the centuries. They also served in the kitchens of the sultans in Topkapi Saraj, as hospitals and avengers. Sweets are preserved to date and transmitted to generations. Gora offers its very important nature, history and culture in the field of tourism.

The development of mountain tourism has enabled the realization of sports activities such as: mountaineering, skiing as well as the inclusion of summer tourism in the plateau of Shishtavec, landscape in nature monuments etc.

Gores' material and spiritual legacy is also his contribution to the treasury of global world culture. There are 45 inns, which are turned into models of agrotouristic farms, where the tourist is known for the rude sheep and the milking of the dairy, with the potato planting and browing, the harvesting of the rye, the running of the horse, the bread and the cheese, the horseradish and the pie, the praying of dry meat and sausage, the harvest of the grass and the sowing of the mill, the harvesting of bee honey and honey processing, the harvesting of fruits and the making of peppers, etc.-Tourism up is equal to Agrotourism.

Gastronomy is another element of the cultural heritage of the province of Gora. Through the gastronomy the whole spiritual world of women is expressed. This area offers tourists a rich and tasty traditional cooking. Agricultural and forestry products are used as raw materialsGora organizes a fair between the three countries presenting the dishes that this area offers for tourists and includes dishes that have as raw material agricultural and bakery products will also be presented all varieties of potatoes cultivated in the Shishtavec Municipality. The popular gaming organization: wrestling and horse racing. They are sporting activities that have been practiced early in this province, in pagan times. Horse racing has been a widespread sport especially in weddings. The first three places will be rewarded with gifts.

Also widespread on the last day of the wedding is the wrestling-puttiness sport.Agro-tourism farms in this area offer services to look at, services performed jointly or individually by visitors, products to try, buy or donate.

A good foundation for livestock development is the high share of pastures and meadows. In spite of natyroe circumstances, the number of livestock growers is small and the number of cattle and sheep has declined especially in recent years.Today's remains remain a traditional activity of this region, and there are 225 private businesses that deal with breeding and beekeeper activities.

The possibility of keeping bees and the quality of honey is very high, thanks to the flora and the clean environment, as well as the insecticide and other chemical uses.It is worth noting that in this area there is a considerable amount of medicinal herbs. Tourists have the opportunity to harvest blueberries, wild roses, blackberries, and many others.Hundreds of tourists are turning their eyes to this area and agritourism farms 1400 feet above sea level.

Keywords: Agroculture, farming, mountain tourism, economic relation between three state, natural-cultural heritage.

EFFECT OF DIFFERENT SUBSURFACE DRIP IRRIGATION APPLICATIONS ON SOME QUALITY PARAMETERS OF TOMATO

Sinan Aras
International Agricultural Research and Training Center, Turkey
Email: arasssinan@ hotmail.com

Şuayip Yüzbaşı
International Agricultural Research and Training Center, Turkey

Şener Özçelik
International Agricultural Research and Training Center, Turkey

Nuri Candan
International Agricultural Research and Training Center, Turkey

Ümit Alkan
International Agricultural Research and Training Center, Turkey

Mehmet Gündüz
International Agricultural Research and Training Center, Turkey

Perihan Tarı Akap
International Agricultural Research and Training Center, Turkey

Fatih Şen
Ege University, Faculty of Agriculture, Department of Horticulture, Turkey

Abstract

Water is one of the most important input for tomato production. Lack of information in tomato production, using the inappropriate agricultural techniques and some deficiencies in growing areas affect yield and quality of tomatoes adversely. The quantities of water need by plant vary according to growth period and region and determining irrigation schedule is very important. In the growing season yield and quality of tomatoes can vary depending on amount of water applied in production stages. In case of excessive irrigation defloration,decrease of fruit formation and decrease of some quality parameters may occur whereas some quality parameters may indicatebetter results however, deficientirrigation may lead to low yield.The study aims to determine the effects of different irrigation treatments and water stress on crop yield and some quality parameters of tomato. The research was conducted at International Agricultural Research and Training Center Menemen / İzmir / Turkey under ecological conditions in summer of 2018. Tomatoes were irrigated by subsurface drip irrigation with four different treatments as S1: full irrigation, S2: 75% of S1, S3: 50% of S1,S3: 25% of S1. Irrigation water amounts were determined according to available soil water level. Average fruit weight, fruit length, fruit firmness and pH were measured,total soluble solids, and ascorbic acid contents were analyzed. According to the results, it was shown that, average fruit, fruit length values increased as the amount of irrigation water increased, the highest (fruit firmness)was measured in S2 treatment, the lowest pH values measured in S1 treatment, the total soluble solids values increased as irrigation water amount decreased and ascorbic acid contents values were higher in S3 and S4 treatments than S1 and S2 treatments which are relatively consist more irrigation water.
Keywords: Irrigation,Subsurface Drip Irrigation, Tomato, Quality Parameters, Soil Moisture.

THE EFFECT OF SPIRULINA PLATENSIS (GOMONT) GEITLER EXTRACTS ON SEED GERMINATION OF LACTUCA SATIVA L.

Füsun Akgül
Mehmet Akif Ersoy University, Department of Molecular Biology and Genetic, Turkey
E-Mail: fakgul@ mehmetakif.edu.tr

Rıza Akgül
Mehmet Akif Ersoy University, Department of Vegetable and Animal Production, Turkey

Abstract

Because of increasing human population and their food need the agricultural production increases, too. But meanwhile artificial fertilizer using and their negative effects to ecosystem are rising day by day. So, the scientist research different alternative solution for this pollution such as eco-friendly biofertilizer.Group of Cyanobacteria consists of photosynthetic prokaryotic microorganisms that has a highly diversity. Cyanobacteria can produce different metabolites that are valuable economically such as amino acids, proteins, vitamins etc. This study focuses the effects of different concentrations of *Spirulina platensis* (Gomont) Geitler extracts on the germination of lettuce seeds. For this purpose, root-stem length, lateral root number and wet-dry weight were investigated. The application of S5 (100% cell extract) showed an inhibitory effect on seed germination and so other parameters could not be measured. S2 (25% cell extract) and S3 (50% cell extract) applications had a positive effect on germination and seedling development in lettuce. As a result; cyanobacterial extract has positive effects on seed germination and plant growth-development and it is possible to produce a commercial and ecological biostimulant by developing different extract concentrations. And this biostimulant may be used instead of the other ecologically harmful artificial fertilizer. By the way; the large amount money that spends for the artificial fertilizer will be brought to the economy of Turkey.
Keywords: Biostimulant, Cyanobacteria, Lettuce, Seed Germination, *Spirulina Platensis*.

1. Introduction

The human population is increasing day to day all over the world and their nutrient requirement, too. However, the quality and quantity of farming areas, water resources and agricultural products decrease. So, the farmers have to obtain more crop per farming area without any pollution that because of artificial fertilizer. And for this aim scientist started to research biofertilizer and biostimulant that affect plant growth positively.

In recent years, photosynthetic microorganisms draw attention to benefits in many sectors such as wastewater treatment, animal feeds, biodiesel, bioethanol, biofuel production, fertilizer and nutrient production (Win et al., 2018).Cyanobacteria are the simplest living autotroph microorganisms that produce huge amount of oxygen. And also they produce organic material from inorganic compounds and when they stressed, they produce seconder metabolites are very useful for the plant growth (Malliga et al., 2002; Kheirfarm et al., 2017).They have a wide distribution in the ecosystem and tolerance to ecological stress factors (de Marsac and Houmard, 1993).

For these characteristics of cyanobacteria; effects of *S. platensis* extract on seed germination of lettucewere investigated in this research. And the optimal concentration of extract was detected for seedlings for the purpose of creating possible commercial bio stimulant instead of artificial ones.

2. Material and Methods

2.1 Cultivation and Harvesting

S. platensis, obtained from Mehmet AkifErsoy University, Algal Biotechnology Laboratory, was cultivated flasks using standard Zarroukculture medium (Zarrouk, 1966), bubbled with air. The

biomass was harvested by centrifugation at day 20 of cultivation. The biomass dried in an oven at 45°C for 24 hours and then powdered with a grinder and stored at +4°C.

2.2 Cell Extract

Dried biomass was suspended in distilled water (DIW)at a concentration of 150 g L^{-1}. For obtaining the intracellular extracts, the suspension was extracted with a sonicator. The suspension centrifuged at 22°C, 6000×g for 6 minutes for removing biomass residue. To minimize potential degradation, the resulting extract supernatant was collected in a flask covered with aluminum foil and stored in a cold room at 4 °C. Five different concentration solution were prepared with cell extract. S1, Control, %0 extract (10 mL DIW); S2, %25 (2,5 mL extract, 7,5mL DIW); S3, %50 (5 mL extract, 5mL DIW); S4, %75 (7,5 mL extract, 2,5mL DIW); S5, %100 (10 mL extract). The biomass residue was also stored in the cold room for potential future use.

2.3 Seed Experiment

All solutions were replicated three times with ten seeds per replicate. The seeds were sterilized with 10 mL of 5 % solution of sodium hypochlorite for 10 min, rinsed twice with DIW, transferred to sterile Petri plates, and soaked in 10 mL of the S1, S2, S3, S4, S5 solutions for 24 h. Following the 24-h soaking period, the seeds were placed between two 42.5-mm Whatman no. 1 filter papers and allowed to dry for 24 h at room temperature (21 °C). Then, the seeds were transferred to a sterile 100-mm Petri plate containing a moist 75-mm Whatman no. 1 filter, which was soaked with 3 mL of DIW. The plates were incubated at 21 °C under a 16-h light/8-h dark cycle. Seed germination was checked at 24-h intervals for 10 days and counted as germinated if at least 2 mm of the radicle had emerged. The filter paper for all treatments was saturated as needed with 3 mL of DIW to maintain moisture. Root, shoot, and leaf lengths (mm) were measured with a caliper. And also number of lateral roots measured and germination percentage (GP), and germination energy (GE) were calculated.
Germination percentage (GP) was calculated as
GP=(number of germinated seeds/total number of seeds)×100
Germination energy (GE) was calculated according to HernándezHerrera et al. (2013),
GE= (number of germinating seeds on X. day/number of total seeds) ×100
In this research GE of 3., 5. and 7. days were calculated.

2.4 Statistical Analysis

Each application concentration was analyzed on three biological replicates. The reported values are the means ± standard deviation of three values. Data were analyzed using two-way analysis of variance (ANOVA) using Microsoft Office Excel 2007. A significant difference was considered at level of $p < 0,0001$.

3. Results and Discussion

It is seen clearly in all figures;S5 treatment has negative effect on seed germination and so the other parameters could not be measured. Similarly, in our results Sornchai et al. (2014) researched effects of *S. maxima* extract on different plants and resulted their research that there is no beneficial effect to seed germination and they showed different reactions on plant growth according to extraction solvent.

In the early days of observation; S3 treatment is effective for accelerating seed germination, but in 3^{th} and later days, this treatment has same effect with control treatment. In general, S1, S2, S3 treatment have similar effect on seed germination, but S4 blocked the germination (Figure 1 and 2). Similarly, in seed germination; S4 treatment has no significant impact on root length. However, S2 treatment has more positive effect on root elongation than control treatment. And also S3 has effect almost as same as control (Figure 3).In shoot length (Figure 4); S2 treatment has the most important effect, then S1, S3 and S4, respectively. Control treatment (S1) has the foremost effect in lateral root number, it means that other treatments are not necessary for rooting (Figure 5). S2 create more fresh and dried weight than S1 and also other treatments (Figure 6).

Aly and Mona (2008) recorded that *S. platensis* is a suitable bio stimulator for pepper plants. Wuang and et al. (2016) indicated that *Spirulina*-based fertilizers enhance plant growth such as leafy vegetables.Alves Dias et al. (2017) indicated that *S. platensis* fertilizer (Spirufert) play important role to plant growth and vegetable crop. Brahmbhatt and Kalasariya (2015) used *Spirogyra* and *Oscillatoria* cyanobacteria and detected that presoaking seed by extracts of cyanobacteria accelerates seed germination and also *Spirogyra* more effective on plant growth than *Oscillatoria*. Mohsen, et al. (2016) indicated that two cyanobacterial extracts (*Anabaena oryzae* and *Nostocmuscorum*) for lettuce plants significantly increased the plant height, number of leaves /plant, head weight and total yield of lettuce plants compared with control treatment.

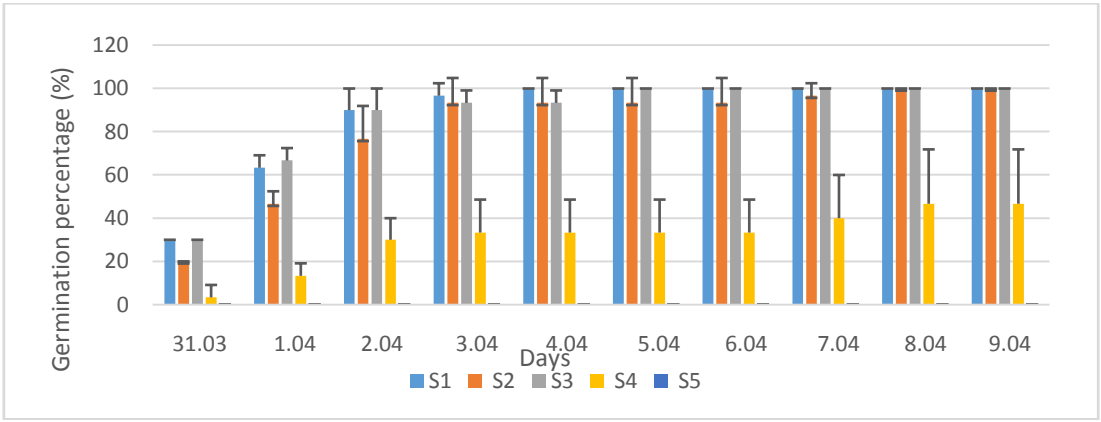


Figure 1. Germination Percentage of Lettuce Seeds According to the Applications and Days (%).

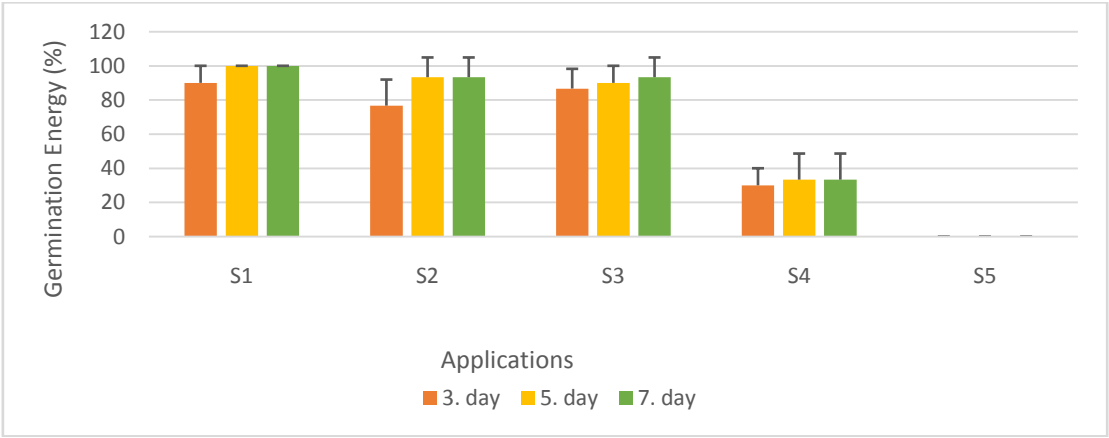


Figure 2. Germination Energies of Lettuce Seeds on the 3th, 5th and 7thDays According to the Applications (%)

Unlike the above studies; Bhowmik et al. (2011); detected in their study that used *Spirulina* as inoculant for Pulses; different reactions observed for plant growth and inoculation of *Spirulina* shows no positive effects in the crop plants.

All these results show that *S. platensis* extract is highly effective for lettuce seedlings. And this or other concentrations that would be adjusted according to this study may be used instead of artificial fertilizers. In future works need to be done to develop new bio efficacy concentrations and maintain under field environment conditions. It is so important for the sustainable environment, because synthetic fertilizers have long-term negative effects. They kill benefit microorganisms, change pH in the soil, pollute groundwater and increase its toxicity and also all aquatic system and the final all ecosystem. In this respect; the studies that aim to create eco-friendly, organic and bio degradable fertilizer like this study are very valuable for the natural life because of affecting all living things.

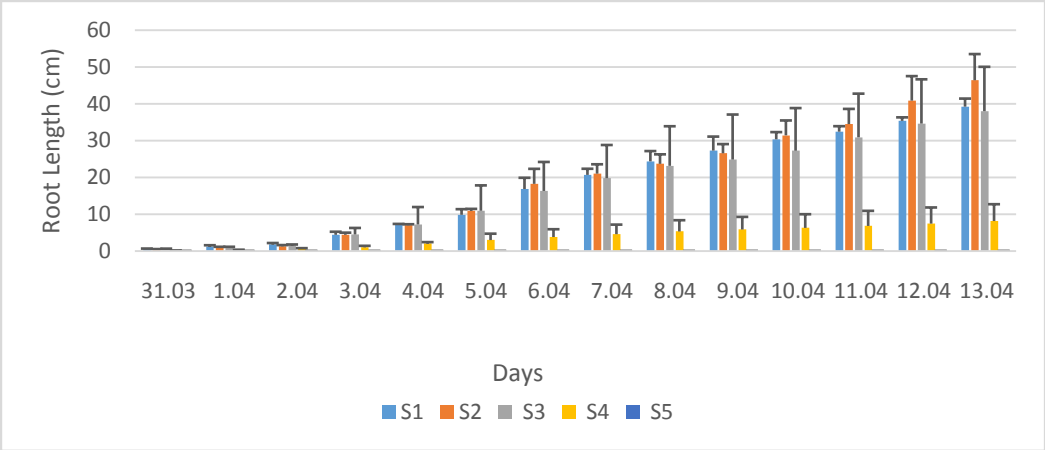


Figure 3. The Root Length of Lettuce Seedlings According to the Applications and Days (cm)

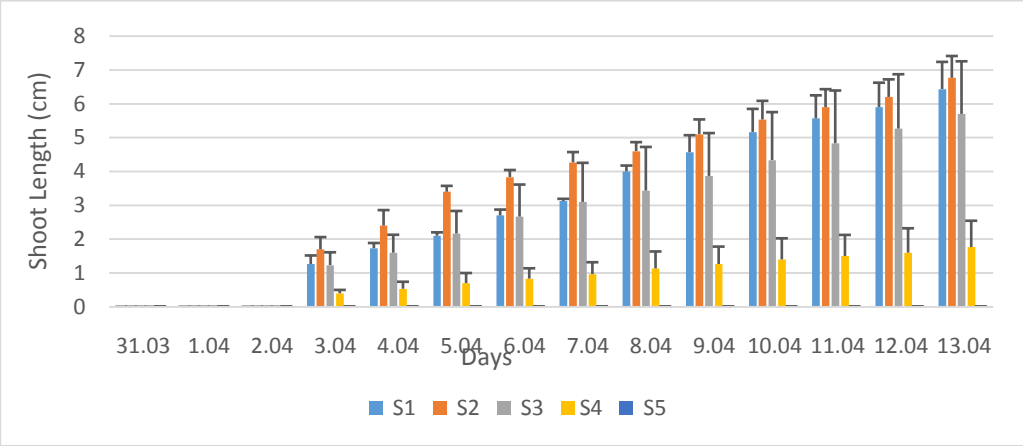


Figure 4.The Shoot Length of Lettuce Seedlings According to the Applications and Days (cm)

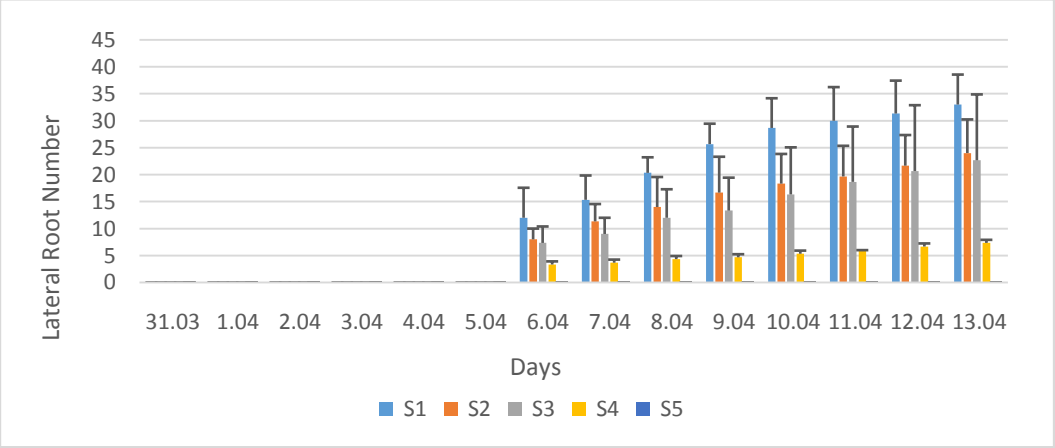


Figure 5.Number of Lateral Roots of Lettuce Seedlings According to the Applications and Days (piece)

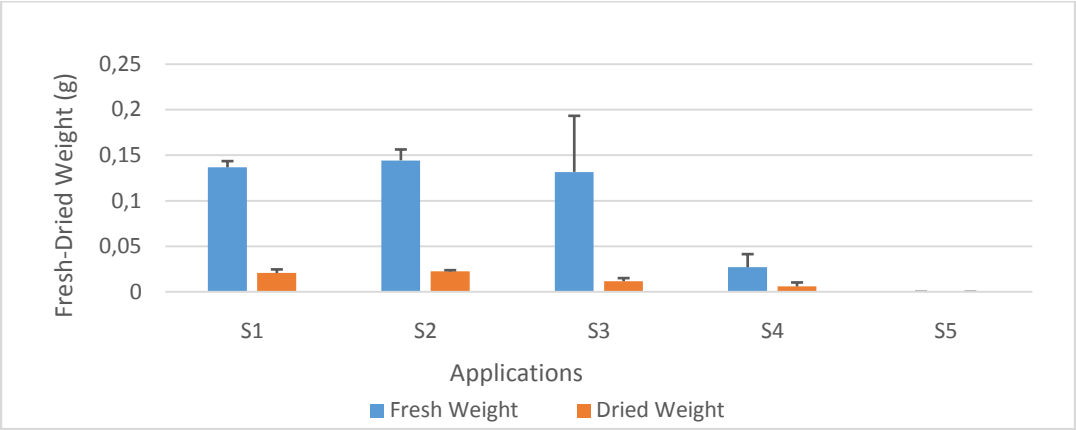


Figure 6.Fresh and Dried Weights of Lettuce Seedlings According to Applications (g).

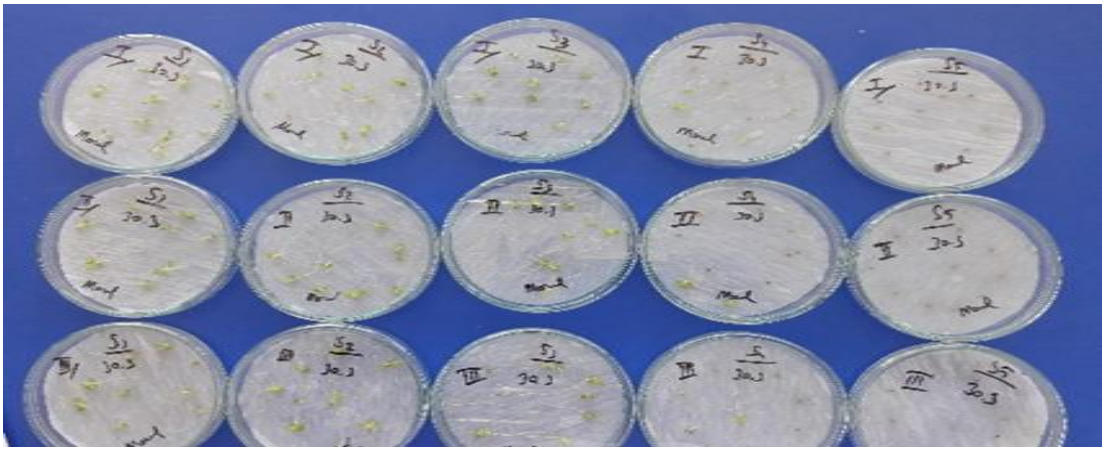


Figure 7. Lettuce Seeds and Seedling Development on the Last Day of İncubation

4. Conclusion

Artificial fertilizer causes ecological damage and creates serious economic expense. Creating and producing a bio degradable and organic bio fertilizer instead of these artificial fertilizer is very important because of protecting the environment and saving money. Though chemical fertilizers increase crop production; their overuse has hardened the soil, decreased fertility, strengthened pesticides, polluted air and water, and released greenhouse gases, thereby bringing hazards to human health and environment as well. When considering disadvantages and cost of chemical fertilizer and the results of this study; for the sustainable environment and economy according to this and similar studies optimum concentration should be found and mass production should be started commercially.

Acknowledgement: This research was supported by BAKA (West Mediterranean Development Agency) project number TR61/16/CEVRE/0027.

References

Alves Dias G, Garcı´a-Martı´nez M, Osornio-Berthet L, et al. Growth, yield, and postharvest quality in eggplant produced under different foliar fertilizer (*Spirulina platensis*) treatments. Water Sci Technol 2017;37(6):1693–1701.

Aly M. S., Mona A. E., 2008 . Evaluation of *Spirulinaplatensis* as Bio. Stimulator for Organic Farming Systems Journal of Genetic Engineering and Biotechnology, 6(2): 1-7.

Bhowmik D., Dubey J. And Mehra S., 2011. Evaluating Potential of *Spirulina* as Innoculant for Pulses Asian J. Exp. Sci., Vol. 25, No. 1, 2011; 41-44.

Brahmbhatt N., Kalasariya H., 2015. Effect of algae on seedling growth of " Queen of Forages", InternationalJournal of EngineeringResearchand General Science, Volume 3, Issue 2, Part 2, 827-833.

de Marsac NT, Houmard J. Adaptation of cyanobacteria to environmental stimuli: new steps towards molecular mechanisms. FEMS Microbiol Lett 1993;104(1–2):119–189.

Hernandez-Herrera RM, Santacruz-Ruvalcaba F, Ruiz-López MA, Norrie J, Hernández-Carmona G, 2013. Effect of liquidseaweedextracts on growth of tomatoseedlings (*Solanumlycopersicum* L.). J ApplPhycol 26:619–628.

Kheirfam H, Hamidreza SS, Homaee M, et al. Quality improvement of an erosion-prone soil through microbial enrichment. Soil Tillage Res 2017;165:230–238.

Malliga PS, Reddy GSM, Reddy SR, et al. Cyanobacterial biofertilizer for sustainable agriculture. Bioinoculants for Sustainable Agriculture and Forestry, Proceedings of National Symposium 2002:99–106.

Mohsen, A. A. M., Salama A. S. A. and El-Saadony F. M. A., 2016. TheEffect of Foliar Spray with Cyano bacterial Extracts on Growth, Yield and Quality of Lettuce Plants (*Lactucasativa*L.). Middle East Journal of AgricultureResearch, 5(1):90-96.

Sornchai P., Saithong N., Srichompoo Y., Unartngam A., Iamtham S., 2014. Effect of *Spirulina maxima* aqueous extract on seed germination and seedling growth of mung bean, *Vigna radiata* and rice, *Oryza sativa* var. Japonica. Journal of the International Society for Southeast Asian Agricultural Sciences 20(2):77-84.

Win TT, Barone GD, Secundo F, Fu P, 2018. Algal Bio fertilizers and Plant Growth Stimulants for Sustainable Agriculture. Industrıal Bıotechnology, doı: 10.1089/ind.2018.0010.

Wuang SC, Mar CK, Chua QD, et al. Use of Spirulina biomass produced from treatment of aquaculture wastewater as agricultural fertilizers. Algal Res 2016; 15:59–64.

Zarrouk C, 1966 Contribution a l'etuded'unecyanobacterie: influence de diversfacteursphysiques et chimiques sur la croissance et la photosynthese de *Spirulinamaxima* (Setchell*et* Gardner) Geitler. Ph.D. thesis, University of Paris, France.

USING BIOPLASTICS IN FOOD PACKAGING

Sinan Uzunlu
Alanya Alaaddin Keykubat University, Food Engineering Department, Turkey
Email: sinan.uzunlu@ alanya.edu.tr

Abstract

Packaging is an essential process to obtain a stable food for both of the producers and consumers. Primary function of packaging is to protect the foodstuffs against to physical, chemical, and biological spoilage during the shelf life. The shelf life period is very much dependent on the conditions of the packaging and storage conditions of the foodstuffs. This period determines not only the stability of the foods but also affects the safety of foods. Exploring the plastics in food packaging gained flexibility in storage and transportation conditions, when compared to glass, to the producers. Using plastics have also decreased the cost of the packaging materials. However, many concerns are being reporting tremendously on synthetic plastics in the food industry.Because, consumers have a general consensus about the sustainability ofthe world, where they believe that plastics are threatening the whole ecosystem. The fact that, globally we waste millions of tonnes plastics to the environment. And, those plastic debris threaten the whole ecosystem, where we share with plants and animals. Nowadays, biodegradable packaging materials, edible films and coatings are therefore respectfully accepted by the consumers. For a sustainable ecosystem, starch, proteins (e.g. casein, whey, soy, gluten, corn maize), polylactic acid, polyhydroxyalcanoate, polyhydroxybutyrate, chitosan is used for their biodegradability both in researches and industrial applications in food packaging. Relatively high cost and mechanical features of the natural biodegradable polymers versus to the synthetic plastic polymers are the limiting factors for their usage in food packaging. Besides, some controversial reports are being reported about the bioaccumulation of plastics in marine life, and its effects on the human diet. The current review will therefore address the question;should we evaluate bioplastic usage in food packaging rational or not?
Keywords: Biodegradability, Bioplastics, Food Packaging, Life Cycle Assessment, Sustainability.

THE FACTORS BEHIND THE EMERGENCE OF THE PRIVATE AGRICULTURAL EXTENSION IN ALGERIA: THE CASE OF THE CITRUS SECTOR

Karima Boudedja
Research Center in Applied Economics for Development, Department of Agricultural, Territory and Environment, Algeria, Email: karima.boudedja@ gmail.com

Akila Derbal
Research Center in Applied Economics for Development, Department of Agricultural, Territory and Environment, Algeria

Abstract

In order to improve the effectiveness of public agricultural advisory systems, many States disengaged themselves from this field fostering the emergence of private services of several types, whether in developed countries or in developing countries.

In Algeria, despite the questioning of the services provided by public organizations whose results are deemed to be mixed, the State did not undertake, even partially, the privatization of the agricultural extension. However, farmers operating in sectors with high added value andwhere investments are at high levels (such as fruit or vegetable production) call on privateadvisersof input-supplyingfirms or public officials or retirees, whogetinformally paid. We examined the case of the wilaya of Chlef, which is situated in the northwestern area in Algeria, and whose citrus production is high, and we noticed that this trend is confirmed.

The citrus fruit growers of this wilaya have been surveyed whereas semi-structured interviewshave been conducted with the various public and private stakeholders. This allowed us to identify the factors that favor the use of private advisory by farmers and the ones we must take into account in case of the privatization of at least a part of the agricultural extension in Algeria. It turns out that one-third of citrus fruit growers who have been surveyed are convinced of the positive impact of the private advisoryon their income and the improvement of their yields and agree to pay the private advisers. While the educational level and geographic level of the target market (local, regional or national) are the factorswhichfavora largercall on of citrus fruit growersto theprivateagricultural advisors.
Keywords : Algeria, Agriculture, Citrus Fruit Growing, Extension, Privatization.

CAN COOPERATIVES INCREASE FARMERS' INCOME: A STUDY OF TEA IN CHINA

Xiaorong Zhang
Renmin University of China, School of Agricultural Economics and Rural Development, Agricultural Economy, China, Email: xrzhang_chn@ 126.com

Xiangzhi Kong
Renmin University of China, School of Agricultural Economics and Rural Development, China

Abstract

China is the largest producer and the second-biggest exporter of tea in the world. In recent years, small farmers face more serious difficulties, such as financing problem, production input problem, lack of market information and so on. Reardon (1999), Austin，(1981) and Swinnen (2007) found that these problems make it easy for them to be "squeezed out" of the market, which has lower profit. The purpose of this paper is to verify that which of the following methods is more suitable for Chinese tea farmers. The method that such farmers could avoid being "squeezed out" of the market is transforming the present value chain into a compact value chain based on contractual relationship, which is more competitive, such as industrial clusters and cooperatives. Narrod (2009) and Bell (2009) believed that farmers could avoid "squeezed out" from the market by joining the value chain in forms of cooperatives, enterprises etc.. For example, Goldsmith (1985),Key (1999) and Masakure (2005) indicated that by joining the value chain, tea farmers could obtain the necessary technology, information, and other related services, therefore they could improve product quality and income. However, Stiglitz (1999), Schwartz (1999), Liu (2003) believed that it may cause more conflicts between farmers and organizations if farmers accede to the value chain.

The interviewees of this paper are tea farmers from Fujian and Hubei Province, in China.The data we collected included 952 farmers in 38 administrative villages.The purpose of this paper is to analyze the influence of tea farmers participating in the value chain on their tea income. Assuming that tea farmers' income（Y_i） is a linear function of explanatory variables（X_i） and the willingness of farmers to participate in the value chain（Z_i）, the regression equation is assumed to be:

$$Y_i = aX_i + bZ_i + \varepsilon \quad (1)$$

In the above formula,Y_i denotes the income of tea farmers, X_i denotes the variable of exogenous variables that measure the personal characteristics, family characteristics, production and management characteristics of tea farmers, and Z_i denotes the endogenous selection variable. When Z_i is an exogenous variable, it can be analyzed by OLS to get the influence of tea farmers participating in the value chain on their income.

In (1), we propose a linear function of farmers' participation in the tea value chain on economic performance. Because of the endogenous nature of the decision-making behavior variables of farmers, the tool of neighbor behavior is introduced into the model. (2), Z_i^* is a linear function of exogenous variables W_i (neighbor behavior) and random perturbation term μ.

$$Z_i^* = cW_i + \mu \quad (2)$$

In addition, the behavioral variables of farmers participating in the value chain are:

$$Z_i = \begin{cases} 1, & if\ Z_i^* > 0 \\ 0, & if\ Z_i^* \leq 0 \end{cases} \quad (3)$$

The following conclusions are expected from the analysis. First,due to the existence of transaction costs and market risks, compared with those tea farmers who create value chain organizations, tea farmers who join anexisting value chain organization have higher expected income. Second, compared to tea farmers joining a tea cooperative, farmers joining a tea business have higher expected income.This is mainly because usually the co-operatives are established in the area producing lower quality tea while enterprises already occupied areas producing better quality tea. In this situation, farmers will sell their products to enterprises to get more profits. These conclusions may arouse researchers' reflection and discussion.

This article has the following contributions. First of all, tea is an important product of the Silk Road historically, affecting people's life and regional economy.Therefore, the study of the current Chinese tea value chain provides meaningfulreference for enhancing the competitive advantage of tea products. Secondly, this paper analyzes the influence of the tea farmers' behavior of joining or creating the value chain organization to avoid being squeezed out of the market, and the findings could indicate that the ideal way of avoiding extrusion for tea farmers is participating in an enterprise. Finally, we analyze the impact of tea farmers' decisions on their earnings, which can provide decision-making reference for farmers.

Keywords: Tea, Value Chain, Organizational Form, Treatment Effect Model, Cooperatives.

EFFECTS OF CONFLICTS ON FOOD SECURITY AND POVERTY STATUS OF IRISH POTATO FARMERS IN PLATEAU STATE, NIGERIA

Ezekiel Salawu Yisa
Department of Agricultural Economics and Farm Management, Federal University of Technology, Nigeria, Email:ezekiel.yisa@ futminna.edu.ng

Ayodeji Alexander Ajibola Coker
Department of Agricultural Economics and Farm Management, Federal University of Technology, Nigeria

Ifeanyi Kingsley Etonihu
Department of Agricultural Economics and Farm Management, Federal University of Technology, Nigeria

Adeoluwa Adewumi
Department of Agricultural Economics and Farm Management, Federal University of Technology, Nigeria

Abstract

This study examined the effect of conflicts on food security and poverty status of Irish potato farmers in Plateau State, Nigeria. Multi-stage sampling technique was used to select a total of 225 respondents in the study area. Data for the research were collected with the aid of a well-structured questionnaire and were analyzed using descriptive statistics, United States food security scale, Foster-Greer-Thorbecke model, Probit regression and Ordered Logit regression model. Results showed that about 12% of respondents in the study area were food secured while 88% of the respondents were food insecure with various degrees of hunger. Majority (88.4%) of the respondents were poor and only 11.6% were non poor. Age, marital status, farm size, food expenditure, membership in cooperative and poverty status were found to be statistically significant factors at $p<0.01$ and $p<0.05$ levels of probability that affects the food security status of farmers during conflicts while level of education, farm size, labour and non-potato income were significant factors at $p<0.01$, $p<0.05$ and $p<0.10$ levels of probability respectively that affects the poverty status of respondents in the study area during conflicts. Also number of conflicts witnessed, household size and susceptibility to sickness were found to be statistically significant factors at $p<0.01$ and $p<0.10$ levels of probability that determine the susceptibility of respondents to conflicts. Respondents perceived and adopted adherence to curfew, living close to security post, cutting the size of meals and participation in community policing as effective coping strategies during conflicts in Plateau State. Agricultural credit should be made available to farmers through government intervention by statutory and commercial banks at little or no interest to increase crop production output, reduce poverty and improve food security status. Security post and barracks should be cited by government in rural communities to guarantee security of life and property.

Keywords: Conflict, Food Security, Poverty Status.

1. Introduction

Agriculture has been the largest industry which accommodates various human categories ranging from commercial farmers to rural peasant farmers, youths, women and men. However, the industry has for long been inefficient in providing food for humans and raw materials for industries, especially in most developing countries and in particular Nigeria (Etonihu*et al*. 2010). The eradication of poverty and insecurity has been declared by the United Nations World Summit for Social Development as the unfinished business of the 21st century. This unfinished business has been made more difficult to be completed, owing to the rising global conflicts.A major factor militating against the achievement of food security and economic wellbeing in Nigeria is conflicts.Conflict has become a global issue in

which Nigeria has witnessed its own share as a member of the global village. Most common phenomenon of conflict is its associated poverty causing effect on the affected population, of which women are the disadvantaged groups. The issue of gender with regards to poverty in Africa is expressed explicitly by Ezekwesili (2009), who asserted that poverty has a female face.

Most farmers in Plateau State cultivate Irish Potato because of the favourable weather which supports the cultivation of the crop. Norman(2014) established that cropping alternatives in any area is determined by physical and biological factors among other variables. According to the International Potato Center (1999), potato is the fourth most important food crop in the world, with annual production of about 300 million tons. Food and Agricultural Organization (FAO) (2014) affirmed that the world's potato production was estimated at about 3.6 million tons in 2012. Ayodele (2005) argued that more than one-third of the global potato output comes from developing countries. Irish potato cultivation has provided the best alternative as a choice crop for cultivation compared to other tubers because of its high yield, short maturity period and wide acceptability. Conflicts affect the economy of any society it befalls, resulting to a wider coverage of the number of people entangled in the vicious cycle of poverty. Many households in Plateau State are food insecure owing to the wide spread conflicts as many of the household heads have been killed in violence leaving the women to fend for their children by engaging in agriculture. It is therefore imperative to investigate the effects of conflicts on the food security and poverty status of the Irish potato farmers in Plateau State.

2. Materials and Methods

2.1 Area of Study

The study was carried out in Plateau State. Plateau is the twelfth largest State in Nigeria and is located approximately in the center of the country. It is geographically unique in Nigeria because of the rocky boundary that surrounds the Jos Plateau. According to the National Population Commission (2006), Jos has a population of around 3.5 million people. Plateau State is located in Nigeria's middle belt and with an area of 26,899 square kilometers. It is located between Latitudes 80°24' North and Longitude 80°32' and 100°38' East. The altitude ranges from around 1,200 meters (about 4000 feet) to a peak of 1,829 metres above sea level in the Shere Hills, near Jos. Years of tin mining have left the area strewn with deep gorges and lakes.

2.2 Sampling Techniques

Multi stage sampling technique was used for this study. The first stage involves purposive selection of four (4) Local Government Areas, two (2) LGAs where conflicts, violent clashes, crises and attacks have occurred these are Bokos and BarkinLadi and the remaining two (2) LGAs where violent clashes and conflict are virtually absent which are Jos South and Mangu. The next stage involved the random selection of four (4) villages each from the four (4) Local Government Areas. This gave a total of sixteen (16) villages. In the third stage, the list of total registered farmers obtained from the Plateau Agricultural Development Programme (PADP) was used as the sample frame. The last stage involved proportionate sampling (10%) of farmers from each of the Sixteen (16) villages to give a sample size of 225 farmers (respondents).

2.3 Analytical Techniques

Descriptive statistics which involved the use of percentages, means, range, weighted sum, frequency, as well as weighted mean, standard United States food security scale, Foster Greer and Theobecke model and inferential statistics such as Probit and Ordered Logistic regression models were used to analyze the data for this research. For determinants of effects of conflicts on food security and poverty status of the respondents' Probit regression model was used to achieve this. The regression model is used in estimating the probability of events based on dependent dichotomous variables. A dichotomous dependent variable assumes only two values (0 or 1). The implicit form of the probit model is given in equation (1) as:

$$P = (Y = 0) = C + (1 - C)F(X'\beta) \quad (1)$$

Where;
Y = Vector of parameter estimates
F = Cumulative distribution function (the normal, logistic, or extreme value)
X = Vector of explanatory variables
P = Probability of a response
C = Natural (threshold) response rate.
The explicit form of probit model is specified as followsin equation (2):

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + ...+ \beta_nX_n \quad (2)$$

Where;
The dependent variable is defined as thus:
Y = Food security status of respondents (1 = food secure, otherwise = 0)
The independent variables are defined as:
X_1 = Age of farmer (Years)
X_2 = Gender (Male = 1, Female =0)
X_3 = Marital Status (1 = Married, otherwise = 0)
X_4 = Education (Years spent in school)
X_5 = Household size (Number of people)
X_6 = Farm size (Hectare)
X_7 = Farming experience (Years)
X_8 = Household expenditure per annum on food (₦)
X_9 = Affected by conflict (Yes=1; No=0)
X_{10} = Distance of homestead to the nearest security outpost (Km)
X_{11} = Extension visits (Number)
X_{12} = Labour (Man day)
X_{13} = Membership of cooperative society (Years)
X_{14} = Poverty status of respondents (1= Poor, 0= Non-poor)
β_0 = Constant
$\beta_1 - \beta_{14}$ = regression coefficients

For determinants of effects of conflict on the poverty status of respondents, the explicit probitmodel is expressed as follows in equation (3):

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + ...+ \beta_{15}X_{15} \quad (3)$$

Where;
Y = Poverty status of Respondent (1 = poor, 0 = non poor)
X_1 = Age of farmer (Years)
X_2 = Gender (Male =1, Female = 0)
X_3 = Marital Status (1 = Married, otherwise = 0)
X_4 = Education (Years spent in school)
X_5 = Household size (Number of people)
X_6 = Membership of cooperative society (Years)
X_7 = Farm size (Hectare)
X_8 = Farming experience (Years)
X_9 = Household expenditure per annum on food (₦)
X_{10} = Affected by conflict (Yes=1; No=0)
X_{11} = Distance of homestead to the nearest security outpost (Km)
X_{12} = Extension visits (Number)
X_{13} = Labour (Man day)
X_{14} = Non- potato income (₦)
X_{15} = Capital input (₦)
β_0 = Constant
$\beta_1 - \beta_{15}$ = regression coefficients

For determinants of susceptibility of respondents to conflicts in the study area, Ordered Logit regression was used to achieve this. The implicit form of the model is expressed as thus:

model is specified as followsin equation (4):

$$\log\left[\frac{yj(X_i)}{1-yj(X_i)}\right] = \mu j - \left[\beta_1 x_{1i} + \beta_2 x_{2i} + ... + \beta_k x_{ki}\right] \quad (4)$$

$$j = 1,..., J; i = 1,..., n$$

Where;

Y_j is the cumulative probability of the dependent variable in a four-point Likertscale:

Y_1= 1(Never susceptible)

Y_2 = 2 (Rarely susceptible)

Y_3 = 3 (Occasionally susceptible)

Y_4 = 4 (Always susceptible)

βi is the column vector and of (β_1, β_2,…….,β_k) parameters

μj is the threshold

Xi is the column vector of explanatory variables which are expressed as thus:

X_1 = Conflicts witnessed in the last one year (Number)

X_2 = Value of properties destroyed in the last one year (₦)

X_3 =Deceased family member during conflict (Number)

X_4 = Meals eaten per day (Number)

X_5 =Household size (numbers)

X_6 = Farm size (hectares)

X_7 = Food expenditure (naira)

X_8 = Labour (man-day)

X_9 = Susceptibility of household head to sickness (susceptible = 1, not = 0)

X_{10} = Income per annum (naira)

X_{11} = Extension visits (Number of visits)

X_{12} = Membership of cooperative society (Years)

The weighted mean was used to assess the respondents' perceptions on coping strategies adopted during conflicts in the study area.A five point Likert scale(5 = Very effective, 4 = Effective, 3 = Undecided, 2 = Rarely effective and 1 = Not effective) was used to compute the weighted mean.

3. Results and Discussion

3.1 Food Security Status of Respondents in the Study Area

The result of food security status of respondents in the study area using the United State food security scale is presented in Table 1. It revealed that 54.7% of the respondents in the study area were food insecure with severe hunger while 26.7% of the respondents are food insecure with moderate hunger. Also, 6.6% of farmers in the study area were found to be food insecure without hunger. These findings corroborates with Robert *et al*. (2013) who found that majority (79%) of farmers in SekereAfram plains district of Ghana were food insecure.

Table 1. Food Security Status of Respondents

Food security status	**Food security scale**	**Frequency**	**Percentage**	**Mean**
Food secured	0.0 − 2.2	27	12%	
Food insecure without hunger	2.3 − 4.4	15	6.6%	
Food insecure with hunger (moderate)	4.5 − 6.4	60	26.7%	2.2
Food insecure with hunger (severe)	6.5 − 10	123	54.7%	
Total		**225**	**100.0**	

Source: Field survey, 2017

3.2 Poverty Status of the Respondents

The result presented in Table 2showed that majority (88.4%) of respondents in the study area were living below the poverty line implying that significant number of farmers in the study area were poor and only 11.6% of the respondents were non poor. This position is also supported by Asogwa*et al*. (2012) who affirm that poverty is disproportionately concentrated among households whose primary livelihood is agricultural activities.

Table 2. Respondents' Poverty Status

Poverty status	**Frequency**	**Percentage**
Poor	199	88.4
Non poor	26	11.6
Total	**225**	**100**

Source: Field survey, 2017

3.3 Effects of Conflicts on Food Security Status of Respondents

The result of probit regression analysis showing the effect of conflict on the food security status of Irish potato farmers is presented in Table 3. It revealed that the regression coefficients of age (X_1), marital status (X_3) farm size (X_6) and membership of cooperative (X_{13}) were positive and significant at $p<0.05$probability level. This means that these factors have positive relationship with the food security status of respondents in the study area. Significant level ($p<0.05$) for age show that for every five years increase in the age of respondents in the study area, their food security status will increase by the coefficient of 0.02. This implies that the older the farmers get the more experience they acquire to improve their food security status. Also, for every 5% increase in the marital status of respondents, their food security status improves by 0.51 and for every 5% increase on the acreage farm size of respondents in the study area; their food security status will increase by 0.17. Similarly for every five years increase in cooperative membership, the food security status of respondents in the study area will improve by 0.83. The regression coefficient of food expenditure (X_8) and Poverty status (X_{14}) were negative and significant at 1% level of probability meaning that these factors have negative relationship with the food security level of respondents. The regression coefficient of food expenditure shows that for every 1% increase in food expenditure, the food security status of respondent drops by 0.001. Also for every 1% increases in poverty status of respondents their food security status drops by 0.8.This could be attributed to the fact that the incessant conflicts in the study area have made most of the respondents to be economically unproductive and hence as they keep getting poor their food security status drops significantly. This finding agrees with Babatunde*et al*. (2008) who found age, farm size and food expenditure as significant factors that affect households' food security status.

3.4 Marginal Effect and Partial/Quasi Elasticity

The result presented in Table 4 shows that the partial elasticities of the age, marital status, farm size, food expenditure, cooperative membership and poverty status are inelastic. This means that a percentage change in these explanatory variables leads to a less than proportionate change in the probability of respondents' food security status.

Table 3. ProbitEstimates on Effects of Conflicts on Food Security Status in the Study Area

Food Security Variables	Coefficients	Standard Error	Z-Value
Constant	-0.154	0.750	0.837
Age (X_1)	0.023	0.011	2.14**
Gender (X_2)	0.164	0.221	0.75
Marital status (X_3)	0.512	0.243	2.11**
Level of education (X_4)	0.025	0.025	1.02
Household size (X_5)	-0.033	0.043	-0.77
Farm size(X_6)	0.167	0.083	2.02**
Farming experience (X_7)	-0.008	0.014	-0.60
Food expenditure (X_8)	-0.001	3.16e-06	-5.95***
Affected by conflict (X_9)	-0.280	0.230	-1.22
Distance to security post (X_{10})	0.052	0.038	1.36
Extension Visits(X_{11})	-0.015	0.040	-0.39
Labour (X_{12})	-0.001	0.007	-0.99
Membership in cooperative (X_{13})	0.827	0.363	2.28**
Poverty status (X_{14})	-0.751	0.220	-3.41***

Log likelihood = -82.563; Prob> chi-square = 0.0000***; Pseudo R^2 = 0.453

*** = significant at 1% level of probability, ** = significant at 5% level of probability

Source: Field survey, 2017

Table 4. Marginal Effect and Partial Elasticities of Factors Affecting Food Security Status of Respondents

Variables	Marginal Effect	Partial Elasticity
Age	0.005	0.002
Marital Status	0.106	0.049
Farm Size	0.035	0.017
Food Expenditure	-3.90e-06	4.04e-07
Cooperative Membership	0.171	0.076
Poverty Status	-0.156	0.045

Source: Field survey, 2017

3.5 Effects of Conflicts on the Poverty Status of Respondents

The result presented in Table 5 shows the probit estimates of the effect of conflicts on respondents' poverty status. It shows that among the fifteen variables included in this model, the regression coefficients of level of education (X_4) had positive relationship on the dependent variable while farm size (X_7), labour (X_{13}) and non-potato income (X_{14}) had negative relationship on the poverty status of respondents in the study area due to conflicts. For the coefficient of educational level significant at ($p<0.05$), this indicates that for every 5% increase in educational level of respondents in the study area, their poverty status increases by 0.067. This implies that as the farmers in the study area acquires more education, the probability of abandoning farming due to the incessant conflict in the study area is 1 and as a result of absence of immediate alternative, the poverty status of the respondents' increases. On the other hand an increase in the acreage of the farm size will drop the poverty level of the respondents by -0.639. This is justifiable as the farmers are able to cultivate more lands amidst the conflict, the poverty level decrease as more crops are harvested and some sold for income. Similarly the more the labour available for farm work in the study area, the further their poverty level drops by -0.002. The coefficient for non-potato income as shown in the table result was at 1% probability level. It shows that an increase in income for the farmers from sources other than Irish potato sales will decrease their poverty level significantly. These finding agrees with Paul *et al.* (2009) who found educational level as a factor that has relationship on the poverty level of farmers in northern Nigeria.

Table 5. Probit Estimates on Effects of Conflicts on Poverty Status in the Study Area

Poverty variables	Coefficients	Standard Error	Z –Value
Constant	3.670	1.452	2.53**
Age(X_1)	-0.014	0.030	-0.46^{ns}
Gender (X_2)	0.237	0.292	0.81^{ns}
Marital Status (X_3)	-0.171	0.318	-0.54^{ns}
Level of Education (X_4)	0.067	0.032	2.08**
Household Size (X_5)	-0.014	0.057	-0.25^{ns}
Membership in Cooperative (X_6)	-0.030	0.022	-1.34^{ns}
Farm Size (X_7)	-0.639	0.263	-2.43**
Farming Experience (X_8)	0.035	0.022	1.61^{ns}
Food Expenditure (X_9)	-9.82e-07	1.04e-06	-0.953^{ns}
Affected by Conflict (X_{10})	0.077	0.336	0.23^{ns}
Distance to Security Post (X_{11})	0.042	0.057	0.75^{ns}
Extension Visits (X_{12})	0.048	0.047	1.02^{ns}
Labour (X_{13})	-0.002	0.001	-1.69*
Non-Potato Income (X_{14})	-0.00002	4.21e-06	-5.43***
Capital Input (X_{15})	0.0000178	0.0000223	0.80^{ns}

Log pseudo likelihood = -43.009; Prob> chi-square = 0.0000***; Pseudo R^2 = 0.466
*** = significant at 1%, ** = significant at 5% and * = significant at 10% probability level
Source: Field Survey, 2017

3.6 Marginal Effect and Partial/Quasi Elasticity

The result in Table 6 shows that the quasi-elasticities of educational level, farm size, labour and non-potato income are less than 1 which implies that they are inelastic. This means that a change in these explanatory variables leads to less than proportionate change in the poverty status of respondents in the studyarea.

Table 6. Estimates of Marginal Effect and Partial Elasticities of Effects of Conflicts on the Poverty Status of Respondents

Variables	Marginal Effect	Partial Elasticity
Educational Level	0.007	0.003
Farm Size	-0.065	0.027
Labour	-0.0001795	0.0001084
Non-Potato Income	-2.33e-07	3.78e-07

Source: Field survey, 2017

3.7 Determinants of Susceptibility of Respondents to Conflict in the Study Area

The result of ordered logit (Ologit) regression model for determinants of susceptibility of respondents to conflict in the study area is presented in Table 7. It shows that out of the twelve explanatory variables included in this model, three were found to be statistically significant at 1% and 10% levels of probability. The coefficient of multiple determinations (R^2) obtained for this model is 0.079 implying that 8% variation in always susceptible to conflicts (dependent variable) is explained by the independent variables included in this model. Log likelihood chi-square of 33.41 is obtained and statistically significant at 1% also implying that the whole model is significant. For number of conflicts witnessed with coefficient of -0.116, a unit increase in number of conflicts (going from 0 to 1), the odds of high always susceptible versus the combined middle and low categories are 0.89 greater, given that all of the other variable in the model are held constant. Likewise, the odds of the combined middle and high categories versus low susceptibility is 0.89 times greater, given the all other variable in the model are held constant. This implies that as the number of conflicts witnessed by the respondents' increases, the probability of always becoming susceptible to conflicts decreases by -0.116. For the household size with coefficient of -0.213, an increase in the household size that is going from 0 to 1, the odds of high always susceptible to conflict versus the combined middle and low

categories are 0.81 greater, given that all other variables in the model are held constant. This shows that as the household size increases, their susceptibility to conflict decreases due to more household members are available to protect each other. Likewise the odds of the combined middle and high categories versus low always susceptibility to conflict is 0.81 times greater, given that all other variables in the model are held constant. This finding is in agreement with Suharyanto*et al.* (2014) who found increase in household size at 1% significant level to be a factor that makes farmers less susceptible during conflict. For one unit increase in susceptibility to sickness, the odds of high category of always susceptible to conflict versus the low and middle categories of always susceptible to conflict is 0.15 times greater, given all other variables in the model are held constant. The same increase, 0.15 times, is found between the low always susceptible to conflict and the combined middle and high categories. This implies that as household members becomes sick; they become less susceptible during conflicts as they are not actively involved in the clashes or disputes due to illness.

Table 7. Estimates of Determinants of Respondents' Susceptibility to Conflict (n=225)

Susceptibility Variables	**Coefficient**	**Odd Ratios**	**Standard Error**	**Z- Value**
Number of Conflicts Witnessed(X_1)	-0.116	0.891	0.064	-1.81*
Value of Property Destroyed(X_2)	-0.002	0.999	0.002	-1.22
Deceased Family Member(X_3)	0.001	1.001	0.108	0.01
No. of Meal Per Day(X_4)	0.097	1.102	0.205	0.47
Household Size(X_5)	-0.213	0.808	0.072	-2.97***
Farm Size(X_6)	-0.115	0.891	0.109	-1.06
Food Expenditure(X_7)	-9.44e-06	0.999	7.73e-06	-1.22
Labour(X_8)	0.00002	1..000	0.001	0.02
Susceptibility to Sickness(X_9)	-1.885	0.152	0.417	-4.52***
Income per Annum(X_{10})	-3.01e-07	0.999	4.33e-07	-0.69
Extension Visits(X_{11})	-0.041	0.959	0.045	-0.92
Cooperative Membership(X_{12})	-0.006	0.994	0.017	-0.33

Log likehood = -245.80349; LR Chi-Square = 33.41***; Pseudo R^2 =0.079
*** = Significant at 1% level of probability, * = Significant at 10% level of probability
Source: Field survey, 2017

3.8 Respondents' Perceptions on Coping Strategies during Conflicts in the Study Area

Result of the analysis reveals the perceptions of respondents to various coping strategies in the study area during conflicts as presented in Table 8. Seven coping strategies which includes: living close to security post, cultivating in less distant farm, participating in community policing, cutting down number of meals, food storage, adherence to curfew and emigration were studied. Result of the analysis showed that adherence to curfew has a weighted mean of 3.87 which showed that it is an effective strategy during conflict in the study area. This finding agrees with Adelakun*et al*., (2015) who found government intervention through enforcing law and order as the most effective means of conflict resolution, guaranteeing survival. The result further revealed that living close to security post accounted for 3.47 in weighted mean, showing that respondents perceived dwelling close to a security post as an effective means of coping with conflicts. It was also discovered that cutting down number of meals accounted for 3.49 in weighted mean which showed that it is an effective coping strategy based on the perception of the respondents. This finding shows why food insecurity is one of the resultant effects of conflict in most part of Nigeria and as a result of this, most households perceive rationing and cutting down sizes of meals as a means of survival during conflicts. Also, the result revealed that participation in community policing with 3.42 weighted mean is opined by respondents as an effective coping strategy during conflict. This implies that cooperating with law enforcement officers in jointly securing lives and properties in conflict areas is an effective survival approach. From the research, it was also discovered that cultivating a less distant farm (2.71) weighted mean was perceived not an effective coping strategy during conflicts by farmers in the study area. This result shows that farming in less distant fields for fear of being attacked while in the farms does not guarantee safety. Similarly, respondents' perception on food storage (2.29) in weighted mean implied

that it is not an effective coping strategy during conflicts. The result from the analysis also revealed that respondents' perception on emigration with 2.32 in weighted mean show that moving out from the communities during conflict is not an effective coping strategy. This shows that exodus of people during conflict is a survival instinct of last resort and common in most rural settlements where government presence is not obvious. This result agrees with Tonah (2006) who found emigration of farmers to be common during farmer- herder conflicts as a means of survival.

Table 8. Perceptions of Respondents on Coping Strategies during Conflicts in the Study Area

Coping Strategies	Weighted Sum	Weighted Mean	Remark
Adherence to Curfew	870	3.87	Effective
Living Close to Security Post	780	3.47	Effective
Cutting Down Number of Meals	785	3.49	Effective
Participation in Community Policing	770	3.42	Effective
Cultivating a Less Distant Farm	610	2.71	Not Effective
Food Storage	515	2.29	Not Effective
Emigration	521	2.32	Not Effective

Source: Field survey, 2017

4. Conclusion

Based on the result of this study, it is concluded that conflicts has no significant effects on the food security and poverty status of Irish potato farmers in the study area. This is because of the diversification of majority of the respondents to non-potato enterprise which buffered the effects of conflicts on the living standard of the respondents. This is shown when the variable non-potato enterprise was excluded from the model; the conflict variable was statistically significant as against when it was included in the model. Age, marital status, farm size, food expenditure, cooperative membership and poverty status significantly affect the food security status of the respondents likewise level of education farm size, labour and non-potato income were significant factors that affect poverty status of respondents during conflicts in the study area. Adhering to curfew, living close to security post and cutting down number of meals were perceived to be effective coping strategies during conflicts by respondents in the study area. Based on the findings of this research, the following recommendations are made: It was revealed from the findings of this study that non-potato income was a signification factor having negative relationship on the poverty status of respondents; it is therefore recommended that farmers should diversify into other non-potato enterprise to alleviate their poverty status and improve living standard. Government through agricultural institutions should make more inputs readily available at subsidized rate. Stakeholder, philanthropist and NGO's should develop more specific poverty alleviation programmes tailored in areas of skill acquisition and along potato value chain in the study area to curb the high poverty rate in the study area.

References

Adelakun, O.E., Adurogbangba, B. and Akinbile, L.A.(2015). Socio-economic effects of farmers-pastoralist conflicts on agricultural extension service delivery in Oyo State, Nigeria. *Journal of Agricultural Extension*, 19 (2):120-128.

Asogwa , B.C.,Okwoche, V.A. and Umeh, J.C. (2012). Analyzing the determinants of poverty severity among rural farmers in Nigeria: A censored regression model approach. *American International Journal of Contemporary Resources*. 2(5): 166-176.

Ayodele, M.O. (2005). Economic analysis of Irish Potato Production in Plateau State: unpublished M.Sc thesis submitted to school of Postgraduate Studies, Department of Agricultural Economics and Rural Sociology, Faculty of Agriculture, Ahmadu Bello University, Kaduna State, Nigeria.

Babatunde, R.O., Omotesho, O.A., Olorunsanya, E.O. &Owotoki, G.M. (2008). Determinants of vulnerability to food insecurity: A gender-based analysis of farming households in Nigeria. *Indian Journal of Agricultural Economics*, 63(3):18-25.

Etonihu, K.I., Rahman, S. A., & Usman, S. (2014). Determinants of access to agricultural credit among crop farmers in a farming community of Nasarawa State Nigeria, *Journal of Development and Agricultural Economics*, 1(5):192-196.

Ezekwesili, O. (2009). In Africa, "poverty has a female face". Conference on women and the changing global outlook, Washington, May 15:15-22.

Food and Agriculture Organization (FAO), (2014). Final 2012 Data and Preliminary 2013 Data for five major commodities aggregate. Retrieved from www.faostat.fao.org/site/339/default.aspx,on 13 August, 2016.

International Potato Center (1999). Potato in the 1990's. Situation and prospects of the world Potato economy. *European Journal of Agricultural Science*, 18(7):16-22.

National Population Commission (NPC), (2006). Census result. Retrieved from http://www.population.gov.ng/index,php. on the 15 January 2016.

Norman, D.W. (2014). An Economic survey of three villages in Zaria province 2: Input-output study, Institute of Agricultural Research (IAR), Ahmadu Bello University Zaria, *SamaruMiscellaneous Paper*, 1 (37):142-158.

Olagunju,F.I and Ajiboye, A.(2010) Agricultural lending decision: A tobit regression analysis. *African Journal of Food, Agriculture, Nutrition and Development*, 10(5):2-30.

Paul, A., Tahirou, A., Patrick, K. & Amare, T. (2009). Changes in household food security and poverty status in PROSAB area of Southern Borno State, Nigeria. International Institute of Tropical Agriculture (IITA), *Agricultural Proceeding on Food Security*, 1(1): 23-32. Retrieved on the 30th August, 2016 from www. iita.*org.*

Suhayanto, J. H., Dwidjono., J.H. and Sri., D. W. (2014). Determinants of food security among rice farming household in the province of Bali: An ordered logistic model. *Journal of Economics and Sustainable Development*, 5(8): 120- 131.

Tonah, S. (2006). Farmer – herder conflict in Volta region of Ghana. *Journal of Social Sciences*,2(1):6-10.

THE IMPLICATIONS OF FINANCIAL AUTONOMY OF THE RURAL MUNICIPALITIES IN LITHUANIA: THE SITUATION AND TRENDS

Astrida Miceikiene
Vytautas Magnus University, Faculty of Bioeconomy development, Research Institute for Bioeconomy,Lithuania, Email: astrida.miceikiene@ vdu.lt

Laima Skaurone
Vytautas Magnus University, Faculty of Bioeconomy development, Research Institute for Bioeconomy, Lithuania, Email: laima.skaurone@ vdu.lt

Abstract

Financial autonomy of municipalities depends on the volume of the revenues and rational expenditure management. Foreign and Lithuanian researchers (Friedrich et. al. (2004), Shoup (2004), Oulasvirta, Turala (2005), Wei (2014), Astrauskas, Striškaitė (2003), Civinskas, Tolvaišis (2006), Davuliset al. (2013), Slavinskaitė (2014) et. al.)have analysed common implications in autonomy of municipalities, but few authors have looked deeper into the issues pertaining to rural municipalities.

Funding of the Lithuanian municipalities in Lithuania is based on the model of interbudgetary redistribution of taxes. Property taxes collected into the municipal budgets, personal income tax are redistributed under the approved methodology. The redistribution involves deduction of a share of the personal tax income from economically more capable municipalities (the donors) into the Public Treasury account, and the funds accumulated using this method are redistributed to support the municipalities which do not collect sufficient revenues (the recipients). The research deals with the implications and trends of the redistribution model.

The redistribution model has been found to not promote financial autonomy of the municipalities and efficient use of local resources in collection of revenues. Following the redistribution, the donor municipalities find themselves in a worse financial situation than the recipient municipalities, which receive the support. The budget revenue and expenditure per capita in the donor municipalities are considerably lower than in the recipient municipalities. Incentives for the economically weaker municipalities to explore the autonomous means for improvement of own economic, financial, and social situation are becoming scarce, considering that improvement of the situation would potentially result in the loss of additional revenue secured by the redistribution for the supported municipality.

The research has demonstrated the following trends: only threemunicipalities in Lithuania are the donors, and all of them are the urban municipalities, while the rural municipalities are the recipients. 13 to 46 % of revenues of the donor municipalities are subject to redistribution. The funds received as a result of the redistribution account for almost the fifth of the entire municipal budget of the majority of recipient municipalities, or even the forth in certain municipalities. The redistributed revenues prevail in the recipient municipalities.

Keywords: Financial Autonomy Of Rural Municipalities, Revenue And Expenditure Autonomy, Economic Freedom.

WHAT HAPPENS TO SMALL DAIRY FARMERS AFTER A FREE TRADE AGREEMENT? A COSTA RICAN CASE STUDY

Mercedes Montero-Vega
University of Costa Rica, Agricultural Economics Department, Costa Rica
Email: mercedes.montero@ ucr.ac.cr

Víctor Rodriguez-Lizano
University of Costa Rica, Agricultural Economics Department, Costa Rica
Email: mercedes.montero@ ucr.ac.cr

Abstract

According to the Free Trade Agreement signed by Costa Rica in 2008 with Dominican Republic, Central America and United States, milk import tariff reliefs will undergo a linear reduction from 59,4% before 2008 to 0% in 2025. Most dairy farms in Costa Rica are small and on the other hand, dairy industrialization is owned by few companies with large market power; the imminent free trade agreement is expected to affect prices and therefore, the structure of the local supply chain. In order to estimate the effects of the FTA on the structure of the supply chain we have conducted a Two Stages Least Square (TSLS) estimation of local demand and supply curves for fluid milk. Then a Monte Carlo simulation was conducted in order to estimate the probabilities of small farmers to maintain a profitable business by triggering both, feed prices and milk prices. Our results from TSLS suggest that import prices, being lower than domestic prices, will cause the demand to increase and national production is expected to decrease, creating a gap between both. This gap is expected to be filled by imported milk, since according to our Monte Carlo results; there is a 38.4% probability that small farmers would have losses, which would eventually change the structure of the current supply chain because of the exit of many small dairy farmers.
Keywords: International Trade, Small Farmers, Milk.

THE IMPACT OF FARM WORKERS STRIKE ON WINE PRODUCTION AND EXPORT IN SOUTH AFRICA: AN ERROR CORRECTION MODEL (ECM) ANALYSIS

Lenogang Petronela Ramafoko
North-West University, Department of Agricultural Economics and Extension, South Africa

Usapfa Luvhengo
North-West University, Department of Agricultural Economics and Extension, South Africa
Email: luvhengousapfa@ gmail.com

Joseph Nembo Lekunze
North-West University, School of Business and Governance, South Africa

Sandile Alexandra Mahlangu
Agricultural Research Council (ARC), RSA

Abstract

South Africa's Western Cape Province employs majority of farm labour in the fruit and wine industry. Theindustry also pays higher wages when compared to other provinces across South Africa. In 2012, the gazetted minimum wage of farm labourers was R69 per day and the amount has increase with the promulgation of the minimum wage rate in South Africa in 2018. The paper is inspired by the historic farm workers strikes that occurred in Western Cape Province of South Africa in 2012/2013 and the ramifications thereafter with regard to wine production and export. Farm workers in this part of the country have consistently expressed dissatisfaction with the treatment they received both from government (protection) and farm owners (as employers) in terms of living conditions and wages. Although the strikes have resulted in farm workers receiving some increases in wage in the years after the violent strikes, the increases are still not at the level of their expectations. Hence, the persistent of strike actions and wage increases requests year on year have have increase production costs, which often lead to an increase in product prices. This paper examined the short- and long- term effects of strike actions of farm workers in South Africa's wine industry from 2012/2013 to 2017/2018 on wine production and export earnings. Data on grape and wine production was obtained from Department of Agriculture, Forestry and Fisheries whereas data on farm workers strike were obtained from the Department of Labour. SAS software was used to analyse the data. Pearson correlation model was used to establish association between selected variables. The Error Correction Model (ECM) was further used to determine the short-term and long-term relationship amongst correlated variables. Pearson correlation analysis found a negative but significant association between farm workers strike and wine production (-0.751). The results further revealed a negative but insignificant relationship between farm workers strike and wine exports in rand value (–0.651) and a strong and positive relationship between grape production and wine exports. The analysis found farm workers strike to have a positive and significant (0.453) effect on wine production and exports in the short-term but in the long-term, the relationship reveals an insignificant relationship between farm workers strike grape production.The insignificant relationship could be attributed to substitution effects of farm workers with machines which are more efficient with reducing capital investments in the long-run. Overall, the short-term relationship showed a significant Error Correction Coefficient with an expected starting point of 41.9% adjustment rate towards long-term equilibrium within a year. Findings from the analysishave shown that, any form of labour strikes may have detrimental effect on the economy in the form of unemployment in the long-run and decreasing wine productivity and exports in the short-run. Farmers suffers from the loss of income and reduced margins which results in the lay off workers ascosts cutting for long-term sustainability of farms.

Keywords: Farm Workers Strikes, Wine Production, Substitution Effects, Minimum Wage

1. Introduction

The debate surrounding the right of workers to strike as enshrined in the Constitution of South Africa has both negative and positive effect on South Africa's productivity and export but is regarded as a sign of healthy democracy. According to Department of Labour (2004), labour strike can be defined as "the partial or complete refusal to work, or the retardation or obstruction of work, by people employed by the same employer or by different employers, for the purposes of remedying a grievance or resolving a dispute in respect of any matter of mutual interest between employer and worker, and every reference to work in this definition includes overtime work, whether it is voluntary or compulsory". Jacobs& Yu, (2013) further stated that, strikes can be considered by some as a way of establishing a good employer and employee relationship as it indicates the presence of a democratic economy even though strikes could entail economic costs that can be quiet enormous, depending on the sector affected, the strike period, and the number of workers participating in that strike. Workers strike for a number of reasons, which include but not limited to: better wages or to halt a wage decrease, unfavourable working conditions, unfair treatment, equity and equality. An example is South Africa's economylosing approximately 0.4% of its growth for the year 2013/2014 as a direct consequence of the Platinum strike that lasted about 5months in the year 2014 (Schussler, 2014).

There are, however, other types of industrial actions that workers take, that may be confused with striking. These include lockouts, work stoppages, secondary strikes, picketing, collective bargaining and also protected and unprotected strikes. Lockouts are the employers' form of industrial action in order to compel workers to yield to a specific ultimatum set out by the employers Clifford *et al* (2014). This happens through employers preventing employees from entering the place of employment or blocking the premises (Venter & Levy, 2014). Work stoppages on the other hand, are basically developed from an arrangement of procedures and consists mainly of two features according to the Departments of Labour. The form of action is both a strike and a lockout, where an action is started by the employees and the employers react in the form of a lockout. A secondary strike exists when a strike expands due to the workers of another employer going on a strike. Protected strikes are strikes which are within the law, while unprotected are illegal and could lead to severe consequences for the workers (Department of Labour, 2004).According to Venter & Levy (2014), picketing is regarded as an additional action to striking. It is used to make the incidences of labour disputes public by keeping guard or monitoring the location near to where the strike is happening, usually used to help win over the public sympathy. Collective bargaining is used to influence a sense of balance between employers and employees, (Venter & Levy, 2014).

1.2 History of Strikes in South Africa

South African workers have often been passive victims of exploitation, especially during the pre-democratic era. Post democratic era have herald strikes as a go to method when employees experiencing injustices and this is not limited to South Africa but the world at large. Unfortunately, major strikes in South Africa are not driven by conditions of work but are politically motivated due to the close associationbetween trade unions, the ruling party and the proximity to state power (Clifford, Dekker, Hofmeyr, 2014).

According to the Department of Labour, South Africa currently has over 190 registered labour unions and these unions are competing for membership and strikes are tools which unions used to galvanise and attracts new membership and controlpower within specific industries. As membership of a particular labour union increases, so is their influence and ability to control workers as well as collective bargaining being more effective than if an individual worker were to strike(Grabianowski, 2006). Some of the basic objectives of labour unions according to Pons & Deale (1998), include:

- To organize and unite all workers employed in all the industries covered by these constitutions into one strong national union.
- To protect and further the interest and promote the welfare of members.
- To affiliate with, confer or enter into arrangements with any other trade union or labour organisation and to work towards one federation of trade unions to unite and represent all workers in South Africa.

- Establishing contacts between the employees and the employers by playing the role of bringing notices of grievances and difficulties of the workers,
- Securing workable facilities and conditions for workers as most businesses do not provide employees with proper working conditions.
- Provision of labour welfare

South Africahas one of the highest rates of industrial action, with the country's strikes being among the most violent in the world. There have been, according to Odendaal N. (2014), five workers strikes that almost brought South Africa to a stand-still. These include:

- The Public Servant strike of 1999 which at the time was the biggest post democratic strike South Africa has seen. About 600000 workers downed tools demanding a 7.5% wage or salary increase, while the government was offering 6.3%. The strike started in January 1999 and end in August same year.
- The public servant strike of 2007 which lasted for 28 days and most schools and hospitals were closed. Public servants rejected governments' offer of 5.3% and demanded 12% salary increases and was supported by the public transportation systems such as taxis and buses with over 43 marches countrywide and ended with a 7.5% salary increase.
- The Public servants strike of 2010/ 2011 where over 1.3million public servants including teachers, health practitioners and nurses, embarked on a 20 day long strike. Economists estimated that the strike cost the country billions of rands a day.
- Doctors' strike in 2009to have their salaries increase by more than 50% than it was and to improve their working conditions. The increase in salaries was prompted by the failure of the government to implement the Occupational Specific Dispensation (OSD), decided on two years earlier. This would see salaries increasing in line with international standard. The duration of strike was from the 17 of June to the 3rd of July 2009.
- Farm workers strike in the year 2012 generally refer to as the "De Doorns" farm workers strike which lasted for four months.. The ramifications of the strike on the Agricultural Industry as a whole was far reaching andis discussed in this paper as it played a major role in grape production, wine manufacturing and exports in South Africa.

According to the South African History Online SAHO (2013) that reported on the farm workers strikes, exploitative practices are common on farms across South Africa. Workers are paying rent, electricity and water to farm owner given the lower than market wages they received from employers. Farms are often isolated and far from shops or urban areas, so for food and other essentials workers rely on the farm owner for transportation and they pay transport fare to farm owners. This practice of relying on the farm owners often leaves the farm workers indebted to farm owners. The Human Rights Watch report (2012), indicated that only 3% of farm workers in the Western Cape belonged to a Trade Union. This low percentage of unionised workers weakened the workers bargaining power as workers who do not belong to a Union could not strike as partaking in any form of strike may result in losing their jobs.

> *We have paid for the caskets of your families. We have paid for their funerals. We have carried their caskets in church with you, cried with you and mourned with you . . . We have bought your children's school clothes . . . I have personally loaned my wedding dress to staff, and the only ball gown I own has been worn to many of your children's matric dances . . . When you were hungry we have brought you food, when you forgot your lunch I have made you sandwiches. You have been part of our family and part of every celebration we have ever had. If you want to strike today, then don't bother coming back."*
>
> **Farm Owner in Letter to the Cape Times Before Planned Strike Action**

1.3 The Western Cape Farm Workers Strike

According to the South African Wine Industry Statistics (2017), there are over 3000 wine producers in South Africa. Furthermore, the South African Wine Industry Statistics (2017), estimates that the total area under cultivation for wine grape vineyards is about 94545 ha with over 279 655 430 vines. The main grape producing areas of South Africa are situated in the Eastern and Western Cape provinces, which are mainly characterized by warm dry summers and cold winters. A study by the University of

Cape Town (2013), reported that the Western Cape farm areas employs the highest number of labourers in the fruit and wine industry and pays significantly higher wages compared to other provinces in South Africa. On average, the minimum wage of a farm labourer was R69 a day (2012), but there are workers who were reported to get less R69/day. Farm workers rely on farm owners for their incomes, their children's school supplies and other necessities. Many of the permanent workers live and work in poor conditions, and worst of all, their cost of living is often increased by inflation while these workers are already struggling to meet their daily food requirements to live a healthy active lifestyle.

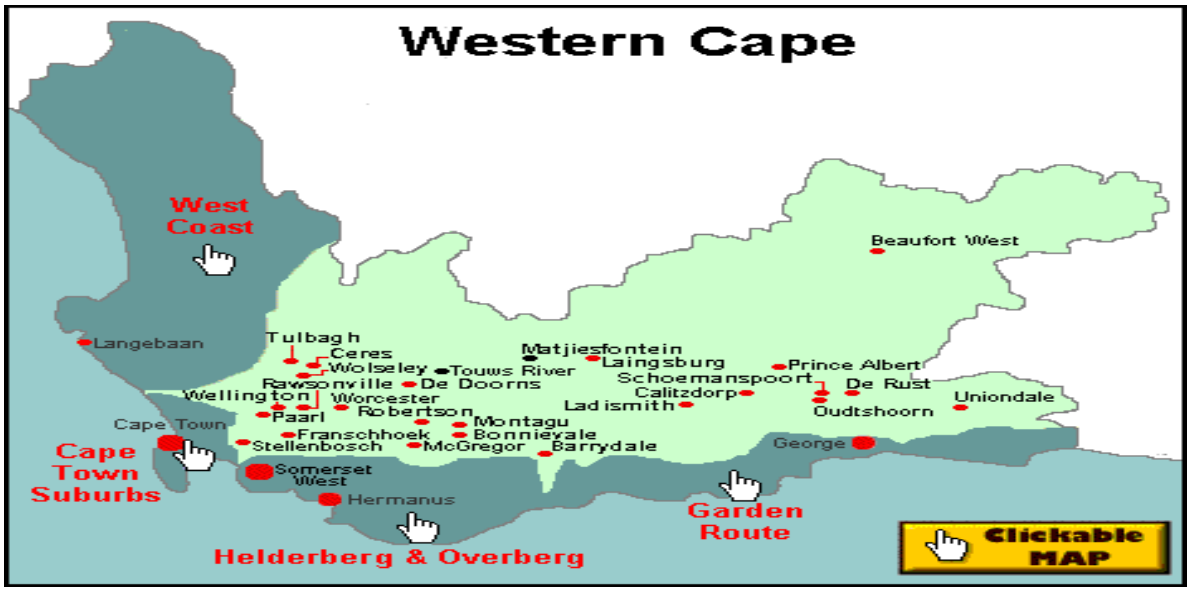


Figure 1. A Map of the Western Cape and all the Hotspots Where Farm Workers Strikes Took Place (2012/2013)

1.3.1 Phase One of the Strike

Phase one of the Western Cape strike occurred in August of 2012 at Kuerboschkloof Farm near De Doorn, Cape Winelands District Municipality. The strike was organized by female farm workers who were responding to new farm owners who wanted workers to sign new contracts with lower wages than the R69/day rate. The news of the strike quickly spread through the Western Cape and escalated in October 2012 where clashes between farm workers and law enforcers were reported. De Doorn was the epicentre for the strike activities with initial protests having a total of 800 protesters. The protest later escalated and a total of 16 towns involving thousands of workers joining the strike action. The increase number of strikers got the attention of the government as the strike spread across South Africa.

The workers did not only strike to stop the decrease in wages, but also demanded that wages be increased from R69 to R150 per day. Other demands included that they also get paid during rainy days when they are unable to perform their tasks. They also demanded a 8 hour working day, paid annual leave and that the farmers do away with labour brokers so they are directly employed by the farmer and also seasonal workers. Woman called for equal wages to men and paid maternity leave. The labourers further called for free housing and improved living conditions free water, subsidized or free electricity, a pause on evictions, and an end to police brutality.

Workers also wanted the farm owners to stop intimidations as there were reports that farmers were threatening to reduce wages or retrench the workers that went on strike. The strikers gave the government up till the 4th of December 2012 to respond to their demands. The then Minister of Labourannounced the following agreements made by the parties involved:

- That matters pertaining salaries, dismissal, disciplinary action against farm workers, evictions and intimidation on the farms should be addressed urgently.
- That a two-aside task team be delegated and establish a mediation task team which will evaluate and assess all complaints brought by workers and farmers.
- The arbitration task team would try to solve issues of workers and farmers through a

process of facilitation and dialogs.

- That in the event that this issues remains unresolved, they would be referred to the appropriate mediums that has a legal obligation to address the complaint.
- That the task team would involve the Bureau for Food and Agricultural Policy (BFAP), as suggested by AgriSA and supported by all parties involved, to provide an agricultural economic analysis that will inform the parties in their negotiation.

1.3.2 Phase Two of the Strike

On the 4th December 2012, strikes continued as both farm workers that returned to work and those that remained striking claimed that there were no grounds to reach any compromise and there was failure by government in reaching an agreement on minimum wages. By early January 2013, most workers who did not belong to a union went back to work except for the De Doorn workers who were still adamant of getting R150 pay per day.

The strikes caused strain and violent conflicts in the farm communities where a number of farm workers were wounded or arrested during clashes with police officers. The farmers also reacted differently to the implication that the strike had on their farms and businesses. Some negotiated wages with their labourers and reached an agreement. There were also reports of retaliatory action against farm workers by farm owners wheresome farm owners went to the extent of retrenching workers who participated in the strikes and kicking them and their families out of the farms. Some farmers increased the rent by 100%, threatening evictions if labourers werenot able to pay their rent. Many of the permanents workers were dismissed from farms, evicted and replaced by seasonal workers employed through labour brokers that the farm workers were initially fighting against. There were also farm workers who claim that they have been black listed by their previous employers, making employment by other farmers virtually impossible. It was estimated that from August 2012 when the strikes began to January 2013 when it ended, 9000 farm workers have gone to strike.

2. Materials and Methods

In this study, data were sourcedfrom the National Treasury of South Africa, abstract of agricultural statistics from Department of Agriculture and Forestry (DAFF), South African Wine Industry Statistics (SAWIS), Economic Conditions Commission (ECC) of South Africa. The focus areas were occurrence of strike, wine production and food prices from 2008 to 2017. The data were analysed using Pearson product-moment correlation, trend tables and graphs as well as vector error correction model.

- **Pearson Product – Moment Correlation Model**

The Pearson product-moment model is widely used in social sciences as a measure of the degree of linear dependence amongst variables. The correlation coefficient is a measure of the linear strength and direction of the correlation between two specified variables $X_1, X_2 ... X_n$.

The coefficient value ranges from -1 to 1, whereby 1 is total positive correlation while 0 is no evidence of correlation, and −1 is total negative correlation. The Pearson's correlation coefficient is commonly represented by the Greek letter ρ (rho) when applied to a population and can be referred to as the *population correlation coefficient* or the *population Pearson correlation coefficient* (Choudhry, 1995). The formula for $\rho$is:

$$\rho_{X,Y} = \frac{Cov(X_1, X_2)}{\sigma_X \sigma_Y}$$

Whereby:

$Cov(X_1, X_2)$ = Covariance of X_1 and X_2

σ_{X1} = The standard deviation of X_1

σ_{X2} = The standard deviation of X_2

Therefore the correlation function amongst Str, G_p and W_{exp} can be summarized as follows:

$$\rho_{W,L,Fp} = \frac{Cov(Str, G_p, W_{exp})}{\sigma_W \sigma_L \sigma_{Fp}}$$

Whereby:

$\rho_{W,L,Fp}$ = Correlation amongst (Str, G_p, W_{exp})

$Cov(Str, G_p, W_{exp})$ = Covariance of Str, G_p and W_{exp}

σStr = Standard deviation of Str,
σG_p = Standard deviation of G_p,
σW_{exp} = Standard deviation of $W_{exp,}$
Str = Workers strike occurrence,
G_p = Grape production
W_{exp} = Wine export

3. Vector Error-Correction (VECM)

In this study, a Vector Error-Correction (VECM) method was employed. According to Choudhry (1995), this model is capable of overcoming spurious regressions problems and provides consistent and reliable estimates of short and long-run factor elasticities that satisfy the characteristics of the classical Ordinary Least Squares (OLS) regression analysis. This is because all chosen variables involved in an Error Correction Model (ECM) are integrated of order zero, I (0). Spurious regression is inconsistent and indistinct when it comes to the measurement of short-run and long-run elasticities (McKay *et al*., 1999). Given that, the empirical model to estimate the effect of wage rate on food prices and unemployment in this study is given as:

W_{exp}= *f* (G_p, Str, Trend)
In= Natural logarithmic element,

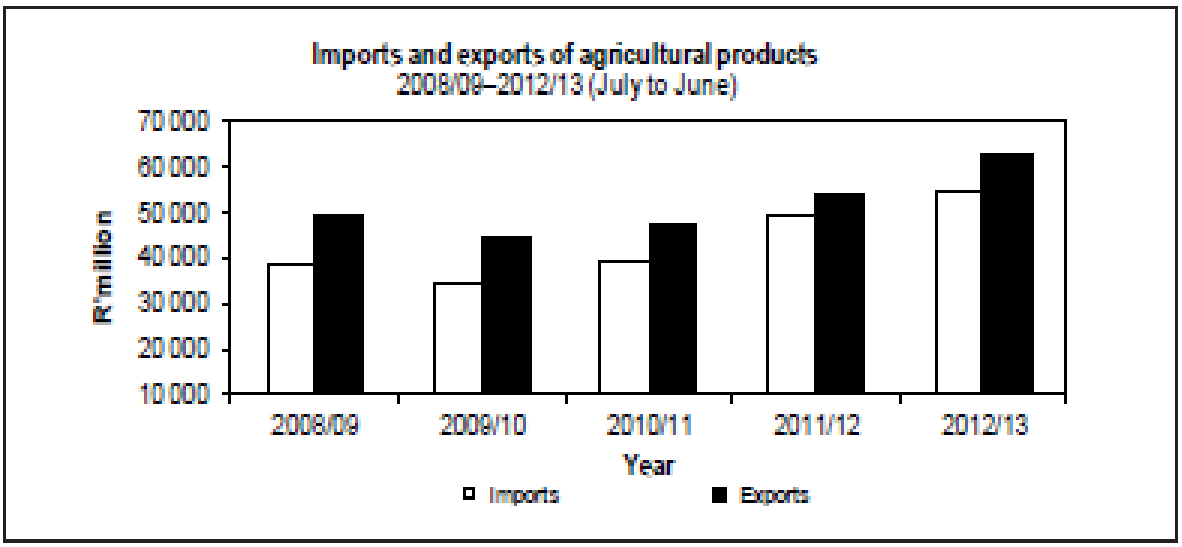
The model is represented as:

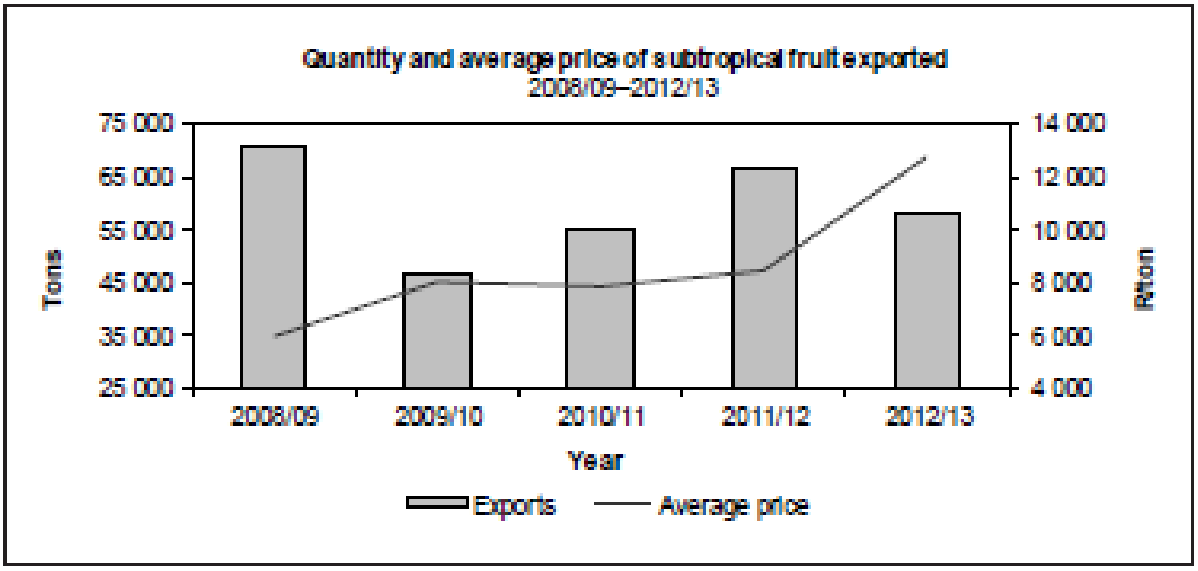
$$\Delta L\, n\, W_{exp} = \lambda (ln\, W_{pro} + \alpha_0 ln\, Str_t - \gamma Trend - \delta_0) + \rho \Delta ln\, Wexp_{t-1} + \alpha 1 \Delta ln\, W_{prot-1} + \delta_1 + \eta Fp_t + \mu STRU$$

Where by:
ln W_{exp} : Natural logarithm of wine export
lnG_p : Natural logarithm of real relative price of grape production.
Trend : Time trend
α_0, β_0 and γ : Coefficients of the variables in the long run relationship
λ : Error Correction Term (ECT).
α_1, β, ρ, η, μ : Coefficients of the variables in the short run.

4. Results and Discussion

The effects on trade was based onthe estimated value of imports for 2012/13 which amounted to R54 778 million, an increase of 12.3% from R48 790 million for 2011/12. The value of exports however, increased by 16.4%, from R53 898 million in 2011/12 to R62 750 million in the year 2012/13 (Department of Labour, 2013). According to the 2012/13 export values, citrus fruit (R7 981 million), wine (R6 965 million), maize (R5 294 million), apples, pears and quinces (R5 172 million) and grapes (R4 576 million) were the most important agricultural export products. The end of the production year 2012 sees a lower yield of wine produced (1 056 840 895 litres) and export (417 217 299 litres) quantity than that of 2013, that is wine produced (1 098 169 525 litres) and exported (525 584 957).





Source: SA Wine Industry Statistics

Figure 2. South African Wine Industry Performance (Wine Produced Authors Calculation)

From the agricultural sector performance of 2013 Figure 2 above, it was noted that export of fruits produced in the country was significantly lower in 2012/2013 probably attributed to the farm workers strike due to high loss in yields. The already constrained agricultural sector of South Africa experience huge losses with having to compete in the international markets, buyers demanding higher quality (Wilderman, 2014). Business Tech reports that Billions of rands were lost during the strikes and work stoppages.

4.1 Results of Pearson Product – Moment Correlation

The result of Pearson product-moment correlation is depicted in Table 1.The result was aim atdetermining the association between Wine export (W_{exp}), Wine production (W_{pro}) and farm workers strikes (*Str)* at 5 % level of significance. Tthe results reveal a positive association exist between wine export and wine production in South Africa. This may be due to reduced wine prices as wine production increases as supported by Van Royen (2011) who stated that, there is a positive association between wine production and export. Furthermore, as the minimum wage rates of unskilled farm workers increases, so does the number of farm workers retrenchment (-0.651) also increases the finding is

contrary to that of a study conducted by Lemos (2003) in Brazil. Although The Brazilian case was different from South Africa due to the existence of many alternative institutions/sectors capable of absorbing unskilled labour force retrenched by the agricultural sector. This caused both the supply and demand side of unskilled labour to be competitive. The supply side of Brazil was relatively more inelastic compared to South Africa where supply of unskilled labour is relatively elastic.

Table 1. Correlation Matrix on the Association between Wine Export (W_{exp}), Wine Production (W_p) and Strike Occurrence (F_p)

	W_{exp}	W_{pro}	Str
W_{exp}	1		
W_{pro}	0.651	1	
Str	0.011	0.001	1

Source: Author's analysis (2000 to 2017)
Note: Values are run at $p<0.05$

Furthermore,a positive (0.021) association was established between Wage rate (W) increases and food prices (F_p). In South Africa, the wage bills of unskilled farm workers constitute more than 50% of farmers operational costs, as such, any increase in minimum wage rate will be transferred in the form of higher output prices in the short-run period. This is explained by the fact that in the short-run, farmers cannot retrench workers and substitute them with machines/technology due to stringent labour laws and the costs associated with these changes. The analysis further revealed no association (0.001) between employment and food prices (F_p) in the South African economy. Despite the rise in minimum wage the disposable income of unskilled farm workers does not rise enough to offset the increases in food prices. The reason being that, households with lower income spend greater than 60% of their monthly income on food resulting in no significant change in overall food prices. This finding is consistent to that of Frye and Gordon (1981), which focused on the impact of Government intervention (e.g. minimum wage increases) in the US inflation. The study revealed that a 10% increase in the minimum wage of unskilled workers was found to increase overall inflation by 0.02 percentage points.

4.2 Estimating the Vector Error Correction Model

The Vector Error Correction Model (VECM) was further employed to determine the long run relationship between workers strikes, wine production (W_{pro}) and wine exports (W_{exp}). Hallam and Zanoli (1993) stated that, a high R^2 in the estimated long-run regression equation is required in order for the equation to reduce the effect of small sample size bias on the estimated co-integration regression parameters (α_0, β_0 and γ). This effect can be carried over to the estimates of the error correction model.

When applying the error correction model, the Granger causality test implies causality from the independent variables in levels to the dependent variable which is wine production (W_{pro}). Engle and Granger (1987) supported this statement by indicating that, causality has to exist in at least one direction of integration if there is co-integration amongst two or more variables in a regression equation. Furthermore, testing for Granger causality requires testing whether the Error Correction Coefficient (ECC) is significantly different from zero. Even, if the coefficients of the lagged changes in the independent variables are not statistically significant, Granger causality still can exist as long as ECT is significantly different from zero (Choudhry, 1995). As a result, the models specified in Table 2 indicate the significance of the ECT which also indicates the presence of granger causality for the independent variables to the dependent variables.

The estimates of VECM for wine exports and workers strike occurrence with an R^2 of 63.4% were significant at 1% level. The long-run co-integration response model revealed that, the strike occurrence mainly in the Western Cape Province has a positive but insignificant effect (0.453) on wine production. This implies that in long-run, wine production and hence exports are not affected by the occurrence of workers strike actions. This relationship is based on the hypothesis that was put forward in the application of the model. Moreover, the Time trend effect was also found to be positive and was highly significant at 5 percent. The trend variable showed the positive response of wine production and export due to change in technology and information access over time. The short-run relationship showed the

error correction term with the expected sign and level of significance of approximately 61% adjustments rate towards the long-run equilibrium of unemployment in agriculture. The analysis also found that, planned supply is significantly affected by the dummy variable for structural break (DUM) in 2012 when minimum wage policy was implemented (see Table 3).

Table 2. Vector Error Correction (VEC) Estimates of Wine Export (W_{exp}) and Grape Production (G_p)

Variables			**Long-run**
ln W_{exp} (-1)			1.000
lnW_{pro} (-1)			0.453 (0.180)*
Trend (Time)			0.009 (0.004)*
Constant			13.808
Short run *Δ Ln* W_{exp}			
Error Correction	**Coefficient**	**S.E**	**P-Value**
CointEq (ECC)	-0.506		
Δ *ln* W_{exp} (-1)	0.032		
Δ *ln* W_{pro} (-1)	-0.139	0.116	0.000
Constant	0.086	0.127	0.778
DUM	0.314	0.081	0.093
R^2	0.484	0.101	0.393
Adj. R^2	0.414	0.061	0.000
F-statistic	6.939		
AIC	-1.471		
SIC	-1.225		
DW stat	3.285		

Note:*Significance at 5 % level, figures in parenthesis denotes standard error, S.E.: Standard error, DUM: Dummy for structural behaviour of unemployment due to policy change, AIC: Akaike information criterion SIC: Schwarz information criterion, DW stat: Durbin: Watson stat, TREND: Time trend, ECC: Error correction coefficient, SE: Standard error, LnW_{pro}: Natural logarithm of price of Wine production.

Similarly, the model for wine exports was estimated and the VECM estimates showed an R^2 of 54.5% at a significant level of 5%. The long-run relationship indicated a negative response of farm workers strike occurrences in South Africa. Agricultural supply was observed to be price elastic in the long-run but price inelastic in the short-run. The short-run relationship also showed a very significant ECT with an expected starting point of approximately 41.9% adjustments rate towards the long-run equilibrium within a period of one year. The structural dummy also observed is very important in explaining policy change within the agricultural labour market.

Table 3. Short-Run and Long-Run Vector Error Correction (VEC) Estimates of Wine Export (W_{exp}) and Strike Occurrence (Str).

Variables		Long-run	
ln W_{exp} (-1)		1.000	
ln Str (-1)		1.168(0.38296)*	
Trend		(0.00501)*	
Constant		-13.092	
Short run Δ Ln L_t			
Error correction	**Coefficient**	**S.E**	**P-Value**
CointEq (ECC)	-0.453	0.110	0.001
Δ *ln* W_{exp} (-1)	-0.015	0.141	0.858
Δ *ln* Str(-1)	0.247	0.156	0.121
Constant	0.077	0.114	0.505
DUM	0.185	0.053	0.001
R^2	0.634		
Adj. R^2	0.261		
F-statistic	3.964		
AIC	-1.239		
SIC	2.112		
DW stat			

Note:*Significance at 5% level, figures in parenthesis denotes standard error, S.E.: Standard error, DUM: Structural break dummy of wine export (W_{exp}) , SIC: Standard industrial classification (agricultural sector), DW stat: Durbin: Watson stat, Trend: Time trend, ECT: Error correction coefficient, SE: Standard error, Str: Natural logarithm of strike occurrence.

5. Conclusion

The paper focused on the impact of the occurrence of farm workers strikes on wine production and export in South Africa. The impact was done by applying the error correction model (EMC) to determine the short-term and long-term relationship amongst various variables such as; the relationship between farmworker strikes and wine production, farm worker strikes and wine export as well as grape production and wine export.

The model found that there was a negative but significant relationship between farm worker strikes and wine production, and a negative but insignificant relationship between farm worker strikes and wine exports. There also exists a positive relationship between grape production and wine production. These relationships can further be said to have a negative impact on the cost of production and therefore affecting prices of products sold which translate to high unemployment levels as a result ofdoubling workers' wages which increases the financial strain on both the farmer and farm worker. The effect was retrenchments of workers in order to adjustincreasing wages bills. Furthermore, there was cutting down on operations thereby reducing farmers' capacities to produce grape and wine. The strikes also led to a decrease in sales both locally and internationally through decreases in exports in the years following the strikes.

The studyrecommends that, farm workers form meaningful organizations that foster transformation and lobby for long term changes in the industry. This can be achieved through Government subsidisation of farmers through cost cutting technologies and reskilling of farm workers to access alternative jobs or ability use new technologies and adapt to the ever changing dynamics of the industry.

References

Choudhry, T. (1995). Long-run money demand function in Argentina during 1935–1962: Evidence from cointegration and error correction models. Applied Econ., 27, 661–667.

Cliffe, Dekker, Hofmeyr. (2014). Employment strike guideline. https://www.cliffedekkerhofmeyr.com/export/sites/cdh/en/practiceareas/downloads/Employment-Strike-Guideline.pdf [Accessed: 20 April 2018]

Daily Vox,Daily Vox: Five strikes that almost brought SA to its knees, 2014, https://www.dailymaverick.co.za/article/2014-07-01-daily-vox-five-strikes-that-almost-brought-sa-to-its-knees/#.Wvkiie-FPIV Access sate: 2 May 2018

Department of Agriculture, Forestry and Fisheries. 2013. Trends in the Agricultural sector 2013,
http://www.daff.gov.za/docs/statsinfo/Trends13.pdfAccess date: 09 May 2018

Department of Labour. (2012). *2011 Annual Industrial Action Report*. Pretoria: Department of Labour, Government of South Africa

Department of Labour. (2013). *2012 Annual Industrial Action Report*. Pretoria: Department of Labour, Government of South Africa

Department of Labour. (2014). *2013 Annual Industrial Action Report*. Pretoria: Department of Labour, Government of South Africa

Frye, J. and Gordon, R.J., 1981. Government Intervention in the Inflation Process: The Econometrics of" Self-Inflicted Wounds". *The American Economic Review*, *71*(2), pp.288-294.

Grabianowski, E. 2006. How to strike. https://money.howstuffworks.com/strike7.htm Access date: 28 April 2018

Hadenn, A. 2017. How much money does the South African economy lose through strikes?. https://www.thesouthafrican.com/how-much-money-does-the-south-african-economy-lose-through-strikes/ Access date: 9 May 2018

Hallam, D. and Zanoli, R., 1993. Error correction models and agricultural supply response. European Review of Agricultural Economics, 20(2), pp.151-166.

Jacobs, T. and Yu, D., 2013. An Overview of Strike Activities in South Africa, 1999-2011.

Mondal, P. 2014 . Trade Union Functions: Top 6 main functions performed by Trade Unions. http://www.yourarticlelibrary.com/trade-unions/trade-union-functions-top-6-main-functions-performed-by-trade-unions/32989 Access date 2018

Odendaal, N. 2014. South Africa one of the worlds' most violent, strike-prone countries. http://www.miningweekly.com/article/sa-one-of-the-worlds-most-violent-strike-prone-countries-2014-08-06 Access date: 12 May 2018

Pons, A. & Deale, P. 1998. Labour Relations Handbook: a practical guide on effective labour relations policies, procedures, and practices for South African managers. Cape Town : Juta

Public sector workers fight for a living wage, 1999, http://cosatu.org.za/show.php?ID=1952 Access date: 13 May 2018

South African History Organization, 2015, http://www.sahistory.org.za/article/western-cape-farm-workers-strike-2012-2013 Access date: 3 May 2018

South African History Organization, http://www.sahistory.org.za/archive/strikes-and-industrial-actions Access date: 20 April 2018

South African Wine Industry 2017 Statistics NR 42, 2017, http://www.wosa.co.za/wosadocs/62018/Book_2017_statistics_year_english_final.pdf Access date: 01 September 2018

South African Wine exports analysis 2008 – 2013, 2014, https://www.wosa.co.za/knowledge/pkdownloaddocument.aspx?docid=3239 Access date: 01 September 2018

The Mandela Initiative, Examining the impact of strikes on the South African economy, 2017, http://www.mandelainitiative.org.za/the-impact-of-strikes.html Access date: 24 April 2018

The South African Health News service, Doctors halt the strike, 2009, https://www.health-e.org.za/2009/07/02/doctors-halt-the-strike/ Access date: 14 May 2018

Van Rooyen,J. Esterhuizen,D, Stroebel, L. 2011. Analyzing the competitive performance of the South African Wine Industry. International Food and Agribusiness Management Review Volume 14, Issue

4, 2011
Venter, R. & Levy, A. (2014). *Labour Relations in South Africa*. Goodwood: Oxford University Press
Wilderman, J. 2014. Farm Worker Uprising in the Western Cape: A Case of Protest, Organising, and Collective Action (Doctoral dissertation, University of the Witwatersrand, Faculty of Humanities, School of Social Sciences).
Williams, M.S., 2017. Examining the economic impact of industrial action activities in South Africa, 2003-2014.
Zille, H. Real story behind farm strikes. 2013, https://www.iol.co.za/capetimes/real-story-behind-farm-strikes-1488904 . Cape Times. Access date: 08 May 2018

ORANGE BUYING AND CONSUMPTION HABITS: A SEGMENTATION OF TUNISIANS CONSUMERS

Arfa Lamia
National Agronomic Institute of Tunisia INAT, Laboratory of Rural Economy, Tunisia

Erraach Yamna
National Agronomic Institute of Tunisia INAT, Laboratory of Rural Economy, Tunisia
Email:emna_raach@ yahoo.fr

Abstract

The current study focuses on understanding Tunisian consumer behaviour in relation to fresh oranges: among others level and frequency of consumption, different uses, establishments purchase, buying motives and quality perception. It further seeks to identify and describe consumer segments based on the main factors that influence consumer purchase intention. The data used was obtained from a face to face survey to 398 consumers conducted during March 2018.

As the number of variables used in this study to explain determinants of purchasing intention of oranges is quite extensive, an exploratory factor analysis was performed to facilitate the interpretation of the variables. The results indicated that the main determinants factors of consumers intention to purchase fresh oranges are associated with "nutritional and health benefits", "budget constraint", "taste and freshness", "purchasing context" and "origin and variety".

Three consumer segments were identified using Cluster analysis and based on determinants of purchase intention: segment 1 (22.1%), segment 2 (47.7%), and segment 3 (30.2%).

The study deals with a little explored topic, thus the identification of different determinant of fresh oranges consumption and socio-demographic features may provide an opportunity for the farmers to develop marketing strategies that will meet demands of different consumers.

Keywords: Fresh Oranges, Consumer Segments, Purchase Intention, Consumption, Tunisia.

A PANEL DATA ANALYSIS OF ALGERIAN FOOD EXPORTS: A GRAVITY MODEL APPROACH

Mohamed Assad Allah Matallah
Higher National School of Agronomy, Department of Rural Economics, Algeria

Mohamed Amine Benmehaia
University of Biskra, Department of Agricultural Sciences, Algeria
Email: amine_benmehaia@ yahoo.fr

Abstract

In this paper, a gravity model approach was employed to analyze the major factors that influence Algerian food exports to the entire trading partners (98 countries) for the period 2001-2017. In accordance with the panel data analysis with WLS regression method, more consistent results were obtained. The results indicate that there is an increased propensity for food exports. Besides, the main factors to Algerian food exports are partner countries' growth, domestic demand and the common culture and border. All these factors affect the country's exports positively. Transportation costs, proxied by distance, have negative andsignificant effect on Algerian food exports. Results allow us to reveal the countryspecific effects through a ranking and shows that neighboring countries are in the top 10 list. Nevertheless, the existence of trade agreement has a significant negative effectwhich reflects the fact that trade gains from the trade agreements have been minimal for Algerian food exports.

Keywords: Food Exports, Gravity Model, Data Panel, Regression, Algeria.

1. Introduction

The food trade exchange of Algeria with other countries do not show any hopeful sign providing a significant contribution to the country's economic development. This is mainly due to low export trade of Algeria compared to its import trade. Therefore, it is essential to find out the determining factors of Algeria's food exports in order to help agricultural policy makers and planners to undertake appropriate measures to improve trade performance with special reference to food safety.

However, the overall performance of Algeria's agricultural exports since the 1970s has been extremely problematic. One of the main characteristics of Algerian exports structure is that food (and agricultural products) exports is strictly less than 1% since 1980 until now (with an average of 0.39%). In 2017, Algerian food exports are in absolute value about 349 million US$, which represents a share of 0.99% in the total exports!Nevertheless, we perceive a clear increasing (positive) trend in this share last decade shifting from 0.13% in 2006 to 0.99% in 2017.

In this challenge in exports structure, it is important to enhance the Algerian's export potential at global level in general and regional level in particular. Thus, this study aims to apply gravity model analysis for this purpose. This study is predominantly concerned with exploring and describing food exports for Algeria by revealing its main determinants and its basic characteristics. These will be derived using panel regression analysis from the overall importing partners (98 countries) over a period of 17 years(2001-2017).

Indeed, the gravity model has been used extensively during the last five decades, since the pioneering work of Tinbergen (1962), in explaining bilateral and multilateral trade flows.Literature review on theoretical and empirical developments of gravity modeling approach of trade are abundant and the main references are Anderson (1979), Bergstrand (1985, 1989) and more recent comprehensive review is Head and Mayer's (2014) chapter.

The rest of the paper is organized as follows: section 2 presents a brief overview of Algerian exports sector, section 3 describes the research methodology (including modeling approach, hypotheses and data used), section 4 is about results and discussion and section 5 concludes the paper.

2. Overview Algerian Food Exports

In this section, we briefly investigate the performance of Algerian food exports over the period 1974-2017 from CNIS (2018) data. In general, Algerian economy is characterized by the lack of economic diversification as a direct result of Dutch Disease (Ainas et al., 2012; Hausmann et al. 2010), and by its export market (Ainas et al., 2012) and alsoby weakly integrated into the global economy (Hausmann et al. 2010; Lakhdari et al., 2015). According to Teulon (2014), Algeria may be considered as a quasi-rentier country since its income is not based only on oil and gas extraction revenues but because it does not systematically have a surplus balance of trade.

Therefore, Algerian export is a key factor for both the domestic economic growth of Algeria and export generating sectors provide vital inputs for the growth of Algeria (Samad, 2011). Figure 1 shows the evolutionofAlgerian food exports, which climbed from 73 million dollars in 1982 to about 350million dollars in 2017.This corresponds to an average yearly growth of 16.07 percent during the period 1982-2017. Despite the increasing trend in food export values, it interesting to reexamine the facts in terms of the percentages of food exports in total Algerian exports. Figure 2 displays the percentage evolution of this share index over the period 1974-2017 (CNIS, 2018).

In comparing the share of Algerian food exports with total exports, Figure 2 clarifies that Algerian food exports a decreased trend over 1974-2017 with an average of 0.87%. This share has also fluctuated over the studied period and ranged from high values in 70s (about 3%) to its worst by tending to zero since 90s.

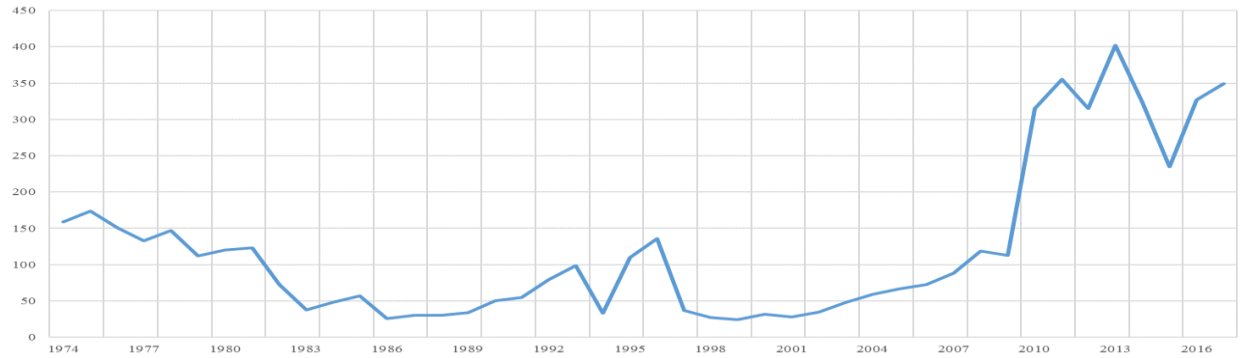


Figure 1. The Evolution of Algerian Food Exports (in Million US$)

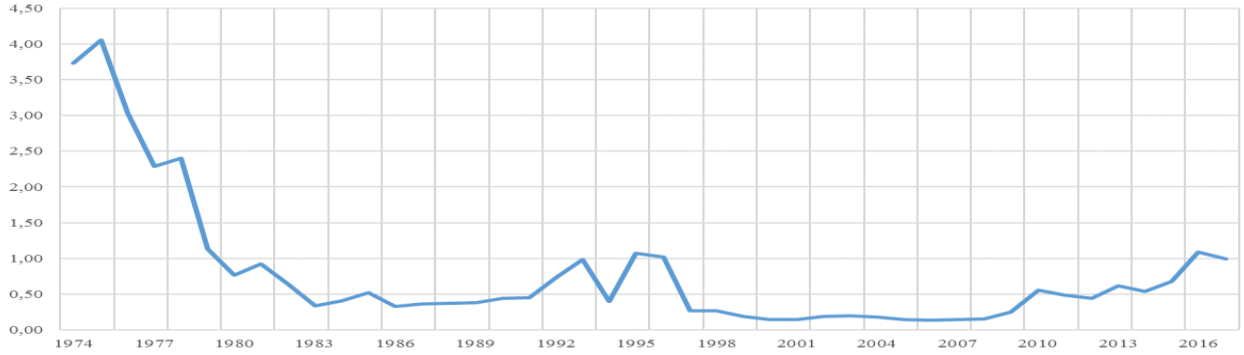


Figure 2. The Algerian Food Exports Shares in Total Exports

It should be noticed that the continued declines in shares since the last three decades may be explained by the increase of total exports, especially petroleum and otheroilexports in recent years.Nevertheless, we can perceive a slight increase in the last decade (since 2010). This could be explained by more expanding on investment promotion for export-oriented policy. The economic reasoning for this policy is based on the export-led growth hypothesis, which suggests that exports

contribute to economic growth, and hence, can be an effective mechanism to expand output, employment, and income and foreign exchange earnings.

3. Research Methodology

3.1 Modeling Approach

According to Newton's Law of universal gravitation, the standard gravity model describes that the force between two physical bodies is determined positively by each body mass, and negatively by the distance between them. This formulation can be generalized in terms of trade between countries as follows: the trade between the two countries is determined positively by each country's sizes, and negatively by the distance between them, by the following formula:

$$X_{ijt} = g \cdot Y_i^{\alpha} \cdot Y_j^{\beta} \cdot D_{ij}^{\delta} \quad (1)$$

where X_{ijt} is the flow of exports into country *j* from country *i*, Y_i and Y_j are country *i*'s and country *j*'s sizes, D_{ij} is the geographical distance between the countries and g is the gravity constant.

The generalized gravity model of trade states that the volume of exports between pairs of countries, X_{ij} is a function of their sizes(in terms of incomes – or/and populations – as standard measures), their distance (as a proxy of transportation costs) and a set of dummy variables either facilitating or restricting trade between them. However, additional variables might be added to improve the basic formulation of the selected gravity equation (Cortes, 2007).

In order to elaborate suitable explanatory variables in our model, we use the countries' GDP (**y**) and population (**p**) as measures of countries' size, and for the spatial dimension, we use the distance (**d**) between countries (in Kilometers) and a dummy variable for the existence of common border (**b**). We also add two dummy variables to reflect factors that influence trade namely: a dummy variable (**C**) for the common culture (with reference to the Arabic language and the Islam religion) and a dummy variable (Z) for the existence of trade agreement between Algeria and the importing country by using the multiplicative error term. Therefore, the simple empirical expression of our model is:

$$X_{ijt} = g \cdot y_{it}^{\alpha} \cdot y_{jt}^{\beta} \cdot d_{ij}^{\delta} \cdot e^{\mu} \quad (2)$$

and the secondempirical expression of our model is:

$$X_{ijt} = g' \cdot y_{it}^{\alpha_1} \cdot y_{jt}^{\alpha_2} \cdot p_{it}^{\beta_1} \cdot p_{jt}^{\beta_2} \cdot d_{ij}^{\delta_1} \cdot b_{ij}^{\delta_2} \cdot C_{ij}^{\omega_1} \cdot Z_{ij}^{\omega_2} \cdot e^{\mu} \quad (3)$$

which omits the cross-sectional unit-time effects. The third empirical expression of our model is:

$$X_{ijt} = g' \cdot y_{it}^{\alpha_1} \cdot y_{jt}^{\alpha_2} \cdot d_{ij}^{\delta_1} \cdot b_{ij}^{\delta_2} \cdot C_{ij}^{\omega_1} \cdot Z_{ij}^{\omega_2} \cdot e^{\mu} \quad (4)$$

considered as a full empirical expression omitting the population variables and re-including the cross-sectional unit-time effects.The modeling of Algerian food exports flow will be based on the log-linear form of thesetwo equations.In our estimation, we have used balanced panel data, and time and individual effects are included in the regressions. From the initial regression results, it has been suggested that weighted least-squares (WLS) of panel estimation is the appropriate model for our study.

Our methodology and hypotheses follow the main empirical studies on gravity model applied to exports, namely: Abu Hatab et al. (2010) and Elshehawy et al. (2014) for Egypt, Özer and Koksal (2016) for Turkey, Sevela (2002) for Czech, Butt (2008) and Abbas and Waheed (2015) for Pakistan, Rahman (2003, 2010) for Bangladesh, Boughanmi (2008) for EAU, Batra, (2006) for India, Abidin and Sahlan (2013) for Malaysia.

3.2 Hypotheses

In this study, the gravity modeling of Algerian food exports will exhibit the factors that determine Algeria's food exportation and they are expected to help us understand Algerian trade patterns through the WLS panel regression, which ignores certain problems experienced with panel data analysis. In this strategy, knowing the determinants of export markets will certainly help food exports. Thus, this study will evaluate the six hypotheses below: Hypothesis 1 about thefood exports propensity: We expect positive propensity of food exports. Hypothesis 2 on the size effects: We expect positive signs for α, α_1, α_2, β, β_1 and β_2. Hypothesis 3 on the distance effects: We expect negative signs for δ and δ_1.

Hypothesis 4 on the common border effect: We expect positive sign for δ_2. Hypothesis 5 on the common culture effect: We expect positive sign for ω_1. And finally, the Hypothesis 6 about the presence of trade agreement: We expect positive sign for ω_2.

3.3 Data

In this study, an export-gravity model is presented using total food exports from Algeria to the worldwide. The panel covers the whole 98 importing countries. The data collected for the period of 2001 to 2017 (17 years). We cannot go beyond this period because data are not available.

The data regarding food exports were obtained from the National Center of Information and Statistics (CNIS, 2018) database in current US$.The variables of Gross Domestic Product (GDP) and the population data between 2001-2017 are obtained from the statistics reports of the World Bank (2018).The distance between the importer country and Algeria is from the official website of distancefromto.net, and for the existence of trade agreements between the importer country and Algeria, the data was obtained from the report of the Head Department of Investment Promotion (DGPI, 2018) of the Algerian Ministry of Industry and Mines.

4. Results and Discussion

The collected data were inserted and processed by Gretl© v.3.2017, where the appropriate function of their logarithm was applied. The main descriptive statistics (mean, standard deviation, maximum and minimum values) are shown in Table 1.

Table 1. Descriptive Statistics of Variables Used in the Model

Variable	Mean	S.D.	Min	Max
log_food_export	10.320	8.529	0.000	22.530
log_gdp_dz	25.600	0.440	24.730	26.090
log_gdp	24.830	2.288	18.090	30.600
log_pop_dz	17.390	0.084	17.270	17.540
log_pop	16.290	1.778	11.300	21.050
log_dist	8.270	0.661	6.850	9.820
border	0.060	0.239	0.000	1.00
culture	0.265	0.441	0.000	1.00
agree	0.469	0.499	0.000	1.00

The independent variable (*log_food_export*) seems to have a mean of 10.32 having a null minimum value, to the extent that there is zero exports for some countries in time interval (2000-2017) with a maximum of 22.53 (values in logarithms).

The GDPs values (variables *log_gdp_dz* for Algeria and *log_gdp* for importer countries) have respectively 25.6 and 24.83 with lower variance for the first proper the exporter country. Populations (variables *log_pop_dz* and *log_pop)* also in the same manner having 17.39 and 16.29 respectively with lower variance for the first. On the other hand, dummy variables reflect the proportions of each one. For the common border dummy (i.e. variable *border*), it seems that 6% of the total countries are effective importers noting that Algeria, according to the data used, exports food for all neighboring countries. Concerning the common culture (language and religion), i.e. the variable *culture*, it seems that 26.5% of all importers shares the same culture is a significant percentage. The existence of trade agreement (i.e. the variable *agree*) presents a value of 0.469, which means that roughly 47% of countries importing food from Algeria do have different trade agreements.

In order to confirm the fact that there is an increasing trend for Algeria's food exports, not in terms of exports absolute values, but in terms of export propensity through time, we proceed to reveal the estimated coefficients for pooled OLS regression and plotting them. It should be noticed that seventeen estimated coefficients are statistically significant (with Fisher's Statistics F(16, 1649) = 20.23(0.0000)). The plot of all 17 values are shown in Figure 3.

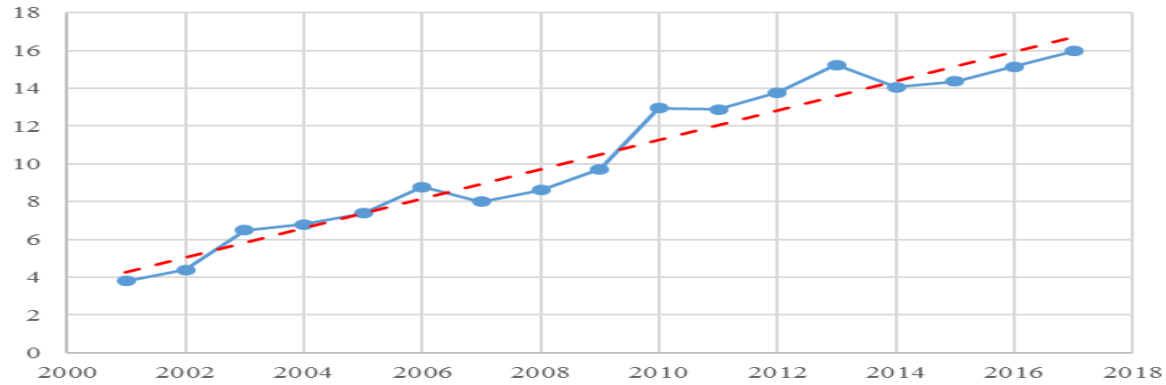


Figure 3. The Trend of the Propensity of Algeria's Food Exports

Each value in Figure 3 reflects the food exports propensity per year. However, the evolution of this index shows a positive slope (about 0.77), which highlights the fact of increasing trend for food exports of Algeria.

The estimation results of the gravity model are presented in Table 3. The simple model equation results are in the second column, where the second model without Country-Time effects is in the third column, and the third model with Country-Time effects without population measures is in the last column. We notice that the weights are based on per-unit error variances. The model has good fitness parameters. It shows values of 0.5 for the correlation (R^2), and overall significance through the F(8, 1641) with much lower p-values, which means that the models are relatively good for interpretation.

From the Table 2, the estimated coefficient of GDP (*log_gdp*) is positive and highly significant in the three models as expected. This implies that Algeria tends to export more towards larger economies. Algeria's exports with country *j* increases by roughly 1% as the product of Algeria's GDP and country *j*'s GDP increases by 1%.

Table 2. Panel Regression Results Using WLS for Algerian Food ExportsGravity Model

	Simple Model			**Model without CT effects**			**Model with CT effects**		
Variables	**Coeff.**	**t-ratio**		**Coeff.**	**t-ratio**		**Coeff.**	**t-ratio**	
const.	27.419	2.23	**	−368.567	−12.07	***	23.161	1.92	*
log_gdp_dz	−0.489	−0.99		−0.125	−0.29		−0.521	−1.08	
log_gdp	1.022	22.16	***	1.311	18.25	***	1.064	21.25	***
log_pop_dz				22.162	9.91	***			
log_pop				−0.449	−4.68	***			
log_dist	−4.420	−29.98	***	−3.848	−20.22	***	−3.977	−21.06	***
border				1.825	4.15	***	1.549	3.41	***
culture				2.042	7.31	***	2.105	7.49	***
Agree				0.298	1.10		−0.176	−0.69	
country	0.008	2.17	**				0.004	1.10	
year	0.422	9.58	***				0.423	9.81	
observations	1650			1650			1650		
R-squared	0.512			0.561			0.555		
Overall F-test	346.015			262.607			256.320		
Log-likelihood	−2317.250			−2318.096			−2321.274		
P-value(F)	0.0000			0.0000			0.0000		

In addition, the country *j*'s population variable indicates that Algeria tends to export more with smaller economies. A 1% increase in the population of food-importing countries (*log_pop)* had been calculated to decrease Algeria's food export by 0.3% (by having high statistical significance for the

last two models). Besides, Algerian population variable seems to have very high estimate with no statistical significance (with reference to the second model).

The distance variable (*log_dist*) is significant and has anticipated negative sign in the three models which indicates that Algeria tends to export more to closer countries. The coefficient value is roughly about 4 which indicates that when distance between Algeria and country *j* increases by 1%, the exports towards this country decreases by 4%. Border dummy (*border*) is found to be highly significant with a positive sign as expected (about 1.6 as average for last two models). Therefore, this evidence could suggest that Algeria should make more efforts to reduce transaction costs of trade with neighboring countries, such as Arab Maghreb Union, COMESA and southern EU countries, to achieve a deeper economic integration.

Common culture also shows a positive effect with high statistical significance. Countries with the same culture (Arabic as the official language and Islamic religious majority) are associated with an increase (about 2%) of Algerian food exports. The presence of trade agreement variable seems to have no significant statistical effect with unanticipated negative sign. This implies that trade gains from the trade agreements have been minimal for Algerian food exports.

With regard to the country specific effects, results are shown in Table 3 (Appendix). The model has R2 = 0.79, and F(97, 1568) = 62.64(0.000). Also there is no multicollinearity problem among the variables. The magnitude of the coefficients reflects the export propensity in our case.We observe that these effects are highly significant for all countries. The propensities are ranged from the highest to the lowest values in the table. Of these effects for example, France, Spain, Libya, Tunisia, Italy, Netherland, Belgium, Morocco, Canada and Mauritania appear to be the top 10 highest propensity to trade with Algeria, and so on to the countries with lower propensities [see Table 3 in Appendix]. It is obvious from the top 10 list, import countries are neighbors except for Netherland and Belgium (less closer) and Canada (extremely far).

5. Conclusions

Recognizing the increased trend in food exports last decade, our study attempted to analyze Algeria's trade pattern empirically and to identify the factors influencing Algerian food exports. We employed the gravity model, which is largely used in explaining bilateral trade, on Algerian food exports covering the period 2001 to 2017 in order to investigate the factors that determine food export flows from Algeria to its 98 trading partners. A panel data analysis with WLS regression method was used to perform the estimation.

According to our results in this study, Algerian food exports follow the basic gravity model, implying that food export flows will increase in proportion to the trading partner's GDP and decrease in proportion to the distance involved.The variable of distance indicates that if distance between Algeria and its importing markets were reduced, the expected change in food export value would be positive. Thus, logistics are important in the export process, which could be increased by improved connections such as infrastructure, direct air travel and improved maritime transportation between Algeria and its trading partners. Results also imply that Algerian food exports tend to increase into countries having the same culture (Arabic language and Islamic religion), which suggests that sharing the same culture promotes exports. This raises the importance ofAlgeria to expand and promote its food exports to those countries. The presence of trade agreements does not encourage Algerian food exports which means that trade gains from the trade agreements have been minimal for Algerian food exports.

This research is of academic value and of value to agricultural trade policy makers and practitioners in the Algerian trade. Hence, there should be some methodological improvements to assess the impact of Algerian food exports in the context of trade costs so that untapped trade potential among trade partners can be evaluated. Furthermore, it would be fortunate to improve the modeling approach so that dynamics considerations in the panel data method can be applied (to the extent that time trend shows significant effects) and thereby projections made based on more statistically significant explanatory variables (e.g. to the extent that population measures are without significant effects). These topics are left for future research.

References

Abbas, S., & Waheed, A. (2015). Pakistan's Potential Export Flow: The Gravity Model Approach. The Journal of Developing Areas 49(4): 367-378.

Abidin, I.S.Z., & Sahlan, R. (2013). The Determinants of Exports between Malaysia and the OIC Member Countries: A Gravity Model Approach. Procedia Economics and Finance 5, 12-19.

Abu Hatab A., Romstad E.&Huo X. (2010). Determinants of Egyptian Agricultural Exports: A Gravity Model Approach. Modern Economy 1: 134-143.

Ainas, Y., Ouarem, N. & Souam, S. (2012). Hydrocarbons: An Asset or an Impediment to Algerian Development?Revue Tiers Monde 2(210): 69-88.

Anderson, J.E. (1979). A Theoretical Foundation for the Gravity Equation.American Economic Review 69:106-116.

Batra, A. (2006). India's Global Trade Potential: The Gravity Model Approach. Global Economic Review 35(3): 327-361.

Bergstrand, J.H. (1989). The Generalized Gravity Equation, Monopolistic Competition, and the Factor Proportion in International Trade.The Review of Economics and Statistics 71(1): 143-153.

Bergstrand, J.H. (1985). The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence.The Review of Economics and Statistics 67(3): 474-481.

Boughanmi, H. (2008). The Trade Potential of the Arab Gulf Cooperation Countries (GCC): A Gravity Model Approach. Journal of Economic Integration 23(1): 42-56.

Butt, W.A. (2008). Pakistan's Export Potential: A Gravity Model Analysis. State Bank of Pakistan, SBP Working Paper Series, 23.

Cortes, M. (2007). Composition of Trade between Australia and Latin America: Gravity Model. Working Paper Department of Economics, University of Wollongong, Wollongong.

Elshehawy, M.A., Shen, H., & Ahmed, R. A. (2014). The Factors Affecting Egypt's Exports: Evidence from the Gravity Model Analysis. Open Journal of Social Sciences 2(11): 138-148.

Hausmann, R., Klinger, B. & Lopez-Calix, J. (2010). Export Diversification in Algeria. Chapter 4 in: Trade Competitiveness of the Middle East and North Africa. The World Bank. 63-102.

Head, K. & Mayer, T. (2014). Gravity Equations: Workhorse, Toolkit, and Cookbook. Chapter 3 in: Handbook of International Economics, 4. Elsevier.

Lakhdari, N., Rechache, A.& Mohammed, K.S. (2015). The Impact of External Shocks on the Algerian Export Performance. International Journal in Management and Social Science 3(12): 77-81.

Özer, O.O., Koksal O. (2016). Determinants of Turkey's Citrus Exports: A Gravity Model Approach. New Medit 3: 37-42.

Rahman, M.M. (2010). The Factors Affecting Bangladesh's Exports: Evidence from the Gravity Model Analysis. The Journal of Developing Areas 44(1): 229-244.

Rahman, M.M. (2003). A Panel Data Analysis of Bangladesh's Trade: The Gravity Model Approach. Proceedings of the 5th Annual Conference of the European Trade Study Group.

Samad, A. (2011). Exploring Exports and Economic Growth Causality in Algeria. Journal of Economics and Behavioral Studies 2(3): 92-96,

Sevela, M. (2002). Gravity-type Model of Czech Agricultural Export. Zemedelska Ekonomika-Praha 48(10): 463-466.

Teulon, F. (2014). Industrialization and Economic Policy in Algeria: A Synthesis over Half Century. IPAG Business School. Working Paper 287.

Tinbergen, J. (1962). Shaping the World Economy: Suggestions for an International Economic Policy. New York: The Twentieth Century Fund.

World Bank (2018). Statistical report on Algeria. World Bank website (www.worldbank.org).

Appendix. Table 3

#	Countries	*Coefficient*	*t-ratio*		#	Countries	*Coefficient*	*t-ratio*	
1	france	21.35	277.80	***	50	guinee_equatorial	9.51	4.75	***
2	spain	20.87	183.50	***	51	sao_principe	9.18	4.76	***
3	libya	20.14	68.54	***	52	burkina_faso	8.85	5.89	***
4	tunisia	20.04	73.81	***	53	rep_coree	8.57	4.22	***
5	italy	19.94	64.96	***	54	india	8.39	4.03	***
6	pays_bas	19.49	83.55	***	55	albania	8.38	3.34	***
7	belgique	18.74	91.19	***	56	danemark	8.31	4.71	***
8	maroc	18.58	110.40	***	57	chypre	8.26	3.76	***
9	canada	18.49	111.80	***	58	vietnam	8.25	4.21	***
10	mauritania	18.40	30.24	***	59	thailand	7.53	3.32	***
11	emirats_eau	18.35	40.61	***	60	hongkong	7.31	3.73	***
12	uk	18.34	50.00	***	61	pologne	7.29	3.68	***
13	russia	18.04	47.51	***	62	angola	7.11	3.70	***
14	usa	17.60	66.93	***	63	bulgaria	6.84	3.29	***
15	koweit	17.53	39.42	***	64	south_africa	6.65	3.72	***
16	germany	17.22	30.29	***	65	australia	6.59	3.76	***
17	turquie	16.99	13.97	***	66	seychelles	5.94	3.32	***
18	arabia_saoudia	16.98	21.34	***	67	bangladesh	5.91	2.93	***
19	niger	16.72	13.52	***	68	tanzania	5.62	2.57	**
20	syria	16.46	9.86	***	69	japon	5.59	3.25	***
21	suisse	16.30	65.42	***	70	nigeria	5.55	2.93	***
22	liban	16.01	11.35	***	71	guatemala	5.54	2.95	***
23	guinee	15.94	8.42	***	72	cambodge	5.41	2.95	***
24	jordanie	15.69	9.90	***	73	cuba	5.34	3.68	***
25	suede	15.53	93.49	***	74	uruguay	5.25	2.95	***
26	ghana	15.32	8.43	***	75	gabon	5.22	3.27	***
27	senegal	15.30	10.54	***	76	kenya	5.08	2.56	**
28	qatar	15.25	10.33	***	77	togo	5.08	2.55	**
29	mali	14.57	40.40	***	78	tadjikistan	4.64	2.57	**
30	croatia	14.54	9.89	***	79	oman	4.48	2.56	**
31	cap_vert	14.22	10.61	***	80	djibouti	4.47	2.54	**
32	grece	13.96	7.05	***	81	roumania	4.27	2.51	**
33	gambie	13.39	7.09	***	82	georgia	4.17	2.21	**
34	sierra_leone	13.10	6.17	***	83	tcheque	4.13	2.54	**
35	benin	12.94	7.00	***	84	norvege	4.11	2.57	**
36	liberia	12.74	6.16	***	85	congo	3.87	2.56	**
37	soudan	12.27	5.75	***	86	new_zeland	3.68	2.20	**
38	portugal	11.59	6.03	***	87	yemen	3.67	2.21	**
39	indonesia	11.56	7.13	***	88	autriche	3.54	2.52	**
40	malte	11.41	6.06	***	89	pakistan	3.30	2.13	**
41	egypt	11.34	5.98	***	90	lituanie	3.30	2.14	**
42	cameroun	11.25	7.01	***	91	mexique	3.23	2.21	**
43	bahrein	10.98	7.06	***	92	tchad	3.20	2.20	**
44	china	10.90	5.98	***	93	azerbaidjan	2.89	1.85	*
45	malaisia	10.85	6.10	***	94	luxembourg	2.38	1.84	*
46	ukraine	10.69	6.04	***	95	panama	2.36	1.83	*
47	irak	10.44	4.18	***	96	maurice	1.75	1.46	
48	yougoslavie	10.04	5.09	***	97	estonie	1.61	1.43	
49	cote_divoire	9.59	4.67	***	98	Maldives	1.51	1.45	

ECONOMETRIC IMPACT OF AGRICULTURAL PRODUCTIVITY SHOCK ON NIGERIA'S ECONOMY

Ayodeji Alexander Ajibola Coker
Federal University of Technology, Department of Agricultural Economics & Farm Management, Nigeria Email: ayodejicoker@ futminna.edu.ng

Ahmed Aliyu
Nigerian Association of Evaluation, Ministry of Budget and National Planning, Nigeria

Abstract

The concerns about agricultural productivity and its impact on the economy have been a recurring decimal within the sub-Saharan African terrain, given the abysmally low yields of most agricultural enterprises relative to best practice. Even though the continent witnessed some growth recently, it is unclear if these can be attributed to agricultural productivity, particularly in the crop sub-sector, thus suggesting the need for a robust tool in unearthing this fact. Using Nigeria as a case study, this research explored the impact of total factor productivity shocks on crops and those of associated variables on the Nigeria economy. The study employed the computable general equilibrium (CGE) approach based on the current Nigeria's social accounting matrix. The result showed that total factor productivity (TFP) impacted positively on numerous macroeconomic indices of the economy, comprising absorption, gross domestic product, export sales, labour supply and incomes, including institutional incomes of households across the various quintile categorizations. The results suggest that implementation of 7.23% TFP growth rate, reflective of the agriculture sector growth rate projected under the Economic Recovery and Growth Plan (2017-2020), 50% subsidy as operational under the on-going growth enhancement support scheme and adherence to 10 % funding of the agriculture sector as prescribed by the Maputo declaration, will to some extent, support the achievements Nigeria's development outcomes, particularly, institutional incomes, in line with its Economic Recovery and Growth Enhancement Plan (2017-2020). However, there is the need to change the direction of subsidy from agro-input support to projects with public good characteristics and for local fertilizer manufacturing, given the need to improve public investments in the agriculture sector and inevitably, the prospect for innovative private investments.
Keywords: Econometric Impact, Agricultural Productivity, CGE Approach, Nigeria.

1. Introduction

The issue of agricultural productivity and its impact on the economies of nations continued to reverberate across the globe, with varied outcomes, given differing interventions by states and peculiarities. In the sub-Saharan Africa for instance, and in Nigeria in particular, the inability to meet domestic food requirements has been partly attributed to productivity challenge, known to have been driven by the current input system and an inefficient farming model (Federal Government of Nigeria, 2016).The United States Agency for International Development (USAID) (2018) noted that Nigeria's situation is worsened by decades of neglect and diminishing productivity. For instance, productivity of maize, a major staple in the country, average only about 1.5mt/ha, compared to 4.4mt/ha and 5.7mt/ha recorded in South Africa and China respectively, while the country's overall productivity per hectare for all crops, ranged between 20% and 50% of thoseobtained in similar developing countries (USAID, 2018). Federal Ministry of Agriculture & Rural Development (2011) noted that low agricultural productivity compared to other developing countries led to loss of estimated 10 billion dollars in yearly export opportunities from key cash crops, such as groundnut, palm oil, cocoa and cotton. Arising from the evidence on ground, USAID (2018)posited that higher productivity and rising farm incomes would play a significant role in reducing rural poverty in Nigeria. Thus, given the priority of the Federal Government of Nigeria in improving productivity through a number of domestically

focused crop enterprises (rice, wheat, maize and sugarcane) and enterprises (poultry, aquaculture and horticulture) as detailed in its Road Map (2016-2020) and Economic Recovery and Growth Plan (2017-2020), this study determined the impact of total factor productivity shock on key crop enterpriseson all aspects of Nigeria's economy. The study hypothesized that total factor productivity shock does not impact on Nigeria's economy.

2. Theoretical and Conceptual Reviews

2.1 CGE and General Equilibrium Theory

Ghadimi (2007) affirmed that the CGE model falls into both the stylized and applied variants ofmodels, linked with the basic economic theory that ensures interaction of various actors as conceived in the neoclassical general equilibrium theory. This theory derives behaviour premised on micro theory optimization assumption that demand and supply sides of all markets are specified. The general equilibrium theory serves as an instrument for the analysis of market economies. Malinvard (2012) affirmed that the neoclassical general equilibrium theory was developed by Walras 1874 and modified by Vifredo Pareto in 1909, who affirmed the efficiency of competitive equilibrium. Kento (2018) further explained that the theory works through holistic functioning of the macro economy, rather than through individual market phenomena. According to the researcher, the theory differs from the partial equilibrium theory which focused on thematic sectors, associated with most economic model, based on partial equilibrium analysis; the price at which, supply equates demand and market in specific markets. General equilibrium theory further shows how all free markets move towards equilibrium in the long run, without necessarily reacting to it. General equilibrium theory focuses on a free market price system published by Adam Smith's Wealth of Nation (1776). However, Walras posited that individual market will be in equilibrium if all other markets are also in equilibrium, implying that the transactions between actors in a marketing system produces prices which allows other market actors to realign their resources and activities along profitable lines.

According to Bezabih *et al.* (2010), the CGE framework enables the isolation of the effect of specific variables on the overall growth of an economy, given that responsiveness to shock depends on the macroeconomic structure of the economy. Moreover, CGE is well placed to show interaction between agriculture and other sectors of the economy. It also allows easy incorporation of changes in other features of the economy. Robinson (2002) argued that the CGE models compared to other econometric models provide a consistent framework to determine the linkages and trade-offs among different policy packages and help to pass better-informed policy prescription.

2.2 Agricultural Productivity, Total Factor Productivity and the Economy

Agricultural productivity has severally beenviewedas a measure of states' production potentials of agriculture, without recourse to whether the potential is from natural endowment of nature or the activities of humans (Shodhganga, undated). However, the concept is shrouded in diverse conceptual interpretations. While some agricultural economists equated productivity to efficiency, others have taken it to mean output. However, some of the common consensus is that agricultural productivity is the ability to produce more economically and efficiently, implying that agricultural productivity is a measure of production system's efficiency.Generally, agricultural productivity can be represented in numerous forms, as either total factor productivity or partial factor productivity. Total factor productivity entails the ratio of output to the aggregation of inputs in same unit or value terms, while partial factor productivity relates to the ratio of output to individual agricultural factors of production, be it agricultural productivity per hectare, agricultural productivity per labour use or per capital.

Relative to the economy, Baier *et al.* (2007)affirmed that total factor productivity growth across countries is associated with negative indices. According to the study, only 14% of the average output growth per worker for all countries is associated with TFP growth. Also, in a study of total factor productivity growth in UK, Thirtle and Bottomley (1992) affirmed that total factor productivity grew at an average rate of 1.9% per annum and that total factor productivity growth increased as a result of increased aggregate output and decreased aggregate input. Ajayi *et al.* (2012) observed that total factor productivity in Nigeria had been low and unstable, depicting a situation of poor and unstable

technological growth in Nigeria. Specifically in the field of agriculture, Gollin (2010) argued that given the nature of developing countries, it is logical to expect agricultural productivity growth to have significant effects on macro variables, including economic growth. Specifically however, Awan and Alam (2015) showed that agricultural productivity has an effect on the economy. The study concluded that agriculture sector contributes more in economic growth.Chen *et al.* (2008) further revealed that the major source of productivity growth in China's agriculture sector is technical progress and that regional productivity diminishes over time. In the study of agricultural productivity, international competitiveness and economic growth, Matsuyama (1992) revealed a positive link between agricultural productivity and economic growth in a closed economy scenario, while for the small open economy,there was a negative link.In a related development, Udabah (undated) argued that productivity is necessary for rapid economic growth. The study established that productivity is low in agriculture and industrial sub sectors, thus causing poverty, low standard of living, limited growth rate and under development of the nation.

2.3 Measuring Impact of Agricultural Productivity Using the CGE

Towards investigating the impact of agricultural productivity on the economy, numerous researchers (Kinyondo *et al.* 2008; Reid *et al.* and Benzabih *et al.* 2010) have all worked on the impact of TFP on the economies of various countries. While some have used the regression approach, others have relied cointegration analysis, with researchers like Awan and Alam (2015) deploying the autoregressive distributed lag approach. This study used the computable general equilibrium approach premised on the 2012 social accounting matrix of Nigeria developed by the International Food Research Institute (IFPRI). While Reid *et al.* (2010) used the static CGE model to estimate the impact of changed agricultural productivity and altered fish availability on the Namibian economy, Benzabih *et al.* (2010) ascertained the impact of climate change and TFP on the Tanzanian economy. Cororation and Orden (2008), in the study on inter-sectoral linkages and poverty implications in the cotton and textile sector for Pakistan using CGE model, affirmed that 5% TFP improvement is welfare increasing for both rural and urban households, while achieving production expansion, export and poverty reduction. Berhane (2013), in ascertaining the effects of improved productivity of manufacturing industries on the Ethiopian economy, showed that the manufacturing sector is a determinant of economic growth, while productivity increase in agro processing, non-agro processing and overall manufacturing sector largely increases real GDP and sectoral output.

2.4 Nigeria'sEconomic Environment

The Nigeria's economic environmenthas been challenging and mainly skewed towards the debit side of development outlook. According to the Nigeria's Economic and Growth Plan (2017-2020), the country is characterised by structural challenges that hinders its ability to sustain growth, generate employment and ameliorate poverty. Without prejudice to the on-going diversification efforts, the country's economy is mono-commodity based for its revenue and foreign exchange with high raw material importation to sustain the manufacturing sector. The country is also largely consumption based, with little investment, with an investment GDP ratio of 13-14%. The country's GDP grew at an average of 6.3% between 2005 and 2015, but entered recession in 2016. The country is highly dependent on the oil and gas sector, which accounts for 94% of export earnings and 62% of government revenue between 2011 and 2015. According to theEconomic Recovery and Growth Plan (2017-2020), foreign exchange reserve declined from USD 53 billion in 2008 to USD 25 billion in November 2016. Inflation nearly doubled between January 2012 and October, 2016, but now down to 11.37%. Aside economic challenges, USAID (2018) affirmed that 53.3% of the population are poor with significant income inequalities along the north-south divide. Malnutrition is also high, with estimated 32% national stunting rates for children under five. The source further revealed that 52% (70.8 million ha) of the agricultural lands remained unutilised, 95% of lands is untitled, thus dis-incentivizing land management. Also of concern is the fact that only 40% of the farming households used fertilizer, estimated 20-27% adopted improved seeds, 6% had access to tractor services, irrigation practices covers 1% of farm lands, while farming is mainly on by smallholder, with 90% cultivating less than 2ha. From the down-stream sector, post-harvest losses accounts for an estimated 20% to 40%

of total production and about 60% perishable goods (Nigeria Institute for Social and Economic Research, 2014).

3. Methodology

3.1 Study Area

Nigeriais one of the 54 countries in Africa, located in West Africa, within both the eastern and northern hemispheres. The country lies between Latitudes 4^o and 14^oN and Longitudes 3^o and 14^o E. Nigeria boost of an estimated land area of 910,768 Km^2, water area of 13,000 Km^2,population of 186,053,386 and population density of 204.28/km^2. It is bordered by Benin, Cameroon, Chad and Niger, as well as the Atlantic Ocean. The climate is equatorial in the south, tropical in the centre and arid in the north. The southern lowland terrain merge into the central hills and plateaus; mountainous in the south east and plains in the north. The country comprises 36 states, a Federal Capital Territory and 774 Local Government Areas.

3.2 Data Sources, Collection and Analysis

This study is based on the 2012 social accounting matrix developed by the International Food Policy Research Institute (2018). The matrix covers 80 activities and commodities each, 13 factors, 15 households' categorization, 5 assorted taxes and 6 other accounts. Data analysis was undertaken using the 2012 Nigeria static CGE Model developed by Davies, Seventer and Thurlow (2012) based on GAMS program. Benzabih *et al*. (2010) and Ghadimi (2007) affirmed that CGE models have been used widely for policy analysis in both developed and developing countries to stimulate effects of external shocks, changes in economic policy or changes in economic structure, have strong links with basic economic theory, derive behaviour based on optimization and operate within a fully closed system, where supply and demand side of the market are specified.Two types of CGE were recognised, namely the static and the dynamic models. While the former simulates medium-term impact of a change in economic conditions, the latterrelates to long-term impact. This study depended on the static analysis.

3.3 Holistic and Thematic Model Specification

The generic CGE model is in three parts, comprising real flow, prices and equilibrium conditions as detailed by Ghadimi *et al.,* (2007)

Real Resource Flow:

$$X = G\,(E, D^s\ \Omega) \quad (1)$$
$$Q^s = F\,(M, D^D\ б) \quad (2)$$
$$Q^{D\,=}\ Y/P^q \quad (3)$$
$$E/D^s = g_2\,(p^e, p^d) \quad (4)$$
$$M/D^D = f_{2\,(}p^m, p^d) \quad (5)$$
$$Y = P^X \square\ X + R\square\ B \quad (6)$$

Prices:

$$P^X = g,\ (p^e, P^d) \quad (7)$$
$$P^m = R\square Pw^m \quad (8)$$
$$p^g = f_{i\,(}P^m, P^d) \quad (9)$$
$$R = 1 \quad (10)$$

Equilibrium Conditions:

$D^D - D^s = 0$ (11)
$Q^D - Q^s = 0$ (12)
$Pw^m \square M - pw^e \square E = B$ (13)
Where:
Endogenous Variables
E: Export good
M: Import good
D^S: Supply of domestic good
D^D: Demand for domestic good
Q^S: Supply of composite good
Q^D: Demand for composite good
Y: Total income
P^e: Domestic price of export good
P^m: Domestic price of import good
P^d: Domestic price of domesticgood
P^x: Price of aggregate output
P^q: Price of composite good
R: Exchange rate
Exogenous Variables
pwe: world price of export good
pwm: world price of import good
B: Balance of trade
σ: Import substitution elasticity
Ω: Export transformationelasticity

However, the abridged model specific for this study, as operationalized within the holistic CGE model comprises three exogenous variables, namely; total factor productivity, subsidy (proxied under sales tax) and government spendings. The endogenous variables covered included key macroeconomic variables, including absorption, export, import, gross domestic product, trade export and output prices. Others included total factor supply, total factor income, household commodity consumption and institutional incomes.

3.4 Summary of Model Policy Simulations and Macroeconomic Closures

The study covers three simulations, excluding the base scenario. These comprises (i) shocking the total factor productivity by 7.33%, ascribed to the projected agriculture sector growth rate for 2019 under the Nigeria's Economic and Growth Recovery Plan (ii) assumption of 50% targeted subsidy regime, which is a continuation of the status quo towards the targeted growth enhancement scheme under the current agricultural promotion policy; (iii) 10% shock of agriculture sector funding, in line with the Maputo declaration and (iv) combined effects of simulations (i) and (ii).

The selected macroeconomic closures considered for this analysis are that (i) the consumer price index, which is the numeraire, is fixed, while the domestic price index is flexible; (ii) savings-investment pathways assumed a uniform marginal propensity to save (MPS) rate point change for selected account institutions; (iii) current account is assumed to be flexible, while foreign savings are fixed; (iv) government savings are flexible, while direct tax rate is fixed. (v) labour as a factor of production is assumed under two scenarios, namely, unemployed and mobile for the rural labour, except for those with tertiary education, which is assumed fully employed and mobile and urban labour, which are also unemployed and mobile, except for urban tertiary labour, which is also fully employed and mobile; (vi) land is assumed fully employed and mobile; and (vii) all forms of capital (crop, livestock, mining and others) are assumed to be fully employed and activity specific.

4. Results and Discussion

In reviewing the outcome of this study, discussions cover the effect of the assorted simulations and shocks undertaken on the general macroeconomic variables, including the gross domestic product; thematic sub-sectors, with focus on the real sectors; trade, prices, factors of production and institutional incomes. These are discussed in subsequent sub-sections of this section.

4.1 Impact of Shock on Nigeria's Economy and General Macroeconomic Results

The results of the three simulations undertaken in support of the objectives of this studyare discussed under relevant sub-themes, comprising impact of shock on GDP, economic sectors, trade, prices, factors of production and institutional incomes.

4.2 Impact on Gross Domestic Product

The analysis from the demand side of the GDP (Table 1) shows that the total factor productivity (TFP) shock increased the total spending in the economy (absorption) by 0.33% while subsidy and government expenditure had significant expansionary impact of 1.66% and 2.0% on the economy. Expectedly, consumption increased significantly with subsidy implementation and increased government expenditure spending, likely due to increased household incomes which manifested in increased purchases of goods and services. While there was significant impact of subsidy and government expenditure on import, probably due to fertilizer importation, as a result of productivity increases. On the other hand, the impact on export was marginal. This may have been due to existing government policy on national food security, the difficult business environment and the existing tax regimes. The combined impact of the three simulations was marginal, ranging from 0-0.2%. Cororation and Orden (2008) affirmed that 5% TFP improvement is welfare increasing for both rural and urban households, while also resulting in output expansion. Berhane (2013) on the other hand revealed that the manufacturing sector is a determinant of economic growth, while productivity increases largely increased real GDP and sectoral output.

Table 1. Impact of Shock on Demand Side GDP Variables

Economic Variables	Base Value	TotalFactor Productivity	Subsidy	Government Spending	Combined Effect
Absorption	**60**	**0.33**	**1.66**	**2**	0.02
Consumption	43	-0.91	2.31	1.4	0.02
Investment	11	0	0	0	0
Stocks	0	0	0	0	0
Government	6	10	0	10	0
Exports	21	0.1	0.49	0.6	0.01
Imports	-9	0.23	1.1	1.36	0.02
GDP at market prices	71	0.281	1.4	1.68	0.01
Indirect taxes	1	0.1	0.82	0.93	0.02

Source: CGE Output

A review of the impact of the shocks implemented on the sub-sectors of the economy (Table 2), shows that that the TFP shock in agriculture sector impacted marginally on private and public services by 0.3% and 0.1% respectively, probably because of their involvement in the value chain activities on agro-input procurement and distribution, but ironically with a negative impact on the agriculture sector (-0.1%). However, subsidy and government spendings caused a significant expansionary effect on the sector by 1.0% each, probably due to the increased output arising from subsidy and expenditure policies. Ironically however, there was no change in the combined implementation of all the shocks. While TFP shock showed no effect on the individual crop subsectors, the impact of subsidy and

government spending was only marginal, that is, 0.1% each for sorghum, roots and vegetables.Meanwhile, while subsidy and increased spendings impacted mildly on the manufacturing and other industries, ranging from 0.1%-0.4%, TFP shock had no effect on manufacturing and other industries.

Table 2. Impact of Shock on Sectoral Contributions to GDP

Economy Sub-sectors	Base Value	TotalFactor Productivity	Subsidy	GovernmentExpenditure	CombinedEffect
GDP	**100**	**0.3**	**1.4**	**1.7**	**0**
Agriculture	20.3	-0.1	1	1	0
Mining	18.2	0	-0.3	-0.3	0
Manufacturing	8	0	0.1	0.1	0
Other Industries	19.7	0	0.4	0.4	0
Private Services	29.8	0.3	0.2	0.4	0
Public Services	4	0.1	0	0.2	0

Source: CGE Output

4.3 Impact on Trade Export

With respect to trade export quantities as detailed in Table 3, TFP shock, subsidy and increased government spendings significantly enhanced export quantities in the agriculture sector by 5.1%, 39.7% and 46.4% respectively. However, the combined effect of these simulations returned only a marginal increase of 0.1% only; impact on the other sub-sectors was negative. The impact observed in the agriculture sector is not unexpected given that productivity enhancement will likely improve output and hence, export of agriculture output as observed. As regards the impact on import quantities (Table 4), while TFP reported a negative impact of -0.6%, subsidy and enhanced spendings returned impact of 1% and 0.4% respectively. Thus, it is worthy of mention that subsidy and government expenditure caused significant impact on private and public services. These may have been due to their involvement across the crop production value chain with respect to importation of agro inputs. Generally, there was no change in import quantities as a result of the simulations implemented.

Table 3. Impact of Shock on Export Quantities

Sub-sector	Base	Total Factor Productivity	Subsidy	Government Spending	Combined Effect
Agriculture	1	5.1	39.7	46.4	0.1
Mining	14	-0.2	-1.7	-1.9	0
Manufacturing	2	-0.2	-1.7	-1.9	0
Other Industries					
Private Services	1	-0.5	0.3	-0.2	0
Public Services					

Source: CGE Output

Table 4. Impact of Shock on Sectoral Import Quantities

Sub-sectors	Base Value	Total Factor Productivity	Subsidy	Government Spending	CombinedEffect
Agriculture	0	-0.6	1	0.4	0
Mining	0	0.3	-0.8	-0.5	0
Manufacturing	9	0.2	0.7	0.9	0
Other Industries	0	0.2	0.6	0.8	0
Private Services	3	-0.6	1.3	0.7	0
Public Services	0	-0.2	1.5	1.4	0

Source: CGE output

4.4 Impact on Output Prices

The results as detailed in Table 5 reveal that the three simulations implemented decreased output prices in the agriculture sector, namely TFP (-0.2%), subsidy (-3.1%) and government spendings (-3.2%). On the other hand, impact on the manufacturing sector, other industries and private services were generally positive. The downward movement of output prices may have been to increased output arising from government spending, agro-input subsidy implementation and TFP enhancement. This has dual effect on the institutions, given that inflation may be on the decrease within the economy while to the farmers, decreased prices may likely reduce income and by extension farm household welfare. Kinyondo *et al.* (2008) revealed that productivity improves household's welfare due to reduced commodity prices.

Table 5. Impact of Shock on Output Prices

Sub-sectors	Base	Total Factor Productivity	Subsidy	Government Spending	Combined
Agriculture	1	-0.2	-3.1	-3.2	0
Mining	1	0.1	-0.3	-0.2	0
Manufacturing	1	0.1	1.2	1.3	0
Other Industries	1	0.2	1.5	1.7	0
Private Services	1	0.2	1.1	1.2	0
Public Services	1	0.9	0.8	1.7	0

Source: CGE Output

4.5 Impact on Total Factor Supply

The combined effect of the shocks implemented showed marginal increases of 0.1% on most rural and urban labour supply without education and those with secondary education (Table 6). Specifically, TFP shock impacted significantly on rural labour with primary and secondary education by 2.7% and 2.3% respectively. Similarly, subsidy and government spending increased most rural and urban labour supply significantly. There was howeverno effect on the other forms of factors, be it land, crops, livestock or mining.

Table 6. Impact of Shock on Total Factor Supply

Labour Types	Base	TotalFactor Productivity	Subsidy	Government Spending	Combined Effect
Labour - rural - no schooling	2.9	-0.6	3.2	2.7	0.1
Labour - rural – primary	3.8	2.7	2.2	4.9	0.1
Labour - rural – secondary	2.4	2.3	2.6	5	0.1
Labour - rural – tertiary	2.8	0	0	0	0
Labour - urban - no schooling	0.7	-0.3	4.1	3.8	0.1
Labour - urban – primary	3.2	0.4	-0.2	0.1	0
Labour - urban – secondary	2.9	1.8	3.4	5.2	0.1
Labour - urban – tertiary	2.8	0	0	0	0
Land	6.2	0	0	0	0
Capital – crop	3.1	0	0	0	0
Capital – livestock	0.8	0	0	0	0
Capital – mining	7.6	0	0	0	0
Capital – other	30.9	0	0	0	0

Source: CGE Output

The implication of this result, particularly for land, suggests that land may have been a limited factor. USAID 2018 affirmed that most rural farming households are small holders, cultivating less than 2 hectares. Kinyondo *et al.* (2008) also noted that economy-wide productivity shock resulted in output led employment demand and increased earnings for all skilled workers. The study affirmed that skilled men benefitted most in the sector, while partial productivity increases was observed to exhibit negative employment impact. Also, Benzabih *et al.* (2010) affirmed that TFP growth measures the production increases which are caused by more efficient application of technology or more efficient use of inputs, rather than by increased use of the factors of production. The authors argued that increased TFP serves as incentives for farmers to use resources efficiently.

4.6 Impact on Shock on Total Factor Income

Table 7 shows that TFP shock impacted significantly on rural labour with primary and secondary education, with 2.7% and 2.3% increases respectively, with varying outcomes obtained for the other factors. For subsidy shock, urban labour with no schooling and those with secondary education mostly impacted by 4.1% and 3.4% respectively.

Table 7. Impact of Shock on Total Factor Incomes

Labour Types	Base	TotalFactor Productivity	Subsidy	Government Spending	Combined Effect
Labour - rural - no schooling	2.9	-0.6	3.2	2.7	0.1
Labour - rural – primary	3.8	2.7	2.2	4.9	0.1
Labour - rural – secondary	2.4	2.3	2.6	5	0.1
Labour - rural – tertiary	2.8	0.9	0.7	1.6	0
Labour - urban - no schooling	0.7	-0.3	4.1	3.8	0.1
Labour - urban – primary	3.2	0.4	-0.2	0.1	0
Labour - urban – secondary	2.9	1.8	3.4	5.2	0.1
Labour - urban – tertiary	2.8	0.9	0.9	1.8	0
Land	6.2	-0.3	1.1	0.9	0
Capital – crop	3.1	-0.3	0.8	0.5	0
Capital – livestock	0.8	-0.5	1.5	1	0
Capital – mining	7.6	0.1	-1.1	-1	0
Capital – other	30.9	0.2	2.2	2.4	0

Source: CGE Output

Ironically, subsidy shock impacted mostly on urban labour without schooling at 4%. However, increased government spending impacted mainly on urban secondary labour by 5.2%. The combined impact across board was marginal, particularly for the rural labour. Arndt and Tarp (2003) affirmed that a 30% increase in agricultural productivity for Mozambique decreased men's wages in commercial agriculture, while women's wages in food crop production rose due to their concentration in the food crop sector.

4.7 Impact on Household Consumption of Commodities

Generally, the impact of TFP shock was negative on all sub-sectors of the economy. However, subsidy implementation showed positive impact, which ranged from 0.5% for other industries to 4.5% in the agriculture sector. Increased government spending shock caused impact which ranged from -0.5% under other industries to 3.8% for agriculture. Combined impact was generally non-existent, except for the manufacturing sector, which returned 0.1% marginal increase (Table 8).Specific outcomes across the sub-sectors tend to suggest that in-spite of the impact of subsidy and government spendings, total factor productivity in the crop sub-sector witnessed a decrease, probably due to climatic variation, inexperience in technology application, given initial adoption, weak agronomic practices, bureaucratic challenges, among others.

Table 8. Impact of Shock on Households Consumption of Commodities

Sub-sectors	Base Value	Total Factor Productivity	Subsidy	Government Spendings	CombinedImpact for all Simulations
Agriculture	31	-0.7	4.5	3.8	0
Mining	0	-0.8	1.1	0.3	0
Manufacturing	22	-0.9	1.3	0.5	0.1
Other Industries	1	-1.1	0.5	-0.5	0
Private Services	42	-1	1.3	0.3	0
Public Services	4	-1.7	1.5	-0.2	0

Source: Output of CGE model

4.8 Impact of Total Factor Productivity on Household Institutional Incomes

The results, as detailed in Figure 1 shows that TFP shock impacted more on the rural non-farming household income of the third, fourth and second quintiles by 0.76%, 0.70% and 0.64%. respectively. This development may not be unconnected to the activities of the households across the value chain, probably those involved in processing and marketing of agricultural output which arose as a result of increased output emanating from productivity increases.

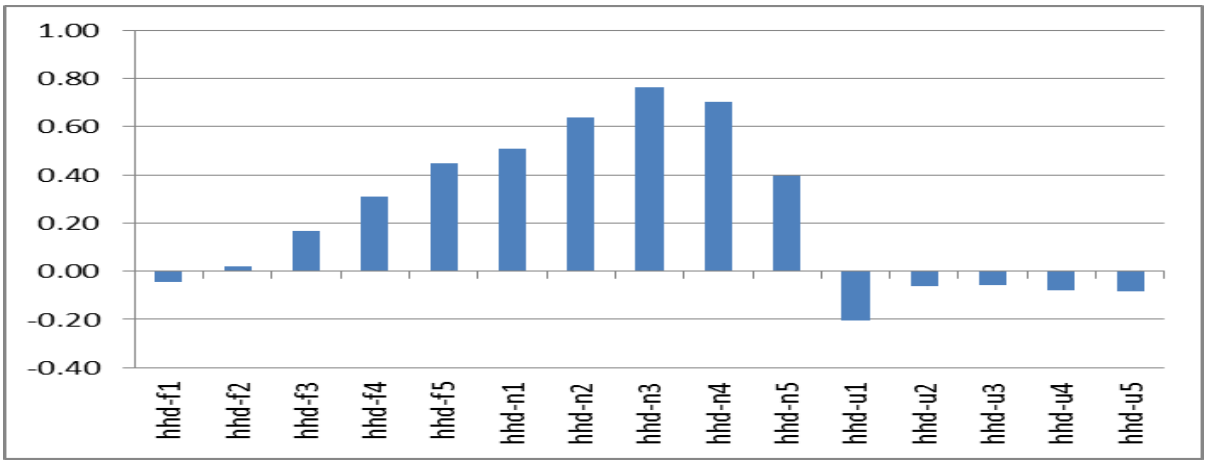


Figure 1. Effect of Total Factor Productivity Shock on Household Incomes

4.9 Impact of Subsidy on Household Incomes

Figure 2 shows that fertilizer subsidy shock impacted on all categories of households in the economy. However, the impact was more on the rural no farming households within the first, second and third quintiles by 2.66%, 2.59% and 2.43% respectively. This development may be as result of the fact that the implemented subsidy scheme enhanced output, which allowed enhanced participation of the rural non-farming households in downstream activities of processing, marketing and transportation.

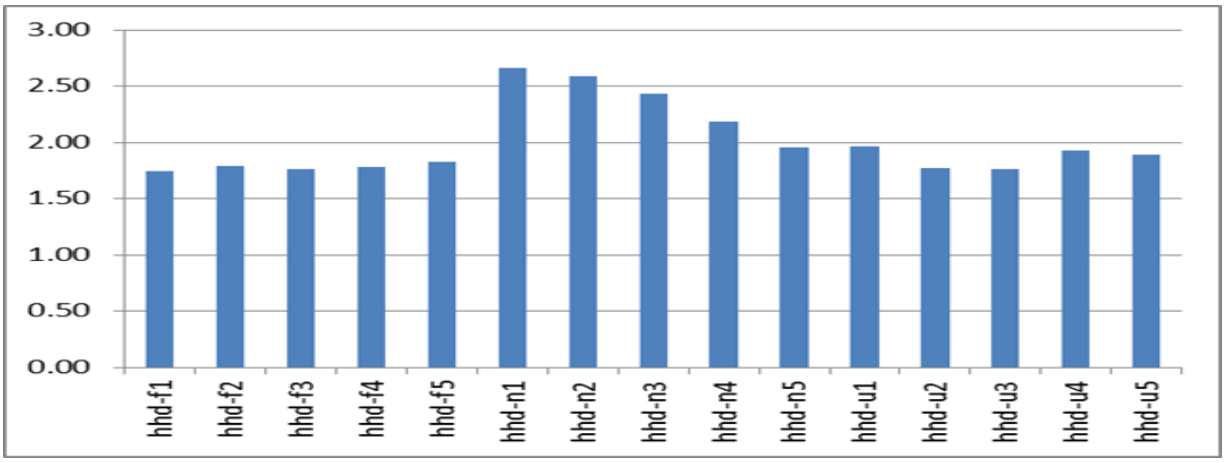


Figure 2. Effect of Subsidy Shock on Household Incomes

4.10 Impact of Government Spending Shock on Household Incomes

Figure 3 reveals that government spending shock impacted on all categories of households within the economy, particularly, households within the first, second and third quintiles non-farm households by 3.1%, 3.0% and 2.9% respectively. Impact ranged from 1.7% for the urban household to 3.26% under the rural non-farming households within the second quintile.

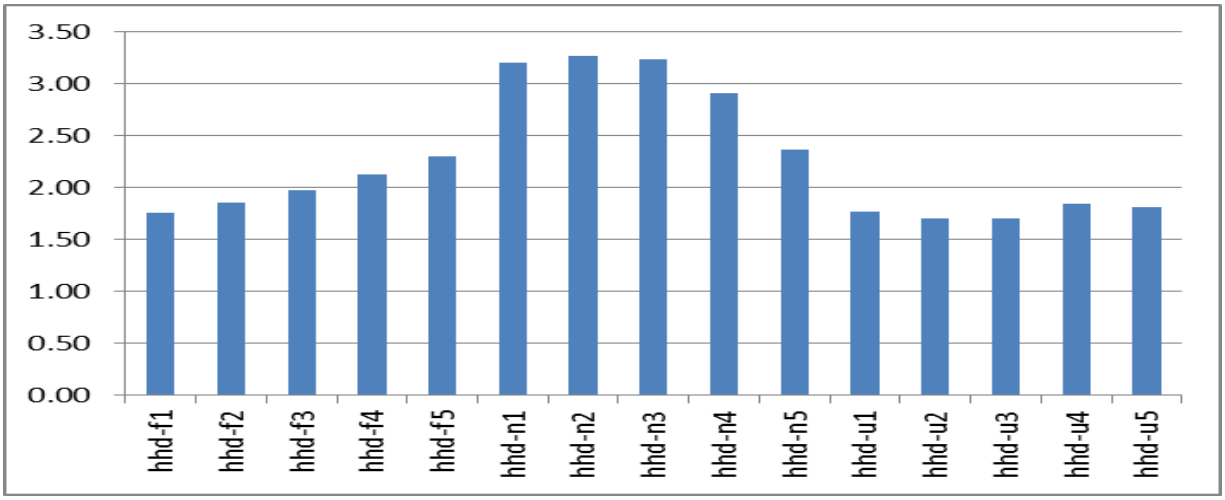


Figure 3. Effect of Government Expenditure Shock on Household Incomes

4.11 Impact on Combined Impact of Total Factor Productivity, Subsidy Regime, and Increased Government Spendings

The combined impact ofproductivity, subsidy and increased government spendings on household incomes across the economy was generally marginal, ranging from 0.02% on the urban households to 0.05% on the first and second quintile households (Table 4).

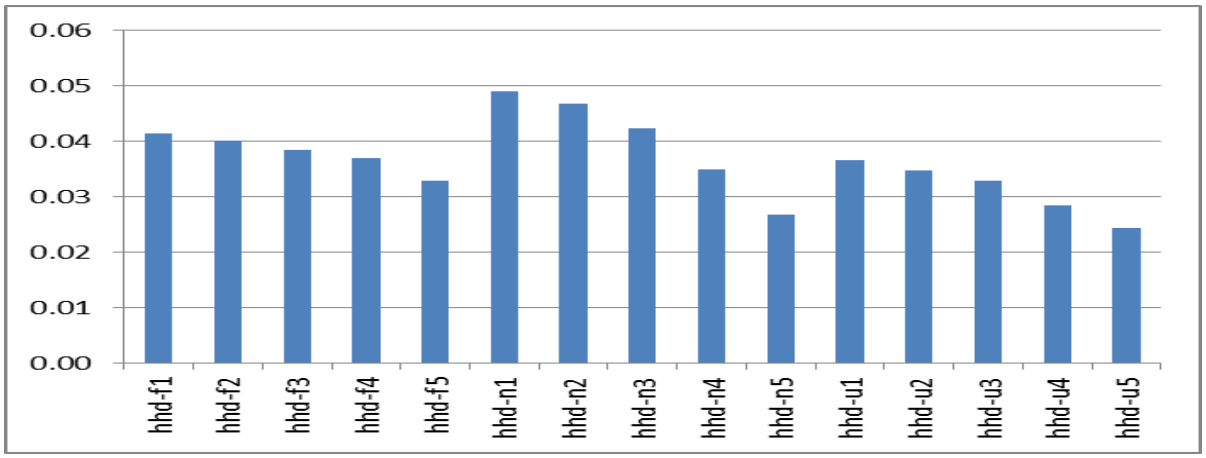


Figure 4. Combined Effect of Total Factor Productivity, Subsidy and Government Expenditure Shocks on Household Incomes

5. Conclusion and Recommendations

Arising from the outcome of the analysis, the result showed that TFP shock had varying impacts on Nigeria's macroeconomic variables, including institutional incomes. The results suggest that implementation of 7.23% TFP growth rate, 50% subsidy and adherence to 10 % funding of the agriculture sector will to some extent, enhance the achievement of the country's development outcomes. However, there may be need to change the direction of subsidy from agro-input support to projects with public good characteristics and for local fertilizer manufacturing, given the need to improve public investments in the agriculture sector and inevitably the prospect for innovative private investments.

References

Ajayi, C.F. & Ekiran. J.O. (2012). Total Factor Productivity and Manufactured Export in Nigeria:19732009. Ife Research Publication in Geography. Vol II, Munber 1, June.

Arndt, C. and Tarp, F. (2003).Trade Policy Reform and the Missing Revenue: A Gendered Analysis for Mozambique. MPRA Paper from University Library of Munich, Germany

Awan, G. and Alam, A. (2015). Impact of Agriculture Productivity on Economic Growth: A Case Study of Pakistan (2015). Industrial Engineering Letters.www.iiste.org. ISSN 2224-6096 (Paper)ISSN2225-0581 (online) Vol5, No.7.

Baier, S.L. Dwyer, P.D & Tamura, R. (2007). How Important are Capital and Total Factor Productivity for Economic Growth. Economic Inquiry. Wiley Online Library. https//doi.org/10.1093/e_1/cbj003.

Berhane, B. (2013). The Effect of Improved Productivity of the Manufacturing Industries on the Ethiopian Economy: A Computable General Equilibrium (CGE) Analysis. Ethiopian Journal of Economics. Vol. XX11No1, April.

Bezahih, M., Chambwera, M. and Stage, J. (2010). Climate Change, Total Factor Productivity, and the Tanzanian Economy. Environment for Development. DiscussionPaper Series, June, DFD DP 10-14.

Chen, P., Ming-Miin, Y., Ching-Cheng, C., & Shih-Hsun, H. (2008). Total Factor Productivity Growth in China's Agricultural Sector. China Economic Review 19, No.4:580-593.

Cororaton, C. & Orden, D. (2008). Pakistan's cotton and textile economy: Intersectoral linkages and effects on rural and urban poverty. Research Report of the International Food Policy Research Institute. 10.2499/9780896291676RR158.

Federal Ministry of Agriculture and Rural Development (FMARD), (2011). Agricultural Transformation Agenda: We Will Grow Nigeria's Agricultural Sector.

Federal Ministry of Agriculture and Rural Development (FMARD), (2016). The Green Alternative. Agriculture Promotion Policy 2016-2020. Building on the Successes of the ATA, Closing Key Gaps. Policy and Strategy Document.

Federal Ministry of Budget and National Planning (FMBNP), (2017). Economic Recovery and Growth Plan (2017-2020). Federal Capital Territory, Abuja.

Ghadimi, H. (2007). Computable General Equilibrium (CGE) Model: A Short Course. Session Two: Specification. Regional Research Institute WWW.RRI.WVU.EDS Spring.

Gollin, D. (2010). Agricultural Productivity and Economic Growth. Research GatePlatform.

International Food Policy Research Institute (IFPRI), 2018). Nigeria's 2012 Social Accounting Matrix.

Kento, W. (2018). General equilibrium Theory, Investopedia. Updated July 19.

Kinyondo, G. (2008). The General Equilibrium Effects of a Productivity Increase on the Economy and Gender in South Africa. Department of Economics Working Paper, University of Pretoria. Working Paper Series, February.

Malinvaud, E. (2012). Neoclassical General Equilibrium Theory as a source of Powerful Concepts, Although Confronted with the Complexity of Market Economies. Economia 2-1/2012

Matsuyama, K. (1992). Agricultural Productivity Comparative Advantage and Economic Growth. Journal of Economic Theory. Vo.58, Issue 2, December PP317-334, III Human Capital.

Nigeria Institute of Social and Economic Research, (2014). Reducing Food Crop Losses throughPost Harvest Management in Nigeria.

Reid, H., Sahlén, L. Stage, J. and MacGregor, J. (2008). Climate Change Impacts on Namibia's Natural Resources and Economy. Climate Policy 8: 452–66.

Robinson, S. (2002). The Influence of Computable General Equilibrium Models on Policy. International Food Policy Research Institute (IFPRI): Trade and Macroeconomics Division Washington D.C.

Shodhganga(http://shodhganga.inflibnet.ac.in/bitstream/10603/95601/12/12_chapter3.pdf) Retrieved February, 2018).

Smith, A. (1776). An Inquiry into the Nature and Causes of the Wealth of Nations. 1 (1 ed.). London: W. Strahan. Google Books.

Thirtle, C., Bottomley, P. (1992). Total factor productivity in UK agriculture 1967-1990. J. Agric. Econ. 43 (3), 381-400.

Udabah, S.I. (2000)). Productivity and Economic Growth. Department of Economics. Proceeding of the 9th Annual Conference of Central Bank of Nigeria, Abeokuta, 12- 16th July, 78-109.

United States Agency for International Development (USAID), 2018. Request for Proposal (RFP). Solicitation Number 72062018R00011. Feed-the-Future West Africa Trade and Investment Hub Activity.

ROLES, RESPONSIBILITIES AND COMPETENCIES NEEDED BY EXTENSION AGENTS IN EXTENSION SYSTEM

Cevahir Kaynakçı
Ondokuz Mayıs University, Department of Agricultural Economics, Turkey
Email: cevahirkaynakci@ gmail.com

İsmet Boz
Ondokuz Mayıs University, Department of Agricultural Economics, Turkey

Abstract

Agricultural extension systems have been developed for people living in rural areas to deal with farm production and marketing activities which have been the main livelihoods of these people. Agricultural Extension is defined as the use of communication methods in a planned manner to help farmers make ideas and right decisions in every subject they need. However, people engaged in agriculture need help in production techniques, input use, marketing, and other activities regarding rural society. For this reason, agricultural extension agents, also called ch nge agents, participate in the extension process to determine the problems of farmers by the most consistent and positive manner. Moreover, these agents provide a two-way link between research institutions and farmers and cooperate with rural development organizations.The overall purpose of this study is to examine the roles, responsibilities, and competencies of the agricultural extension agents in the extension systems,and to determine common strategies that maximize the impact of extension agents' efforts for agricultural and rural development.The study begins with a basic need assessment for agricultural extension services and extension agents in the agricultural development process. Qualitative research methods were utilizedsince this was a review study.In this context, published articles, conference proceedings, books, statistics from official institutions and the private sector, and various web sites were used. The study concluded that an extension agent has a variety of roles and responsibilities. Furthermore, they need professional, individual, and technic competencies to fulfill their roles and responsibilities. It is thought that the research results will provide useful information for agricultural politicians, scientists, farmers, and extension staff.
Keywords: Agricultural Extension, Extension Agent, Rural Development, Change Agent.

1. Introduction

The rapid changes in rural areas indicate that people whoserve as extension agents need to diagnose the emerging issues, come up with adequate proposals to bring solutions to these issues, and coordinate the work between extension organizations and the clientele. Global changes influence rural development and rural society in every country and therefore updated extension services which are implemented by highly skilled extension personnel are needed.

First of all,everything arises from needs. Needs in the economic term is defined as desires or wants which make an individual happy when met, and sad vice versa. These needs are either felt by the person/ society itself or revealed through others.The absence of essential services in rural areas such as infrastructure, healthcare, and education facilities, etc. can easily be felt and expressed by ordinary rural people; however, it is a prerequisite for individuals to have some qualifications to feel the need for knowledge, change, and innovation.In this sense, rural areas are more disadvantaged regions as compared to urban areas. To close this gap and to help the socio-economic development of rural areas, and to ensure the preservation and development of cultural and local values harmoniously, agricultural extension system has been developed.

Agricultural extension is defined as the use of communication methods in a planned manner to help farmers and other rural people to formulate ideas and to make the right decision to solve their problems. On the other hand, a system is defined as the way used or methods adopted to get results from economic activities.The purpose of an extension system is to contribute to the economic and

social activities of people living in rural societies to provide them with better living standards.Agricultural extension systems have been developed for people living in rural areas to deal with farm production and marketing activities which have been the main livelihoods of these people.

Agricultural extension systems can be examined in three groups as public, private and pluralistic systems, regarding their implementation process. However, the components of these systems are the budget allocated for extension services, extension personnel, and physical equipment such as vehicles, buildings, tools, and other requirements. The key factorsthat convert physical and financial investments into efficiency and performance are the extension agents(Karbasioun and Mulder 2004). Governmental institutions can employ these agents as salaried personnel. Some of them can work in the private sector as farm advisors, or work in a collaborating system where regional, national, and international organizations and donors are involved. In this study, the common characteristic of these three groups has been referred to as an extension/change agents.

In rural society, people need assistance regarding input provisions such as quality seeds, timely supply of inputs such as fertilizers credit to buy inputs, cultivation techniques, farm management practices, harvesting, storage, and access to market information and services and marketing strategies. In addition, problems related to rural livelihoods, women entrepreneurship, and rural youth are expected to be solved. Furthermore, extension services are required to raise awareness and sensitivity on environmental issues, to improve public health and education, and to come up with solutions on gender-related issues. At all, they expect these services to be responsive to customer-expressed needs -- that is customer-driven (Suvedi, M; Kaplowitz, M. 2016).To provide all these services and to solve the problems of rural people in the most consistent way, there is a need for experts who work together with them, provide a two-way connection between research institutions and rural people, and cooperate with rural development organizations. These duties and responsibilities are carried out by extension agents. The successful extension agents are assumed to be the experts who correctly play their roles while serving rural people.These roles and responsibilities put pressure on extension professionals to be more knowledgeable, skillful and able, not only in technical subject matter but also in process skills.

A critical issue that can hinder the success of the extension organization is the lack of clarity about the roles, responsibilities, and expectations of active personnel.The concepts of role and responsibility are sometimes misunderstood, mixed, or even confused. In general, roles are the positions the team members assume or the parts they play in a particular process.On the other hand, responsibilities are specific jobs or tasks that are expected to complete as a function of members' roles (Collaborative Justice, 2018). To fulfill the roles and responsibilities, an extension agent should haveadequate individual and organizational competencies.

The overall purpose of this study is to examine the roles, responsibilities, and competencies of agricultural extension agents working within different extension systems, and to determine common strategies that maximize the impact of extension agents' efforts for agricultural and rural development. It is expected that the research results will provide useful information for agricultural politicians, scientists, farmers and extension staff.

2. Materials and Methods

Qualitative research methods were used to achieve the objectives of the study. In this context, published articles, conference proceedings, books, statistics from official institutions and the private sector, and various web sites were used. The study begins with the definitions of agricultural extension, extension systems, agricultural extension agent, roles, responsibilities and competencies in the introduction section. Broader descriptions and explanation of these concepts are given in the findings section. The study concludes with a set of recommendation to improve extension agents' performance regarding their roles, responsibilities, and competencies.

3. Findings

3.1 The Roles of Extension Agents

Extension services, today, are not limited to plant and livestock production. Extension agents perform many roles in the communication process between the extension organization and the target audience. In this respect, the extension agent must evaluate each case separately and assume an appropriate position or role accordingly. They can apply various extension strategies that can affect the knowledge, information, attitudes, and behavior of the target audience towards change. According to Rogers (2010), the extension agent is the person who influences the innovation decisions of the target group following the requests of an extension organization. The extension organizations often strive to ensure that farmers adopt new ideas and these ideas are diffused to large communities. However, an unsuccessful extension agent may prevent or slow down the diffusion of innovations by not establishing useful communication links with farmers and not applying the right extension methods.

The ultimate goal of extension systems is to create an environment in which target farmers can help themselves in the long term and bring the job to a situation that does not require extension personnel. Thus, extension personnel uses the concept of communication to participate in any innovation movement and to facilitate the exchange of information with each other so that the participants can reach a common understanding.The extension agent must be able to assume seven important roles while working in adoption and diffusion of innovations in the target group (Rogers, 2010):

1. Improves the need for change: The extension agent initially makes the target group aware of the needs to change their behavior of the target audience. He/she introduces new alternatives to the solution of the existing problems to begin the change process, emphasizes the importance of these problems and at this stage evaluates the needs of the farmers and helps them to emerge with a counseling style.
2. Establishes an information-exchange link: In the first stage, a need for change is created. Here, the extension staff should develop relations with the target group. These relationships can be enhanced by the agents' abilities, reliability, empathy, and credibility. Farmers are obliged to accept the extension agent before taking the innovations that the extension member is trying to disseminate.
3. Identifies the problems of the target audience: The extension is obliged to analyze the issues of the farmers to determine why the current situation in the target group does not meet the requirements. To successfully identifying farmers' problems, extension agents should approach them empathically. They should not approach farmers with their perspectives.
4. Creates an intention towards change in the target group: Once extension agents identify farmers' problems, an intention toward change should be built in the clientele to move forward.
5. Transforms intentions into action: The extension staff makes some suggestions based on the needs of the target audience. They try to influence the behavior of the target group in a way that is appropriate to these suggestions. In this way, the propagation element is concerned only with the opinion leaders and directs the situation indirectly.
6. Stabilizes the adoption of innovations and prevents them from giving up. The extension staff can improve the behavior of the farmers who adopt changes by maintaining their new actions. The dissemination element often accomplishes this activity when the farmers' innovation-decision process is completed or during the approval phase.
7. Ensures success in the last relationships with farmers. The final target of the extension worker is to improve the self-renewal behavior of the farmers. The extension should only end the task if some farmers in the target group carry out their functions without the help of extension services.

In addition to Rogers' (2010) description of the roles,Oakley and Garforth (1985) also examined the roles of extension staff in different parts of the world.Moreover, research of Suvedi and Kaplowitz (2016) support earlier research drawing attention to update changing roles and responsibilities of extension worker such as supporting adaptation to climate change, organizing participatory, demand-driven program planning for extension, and to carry out gender issues and marginal groups.According to the examinations of all researchers, extensionagents carry out multiple roles at once and take on the responsibilities required by each role.As a result, the roles of extension agents are different. It cannot be assumed that a role is more valid or important than others. This characteristic is stressed to illustrate

the complexity of the role of the extension agent and to emphasize the need for careful consideration of the whole process.

3.2 Responsibilities of Extension Agents Required by A Role

The roles of extension workers providea link between agricultural research institutions and rural areas. There are a number of responsibilities required by these roles which include pursuing research and innovations developed by different institutions, preparing and implementing extension programs to deliver knowledge and information to farmers, and evaluating the performance of the work carried out for rural society. More specifically the responsibilities extension agent can be summarized as dissemination, developing social network in local area, encourage producers to organize into groups, following marketing issues, facilitating access to credit, and supporting climate change etc.

There are specific responsibilities in which extension agents undertake when they assume a role in a project or team (or when they are assigned). For example, while taking on the roles of teachers and trainers, they provide people to know their problems, to be interested in their problems, and to learn ways of how to deal with their problems. He/she tries to mobilize people to convince them to practice what they teach by taking on the roles of a stimulator, activist or catalyst.Then, by taking on the role of motivating, he/she makes the audience feel the satisfaction of having done a job at the end and makes them feel proud of their achievements.According to Oakley and Garforth (1985), responsibilities are examined in two groups as information/communication/ innovation, and educator/ facilitator/ catalyst roles. Responsibilities required by these roles are as follows:

3.2.1 Information/ Communication/ Innovation

The extension agent is responsible for explaining farmer what is the meaning of innovation,and how will he/she decide to adopt this innovation.They use their knowledge and information to take innovation to farmers. In these roles, the extension agent is often seen as the agent of technical information and a teacher instructing farmers to use this information.The extension agent is first equipped with formal education for his/her position, and then with technical knowledge and abilities to transfer this knowledge to farmers.In all of these roles, the work of extension staff is often very well structured and based on existing government policies and rural development programs.

3.2.2 Trainer/ Facilitator/ Catalyst

Extension is not only about educating rural people to attain physical and economic welfare; but it also involves a holistic development of the people in rural, suburban and urban areas. Hence, forthe second group of the roles, the extension agent is less concerned about information-communication and is more concerned with the personal development of farmers. He/she gives more importance to farmers' gaining confidence, to organize themselves, and to participate in extension activities.The role of the extension agent at this point is to support farmers to develop their initiatives and to encourage them to solve their problems. When performing their roles, extension agents should identify the present situation, analyze the issues and determine a position to address the issues. While playing various roles, the extension agent intervenes in the farmers' world to improve their lives in a region. This action is not an easy task, and several problems arise from this intervention. It is crucial for extension agents to have technical knowledge abilities and personal skills to bring change in rural society (Oakley and Garforth 1985). The extension agent should also be competent in professional (knowledge types) and personal (skill-specific) issues to properly and effectively perform the listed roles.

3.3 Competencies of Extension Agent to Fulfill the Roles

"Agricultural systems and practices are changing across the world, and producers' needs are changing, too. Farmers of the developing world are increasingly aware of new technologies and improved practices. They are demanding credible information about the benefits of adopting these improved practices."Agricultural extension and advisory services are transitioning from a focus on

technology transferto a focus on facilitating a range of interventions in complex contexts. No longer is extension first and foremost a conduit of innovations coming from research and passing them on to farmers. Today's agricultural extension and advisory services are being challenged to serve as the connecting actor in complex agricultural innovation systems. Extension workers should remain current with emerging technologies, be able to handle challenges, tap opportunities and demonstrate competency in their services. They need to possess a set of core competencies -- i.e., collective organizational skills upon which the organization bases its primary operation or services.The role of extension in agricultural development is continuously evolving, and effective front-line staff members need skill sets that may differ from those they learned in school. Extension professionals must have an understanding of the communities they work in and have compassion for the people they serve. They should be well-versed in adult education principles. Besides sound technical knowledge, they must possess adequate knowledge and skill in participatory tools and techniques for planning, implementation, and evaluation of extension programs. Good communication skills are critical in all aspects of their work" (Suvedi, M; Kaplowitz, M. 2016).

Competencies and skills are categorized differently according to different sources. According to Lovett (2019), there are two kinds of competencies. The first one is individual competencies which are examined in two categories as technical and behavioral, and the other one is organizational competencies. Technical competencies include specific knowledge skills and abilities that are used to accomplish a particular task, job or function. Behavioral competencies arethe attributes which extension agents display while they carry out their work, and most responsive to the question of "how?". For instance, how they communicate, how they interact and work with rural people (especially farmer), and their organization. Also, how open-minded they are to new ideas and ways of working, how they plan and organize their work to meet deadlines and targets. To what extent and how they share their knowledge and expertise with others(Lloyd's Register 2019). On the other hand, organizational competencies and capabilities describe "how" it expects the "what" to be accomplished. Generally, organizational competencies may include: decision-making, risk-taking, develop relationships, problem-solving, attention to detail, innovation, integrity, resilience, customer service, strategic perspective, teamwork, and leadership (Lovett, M.2019).

In the United States, Africa, Asia, and the Middle East, several studies have been carried out on the competencies of agricultural extension systems and extension employees.Suvedi and Kaplowitz (2016) extensively discussed the competencies and skills of the extension worker. This study classified the competencies of extension worker into two broad categories: process skills or functional competencies, and technical skills. According to Suvedi and Kaplowitz (2016), networking with local organizations, facilitating group formation, resolving conflict and engaging stakeholders in program planning are examples of process skills or functional competencies. Process skills are also called soft skills that help extension workers perform their tasks well.

On the other hand, identifying the causal organism of maize disease, testing the soil pH and interpreting the results, and conducting a method demonstration on how to perform artificial insemination on dairy cattle are examples of technical competencies. Suvedi and Kaplowitz (2016) offer nine areas of professional core competencies adequately address the needs of demand-driven, decentralized, pluralistic and participatory extension systems. They are "plan well, coordinate and collaborate to implement, be humble, communicate confidently, build public relations, value diversity, acquire educational and informational technology, evaluate to show the result, and update knowledge.

Davis (2015), Davis and Sulaiman (2014), and Sulaiman and Davis (2012) articulate the need to develop functional and technical capacities across three levels: individuals, organizations and enabling environment. They also emphasize capacity development as a long-term investment for the extension. The level of skills required may vary with the place, country, and context. The general conclusion of the research carried out in different countries revealed that the extension worker should always keep up with the change in the professional subjects for the organization and the target group as well as for the security of their careers. For this purpose, it is emphasized that in-service training is required to update and upgrade knowledge and skills related to their profession (Boz 2008;Boyd 2004).

4. Conclusions and Recommendations

In the 21st century, extension and advisory services need to clearly articulate their role in the rapidly changing rural and agricultural context to redefine themselves and to increase its interest in extension services.To improve the performance of extension services; first of all the roles, responsibilities and competencies of extension workers should be clearly defined.When employing extension agents, their proficiency levels relating all of these concepts should be assessed. Continuous education and in-service training should be given to update and upgrade the abilities and skills of the extension agent.The agricultural extension should be assigned duties and responsibilities in the areas where they best perform their roles. Educational backgrounds and majors must be taken into consideration when selecting extension agents for specific tasks. Higher salaries and better social security opportunities provide better motivation for extension agents to perform their job. Instead of doing too much office work, extension agents must spend most of their time with farmers. The agricultural extension agents should be assigned duties and responsibilities in the areas where they best perform their roles.

References

Boyd, B.L. (2004). Extension Agents as Administrators of Volunteers. Journal of Extension, 42(2)https://joe.org/

Boz, I. (2008). Yayım elemanlarında bulunması gereken profesyonel yeterlilikler: Kahramanmaras ili örneği. KSÜ Doğa Bilimleri Dergisi, 11(1), 97-107.

Davis, K. (2015). The new extensionist: Core competencies for individuals. GFRAS Brief # 3. Lindau, Switzerland: Global Forum for Rural Advisory Services (GFRAS).

Davis, K., and R. Sulaiman. (2014). The new extensionist: Roles and capacities to strengthen extension and advisory services. Journal of International Agriculture and Extension Education, 21(3). doi:10.5191/jiaee.2014.21301.

Karbasioun, M. ve Mulder, M. (2004). HRM and HRD in agricultural extension organizations in Iran a literature review. AIAEE, Proceedings of the 20th Annual Conference, 13-24, Dublin, Ireland.

Lovett, M. (2019). HRD Strategies. http://www.hrdstrategies.com/individual-and-organizational-competencies/

Lylod's Register. (2019). Behavioral Competencies Guide &Dictionary. Helping to achieve your potential.http://www.lr-behaviouralcompetencies.org/pdfs/BC-Dictionary-re-brand-final.pdf

Oakley, P. and Garforth, C. (1985). The extension agent (sixth section), Guide to extension training. Food and Agriculture Organization of the United Nations, United Kingdom, p:67. ISBN 92-5-101453-1.

http://www.fao.org/docrep/t0060e/T0060E08.htm#6

Rogers, E. M. (2010). Diffusion of innovations. Simon and Schuster.

Sulaiman, R., and K. Davis. (2012). The "new extensionist": Roles, strategies, and capacities to strengthen extension and advisory services. Lindau, Switzerland: Global Forum for Rural Advisory Services (GFRAS).

Suvedi, M., Kaplowitz, M. (2016) What Every Extension Worker Should Know – Core Competency Handbook –Department of Community Sustainability Michigan State University East Lansing, Michigan, USAU.S. Agency for International Development (USAID) project Modernizing Extension and Advisory Services (MEAS).

CHANGES IN THE LEVEL OF EDUCATION OF FARMERS IN POLAND

Ewa Stawicka
Warsaw University Of Life Sciences – SGGW, Faculty of Economic Sciences, Department of Education Economics, Communication and Counselling, Poland
Email: Ewa_stawicka@ sggw.pl

Beata Żelazko
SGH Warsaw School of Economics, The Family Business Unit,The Enterprise Institute, Poland
Email: bzelaz@ sgh.waw.pl.

Abstract

Education plays a pivotal role in the running of farms the world over and Poland is no exception, the level of education of farm owners is one of the key factors of their development. Considerations of the article were subordinated to questions about trends and diversification of the level of education among the agricultural population in Poland. Due to the biological and technical progress and the need to adapt to changing conditions in the market economy, special attention should be directed to the level of knowledge available to household members. Although knowledge is immeasurable and it is difficult to determine its level, education seems to be the best measure (Stawicka, 2012). However, the analysis was made with full awareness that this is not a perfect measure, because not always education in the formal sense coincides with actual knowledge. Nevertheless, it affects the level of living standards of households connected with agriculture, translating into satisfying the needs and development possibilities of the farm (Klerkx, 2012).

In 2010-2017, both the number of family farms and those working there decreased. This process resulted from the liquidation of small farms and the transition of people associated with them, both to the non-agricultural job market and to the group of inactive people. Among farm families, the share of older age categories increased. The percentage of farm owners with a relatively higher level of general education increased, and to a lesser extent, with school agricultural preparation. The tendency to improve the level of qualifications concerned farmers for whom income from agricultural production was important for household budgets as well as for persons managing farms focused on work outside agriculture. The improvement in the level of vocational education mainly concerned users of large and developing entities (Dudek, 2018). It should be emphasized that the level of education, especially of managers of farms (higher agricultural preparation) had a direct impact on the speed and effects of implementing technical, technological, social and organizational innovation, including eco-innovation, as it involved obtaining financial resources for business development. Among family-oriented family oriented farms with a relatively large production potential, progress has been made in professional preparation for the profession of a farmer, seeking knowledge or implementing agricultural investments.

The article used the data of the Central Statistical Office published in the study Agricultural Property Characteristics that came from the General Agricultural Census 2010 survey and the results of the farm structure survey (BSGR) carried out in 2013 and 2016. The study emplyed the comparative method and statistical data analysis

Keywords: Farmers, Family Farms, Level of Education, Development.

1. Introduction

The official public statistics indicate, that in the years 1995-2016 the role of agriculture in the Polish economy was significantly reduced. In this period, the agriculture's share in GDP has declined by approx. 8.3 percentage points, from about 10.7% to 2.4% (GUS 2018). As a result of a significant decrease in the number of farms, the percentage of people involved in agriculture decreased, and also the dependence of the rural population on the agricultural sector as a source of jobs.

The number of non-farming families and the migration balance increase, which resulted mainly from the sub-urbanization process. Still, Poland is a country with relatively high employment in the agricultural sector.

High qualifications of farmers is one of the key factors stimulating the development of family farms (Nowak, 2009). It has been shown that the level of education of the farm manager in Poland has a significant impact on the efficiency of the labor factor (Anna Nowak, Tomasz Kijek, Ewa Wójcik, 2017).

Over the last ten years, the level of education of managers of individual farms has been growing (improvement of the level of education, acquisition of current industry knowledge by farmers - additional education, the possibility of attending in agricultural courses). On farms, farmers use more and more modern technology, they implement innovations. Changes related to sustainable development and, above all, socially responsible strategies are increasingly leading to:

- modernization and growth of innovation in the agricultural sector,
- creating and transferring knowledge and technology for sustainable development,
- adapting structures to the changing challenges in Poland, the EU and on a global scale,
- promotion and expansion of markets for agri-food products (Stawicka, 2017).

The aim of the study is to determine the nature of changes in the human capital of Polish agricultural holdings in Poland in 2010-2016. The specific objectives are:

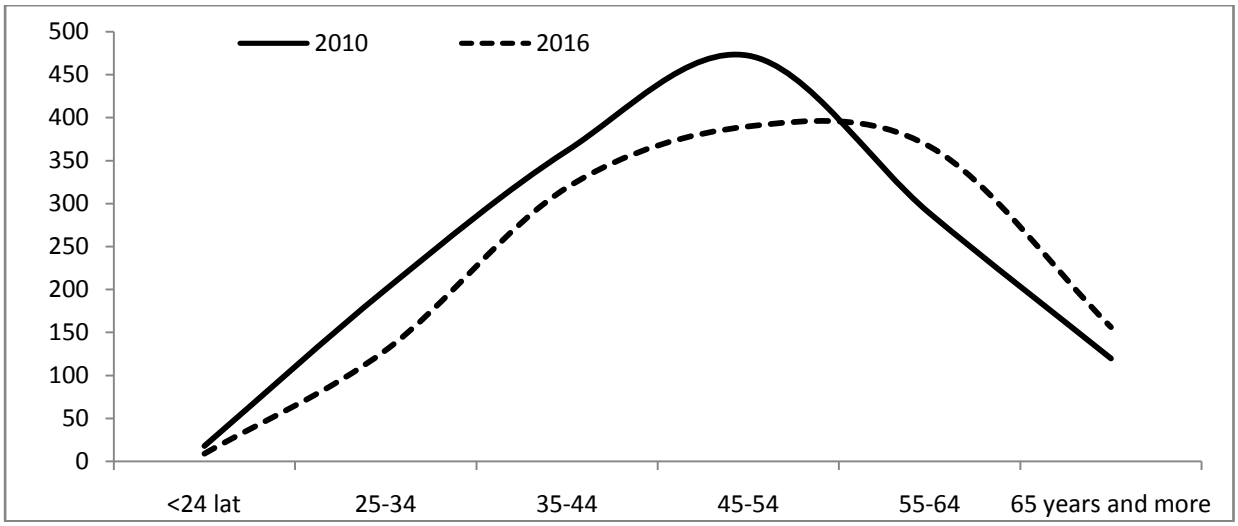
- socio-demographic characteristics (based on the analysis of such variables as gender, age, general and agricultural education) of family users of agricultural holdings in 2010-2016,
- determining the level of professional activity of family users of farms.

Data analysis is a contribution to further research on the development of individual farms in the field of sustainable development in the aspect of the quality of the human factor. The study analyzed the socio-demographic characteristics of the agricultural population, such as: age, sex, general and agricultural education, professional activity of these people in agricultural holdings, economic activity undertaken from agricultural and non-agricultural activities. The results are presented in graphic form using statistical and comparative methods.

2. Demographic Characteristics of the Agricultural Population in Poland

Analyzing public statistics, the majority of all 1.4 million family farms (over three-quarters) were small- (in terms of economic potential) and mainly poorly market-oriented entities. Families associated with them usually obtained the majority of their income from non-agricultural sources (wage labor, old-age and disability pensions), and the remaining agricultural assets at their disposal served as a safeguard and social function.Another attitude in this respect and other characteristics were evident in the case of families from profitable and economically strong farms, which belonged to a minority (about one fifth of all houseeholds). Family members in pro-market oriented farms had appropriate professional qualifications and were heavily involved in agricultural production. It should be noted that in the domestic agriculture for many years there has been a tendency to shrink the group of small farms and the growing collection of large and family-owned family entities. This process translated into the shape of part of the agricultural population characteristics.

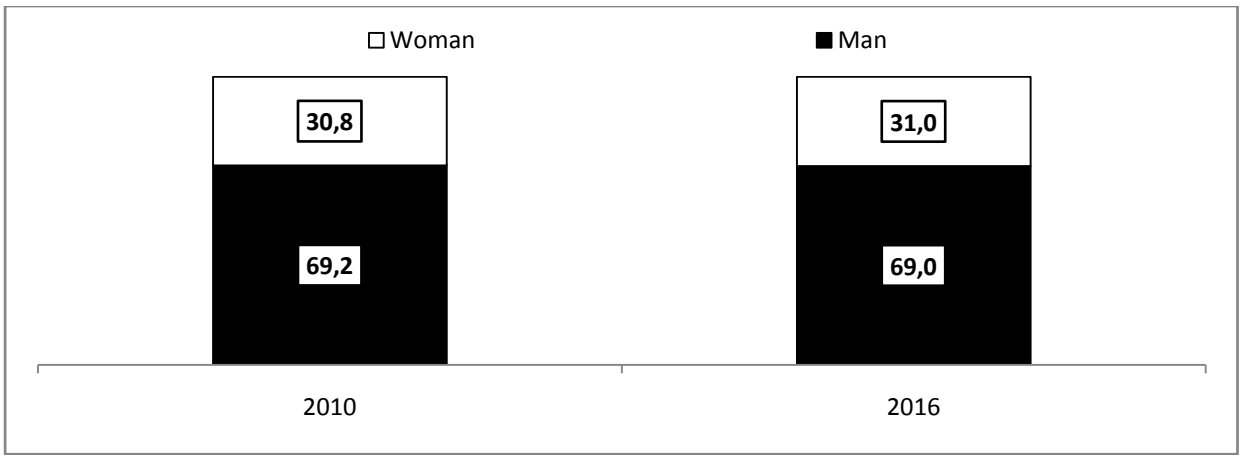
Fluctuations in the size of family farms were relatively the weakest in terms of changes in the population structure associated with them by gender. Farm managers were much more often men. Their advantage among managers of farming has been long-standing and had a deep socio-cultural background. The profession of a farmer was treated as a typically male occupation, which was reflected in the directions of transfer of land and production assets within families. These transfers were made by the owners generally to their sons. The largest age group in both 2016 and 2010 were farmers aged 45-54. However, there has been an increase in the number of managers aged 55-64 and 65 and over. It should be noted that the managers of farms with high economic potential were relatively younger, which meant that in the case of these entities, the problems related to succession were relatively less urgent (Figure 1).



Source:calculations based on the CSO, Warszawa 2017

Figure 1. People Managing Family Farms by Age in 2010-2016

People working in agriculture were relatively older than workers in the general population. In addition, in the population of people managing farms, less than a third of the total population were women. They usually ran small farms that were not oriented to the market. Often also the implementation of management tasks on farms resulted from a life or economic situation (loneliness, work of a spouse outside agriculture) (Figure 2).



Source:calculations based on the CSO , Warszawa 2017

Figure 2. People Managing Family Farms by sex in 2010-2016

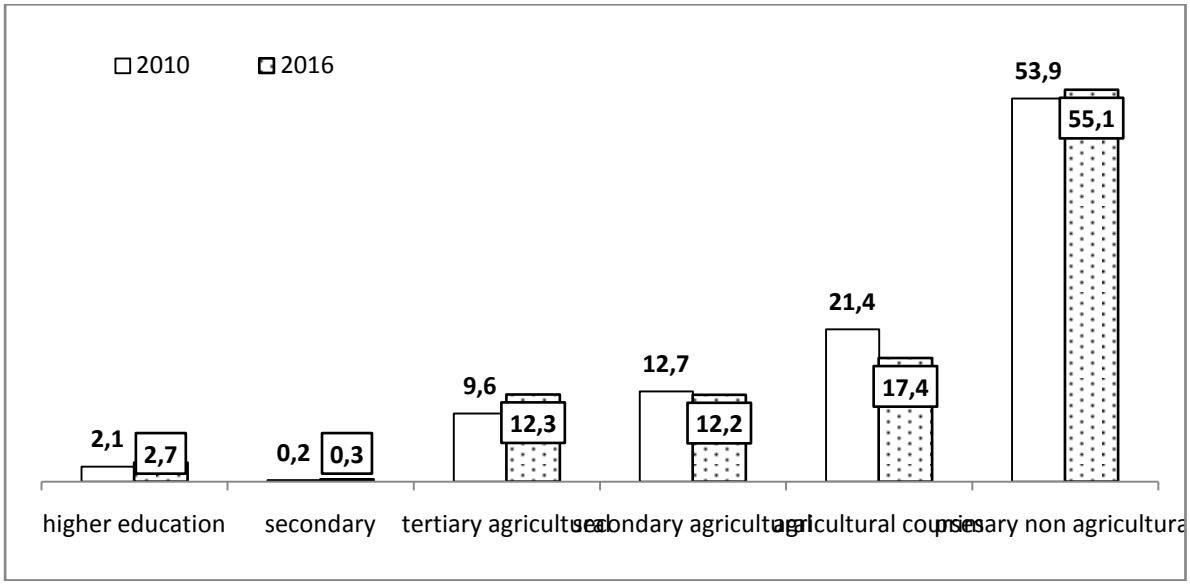
In the EU women account for 35.1 % of the agricultural workforce. The 2016 LFS shows that the proportion of women working in agriculture across the EU was much smaller than their share of the total working population (35.1 % against 45.9 %). Women accounted for more than 40 % of the agricultural workforce in only five Member States, namely Austria (44.5 %), Romania (43.1 %) Poland, Greece and Slovenia (41.1 % in each of three countries). By contrast, the lowest proportions of women farmers were reported in Denmark (19.9 %) and Ireland (11.6 %) (Eurostat, 25.03. 2019).

Aamong the spouses of managers of family farms in Poland, older people arrived and some of younger ones disappeared, which indicated the aging of this group. Other members of family farms, as a rule, children of farm managers and spouses, as well as parents or in-laws of the latter (much less often it was the siblings of managers and spouses) constituted a diversified category. At the same time it should be noted that the younger age categories of other members of farming families were more numerous than the older ones. However, there was a decline in the total number of farms and agricultural population, as well as a drop in fertility and migration of young people from rural areas.

3. Changes in the Level of Education of People Managing Family Farms in Poland

Demographic changes among the agricultural population were accompanied by changes in the level of formal qualifications of this population. This process also took place in relation to farm managers. From the point of view of the economic situation and the prospects of farm development, the quality of managers' competences was decisive due to their role in making current and strategic decisions regarding agricultural business operations. Farmers were in the socio-occupational category with one of the lowest human capital parameters measured by achievements in school education. However, over the period 2010-2016, the level of education of this group has improved. Among all farm managers there was an increase in the share of people with higher education (from 10 to 13%) and secondary vocational education (from 24 to 31%). At the same time, in the described group there was a decrease in the percentage of people with basic vocational education (from 40 to 37%) and lower secondary and primary education (from 17 to 12%). It should be noted, however, that the usually higher level of general education was characteristic of users of farms who were oriented to gainful employment in non-agricultural sectors. The improvement in the level of general education of farmers did not involve a change in their formal professional qualifications.

However, as for sectoral and agricultural preparation, over half of farm managers did not have any formal preparation for running a farm (Figure 3).



Source:calculations based on the CSO , Warszawa 2017

Figure 3. Structure of Agricultural Education of People Managing Family Farms in 2010-2016 (%)

Among the managers of farms, the largest share was held by people who completed the agricultural course. This type of agricultural education concerned mainly the relatively oldest people. Over one in ten family farm managers in turn held secondary vocational and basic vocational agricultural education. The population with agricultural, directional preparation at the higher level constituted minority (2-3%). It should be emphasized that managers with industry-related agricultural preparation usually had significant and modern production facilities and maintained a strong relationship with the market. This group often used financial resources for the development of activities in the form of loans or EU subsidies. In this context, it is worth adding that having a field agricultural education or a commitment to supplement it was a condition for using the means of supporting agricultural investments co-financed from the EU budget.

The decline in employment in this sector was a reflection of structural changes in domestic family farming. In 2010-2016, labor expenditures measured in the annual work unit decreased in family farms. These changes should be attributed primarily to a decrease in the number of farms as well as a progressive decline in the demand for agricultural labor. This process concerned, in particular, small

family farms (with UA area up to 30 ha), usually with a small scale of commodity production. In turn, in entities with a relatively larger economic potential and market-oriented (30 ha and more), labor inputs have increased. Farmers with agricultural preparation more often developed their farms. Farmers with agricultural education more often perceived a competitive advantage in a more labor-intensive, but increasingly more important, also in the aspect of EU policy, sustainable agriculture. Almost 90% of them emphasized that they see the positive effects of sustainable agriculture. The farmers most often pointed the improvement of the natural environment, the production of healthier and better quality food and high yields. It turns out that the sex of the farm manager has a big impact on the perception of sustainable development. Women more often than men emphasized the benefits of applying the principles of sustainable agriculture in practice in the form of healthier and better in terms of quality of food, higher yields, improved work safety of the farmer. Farmers, especially those with higher agricultural education, see the use of sustainable agricultural practices of the future for Polish agriculture (agrofakt.pl, 25.03.2019).

However, there was a decrease in the involvement of farming families in classes on farms. It also means the process of a progressive decline in the importance of the agricultural sector as a place of employment and source of income for rural residents. GUS (in English: CSO - Central Statistical Office) data showed that agricultural activity was the main source of income for about one third of families using farms. In their case, the person managing was a middle-aged man with agricultural qualifications.

In entities with a large economic size, production was earmarked for sale and, as a rule, investments aimed at business development were carried out. In farms where the manager was a person without agricultural preparation, as a rule, most of the family derived income primarily from wage labor. They used degraded agricultural wealth for production intended for self-supply or for sale as an additional stream of money supplementing home budgets. The group of families with farms living on agricultural activities and families with farms living on wage labor were similar in many socio-demographic aspects. Two features distinguished tchem working time devoted to classes at the farm and having qualifications useful for running it. A separate category was made up of farming families that mainly survived from retirement and disability pensions.

4. Conclusions

The adoption of sustainable development and social responsibility in agricultural enterprises causes more and more attention to be paid to activities not only in economic but also environmental and social terms. Good CSR models / strategies emerging in Poland are usually the result of a favorable market context and require good preparation of managers to conduct activities in the agricultural sector. In the intergenerational change, or more precisely in the level of knowledge and motivation of successors, the possibilities of family farms are seen as well as the possibility of quick adaptation to the requirements of sustainable development (Lobley M., Baker J.R., Witehead I.,)

In 2010-2016 both the number of family farms and those working there decreased. This process resulted from the liquidation of small farms and the transition of people associated with them, both to the non-agricultural job market and to the group of inactive people. Among farm households, the percentage of farm managers with a relatively higher level of education and agricultural preparation increased. The tendency to improve the level of qualifications concerned farmers for whom income from agricultural production was important for household budgets. Among market oriented family farm managers with a relatively high production potential, progress has been made in professional preparation for the profession of a farmer, seeking knowledge, establishing relationships (belonging to producer groups), greater focus on the pursuit of sustainable development.

The improvement in the level of vocational education mainly concerned people representing large and developing entities. The level of education (higher agricultural) had a direct impact on the speed and effects of implementing technical, technological, social, organizational innovations and Eco-innovations. Relatively despite the aging of the society, the younger age of the Polish economy (also against the background of Europe) and the systematically improving level of education is a positive signal in the pro-effective rebuilding of structures in Polish agriculture. The work is the basis for analyzing the impact of the level of education (gaining industry knowledge and training) on the implementation of the sustainable agriculture model on farms.

References

Becker, G. S. (1993). A treatise on the family, Harvard University Press, London, England.
Boehlje,M.(1992).Alternative models of structural change in agriculture and related industries,Agribusiness vol. 8, no. 3, John Wiley & Sons, Inc. p.219.
Dudek, M. (2018). InstrumentyWspólnejPolitykiRolnejUniiEuropejskiej a wzmacnianiekompetencjizawodowychosóbpracujących w polskimrolnictwie. Marketing izarzadzanie 51, pp. 41-49.
Dudek, M.(2016).Kapitał ludzki w procesach przemian strukturalnych polskiego rolnictwa.In A. Kowalski (Eds.) WPR a konkurencyjność polskiego i europejskiego sektora żywnościowego. IERiGŻ-PIB, Warszawa.
Kempa, E.(2011). Strategia rozwoju firm rodzinnych w sektorze MMSP. In A. Marjański(Eds.) Firmy rodzinne -determinanty funkcjonowania i rozwoju. Strategie zarzadzania przedsiębiorstwem rodzinnym. Społeczna Wyższa Szkoła Przedsiębiorczości i Zarządzania w łodzi, Łódź.
Klimek, J. (2014). W rodzinnej firmie. Powstanie, rozwój, zagrożenia i szanse. Wydawnictwo Menedżerskie PTM, Warszawa.
Klerkx, L. (2012). The role of innovation brokers in the agricultural innovation system. Improving Agricultural Knowledge and Innovation Systems: OECD Confernce Proceedings.
Lobley M., Baker J.R., Witehead I., Farm succession and retirement: some international comparisons, Journal of Agriculture, Food Systems and Community Development, tom 1, nr 1, New Leaf Associates, Inc. 2010, pp. 60.
Nowak A., (2009), Kwalifikacje rolników czynnikiem rozwoju gospodarstw rolnych, http://www.oeconomia.actapol.net/pub/8_3_107.pdf
Nowak A., Kijek T., Wójcik E. (2017), Wpływ wykształcenia rolników na produktywność pracy w towarowychgospodarstwachrolnychwPolsce, https://ageconsearch.umn.edu/record/257374/files/18-1-Nowak.pdf
Pollak, R. A. (2002). Gary Becker's Contributions to Family and Household Economics, Washington University in. St. Louis, 2002.
Schultz, T.W. (1981). Investing in People: the economics of Population Quality, University of Kalifornia and Berkley.
Sikorska, A. (2011). Uwarunkowania rozwoju kapitału ludzkiego w rolnictwie i na obszarach wiejskich, IERiGŻ-PIB, Warszawa.
Stawicka, E. (2011). Społeczna odpowiedzialność w firmach rodzinnych, InA. Marjański (Eds.) Firmy rodzinne -determinanty funkcjonowania i rozwoju. Strategie zarzadzania przedsiębiorstwem rodzinnym. Społeczna Wyższa Szkoła Przedsiębiorczości i Zarządzania w łodzi, Łódź.
Stawicka, E. (2012). Koncepcja kapitału ludzkiego w naukach o zarządzaniu. In S. Alojzy Czech (Eds.) Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach, Katowice, pp. 231-242.
Stawicka, E.(2017). CSR w kontekście zrównoważonego rozwoju sektora rolno-spożywczego, Turystyka i Rozwój Regionalny nr 8, pp. 93-104.
Sułkowski, Ł., Marjański A. (2009). Firmy rodzinne. Poltext, Warszawa.
MRiRW, (2011). Strategia Zrównoważonego Rozwoju Wsi, Rolnictwa i Rybactwa (Projekt z 15. 06. 2011r.) Warszawa.
Wigier, M., Wieliczko, B., (2014). Raport Programu Wieloletniego 2011-2014 nr 146, IERiGŻ-PIB, Warszawa, pp. 248-259.
Zegar, J.(2009). Struktura polskiego rolnictwa rodzinnego pod koniec pierwszej dekady XXI wieku, IERiGŻ-PIB, Warszawa,pp. 9-16.
OECD, Agricultural Policy Monitoring and Evaluation 2015, OECD Publishing, Paris.Charakterystyka gospodarstw rolnych w 2016 r., GUS, Warszawa 2017.
Charakterystyka gospodarstw rolnych. Powszechny Spis Rolny 2010, GUS, Warszawa 2012.
Rachunki narodowe według sektorów i podsektorów instytucjonalnych w latach 2013–2016, GUS, Warszawa 2018.
ec.europa.eu/Eurostat
agrofakt.pl

ESTIMATING NUTRIENT ELASTICITY FOR TURKEY

Neslihan Dönmez
Yildiz Technical University, Department of Economics, Turkey, Email:neslihandonmz@ gmail.com

Hüseyin Taştan
Yildiz Technical University, Department of Economics, Turkey

Abstract

Technological developments in food production and distribution affect the way food is accessed and consumed. Although access to food has become relatively easy recently, micronutrient deficiency, or hidden hunger, and obesity still remain as crucial problems in food consumption. These problems may be studied using the concept of nutrition demand in addition to food demand. Nutrition demand analysis can be used to examine the impact of changes in food prices on nutrient intake. In this study, we investigate the effect of a price change on the intake of different nutrients in Turkey by estimating a complete demand system. For this purpose, we created twelve aggregated food groups for foods consumed by households and then estimated Quadratic Almost Ideal Demand System (QUAIDS) by using Turkey's Household Budget Survey Data for the year 2003 in order to find expenditure and price elasticities for each food group. The reason for using year 2003 data is that it includes information about quantitiesof every food type classified according to ten-digit classification of individual consumption by purpose (COICOP). In addition, in order to estimate nutrient elasticities,we calculated the share of twenty-one different nutrients in the consumption of each food group by using food nutrient and calorie values data published byTürKomp National Food Composition Database. Then, using uncompensated elasticities and the shares of nutrients, we calculated nutrient elasticities for each nutrient. Empirical results suggest that increases in food prices have negative impacts on the intake of most nutrients. The largest nutrient elasticities were estimated for Vitamin-A and Vitamin-C that are subject to the price changes in the vegetable food group. Also, a price increase in the bread food group results in a decrease in the intake of all nutrients, except niacin. Moreover, calorie and protein intakes are negatively affected by price increases in all product groups without any exception. Finally, for carbohydrate intake, the effect of the increases in meat and oil prices are positive.
Keywords: Nutrient Elasticities, Demand System, Turkey, Household Survey Data, Food Demand.

THE IMPACT OF EXCHANGE RATE VOLATILITY ON TURKEY'S LIVESTOCK IMPORTS

Yakup Arı
Alanya Alaaddin Keykubat University, Department of Economics and Finance, Turkey

Yılmaz Toktaş
Amasya University, Department of Economics, Turkey, Email: toktasyilmaz@ gmail.com

Abstract

Turkey is a country with high young population rate. Also, after the internal conflicts that arose in neighboring countries, flocks of people have immigrated to Turkey. High population growth caused high food demand. Also, most of the population in Turkey is Muslim, and it is creating extra demand in the feast of sacrifice. During recent years, because of these reasons, the supply of meat could not meet the demand, and high demand increased the meat prices with high costs. The government of Turkey, therefore, started to import live animals to reduce meat prices. In this study, for the period 2005M01- 2018M01, the relationship between real effective exchange rate, real effective exchange rate volatility and Turkey's livestock imports was examined using bounds test, symmetric and time-varying symmetric causality tests.

In this study, unit root analysis was performed using ADF and PP tests. The results of ADF and PP unit root tests indicated that the parameters were stationary at different levels and that none of the parameters was stationary at the 2nd level. According to bounds test, the F-statistic value calculated at a significant level of 5% and 10% was found less than bottom limits, the cointegration relation between the variables was not determined. As a result of the bounds test, it was concluded that there was no long-term relationship between the variables. According to the results of a Hacker-Hatemi-J causality test, a causality relationship was not found from volatility, reel effective exchange rate and industrial production index to Turkey's livestock exports. Timer varying causality analysis confirmed this result for a significant part of the time interval. However, a causality relationship was determined for some periods from volatility, reel effective exchange rate and industrial production index to Turkey's livestock exports.

In this study,for the period 2005M01- 2018M01, the relationship between real effective exchange rate, real effective exchange rate volatility and Turkey's livestock imports was examined using bounds test, symmetric and time-varying symmetric causality tests.

Keywords: Foreign Trade, Real Exchange Rate, Time Series, Bounds Test, Causality Tests
Related Field: B-5

1. Introduction

Turkey is a country with high young population rate. Also, after the internal conflicts that arose in neighboring countries, flocks of people have immigrated to Turkey. High population growth caused high food demand. Also, most of the population in Turkey is Muslim, and it is creating extra demand in the feast of sacrifice. During recent years, because of these reasons, the supply of meat could not meet the demand, and high demand increased the meat prices. The government of Turkey, therefore, started to import live animals to reduce meat prices.

Due to the changes in supply and demand conditions, from the second half of the 2000s, food prices have been a significant increase in the world. The period 2007-2008 was the period of high food prices and instability in the markets and a period known as the food crisis period. The prices, which started to decline after 2008, started to rise again in 2010 (Bayramoğlu and Yurtkur 2015).

In recent days, Turkey's agricultural and animal products prices are on the agenda of the country. Policymakers are applying different solutions to under control the prices. Understand the reasons of high agricultural and animal products prices is necessary to find and apply logical solutions.

Turkey also faced with the high exchange rate fluctuations and reveals a higher risk countries for food suppliers. Turkey has limited studies on the determinants of food prices. In some of the studies, the effect of exchange rate on Turkish food prices was also examined. Çıplak and Yücel (2004) and Bayramoğlu and Yurtkur (2015) are some of these studies. The foreign exchange rates found in the works of Çıplak and Yücel (2004) are the determining factors of food prices. Bayramoğlu and Yurtkur (2015) analyzed the relationship between exchange rates and agricultural producer prices with the VAR approach between 1999: 2-2014: 4. According to empirical results, exchange rates have a lagged effect on prices.

The main aim of this study is to determine the effects of volatility in real effective exchange rates on Turkey's livestock imports.

The accomplishment of this objective is expected to answer the following research questions:

1. What effect does the exchange rate volatility have on Turkey's livestock imports?
2. How does the exchange rate affect livestock traders and farm policy?
3. What measures do governmental policy planners need to implement to minimize the impact of exchange rate volatility?

2. Turkey's Livestock Production and Imports

The annual meat consumption per person in Turkey has increased by 95 per cent in the last 20 years. In 1998, 16.6 kilograms of meat per capita was consumed per year. This figure increased to 32.3 kilograms in 2017. While the highest increase was experienced in cattle consumption with 149 per cent, sheep consumption decreased by 20 per cent in the same period. On the other hand, chicken meat consumption increased by 107 per cent.

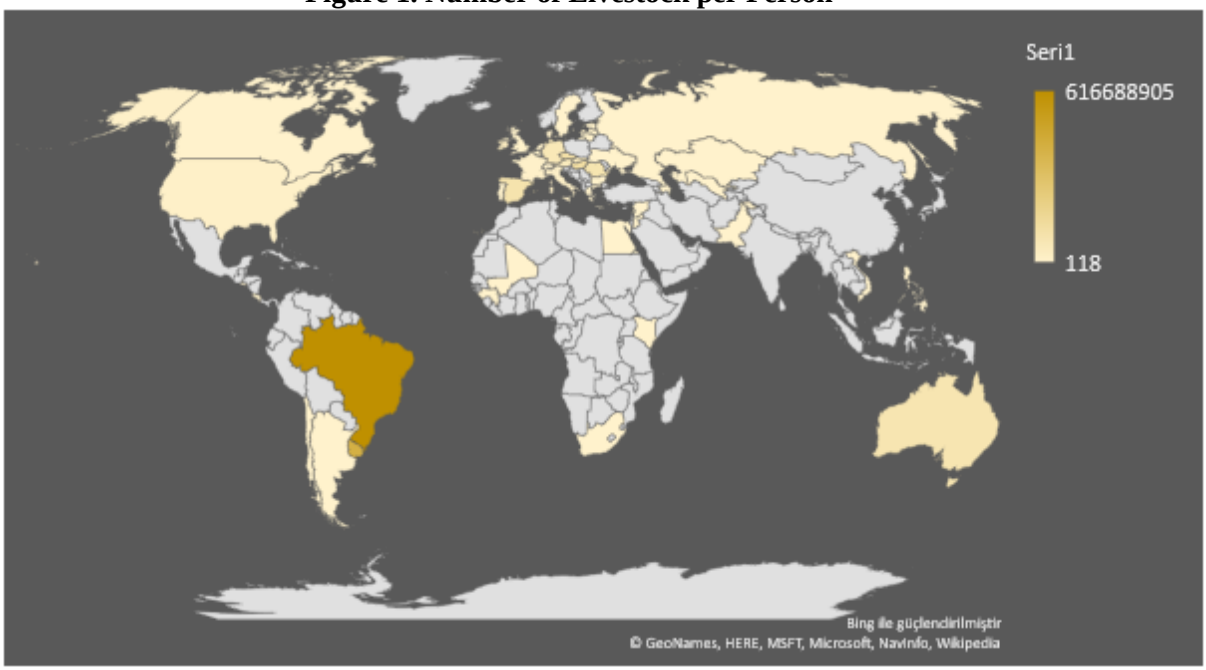
Table 1. Turkey's Number of Livestock and Livestock Products

	Cattle	Sheep	Goats	Total(Head)
2001	10 548 000	26 972 000	7 022 000	44 542 000
2002	9 803 498	25 173 706	6 780 094	41 757 298
2003	9 788 102	25 431 539	6 771 675	41 991 316
2004	10 069 346	25 201 155	6 609 937	41 880 438
2005	10 526 440	25 304 325	6 517 464	42 348 229
2006	10 871 364	25 616 912	6 643 294	43 131 570
2007	11 036 753	25 462 293	6 286 358	42 785 404
2008	10 859 942	23 974 591	5 593 561	40 428 094
2009	10 723 958	21 749 508	5 128 285	37 601 751
2010	11 369 800	23 089 691	6 293 233	40 752 724
2011	12 386 337	25 031 565	7 277 953	44 695 855
2012	13 914 912	27 425 233	8 357 286	49 697 431
2013	14 415 257	29 284 247	9 225 548	52 925 052
2014	14 223 109	31 140 244	10 344 936	55 708 289
2015	13 994 071	31 507 934	10 416 166	55 918 171
2016	14 080 155	30 983 933	10 345 299	55 409 387
2017	15 943 586	33 677 636	10 634 672	60 255 894

Source: Turkish Statistical Institute, 2019.

Source: Turkish Statistical Institute, 2019.

Figure 1. Number of Livestock per Person



Source: Turkish Statistical Institute, 2019.

Figure 2. Turkey's Livestock Import Destinations– 2018

Table 2. Livestock Products T

	Meat (Tons)	**Milk (Tons)**	**Chicken meat (Tons)**
2001	435 778	9 495 550	614 745
2002	420 595	8 408 568	696 187
2003	366 962	10 611 011	872 419
2004	447 154	10 679 406	876 774
2005	409 423	11 107 897	936 697
2006	438 530	11 952 099	917 659
2007	575 622	12 329 789	1 068 454
2008	482 458	12 243 040	1 087 682
2009	412 621	12 542 186	1 293 315
2010	780 718	13 543 674	1 444 059
2011	776 915	15 056 211	1 613 309
2012	915 844	17 401 262	1 723 919
2013	996 125	18 223 712	1 758 363
2014	1 008 272	18 630 859	1 894 669
2015	1 149 262	18 654 682	1 909 276
2016	1 173 042	18 489 161	1 879 018
2017	1 126 403	20 699 894	2 136 734

Source: Turkish Statistical Institute, 2019.

The percentage of the livestock in Turkey rose by 29% from 2007 to 2017. In this period, Turkey's population also increased by 13%. However, we should also keep in mind that illegal immigrants entered in Turkey in this period.

Table 3. Livestock Import Destinations Table (2018)

Country	Livestock Import	Percentage of Total Livestock Import
Brazil	616688905	34.88%
Uruguay	412486313	23.33%
Hungary	120387970	6.81%
Czechia	111447112	6.30%
Spain	92625884	5.24%
Romania	83272421	4.71%
Australia	81862800	4.63%
Germany	62060422	3.51%
Austria	44764976	2.53%
Slovakia	41517708	2.35%
Total		94.30%

Source: Turkish Statistical Institute, 2019.

Turkey mostly imported livestock from Latin American countries such as Brazil and Uruguay in 2018. The share of these two countries in total livestock imports of Turkey is 58.21%. With a share of 31.45%, European countries (Hungary, Czechia, Spain, Romania, Germany, Austria and Slovakia) are in the list of top ten countries supplying Turkey's livestock imports after Latin American countries.

3. Empirical Analyses

In the study, the model developed by Bahmani-Oskooee and Goswami (2004) was used to examine the relationship between the real effective exchange rate and volatility and exports. Model (1) is given below:

$$LNLA = LNREER + VOL + LNIPE$$

Table 4. Variables Used in Present Study

Abbreviation of Variable	Definition	Period	Source
LNLA	Turkey's Livestock Imports	2005M01-2018M01	Turkish Statistical Institute Database
LNREER	Real Effective Exchange Rates		
LNIPE	Industrial Production Index		
VOL	Volatility		EGARCH (1.1)

3.1 GARCH Model

Bollerslev (1986) extended the ARCH model to the Generalized Autoregressive Conditionally Heteroscedastic (GARCH) model, which assumes that the conditional variance depends on its own p past values, and q past values of the squared error terms. The variance equation of the GARCH (p,q) model can be expressed as

$$a_t = \sigma_t \varepsilon_t \; where \; \varepsilon_t \sim f_v(0,1)$$

$$\sigma_t^2 = \alpha_0 + \sum_{i=1}^{p} \alpha_i a_{t-i}^2 + \sum_{i=1}^{q} \beta_i \sigma_{t-i}^2$$

$$\sigma_t^2 = \alpha_0 + \alpha(B)a_{t-1}^2 + \beta(B)\sigma_{t-1}^2$$

where α_0 is a constant and the innovations or residuals follow the probability density function $f_v(0,1)$ with zero mean and unit variance. In non-normal case, $v$are used as additional distributional parameters for the scale and the shape of the distribution. $\alpha(B)$is a polynomial of degree p and $\beta(B)$ is a polynomial of degree q where B is the backward shift operator.

Bollerslev (1986) has shown that the GARCH(p,q) process is covariance stationary with E(a_t) = 0, var(a_t) = α_0 / (1 − $\alpha(1)$ − $\beta(1)$) and cov(a_t, a_s) = 0 for t ≠ s if and only if $\alpha(1) + \beta(1) < 1$.

In this study, Standart GARCH (Bollerslev,1986), Integrated GARCH (Engle and Bollerslev, 1986, Nelson, 1990), Exponential GARCH (Nelson, 1991), Threshold GARCH (Zakoian, 1994), GJR-GARCH of Glosten, Jagannathan and Runkle (1993) and Absolute Value GARCH (Taylor, 1986) models are applied for modeling the volatility of foreign exchange rates. Moreover, the innovation process is allowed to follow the normal distribution, skewed normal distribution, Student-t distribution, skewed Student-t distribution, Generalised Error Distribution (GED), skewed GED, normal inverse Gaussian (NIG) distribution and Johnson's SU distribution which are assumed conditional distributions for mentioned models. For details, one can read the article by Chu et al. (2017).

3.2 EGARCH Model

Nelson (1991) proposed the exponential GARCH (EGARCH) model to handle with some weakness of the GARCH model. The positive and negative error terms have a symmetric effect on the volatility is an assumption of an ordinary GARCH model. In fact, the negative shocks on asset price have a greater influence on volatility than positive shocks if negative and positive shocks have the same magnitude. In particular, the weighted innovations are considered in the EGARCH model to allow for asymmetric effects between positive and negative asset returns. The weighted innovations can be written as follows

$$g(\varepsilon_t) = \theta\varepsilon_t + \gamma[|\varepsilon_t| - E(|\varepsilon_t|)]$$

where , $\gamma \in \mathbb{R}$. $\varepsilon_t$and$|\varepsilon_t| - E(|\varepsilon_t|)$ are iid sequences with zero mean and both follows continuous distributions. Thus, $E[g(\varepsilon_t)] = 0$. $g(\varepsilon_t)$is an asymmetric function since

$$g(\varepsilon_t) = \begin{cases} (\theta+\gamma)\varepsilon_t - \gamma E(|\varepsilon_t|), if\, \varepsilon_t \geq 0 \\ (\theta-\gamma)\varepsilon_t - \gamma E(|\varepsilon_t|), if\, \varepsilon_t < 0 \end{cases}$$

The general form of the EGARCH(p,q) model is

$$a_t = \sigma_t\varepsilon_t, \qquad \ln(\sigma_t^2) = \alpha_0 + \left[\frac{1 + \beta_1 B + \cdots + \beta_{q-1}B^{q-1}}{1 - \alpha_1 B + \cdots + \alpha_{p-1}B^{p-1}}\right] g(\varepsilon_{t-1})$$

where$1 + \beta_1 B + \cdots + \beta_{q-1}B^{q-1}$ and $1 - \alpha_1 B + \cdots + \alpha_{p-1}B^{p-1}$ are polynomials with zeros outside the unit circle and have no common factors (Tsay, 2012). The natural logarithm of the conditional variance enables the coefficients of the model can have negative values and $g(\varepsilon_t)$ function satisfies that the model can respond asymmetrically to positive and negative lagged values of a_t.

The normal distributed EGARCH(1,1) model is

$$a_t = \sigma_t\varepsilon_t, \qquad (1 - \alpha_1 \mathrm{B})\ln(\sigma_t^2) = (1 - \alpha_1)\alpha_0 + g(\varepsilon_{t-1})$$

where the ε_t are iid standart normal. In the case of normal distiributed EGARCH(1,1) model, $E(|\varepsilon_t|) = \sqrt{2/\pi}$ and by rewritting the $g(\varepsilon_{t-1})$ the model becomes

$$(1 - \alpha_1 \mathrm{B})\ln(\sigma_t^2) = \begin{cases} \alpha_* + (\theta+\gamma)\varepsilon_{t-1}, if\, \varepsilon_{t-1} \geq 0 \\ \alpha_* + (\gamma - \theta)(-\varepsilon_{t-1}), if\, \varepsilon_{t-1} < 0 \end{cases}$$

where$\alpha_* = (1 - \alpha_1 \mathrm{B})\alpha_0 - \left(\sqrt{2/\pi}\right)\gamma$ and the coefficients $(\theta + \gamma)$ and $(\gamma - \theta)$ show the symmetry in response to positive and negative a_{t-1} (Tsay, 2012). If the conditional distribution for the innovations is standardized Sudent-t distribution the expected mean of ε_t is

$$E(|\varepsilon_t|) = \frac{2\sqrt{v-2}\Gamma((v+1)/2)}{(v-1)\Gamma(v/2)\sqrt{\pi}}$$

So;

$$\alpha_* = (1 - \alpha_1 \mathrm{B})\alpha_0 - \left(\frac{2\sqrt{v-2}\Gamma((v+1)/2)}{(v-1)\Gamma(v/2)\sqrt{\pi}}\right)\gamma$$

The effective foreign exchange rate of the US Dollar (USD) and the Turkish Lira (TRY) monthly data in the period of years 2005-2018 were used to determine the volatility. The logarithm of the FOREX had a unit root according to ADF and KPSS test. By taking the first difference of log of USD/TRY data, it became stationary. ARCH-LM and Ljung-Box tests show that there was an ARCH effect on the data. So, GARCH type models can be applied to the data. GARCH, IGARCH, SGARCH, EGARCH, TGARCH, AVGARCH and GJR-GARCH were fitted to data and normal distribution, skewed normal distribution, Student-t distribution, skewed Student-t distribution, Generalised Error Distribution (GED), skewed GED, normal inverse Gaussian (NIG) distribution and Johnson's SU distribution were assumed as the conditional distributions for the innovations. The fitted models were compared according to information criteria which are given at the following table. In conclusion, the Student-t EGARCH (1,1) model was found as the best convenient model for the volatility of USD/TRY FOREX data and the parameter estimations are given in Table 2. The diagnostics test are given in Appendix A.

Table 5. Model Comparison

	Information Criteria				
Model	**Akaike**	**Bayes**	**Shibata**	**Hannan-Quinn**	**Likelihood**
sgedgarch	-4.459436	-4.342133	-4.462251	-4.411793	353.836
stdtgarch	-4.518344	-4.420593	-4.520315	-4.478642	357.4309
gedavgarch	-4.513916	-4.377064	-4.517717	-4.458332	359.0855
stdgjrgarch	-4.51862	-4.381768	-4.522422	-4.463037	359.4524
stdegarch*	-4.565199	-4.467448	-4.56717	-4.525497	361.0856
sgedigarch	-4.456271	-4.378069	-4.457542	-4.424509	351.5891
nigsgarch	-4.433666	-4.335915	-4.435637	-4.393964	350.826

Table 6. Student-t EGARCH(1,1)

Optimal Parameters for Student-t EGARCH(1,1)				
	Estimate	**Std. Error**	**t value**	**Pr(>|t|)**
alpha0	-4.954573	1.07923	-4.59086	0.000004
alpha1	-0.727058	0.14775	-4.9209	0.000001
beta1	0.335505	0.14516	2.31135	0.020813
gamma1	0.071535	0.20225	0.35369	0.723572
shape	10.592908	8.79518	1.2044	0.228435

3.3 Unit Root Tests

In this study, unit root analysis was performed using ADF and PP tests. The results of tests are presented in Table 3. The null hypotheses of ADF and PP test equations were established based on the assumption that the series includes unit root.

The results of ADF and PP unit root tests indicated that the parameters were stationary at different levels and that none of the parameters was stationary at the 2nd level. According to the data in Table, the results are as follows; LNLAI(I), LNIPE I(I), VOL(0), and LNREER I(I) at the significance level of 5%.

Table 7. Stationary Test Results Table

UNIT ROOT TEST TABLE (PP)											
	At Level					At First Difference					
		LNLA	**LNIPE**	**LNREER**	**VOL**			**d(LNLA)**	**d(LNIPE)**	**d(LNREER)**	**d(VOL)**
With Constant	t-Statistic	-2.7	0.1	-1.4	-8.8	With Constant	t-Statistic	-33.1	-15.0	-9.7	-62.9
	Prob.	0.1	1.0	0.6	0.0		Prob.	0.0	0.0	0.0	0.0
		*	n0	n0	***			***	***	***	***
With Constant & Trend	t-Statistic	-6.6	-2.3	-3.2	-8.7	With Constant & Trend	t-Statistic	-32.9	-15.0	-9.7	-62.8
	Prob.	0.0	0.4	0.1	0.0		Prob.	0.0	0.0	0.0	0.0
		***	n0	*	***			***	***	***	***
Without Constant & Trend	t-Statistic	0.9	2.6	-0.6	-6.1	Without Constant & Trend	t-Statistic	-29.0	-14.5	-9.7	-62.9
	Prob.	0.9	1.0	0.4	0.0		Prob.	0.0	0.0	0.0	0.0
		n0	n0	n0	***			***	***	***	***
UNIT ROOT TEST TABLE (ADF)											
	At Level					At First Difference					
		LNLA	**LNIPE**	**LNREER**	**VOL**			**d(LNLA)**	**d(LNIPE)**	**d(LNREER)**	**d(VOL)**
With Constant	t-Statistic	-1.2	0.1	-1.1	-9.1	With Constant	t-Statistic	-11.6	-15.4	-9.7	-9.6
	Prob.	0.7	1.0	0.7	0.0		Prob.	0.0	0.0	0.0	0.0
		n0	n0	n0	***			***	***	***	***
With Constant & Trend	t-Statistic	-3.5	-1.7	-3.6	-9.0	With Constant & Trend	t-Statistic	-11.5	-15.3	-9.7	-9.6
	Prob.	0.0	0.8	0.0	0.0		Prob.	0.0	0.0	0.0	0.0
		**	n0	**	***			***	***	***	***
Without Constant & Trend	t-Statistic	1.0	3.2	-0.7	-6.2	Without Constant & Trend	t-Statistic	-11.5	-14.6	-9.6	-9.6
	Prob.	0.9	1.0	0.4	0.0		Prob.	0.0	0.0	0.0	0.0
		n0	n0	n0	***			***	***	***	***

Notes: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1%. and (no) Not Significant
*MacKinnon (1996)
onesided p-values.

For cointegration analysis, there are cointegration tests in literature used by Engel and Granger (1987), Johansen (1988), Johansen and Juselius (1990). These tests cannot be used in cases of various levels of stationarity of variables. The bounds test developed by Paseran et al. (2001) allows the cointegrationanalysis in case of various levels of stationarity of variables. According to variables stationary levels, we used the bounds test for cointegration analyses.

3.4 Bounds Test and Hacker – Hatemi-J Causality Test

After determining the optimal length of lag regarding the unlimited error correction model, the cointegration relationship between the variables was examined using the bounds test. The results of the bounds test are presented in the table.

Table 8. Bounds Test Results

F-Bound Test	**H0: No cointegration relationship**			
Test Statistic	**Test Value**	**Significance Level**	**I(0)**	**I(1)**
F-Test Value	1.507	%10	3.588	4.605
k	3	%5	4.203	5.320
ARDL (4,0,2,1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNCH(-1)	0.300	0.081	3.688	0.000
LNCH(-2)	0.243	0.084	2.900	0.004
LNCH(-3)	0.085	0.084	1.014	0.312
LNCH(-4)	0.211	0.081	2.610	0.010
LNRER	1.628	1.491	1.092	0.277
VOL	4.195	90.172	0.047	0.963
VOL(-1)	-46.544	88.381	-0.527	0.599
VOL(-2)	117.172	87.724	1.336	0.184
LNIPE	-5.759	3.725	-1.546	0.124
LNIPE(-1)	6.448	3.666	1.759	0.081
C	-8.470	9.834	-0.861	0.391
@TREND	0.005	0.006	0.901	0.369
Diagnostic Tests				
X^2_{BG}		9,155 [0,057]		
X^2_{NORM}		4,575 [0,032]		
X^2_{WHITE}		5,444 [0,063]		
X^2_{RAMSEY}		0,347 [0,555]		

According to Table, the F-statistic value calculated at a significant level of 5% and 10% was found less than bottom limits, the cointegration relation between the variables was not determined. As a result of the bounds test, it was concluded that there was no long-term relationship between the variables. To determine the number of lags in the ARDL model, the Schwarz information criteria were utilized. As seen in Table, ARDL (4,0,2,1) model was chosen as the suitable ARDL model.

After the bounds test, the "Hacker and Hatemi-J (2006) test" was used for causality analyses. Examination of the stationarity processes of series is not required. However, to determine the lag lengths required for a VAR model, it is necessary to perform stationarity analysis of series and determine the level of maximum stationarity.

When the normality assumption is met, the aforementioned Wald Test statistics have asymptotic X2 distribution that has an equal degree of freedom when compared to the limitations to be tested

(Hacker and Hatemi-J, 2006). In their study, Hacker-Hatemi-J (2006) applied the Toda-Yamamato test but achieved the critical values via bootstrap simulation even though the error terms were not normally distributed (Yılancı 2012).

Table 9. Hacker ve Hatemi-J Causality Test Results

Causality Direction	Test Value	Critical Values		
		%1	%5	%10
VOL->LNLA	0.176	4.737	6.473	10.860
LNREER->LNLA	1.892	4.826	6.205	9.723
LNIPE->LNLA	2.830	4.662	6.139	10.043

According to the results of a Hacker-Hatemi-J causality test, a causality relationship was not found from volatility, reel effective exchange rate and industrial production index to Turkey's live animal exports.

3.5 A Time-Varying Symmetric Causality Analysis

According to the results of the Hacker Hatemi-J causality test, there was no causality relationship determined from volatility to livestock imports, from real effective exchange rate to livestock imports and from industrial production index to livestock imports. Timer varying causality analysis confirmed this result for a significant part of the time interval. However, a causality relationship was determined for some periods from VOL, LNREER and LNIPE to LNLA.

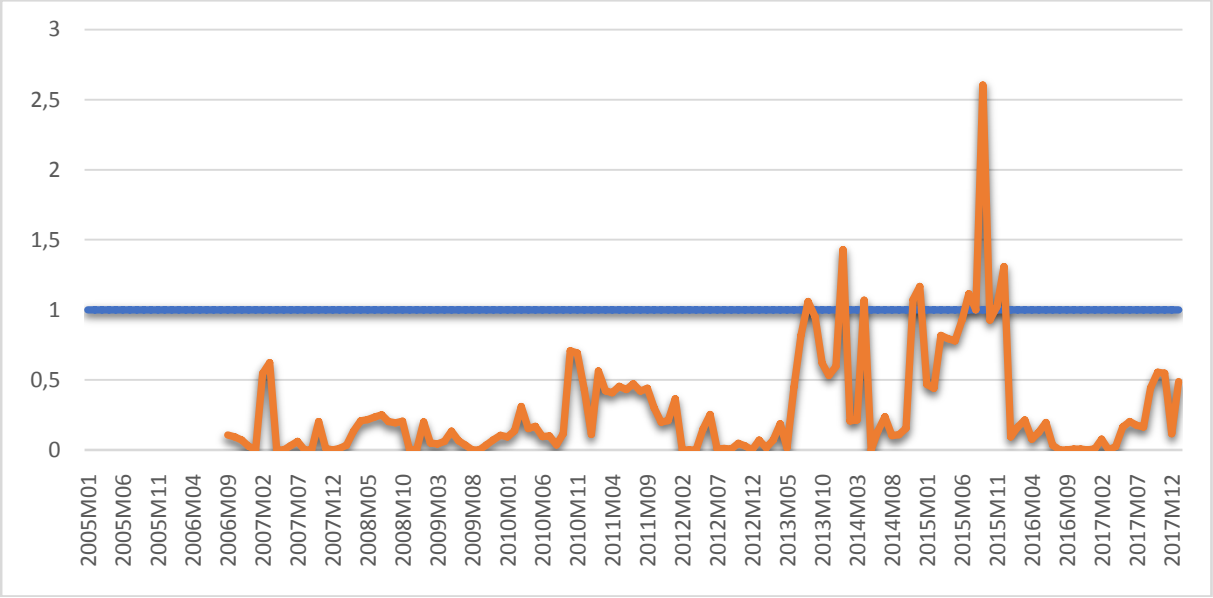


Figure 4. Time-Varying Symmetric Causality Test Results from VOL to LNLA

Two general elections were held in Turkey in 2015. The first elections were held in June and the second in November. The second elections were held because a coalition government was not formed after the first elections. This election process increased the uncertainty in the country. During the Feast of Sacrifice (2015M09), causality relation from VOL to LNLA was revealed.

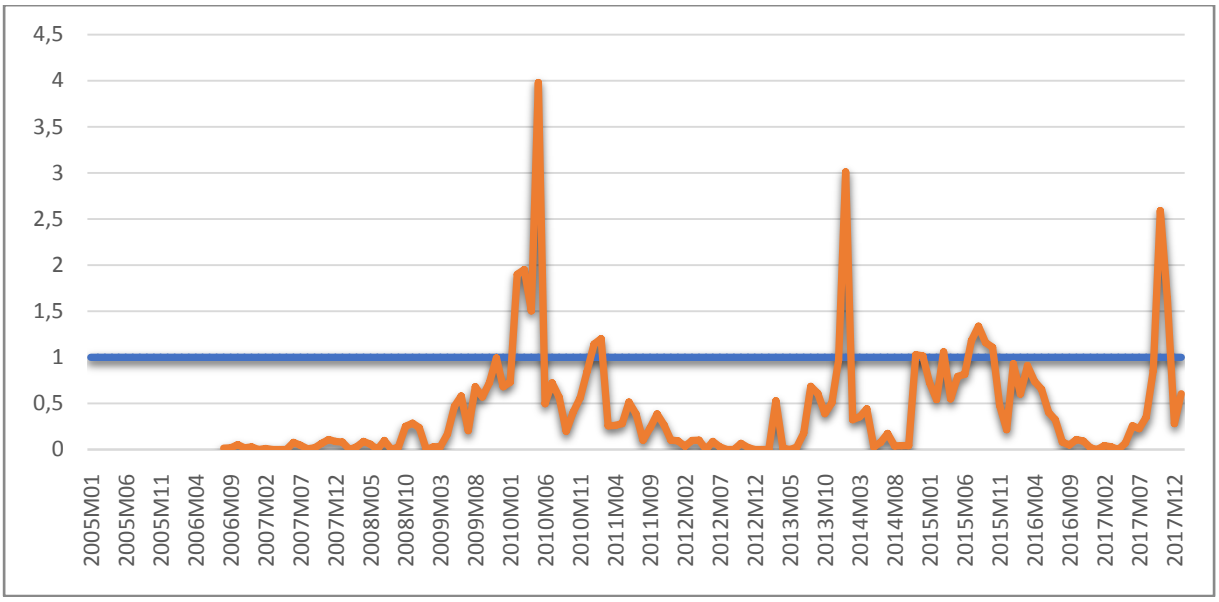


Figure 5. Time-Varying Symmetric Causality Test Results from LNREER to LNLA

In April 2010, the General Directorate of Meat and Fish Authority opened the tariff quota for live cattle and beef meat imports to reduce meat prices.

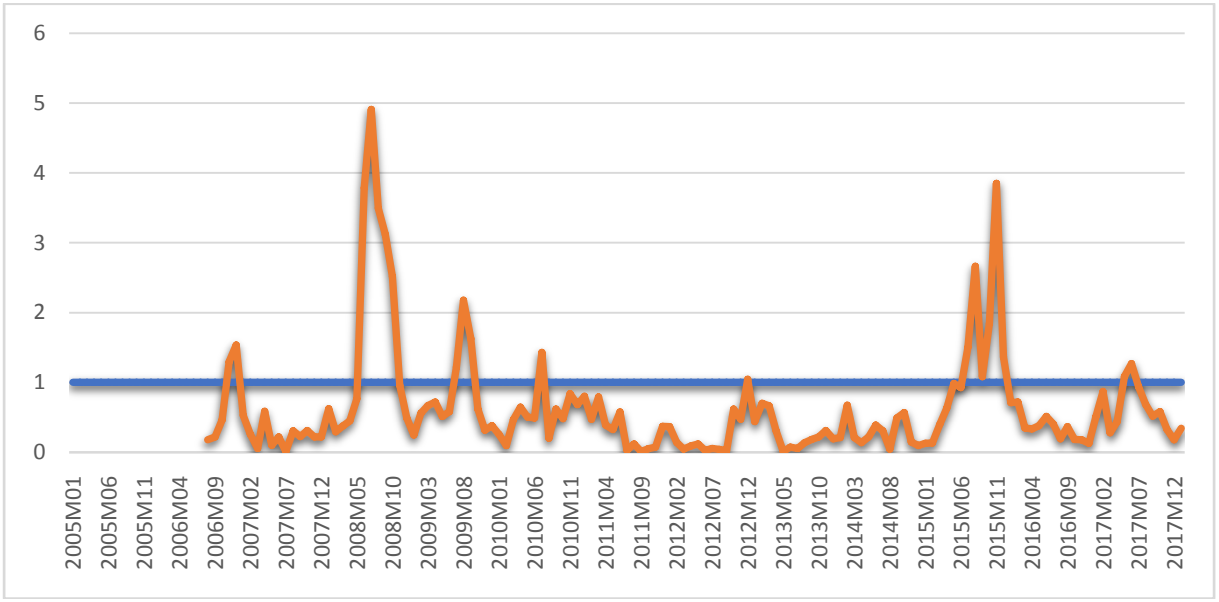


Figure 6. Time-Varying Symmetric Causality Test Results from LNIPE to LNLA

Timer varying causality analysis result confirmed there is no causality relationship as a result of symmetric causality test from LNIPE to LNLA for a significant part of the time interval. However, a causality relationship was determined from LNIPE to LNLA for the year 2008 when there was an economic crisis and for the year 2015 when two general elections were held in Turkey.

4. Conclusion

Turkey is experiencing an issue with high meat prices, and also Turkey's per capita meat consumption is below the world average. According to the empirical results, Turkey's exchange rate volatility does not have a long term impact on Turkey's livestock imports. However, for some years in the study period, we determined a causality relationship from exchange rate volatility to livestock

imports. For this reason, we can conclude that the economic and political situations are determining the impact of exchange rate volatility.

Turkish farmers were held responsible for high meat prices for a long time. However, Turkey's farmers are faced with high costs of various inputs such as animal feed and petroleum. Turkey is a net livestock importer. According to the test results, exchange rate and volatility do not have a direct impact on livestock (live animal) imports. But exchange rates have an impact on the costs of livestock (live animal) producers.

Turkey has a meat supply deficit and the Turkish Government has been trying to solve the meat supply deficit by imports. However, I believe it should support Turkey's livestock sector because Turkey's exchange rate on the imports of livestock has achieved no effect in the long term. The relationship between the two variables has been determined for some periods. Therefore, the reasons for this should be determined.

References

Bahmani-Oskooee, M. veGoswami, G.G. (2004), ‘‘Exchange rate sensitivity of Japan’s bilateral trade flows’’. *Japan and the World Economy, 16,* 1–15.

Bayramoğlu, Arzu Tay , and Asuman Koç Yurtkur . 2015. " Türkiye’de Gıda ve Tarımsal Ürün Fiyatlarını Uluslararası Belirleyicileri." Anadolu Üniversitesi Sosyal Bilimler Dergisi 15 (2):63-73.

Bollerslev, T. P. (1986).Generalized autoregressive conditional heteroscedasticity, Journal of Econometrics 31: 307-327.

Chu J., Chan S., Nadarajah S. and Osterrieder J. (2017). GARCH Modelling of Cryptocurrencies, Journal of Risk and Financial Management, doi: 10.3390/jrfm10040017

Çıplak, Ugur, and Mustafa Yücel. 2004. "IthalattaKorumaOnlemleriileTarimve Gida Fiyatlari." In.: Research and Monetary Policy Department, Central Bank of the Republic of Turkey.

Ding Z., Engle R.F. and Granger C.W.J. (1993). A long memory property of stock market return and a new model, Journal of Empirical Finance 1(1), 83-106.

Glosten L.R, Jagannathan R. and Runkle D.E. (1993). Relationship between the expected value and the volatility of the nominal excess return on stocks, The Journal of Finance,48(5), 1779-1801.

Hacker, R. Scott and Hatemi-J, Abdulnasser. 2006. "Tests for causality between integrated variables using asymptotic and bootstrap distributions: theory and application." Applied Economics 38 (13): 1489-1500.

Hacker, R. Scott and Hatemi-J, Abdulnasser. 2010. "HHcte: GAUSS module to Apply a Bootstrap Test for Causality with Endogenous Lag Order," Statistical Software Components G00012, Boston College Department of Economics

Nelson D. B. (1990). Stationarity and persistence in the GARCH(1,1) models. Econometric Theory 6, 318-334.

Nelson, D. B. (1991).Conditional heteroskedasticity in asset returns: A new approach, Econometrica 59: 347-370.

Pesaran, M. H., Shin, Y. ve Smith, R. J. (2001), “Bounds testing approaches to the analysis of level relationship’’, *Journal of Applied Econometrics*, 16, 289–326.

Taylor S. (1986). Modelling Financial Time Series, Wiley, New York

Tsay R. S. (2012). An Introduction to Analysis of Financial Data with R, Wiley, New York.

Turkish Statistical InstituteDatabase, Retrieved 2018, October 7 from http://www.tuik.gov.tr/PreTabloArama.do?metod=search&araType=vt

Zakoian J.M., (1994). Threshold heteroscedasticity models. Journal of Economic Dynamics and Control, 18(5), 931–955.

Appendix A.

```
*---------------------------------*
*         GARCH Model Fit         *
*---------------------------------*

Conditional Variance Dynamics
-----------------------------------
GARCH Model       : eGARCH(1,1)
Mean Model        : ARFIMA(0,0,0)
Distribution      : std

Optimal Parameters
-----------------------------------
       Estimate  Std. Error  t value Pr(>|t|)
omega  -4.954573    1.07923 -4.59086 0.000004
alpha1 -0.727058    0.14775 -4.92090 0.000001
beta1   0.335505    0.14516  2.31135 0.020813
gamma1  0.071535    0.20225  0.35369 0.723572
shape  10.592908    8.79518  1.20440 0.228435

Robust Standard Errors:
       Estimate  Std. Error  t value Pr(>|t|)
omega  -4.954573    1.78940  -2.7689 0.005625
alpha1 -0.727058    0.16572  -4.3874 0.000011
beta1   0.335505    0.24472   1.3710 0.170386
gamma1  0.071535    0.14466   0.4945 0.620957
shape  10.592908    6.85351   1.5456 0.122197

LogLikelihood : 361.0856

Information Criteria
-----------------------------------

Akaike       -4.5652
Bayes        -4.4674
Shibata      -4.5672
Hannan-Quinn -4.5255

Nyblom stability test
-----------------------------------
Joint Statistic:  1.0953
Individual Statistics:
omega  0.04974
alpha1 0.62495
beta1  0.05487
gamma1 0.06576
shape  0.05462

Asymptotic Critical Values (10% 5% 1%)
Joint Statistic:          1.28 1.47 1.88
Individual Statistic:   0.35 0.47 0.75
```

```
Weighted Ljung-Box Test on Standardized Residuals
-----------------------------------
                        statistic p-value
Lag[1]                      2.924 0.08725
Lag[2*(p+q)+(p+q)-1][2]     4.714 0.04850
Lag[4*(p+q)+(p+q)-1][5]     6.334 0.07500
d.o.f=0
H0 : No serial correlation

Weighted Ljung-Box Test on Standardized Squared Residuals
-----------------------------------
                        statistic p-value
Lag[1]                     0.3174  0.5732
Lag[2*(p+q)+(p+q)-1][5]    2.4979  0.5063
Lag[4*(p+q)+(p+q)-1][9]    4.2094  0.5537
d.o.f=2

Weighted ARCH LM Tests
-----------------------------------
            Statistic Shape Scale P-Value
ARCH Lag[3]   0.06971 0.500 2.000  0.7918
ARCH Lag[5]   3.19693 1.440 1.667  0.2625
ARCH Lag[7]   3.90184 2.315 1.543  0.3609


Sign Bias Test
-----------------------------------
                   t-value   prob sig
Sign Bias          0.5636 0.5739
Negative Sign Bias  0.8746 0.3832
Positive Sign Bias  0.8944 0.3726
Joint Effect        1.8994 0.5935


Adjusted Pearson Goodness-of-Fit Test:
-----------------------------------
  group statistic p-value(g-1)
1    20     18.62       0.4817
2    30     25.54       0.6500
3    40     47.59       0.1627
4    50     52.33       0.3459


Elapsed time : 0.4338379
```

ANALYSIS OF THE PREFERENCES OF HERDERS' IN INNER MONGOLIA FOR GRASSLAND PROTECTION COMPENSATION AND REWARD POLICIES USING A CHOICE EXPERIMENT: A CASE STUDY OF ORDOS

Guanghua Qiao
Inner Mongolia Agricultural University, College of Economics and Management, China
Email: qiao_imau@.126.com

Bao Zhang
Inner Mongolia Agricultural University, College of Economics and Management, China

Abstract

The purpose of this study was to determine a method by which to strengthen the incentives of the compensation and rewards policies for grassland protection. This study was aimed at the accurate identification of herders' preferences for the incentive attributes of these policies, and also to reveal the optimal policy combination. The primary data from 120 herder households were analyzed through choice modeling, using the case of Ordos, Inner Mongolia as the study object. Conditional Logit and Random Logit Models were used to estimate the herders' preferences. Then, on the basis of the results obtained using the preferred Random Logit Model, the implicit prices for each attribute, as well as the total willingness to accept by the herders, were estimated for a range of policy combinations. The empirical results of this study suggested that pension levels, repayment periods of loans and conditional eco-compensation payments all had positive impacts on the herders' preferences. Meanwhile, enforcement and penalties were found to negatively affect the herders' preferences. Furthermore, it was determined that the herders were willing to give up CNY 4.64 per mu of eco-compensation for the policy scenario which incorporated CNY 1200 of pension per month, five years for loan repayments, CNY 600 for penalties, and 50% enforcement.

Keywords: Grassland Policies, Strengthening Incentives, Choice Modeling, Herders' Preferences, Ordos.

INCORPORATING COLLECTIVE ENTREPRENEURSHIP AND CAPACITY DEVELOPMENT FOR EMERGING COOPERATIVE FARMING SYSTEMS: THE SOUTH AFRICAN REVIEW

Usapfa Luvhengo
North-West University, Department of Agricultural Economics and Extension, South Africa
University of the Free-State, Department of Agricultural Economics and Natural Sciences, South Africa, Email:luvhengousapfa@ gmail.com

Janus Henning
University of the Free-State, Department of Agricultural Economics and Natural Sciences, South Africa

Yonas Barhta
University of the Free-State, Department of Agricultural Economics and Natural Sciences, South Africa

Abstract

The aims of this paper is to review and outline arguments underlying the failures of emerging agricultural cooperatives, investigating the foundation of the implemented strategies and their outcomes in South Africa. Finally and most importantly, to compare international literature on the success and significance of collective entrepreneurship worldwide and how the concept can be merged with capacity development to develop a new framework that will help improve the survival of emerging farming cooperatives in South Africa. In recent years, agricultural contribution towards the South African GDP has been on a steady increase. Despite the growth in contribution, the overall economic decline, political and policy uncertainties importation of cheaper agricultural produce amongst other reasons has resulted in a consistent increase in food prices. On the consumers' side, high unemployment rate, declining disposable income and low entrepreneurial participation has resulted in reduced food security countrywide. These challenges can be addressed through the inclusive growth and performance between large-scale commercial and small-scale emerging farming systems. It is in this view that emerging farming cannot be ignored and must be the focus of employment creation, economic development and income generation for rural populations.

In South Africa, emerging agricultural cooperatives were formed in order to resolve resource scarcity, human capacity, skills transfer and market access challenges. However, over the years these collective entities have declined in numbers due to various factors which are outlined in numerous literature not only limited to; lack of skills, resources, trust amongst members, and lack of market access amongst others. Countrywide, countless initiatives in terms of resource support, capacity development and cooperative research have been implemented to address the continuous collapses with little to no success.

The review findings and conclusion of this paper is twofold. First, the majority of Eastern European and North African countries have successfully applied the concept of collective entrepreneurship. The concert aims at collective workmanship (either vertical or horizontally) biased on willingness to participate with common objectives rather than forming a collective in order to address resource challenges amongst farmers who are not entrepreneurial by nature. In some countries they even transformed from primary to New Generation Cooperatives (NGCs) with complex levels of vertical and horizontal integration. Secondly the review revealed that, in South Africa, the concept of entrepreneurship let alone collective entrepreneurship in the emerging farming sector has been given little to no attention especially in emergingfarming cooperative systems. Therefore, the integrated capacity development and collective entrepreneurship framework can help improve the sustainability and performance of emerging cooperative farmers countrywide.

Keywords: Collective Entrepreneurship, Cooperatives, Emerging Farmers, South Africa.

ADOPTION OF PRESSURIZED IRRIGATION SYSTEMS AMONG MAIZE PRODUCING FARMERS IN ÇARŞAMBA DISTRICT-SAMSUN

İsmet Boz
Ondokuz Mayis University, Department of Agricultural Economics, Turkey
Email: ismet.boz@ omu.edu.tr

Cevahir Kaynakçı
Ondokuz Mayis University, Department of Agricultural Economics, Turkey

Abstract

Adoption of pressurized irrigation systems such as drip irrigation and sprinkler irrigation influences productivity and sustainable use of water resources. Since Turkey isn't counted among water-rich countries, farmers need to use these irrigation systems. However, there are many factors associated with the adoption of agricultural innovations. This study investigates the factors influencing the adoption of pressurized irrigation technologies in Çarşamba District of Samsun Province.

Participants of this study were a stratified sample of 350 farmers operated in different villages of Carşamba district. A well-structured questionnaire was administered and sought information about socioeconomic characteristicsand different farming practices applied by the participants. Data collection was completed in the May-September period of 2015. Descriptive statistics including frequencies, percentages, means and standard deviations were used to describe socioeconomic characteristics of respondents. Then farmers weredivided into two broad categories as adopters and non-adopters of pressurized irrigation systems. The independent sample t-test procedure was used to compare these two groups regarding their socioeconomic characteristics and farming practices.

Results of this study showed that adopters of the pressurized irrigation system in the region use more credit for inputs, obtain a higher yield of maize per decare, and have higher level of off-farm income; however, they have smaller family size, fewer persons involved in agricultural activities, and lower number of parcels of agricultural land.

Research results are expected to provide useful information in identifying the issues related to the adoption of innovations in agriculture, and in developing innovation adoption programs for rural communities.

Keywords: Pressurized Irrigation, Drip Irrigation, Sprinkler Irrigation, Adoption of Innovations.

1. Introduction

Although the population of the world and water being used for irrigation are continuously increasing, water potential in the earth remains constant. This means per capita water consumption will diminish in the future and people will have to find out new strategies for sustainable use of water resources (Ağır and Boz, 2013).Irrigation is one of the most important agricultural techniques of providing an adequate amount of water to plants which cannot be met by natural means, in a controlled system (Tekinel, 1995). Irrigation makes significant contributions to increasing productivity in agriculture and providing an adequate and balanced diet for the growing world population. Besides yield increases in irrigated areas, the production patterns can also be changed. It is always possible to grow a second and even a third product in the same year with proper irrigation (Güvercin and Boz, 2003).

Because water resources in the world do not allow all agricultural areas to be irrigated, more economical use of existing resources for future generations is inevitable. In many developing countries including Turkey, the available water sources aren't being used

economically. The furrow irrigation method practiced in many regions both cause significant reduction in water sources and damage the land and environment due to lack of proper drainage systems. Therefore, it is necessary for farmers to adopt pressurized irrigation systems which make contributions to agricultural sustainability regarding economic use of available water sources, and yield increases in many farm commodities.

The most commonly used pressurized irrigation systems in Turkey are drip irrigation and sprinkler irrigation. The advantages of the drip irrigation system include the following (Tekinel, 1996):

1. Provides high efficiency in water use.
2. Provides constant watering to the plant root in the field capacity, increases the effectiveness of fertilizers applied and therefore results in productivity.
3. Allows growing vegetables and fruits in greenhouses.
4. It is a secure irrigation method and does not require too much work.
5. It prevents the development of plant diseases and pests.
6. It isn't affected by slopping lands and wind conditions.
7. Due to the low dripper flow rate, the infiltration of water into the soil is rapid. Thus, it does not cause erosion on flat or sloping lands.
8. Savings from labor and other expenses increased productivity, and lower costs provide a significant increase in net income.

Researchers proved the benefits of drip irrigation system. For example, in a study conducted in Kahramanmaraş, it was concluded that drip irrigation increased the yield in pepper production, and irrigation water was used more economically with this method. In the same study, it was stated that Phytophthora Capcici L fungus, which negatively affects pepper yield and quality, decreased with drip irrigation (Gençoğlan et al. 2002).

In the sprinkler irrigation system, water is given to the air under pressure from the sprinkler heads which are placed on the land at specified intervals and fall into the land surface and enter into the soil by infiltration and stored in the plant root zone.The sprinkler irrigation system resembles an artificial rain in terms of application (KHGM, 2010).This method can be used efficiently in sloping and uneven lands; and in soils with low depth, high permeability and little water holding capacity.

The advantages of the system are listed as follows (Tarım Kütüphanesi, 2019):

1. It provideshigh irrigation efficiency in light textured soils with a high water absorption rate.
2. Controlled irrigation is done in shallow soils (without raising the groundwater).
3. Due to the water distribution uniformity, irrigation efficiency is high, and therefore it enables irrigation of larger areas with existing water.
4. Erosion problem is eliminated with good project and operation.
5. Irrigation labor costs are less.
6. Commercial fertilizers and agrochemicals can be supplied with the system.
7. Fruit trees are protected from frost with short periodic applications of the system.
8. During the germination period, it facilitates the plant to rise above the soil.
9. As the field trenches are no longer needed, the cultivated area increases and the field operations are made easier.

Although the system has many advantages, the initial investment costs are quite high, water distribution is affected by wind, and operating the system requires energy consumption.

Different researchers in Turkey have studied the adoption of agricultural innovations. Kaynak and Boz (2012) investigated the adoption of new cotton varieties by Kahramanmaraş farmers and found significant differences between the adopters and non-adopters regarding the socioeconomic variables of education, and information seeking behavior variables of using the Internet and visiting extension agents of agricultural ministry, and faculty members of the college of agriculture. Öz and Boz (2014) conducted a study around the Lake Eğirdir area of Isparta Province to determine factors that influenced the adoption of the Environmentally Friendly Agricultural Land Protection program (ÇATAK-in Turkish). Results of the study showed that the program was useful in the region to protect soil and provide sustainability. Participation in village administration, credit use for investments, the income level of farmers, and contacts with extension personnel were the main factors that

influenced the adoption of the program. The study conducted in the Eastern Mediterranean Region of Turkey (Budak et al., 2011) showed that socioeconomic factors of farmers' experience and income; and meeting frequency with private veterinarians had a positive effect on adoption of innovation among sheep farmers. Another study conducted in the same region (Boz, 2014) showed that adoption of innovation among beef cattle farmers was quite low, and it was influenced by socioeconomic variables of cooperative membership, investments, farm size, owning improved breeds, and income level; and by information-seeking variables of reading newspapers, using the Internet, contacts with extension personnel, and contacts with private veterinarians.

The overall purpose of this study was to determine irrigation methods used by maize farmers and to compare the adopters and nonadopters of pressurized irrigation system regarding different selected socioeconomic variables and farming practices. The study concludes with a list of recommendations to increase the adoption of these irrigation systems in the region.

2. Materials and Methods

In determining the sample size, firstly villages with high agricultural potential were identified consulting with the technical personnel of the district directory of the Ministry of Agriculture and Forestry. Then lists of farmers in these villages and their land size were obtained, and this made the accessible population of the study. Considering the frequency distribution of the land size farmers operated, the accessible population was divided into three strata. Primary purposes in stratified sampling increase the accuracy and the degree of adequate representation of different groups of the main population in the research. Besides, the principle in this method is to reduce the variance. In this way, with fewer respondents, a good and detailed study is possible (Güneş and Arıkan, 1985). According to the stratified sampling method, the number of farmers entering the sample of the research was found by the following formula (Yamane, 2001):

$$x = \frac{N\Sigma N_h S_h^2}{N^2 D^2 + \Sigma N_h S_h^2},\ D^2 = \frac{e^2}{t^2}$$

n = Sample size,
N = Number of farmers in the stratisfied sample,
N_h = Number of farmers in each stratum,
S_h = Standard deviation within a stratum,
D_2 = Desired variance
e = Error accepted from the mean of the accessible population,
t = t-table value of the accepted confidence interval.

Accepting 5% error from the mean and 95% confidence interval (t=1.645), the sample size was calculated as 350. This sample size was proportionally distributed to the three strata, and the farmers who were surveyed from each stratum were determined by using the random numbers table. The reserve subjects were also determined considering the possibility of the farmer not being able to be found or refused to answer the questionnaire.

Of the 350 sampled farmers in Çarşamba district, 67 were maize growers, and data collection and analyses procedures were carried out for these farmers. Maize growing rate among the sampled farmers was calculated as 19.14%, meaning approximately one-fifth of the farmers grew maize in the region. The researchers developed a well-structured questionnaire seeking information about farmers' socioeconomic characteristics and farming practices. Rogers (2010)' study was explicitly utilized in preparing the questionnaire. Data were collected in the May-September period of 2016. Descriptive statistics including frequencies, percentages, means, and standard deviations were used to describe respondents' socioeconomic characteristics. The independent sampled t-test was used to compare the adopters and nonadopters of respondents.

4. Research Findings

Socioeconomic characteristics of the respondents are presented in Table 1. It can be seen from the table that more than half of the respondents (56.7%) were above than 50 years of age, and 59.7% hold a primary school degree. A vast majority (86.6%) had farming experience for more than 20 years. More than half of the respondents (53.7%) belonged to a family consisting of 1-2 persons. While a vast majority (81.2%) had off-farm income, those who had tractors made almost half of the respondents (49.3%). Those who used credit for farm inputs made 49.3%, and a vast majority (83.6%) kept farm records for their farming practices.

Regarding income level more than half of the respondents (58.2%) reported that they fell in the medium income level category if the farmers of their village were divided into three income categories as low, medium, and high-income levels. More than half of the respondents (56.7%) had farm size larger than 50 decares, and 44.8% grew maize in 16-30 decares of agricultural land. Slightly higher than half of the respondents (50.7%) used no irrigation for maize production while 47.8% used sprinkler irrigation and 1.5% used drip irrigation.

Table 1. Socioeconomic Characteristics of Maize Farmers

Yaş	N	%	Credit use for farm inputs	n	%
≤35	4	6	Yes	33	49.3
36-50	25	37.3	No	34	50.7
51≤	38	56.7	TOTAL	67	100.0
TOTAL	67	100.0	Keeping farm records		
Education level			Yes	56	83.6
Primary school	40	59.7	No	11	16.4
Secondary school	20	29.7	TOTAL	67	100.0
High school	7	10.5	Level of income		
TOTAL	67	100.0	Low	19	28.4
Farming experience			Medium	39	58.2
≤10 years	2	3.0	High	9	13.4
11-20	7	10.4	TOTAL	67	100.0
21years ≤	58	86.6	Farm size		
TOLAR	67	100.0	≤30 decares	7	10.4
Family size			31-50	22	32.8
1-2 persons	36	53.7	51≤	38	56.7
3-4 persons	19	28.4	TOTAL	67	100.0
5 and more	12	17.9	Maize production area		
TOTAL	67	100.0	≤15 decares	21	31.3
Off farm income			16-30 decares	30	44.8
Yes	55	82.1	31 decares	16	23.9
No	12	17.9	TOTAL	76	100.0
TOTAL	67	100.0	Irrigation methods		
Tractor ownership			No irrigation	34	50.7
Yes	33	49.3	Drip irrigation	1	1.5
No	34	50.7	Sprinkler irrigation	32	47.8
TOTAL	67	100.0	TOTAL	67	100.0

Table 2 presents the comparisons between the adopters and non-adopters of pressurized irrigation systems among maize farmers in the research area. Of the 67 maize farmers participated in this study 33 (50.3%) adopted pressurized irrigation system (32 farmers adopted sprinkler irrigation and 1 farmer drip irrigation), and 34 (50.7%) used no irrigation for maize production.

Of the sixteen variables selected to compare the adopters and non-adopters of the pressurized irrigation system, six were significant at an Alpha level of 0.05. The first significant variable

was credit use for inputs for which the rate of adopters was 73%, and nonadopters 27%. The independent sample t-test conducted between these two categories yield significance indicating that adopters of pressurized irrigation used more credit for input as compared with non-adopters.

The second significant variable was the number of persons in the family engaged in agricultural activities, and it was found as 1.52 persons for adopters and 2.21 persons for non-adopters. The independent t-test conducted between these two categories yield significance indicating that the adopters had fewer individuals engaged in farming activities.

Average maize yield per decare was 577 Kg/da in adopters, and 453 Kg/da in non-adopters. The independent sample t-test between these two groups was significant meaning that the average maize yield in adopters was significantly higher than non-adopters.

Table 2. Comparisons between Adopters and non-adopters on Selected Farming Variables

Variables		Mean		t	p
		Adopters	**Nonadopters**		
1	Credit use (1=yes, 0=no)	0.73	0.27	4.26	0.001
2	Number of persons working on the farm	1.52	2.21	-3.29	0.002
3	Yield Kg/da	577	453	2.91	0.005
4	Family size	2.42	3.41	-2.87	0.005
5	Number of parcels	5.58	9.47	-2.33	0.023
6	Off-farm income TL/Month	3168	2020	2.27	0.026
7	Knowledge about water consumption of irrigated plant (1=yes, 0=no)	0.55	0.38	1.336	0.186
8	Maize growing area (Da)	21.82	25.16	0.935	0.353
9	Farming experience (Year)	31.79	33.53	-0.643	0.523
10	Tractor ownership 1=yes, 0=no)	0.45	0.53	-0.605	0.547
11	Average proximity of the land to the water source (Meters)	152	173	-0.591	0.557
12	Age of farmer	52.82	54.18	-0.513	0.610
13	Owned land (Da)	81.88	78.01	0.456	0.650
14	Do you think there will be water shortages in the future? 1=yes, 0=no	0.42	0.47	-0.376	0.708
15	The education level of farmers (Years)	6.73	6.50	0.355	0.723
16	Total operating land (Da)	87.52	88.95	-0.111	0.912

Similarto family members engaged in agricultural activities, the family size was also significantly different between the two groups, as it was 2.42 persons in adopters, and 3.41 persons in non-adopters. The difference between these two groups was statistically significant indicating that adopters had fewer persons in their families than non-adopters.

The fifth significant variable was the number of parcels of land operated by each adoption categories. Results showed that the number of parcels was 5.58 decares for adopters, and 9.47 decares for non-adopters. The independent sample t-test between these two categories was significant indicating that the adopters had fewer parcels than non-adopters.

Finally, the last significant variable was off-farm income for which monthly off-farm income was 3166 Tl for adopters, and 2020 Tl for non-adopters. The independent sample t-test between these two groups showed that there was a significant difference between these two categories meaning that the adopters had higher off-farm income as compared with non-adopters.

4. Conclusions and Recommendations

This study was conducted in Çarşamba District-Samsun to determine socioeconomic characteristics and farming practices of maize growers, and to compare adopters and non-adopters of pressurized irrigation systems regarding these characteristics and practices. Results showed that half of the farmers in the region applied no irrigation and average maize yield among the farmers who applied irrigation was quite higher than those who didn't use any irrigation. This finding indicates that farmers need to be encouraged and even supported to adopt irrigation, particularly pressured irrigation systems.

An average profile of the farmers in the district is a male,aged over 50 years, holds a primary school education degree, has farming experience more than 20 years, belongs to a family with less than four persons, keeps farming records, earns off-farm income, operates approximately 88 decares of land, and grows maize in about 23 decares.

Results of this study showed that the farming population in rural areas is decreasing and people engaged in agricultural activities are getting older. Although an average farm in the locality can provide sufficient income for a family, they still search occupations other than farming. In order to convince farmers to stay in rurality and continue with agrarian activities, agriculture needs to be made more attractive. Promoting agricultural innovations to rural areas may easier the work done by farmers, and higher their income. If farmers generate more stable income from agriculture and don't spend most of their time working in the fields, they may be willing to live in rural areas.

Although the Black Sea Region is the most-rainy area of Turkey, irrigation is necessary for summer, and it increases productivity. The government promotes the adoption of pressurized irrigation systems through different programs. For example, the government provides long term low-interest loans to farmers who agree to apply drip irrigation or sprinkler irrigation. Adoption of these systems not only increases the productivity and income of farmers but also provides economical use of water sources and contributes to sustainable agriculture.

Ministry of Agriculture and Forestry may play an essential role in promoting pressurized irrigation systems. Irrigation associations should also undertake many necessary tasks on irrigation. They should not only distribute the water to farmers but also employ irrigation experts and give training to farmers regarding water consumption of plants, water plant relationships, and irrigation practices. The ministry should also provide regular extension services on irrigation.

Further research should be conducted to determine factors influencing the adoption of pressurized irrigation systems in different crops. The constraints of adoption should be determined, and proper extension programs should be implemented accordingly.

Acknowledgments: This paper was produced from a project financed by Ondokuz Mayıs University Scientific Research Projects Unit. Project No: PYO.ZRT.1901.14.009.

References

Ağır, H. B.,& Boz, İ. (2013). The need of sustainable water use in Turkish agriculture. IVInternational Symposium "Agrosym 2013" Jahorina 3-6 October. Retrived from:http://agrosym.ues.rs.ba/agrosym/agrosym_2013/documents/4epnm/ep29.pdf.

Boz, İ. (2014). Determination of best management practices and innovations in beef cattle farming and their adoption in the Eastern Mediterranean Region of Turkey.Bulgarian Journal of Agricultural Science,20(3): 552-562.

Budak, D. B., Boz, I., Akbay, C., & Bas, S. (2012). Factors influencing the adoption of selected innovations by sheep farmers in the East Mediterranean region of Turkey.Journal of Animal and Veterinary Advances,11(10), 1713-1718.

Gençoğlan, C., Akıncı, İE., Akıncı, S., Uçan, K., &Baytorun, N.(2002). Farklı sulama yöntemlerinin Kahramanmaraş Kırmızı Biberinde verim, kalite, su kullanım randımanı ve kök boğazı çürüklüğü (Phytophthora Capcici L.) nedeniyle bitki kurumaları üzerıne

etkileri. TÜBİTAK Proje Kesin Sonuç Raporu, Proje No: TOGTAG/TARP-2088, 2002.
Güneş, T., &Arıkan, R. (1985). Tarım Ekonomisi İstatistiği. Ankara Üniversitesi Ziraat Fakültesi Yayınları No: 924. Ankara.
Güvercin, Ö., &Boz, İ. (2003). Üreticilerin sulu tarım konusundaki deneyimleri ve sulama birliklerine bakışı:Düziçi İlçesi Örneği. KSÜ Fen ve Mühendislik Dergisi. 6(2):80-90.
Kaynak, O., Boz, İ. (2014). Doğu Akdeniz Geçit Kuşağı Tarımsal Araştırma Enstitüsü tarafından geliştirilen bazı pamuk çeşitlerinin benimsenmesi ve yayılması.Bahri Dağdaş Bitkisel Araştırma Dergisi,3(1): 26-34.
KHGM (Köy Hizmetleri Genel Müdürlüğü). (2010). KÖY Hizmetleri Genel Müdürlüğü İnternet Sayfası. Retrieved from: http://www.khgm.gov.tr/
Öz, G., Boz, İ. (2014). Isparta İli Eğirdir İlçesi Kovada Kanal Bölgesinde çevre amaçlı tarım arazilerinin korunması (ÇATAK) programının benimsenmesi ve yayılması.XI. Ulusal Tarım Ekonomisi Kongresi. 3-5 Eylül Samsun. s.1599-1605.
Rogers, E. M. (2010). Diffusion of innovations. New York: Simon and Schuster.
Tarım Kütüphanesi. (2019). Yağmurlama sulama yöntem. Tarım Kütüphanesi Internet Sitesi. Retrived from:http://www.tarimkutuphanesi.com/YAGMURLAMA_SULAMA_YONTEMI_00548.html
Tekinel, O. (1996). Tarımsal Sulama, Pamuk ve Sera Bitkileri Sulamasının Genel Esasları. Kahramanmaraş ÜtçüİmamÜniversitesi Rektörlüğü. Kahramanmaraş.
Yamane T (2009). Temel Örnekleme Yöntemleri (Basic Sampling Methods-Turkish translation). Çevirenler: Alptekin Esin, Celal Aydin, M. Akif Bakir, Esen Gürbüzsel. Literatür Yayincilik, İstanbul.

ASSURING QUALITY IN THE BEEF PRODUCTION CHAIN

Bruno A. Lanfranco
Instituto Nacional de Investigación Agropecuaria (INIA), Applied Economics, Uruguay
E-mail:blanfranco@ inia.org.uy

Juan M. Soares de Lima
INIA, Applied Economics, Uruguay

Marcia del Campo
INIA, Applied Economics, Uruguay

Gustavo Toyo
Instituto Nacional de Carnes (INAC), Uruguay

Jorge Acosta
Instituto Nacional de Carnes (INAC), Uruguay

Abstract

Since 2002, and every four to six years, the National Institute of Agricultural Research (INIA) and the National Meat Institute (INAC) have been conducting the "meat quality audit" for the beef chain. The aim of the audits, since its inception, is to provide the meat chain with a significant set of indicators and measures regarding the quality of the cattle, as well as the beef all its sub-products, going through all the links of the chain, from the farm to the consumer. The final objective was to determine and quantify the main factors that could be responsible for the potential loss of value along the chain due to inefficiencies occurring at some critical points of the chain. Each audit is carried out in three parts: Phase I consists in a survey conducted across the meat chain, to get insights on how agents operating at different levels perceive the productive process and the different attributesthat make the quality of the meat products in Uruguay. Phase II comprises on-site work at slaughter and packing operations, recording information potential efficiency and product quality problems that can be detected at this level, even when caused in the previous links of the meat chain.Phase III includes a final workshop with all the relevant agents and stakeholders for discussion of results of phases I and II, economic quantification of the problem either referred to direct and indirect losses as well as what is left on the table due to inefficiencies of the process. The objective of this article is comparing the evolution of the results of the three meat-quality audits performed for the Uruguayan beef chain (2003, 2008, and 2013). To make results comparable among audits, the figures were recalculated using the methodology applied in the last one (2013), assuming prices and the volume of the slaughter of that year. With regard to the agent's perceptions, the evidence showsimportant differences in the meaningor idea behind the concept of quality, even within the same link of the chain. No unanimous appreciation exists about the attributes that make up the quality of the product, being very difficult from a single chain link to have a complete overview of the entire industry. Agents working at a certain link usually know better the previous (supplier) and the subsequent (client) links. In addition, agents tend to weigh with greater emphasis those attributes more closely related with their particular link and therefore directly affecting their own business.Thus, the concept of quality applicable to the meat industry must be defined before any further consideration about its status. Nevertheless, food safety was clearly the main concern of the agents in the meat industry. It is a basic requirement so that it does not enter the discussion about quality characteristics. Overall, traits and attributes related to consumer satisfaction was the most relevant issue. On the other hand, the most relevant sources of potential losses in the Uruguayan beef chain were the presence of bruises in cattle and beef cuts, high pH and dark cuts,inadequate vaccination procedures, damage in hides, livercondemnations, and excess of yellow fat. Nevertheless, the continuous work effort resulting from joint strategies agreed on phase III after each audit allowed a reduction in the economic losses caused by problems of quality. In 2003,

the amount of money left on the table derived from quality problems was USD 23.8 per slaughtered cattle head. This loss reduced to USD 16.2 by 2008 and further to USD 15.5 per cattle head in 2013. Beef exports is a business of some 1.5 billion USD for Uruguay. With an average slaughter of 2 million heads per year, it means that actual quality losses in the beef export chain represent only 2% of total export value.
Keywords: Economic Loss, Product Quality, Food Chain, Beef Industry.

SUSTAINABLE LIVESTOCK FARMING IN TURKEY AND PINARHISAR GENE CENTER IMPLEMENTATION

Mesut Doğan
İstanbul University, Geography Department, Turkey, Email: esutan@ istanbul.edu.tr

Abstract

By it's natural and human features our country attracts attention. Despite hosting variety of economic activities, Turkey havent't succeeded determined level of livestock farming yet. By having the definition of 'Insurance of Cultivation', livestock farming still far away from being self sufficient economic activity for Turkey with it's total number of animals, breed and productiveness. However, every single geographical parts of our country provide opportunity for different kind of livestock farming. Agricultural laws and legislations passed by parliament, unsufficient education level on the subject, exceed number of unmodern facilities, not having necessary health conditions for the livestocks at the facilities and unstaistfying marketing condutions can be counted as the reasons of not being on the targeted level of livestock activities.

With its history that dates back a long time, our country holds origins of many different breed of animals. Many areas of our country determined as genetic centrals in order to achieve the goal of develop livestock activities. Unfortunately, results of many trials not only ended up with being below expectations but also gotten far away from being applicable.

Using Black Pied Cow breed of Holstein race in application areas predominantly, would be important for both Pinarhisar county and for whole country. Although, considered as one of the underdeveloped district in Turkey in socioeconomic perspective, Pinarhisar also known as a place where the rural activites mainly take place. Economic problems that show themselves on the rural places cause rural poverty on the very same area. This rural poverty mainly based on not make use of the county's potential correctly. It's very important to determine the potential of livestock farming inside the current farming activity -which is the most important source of income of the county- in details and manifesting strategies to make use of this potential correctly. Hereby, rural areas of county can be earned back into the economy by sustainable livestock farming activities.

Keywords: Turkey, Kirklareli, Pinarhisar, Livestock Activities, Gene Centers.

TÜRKİYE'DE SÜRDÜRÜLEBİLİR HAYVANCILIK VE PINARHİSAR GEN MERKEZİ UYGULAMALARI[1]

Özet

Ülkemiz bulunduğu konum itibariye doğal ve beşeri özellikleri bakımından dikkat çekmektedir. Çok çeşitli ekonomik faaliyetlerin gerçekleştirildiği ülkemizde, hayvancılık faaliyetlerinde beklenen seviyeye ulaşılmamıştır. Tarımın sigortası olarak görülen hayvancılık; sayısı, çeşidi ve verimi bakımından sürdürülebilir olmaktan uzaktır. Oysa ki, ülkemizin her bölgesi çok çeşitli hayvancılık faaliyetlerine olanaklar sağlamaktadır. Tarımsal faaliyetler için uygulanan politikalar, bu alandaki eğitim yetersizliği, modern olmayan tesislerin fazlalığı, hayvan sağlığı şartlarının oluşmaması ve elde edilen ürünlerin pazar koşullarının tam olarak oluşmaması hayvancılık faaliyetlerinin istenilen ve arzu edilen seviyeye gelmemesine neden olmaktadır.

Tarihi eskiye inen ülkemiz, hayvan genetiği bakımından birçok ırkın menşedir. Ülkemizde hayvancılık faaliyetlerinin geliştirilmesi için birçok saha gen merkezi olarak belirlenmiştir. Ancak buralardan alınan sonuçlar her zaman beklentilerin altında kalmış ve uygulanabilir olmaktan uzaklaşmıştır.

[1] Bu çalışma, İstanbul Üniversitesi Bilimsel Araştırma Projeleri Koordinasyon Birimi tarafından desteklenmiştir. Proje numarası: 29366.

Çalışma sahasının büyükbaş hayvancılık içinde Holstein ırkının Siyah Alaca çeşidinin gen merkezi olarak daha fazla değerlendirilmesi hem ülkemiz hem de Pınarhisar için önemli olacaktır. Birçok sosyo-ekonomik gösterge bakımından ülkemizin geri kalmış ilçelerinden olan Pınarhisar, kırsal yaşamın ağırlık kazandığı bir alan olarak dikkat çekmektedir. İlçenin kırsal alanındaki ekonomik problemler yaygın bir kırsal yoksulluğa yol açmaktadır. Kırsal alanlardaki ekonomik problemler, temelde mevcut ekonomik potansiyelin uygun bir şekilde değerlendirilememesinden kaynaklanmaktadır. İlçenin en önemli geçim kaynağı durumundaki tarımsal faaliyetler içinde hayvancılık potansiyelinin ayrıntılı olarak ortaya konulması ve bu potansiyelin uygun bir şekilde değerlendirilmesine yönelik stratejilerin belirlenmesi son derece önemlidir. Böylece sürdürülebilir hayvancılık faaliyetleriyle ilçedeki kırsal alanların ekonomiye kazandırılması sağlanmış olacaktır.
Anahtar Kelimeler: Türkiye, Kırklareli, Pınarhisar, Hayvancılık Faaliyetleri, Gen Merkezi.

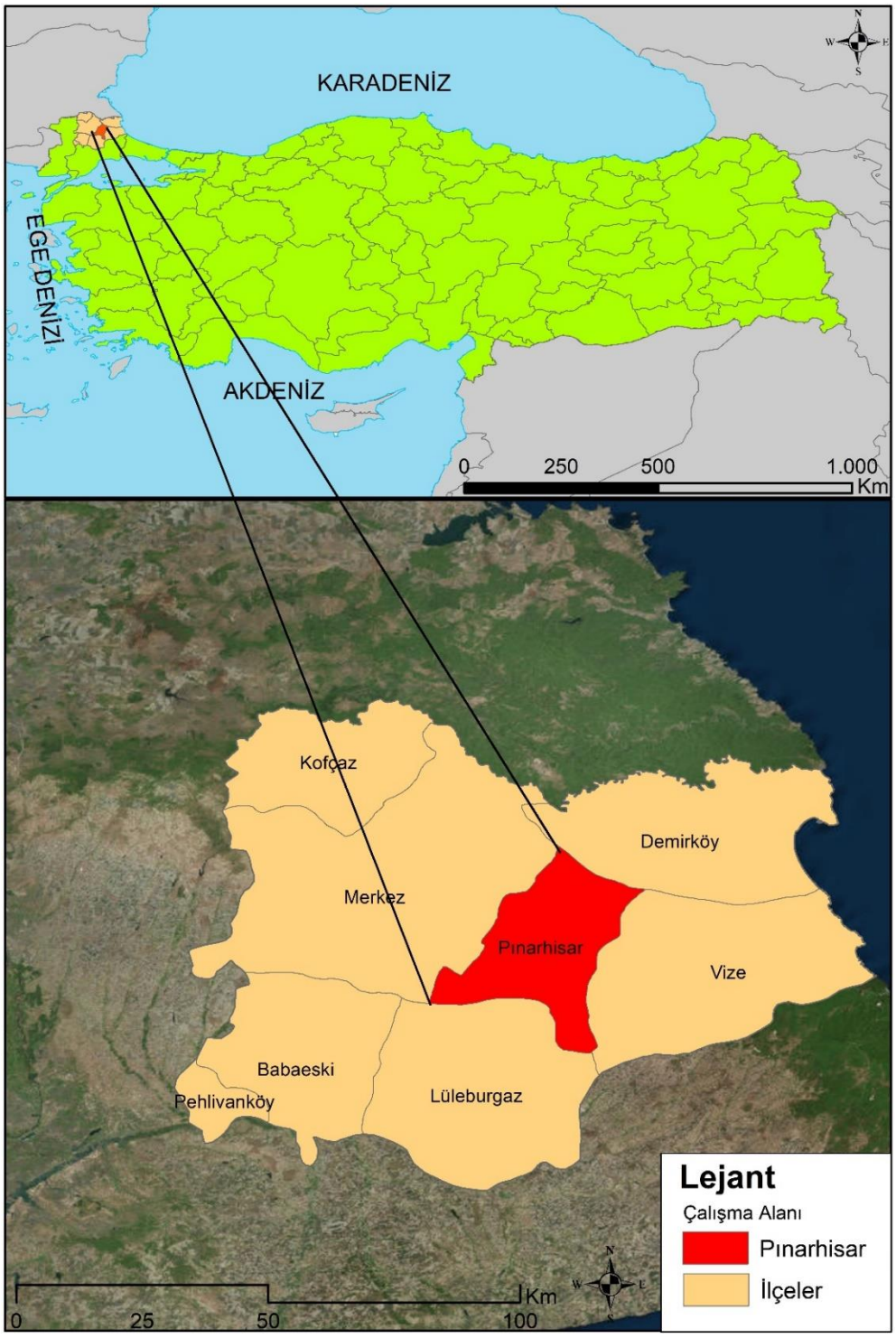
1. Giriş

Tarım faaliyetleri içerisinde yer alan hayvancılık; mera, besi-ahır ve yarı göçebe hayvancılığı şeklinde yapılabilmektedir**.** "Ülkemizde ahır ve besi hayvancılığı daha çok güney Marmara ve Trakya bölümünde yapılmakta alınan verimle ülkenin beslenmesine ve ekonomik faaliyetlerine çok fazla katkı sağlamaktadır"(Doğan, 2016:144). Et, süt ve süt ürünleri temel besin maddelerinin sağlandığı ana hayvancılık sektöründe, verim değeri büyük önem taşımaktadır. Bu nedenle verimi düşük olan yerli hayvanlar yerine saf kültür hayvanlar veya iki farklı türün çiftleştirilmesiyle oluşmuş kültür melezleriyle verimlilik arttırılmaya çalışılmaktadır.

Türkiye'nin kuzeybatısında Karadeniz, Ege ve Marmara Denizleri arasında yer alan Trakya Yarımadası'nın yerleşim tarihi yaklaşık olarak 7.000 yıl öncesine inmektedir. Doğal koşulların uygun olmasıyla birlikte Avrupa ve Asya arasındaki geçiş güzergâhında yer alması, Trakya'nın her zaman ön plana çıkmasına ve yerleşmeye açılmasına neden olmuştur. "Ziraat bir taraftan başta gıda, tütün, içki, şeker, dokuma ve hayvan mahsulleri işleyen sanayi tesislerinin hammadde ihtiyaçlarını karşılarken, diğer taraftan da Türkiye'nin hızla artan nüfusuna rağmen beslenme ihtiyacını karşılamaktadır"(Sertkaya Doğan, 2008: 98). Engebeli olmayan arazinin fazla olması ve alüvyal toprakların geniş yer kaplaması çalışma bölgesinin hem bitkisel üretimin hem de hayvancılık faaliyetlerinin dikkat çekmesine neden olmuştur.

Hayvancılık, insanlığın en eski kültürel faaliyetlerinden birisi olup kültürel anlamda yapılan hayvancılıktan çok önceleri de insanlar yaşamlarını idame ettirebilmek için uzun bir süre türlü açılardan hayvanlardan istifade etmişlerdir. Gücünden, etinden, sütünden, derisinden, kemiklerinden ve sayısı artırılabilecek çok çeşitli yönlerinden faydalanmak için insanlar her zaman hayvanlara ihtiyaç duymuştur (Şahin,2015: 15). Trakya da geçmişten itibaren Türkiye'nin özellikle de küçükbaş, büyükbaş hayvancılıkta ve manda yetiştiriciliğinde önemli merkezlerinden biri olmuştur. Bu saha yerli ırklarıyla (kıvırcık koyun, boz sığır ırkı, Trakya arısı gibi) aynı zamanda önemli bir gen merkezi konumundadır. İstanbul gibi büyük tüketim merkezlerine yakınlığı ve azalsa da halen önemli tarım alanlarının olması hem Trakya'yı hem de Pınarhisar'ı önemli kılmaktadır.

Hayvancılık faaliyetlerinde verimlilik konusunda sıkıntı yaşanan Türkiye'de, başta büyükbaş olmak üzere tüm hayvancılık faaliyetlerinde verimliliği arttırmak için gen merkezli planlı ve sürdürülebilir çalışmaların yapılması gerekmektedir. "Trakya genelinde sığır varlığının genotip yapısının kültür ve kültür melezine yakın olması nedeniyle bölge hayvanları Türkiye'nin diğer bölgelerinde damızlık materyali olarak da kullanılmaktadır"(Semerci, 2006: 67). Bu nedenle Trakya'daki hayvanların yapısal özellikleri genetik anlamda ayrı bir öneme sahiptir. "Trakya'da kültür ve melez hayvanların kökenini ağırlıklı olarak (%73,8) Holstein tipi ırklar oluşturmaktadır. Bölgedeki büyükbaş hayvan besiciliği daha çok süt üretimine yöneliktir"(Gültekin, 2014: 18). Trakya, şap hastalığından ari hale getirilirken, hayvanlarda görülen diğer hastalıklarla ilgili çalışmalar da devam etmektedir. Trakya ve dolayısıyla bu bölge içinde yer alan Pınarhisar gen merkezidir. Çalışma sahasının büyükbaş hayvancılık içinde Holstein ırkının Siyah Alaca çeşidinin gen merkezi olarak korunması önemlidir. Anadolu'dan Trakya'ya başka hayvan ırk ve çeşitlerinin sokulmaması genlerin korunması bakımından değerlidir. Trakya'dan bu ırk ve çeşitlerin ülkemizin dört tarafına çıkışının yapılması uygulanan hayvancılık politikasın güçlü tutacaktır.



Şekil 1. Çalışma Sahasının Lokasyon Haritası

Kırklareli İli, 320.940 küçükbaş ve 143.592 büyükbaş olmak üzere toplam 464.512 hayvan varlığına sahiptir (2017). İl genelinde küçükbaş hayvan varlığının büyükbaş hayvan varlığından fazla olmasına rağmen, elde edilen verimin ilin doğal yapısının elverişliliği nedeniyle büyükbaş hayvancılığından daha fazla olduğu dikkat çekmektedir. Pınarhisar'da ise aynı yılda 40.936 küçükbaş ve 6.725 büyükbaş olmak üzere toplam 47.661 hayvan varlığı vardır. Çalışma sahasının topografik özellikleri il genelinden farklı bir durum arz etmektedir. Buna rağmen hem hayvancılık hem de bitkisel üretim faaliyetlerinde olması gereken seviyeye gelememiştir.

Tarihi eski çağlara kadar uzanan Pınarhisar, Kırklareli İl'inin orta kesiminde ve Istranca Dağları'nın eteğinde kurulmuştur. Pınarhisar su kaynaklarıyla dikkat çekse de kuzeyindeki Istranca Dağları'nın deniz etkisini kesmesi, bölgede iklimin karasal özellik kazanmasında etkili olduğundan bitkisel üretimi kısıtlamıştır. Hayvancılık faaliyetleriyle dikkat öne çıkan Pınarhisar İlçesi, Trakya Bölgesi içinde hayvancılık alanında genetik bir merkez olarak değerlendirilmesi son derece faydalı olacaktır.

Foto 1. Holstein Irkından Siyah Alaca

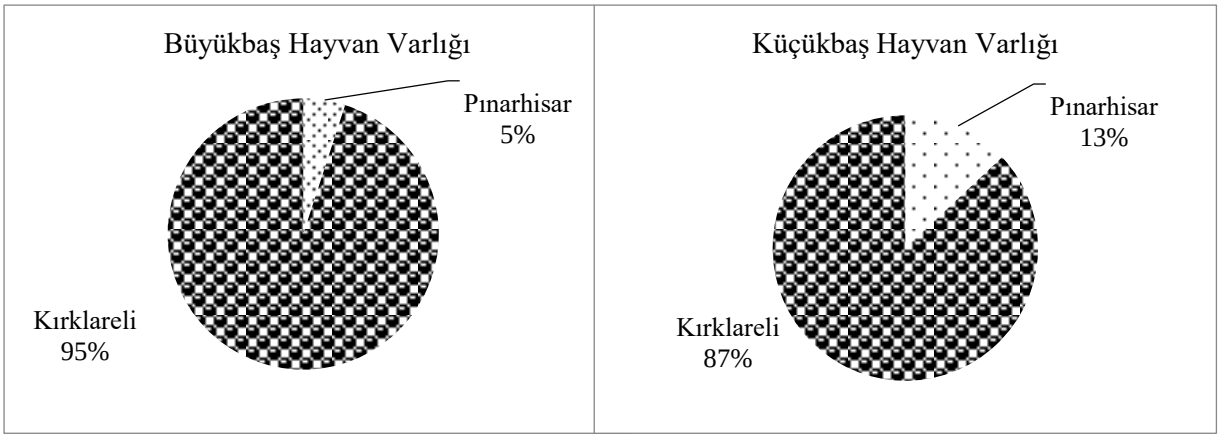
"Türkiye'de kırsal ekonomik faaliyetlerin yapı ve nitelikleri bakımından en fazla sorun barındıran sektör kuşkusuz tarım sektörüdür"(Bakırcı,2007:323). Ülkemizin tarımsal faaliyetlerinde kronikleşmiş sorunlar çalışma bölgesi ve çevresinde de etkisini göstermektedir. Tarımsal faaliyetler içinde yapılan hayvancılıkta da bu sorunlar açık olarak görülmektedir. Yaklaşık 50 yıl önce başlayan ama son 30 yılda gittikçe artan sanayi faaliyetleri, kırdan kente olan göç, çevresel kirlilik, artan girdi fiyatları, uygulanan tarımsal politikaların yetersizliği ve yeni kuşağın başka mesleklere yönelmesi hayvancılık faaliyetlerini de olumsuz etkilemiştir. Artan girdi fiyatları hem ülkemizde hem Trakya'da hem de Pınarhisar'da başta süt, süt ürünleri ve ette olmak üzere beklenen kazançlar elde edilememiş ve hayvancılık faaliyetleri de gerilemeye başlamıştır.

Ayrıca her zaman hayvancılık faaliyetlerinin bitkisel üretimin gerisinde yapılması ülkemiz ve Pınarhisar hayvancılığının gelişmemesine neden olmuştur. Bunun yanında mandacılık gibi önemli ve değerli faaliyet de olumsuz etkilemiş, manda varlığı ve ürünleri üretiminde büyük düşüşler yaşanmıştır.

1.1 Kırklareli İl'inde Yapılan Hayvancılık Faaliyetlerinde Pınarhisar'ın Yeri

Geniş bir ovaya sahip olan Pınarhisar, kuru tarım uygulamaları nedeniyle ekonomik gelişme bakımından pek fazla öne çıkamamıştır. Çevresindeki sanayi alanları gençlerin çekim merkezleri olduğundan hem bitkisel üretim hem de hayvancılık faaliyetleri yeteri kadar gelişmemiştir. Uygulanacak sulu tarım metod ve yöntemleriyle genç nüfusu topraklarına bağlamak özellikle tarımsal potansiyeli öne çıkaracağından değerli olacak ve buna bağlı olarak gıda sanayi yatırımlarının da önünü açacaktır. Kırklareli'nin 8 ilçesinden biri olan Pınarhisar, genel olarak hayvancılık faaliyetleri bakımından istenen seviyeye gelememiştir. İstanbul gibi bir mega şehre yakınlık, doğal ve beşeri özellikler bakımından olumlu koşullar ortaya koyan "Pınarhisar'da, hayvancılık faaliyetlerini bazı aileler ek gelir sağlamak amacıyla ikinci bir iş olarak yaparken bazı aileler de özellikle ilçenin kuzey kesimlerinde arazinin engebeli, bitkisel üretim için tarım topraklarının azlığı ve verimsizliği nedeniyle temel geçim kaynağı olarak yapmaktadırlar"(Cidan,2016:83). Çalışma sahasında yer alan büyük ovaya rağmen kuru tarım faaliyeti nedeniyle buğday ve ayçiçeği yetiştirilmektedir. Sulama sıkıntısı giderildiğinde bitkisel ürün çeşitliliği artacağından elde edilen verim ve buna bağlı olarak gelir de yükselecektir. Pınarhisar'da hayvancılık faaliyetleri extansif koşullarda ve küçük aile işletmelerde yapılmasına rağmen "hayvanların daha doğal ortamlarda beslenmesi nedeniyle et ve et ürünlerinin kalitesi çok yüksektir"(Trakya Kalkınma Ajansı,2012). Bununla beraber "bölgede entansif hayvancılığın geliştirilmesi için çiftçinin yeni teknik ve teknolojilerle tanıştırılması, bilgilendirilmesi gerekmektedir" (Balcı Akova, 2002: 38). Küçükbaş hayvancılık varlığı bakımından nispeten daha iyi durumda olan Pınarhisar, arıcılık açısından da Kırklareli'nin önde gelen ilçelerinden biridir. Denize

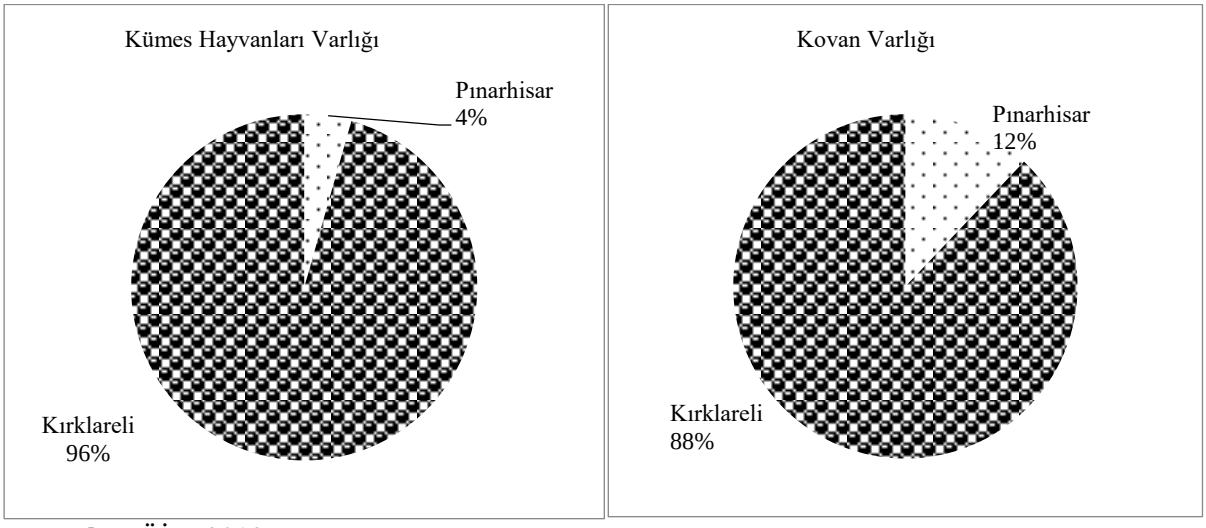
kıyısı bulunmayan ilçede aquakültür faaliyetleri de söz konusu olmayıp, ipekböcekçiliği gibi diğer hayvancılık faaliyetleri de yapılmamaktadır.



Kaynak: TÜİK, 2019.

Şekil 2. 2017 İtibariyle Pınarhisar'da Büyükbaş ve Küçükbaş Hayvan Varlığının İl Geneline Oranı

Şekil 2'de görüldüğü üzere; 2017 yılında Kırklareli İl'inde yapılan büyük ve küçükbaş hayvancılık faaliyetlerinde Pınarhisar ilçesi % 18'lik bir oranla dikkat çekmektedir. Bu oranın % 5'i büyükbaş, % 13'ü de küçükbaş hayvancılık faaliyeti meydana getirmektedir. Küçükbaş hayvancılık faaliyeti içinde yerli koyun ırkı ve kısmen de kıl keçisi dikkat çekmektedir.



Kaynak: TÜİK, 2019.

Şekil 3. 2017 İtibariyle Pınarhisar'da Kümes Hayvanları ve Kovan Varlığının İl Geneline Oranı

Yine 2017 yılında ilçenin kümes hayvancılığı faaliyetlerinin Kırklareli il genelindeki oranı % 4,4'tür. Bu oran kümes hayvancılığının çok gelişmemiş olduğunu göstermektedir (Şekil 3). Bu oranının tamamına yakınını ise, tavuk (yumurta tavuğu) yetiştiriciliği oluşturmaktadır. Pınarhisar'da kümes hayvanlarından en fazla 22.526 başla yumurta tavuğu gelmekte olup, ilçede et tavuğu yetiştiriciliği bulunmamaktadır. Diğer kümes hayvanlarının (ördek, kaz ve hindi) varlığı da çok daha sınırlı düzeydedir (541 baş). İlçenin ilk sıralarda yer aldığı tek hayvancılık kolu olan arıcılıkta ise il genelinin toplam kovan varlığında % 12,1'lik payı vardır (Şekil 3). İlçede, 2017 yılında bulunan toplam 6.010 kovanın 500'ü eski tip kovandır.

Son dönemde tarımsal faaliyetlerde hızlı bir dönüşümün yaşandığı (GDO'lu ürünler, organik tarım, yerli tohum kullanımı ve İstanbul'a yakınlık vb. gibi) unsurlar dikkate alındığında Pınarhisar ilçesinde

yapılan hayvancılığının potansiyeline bağlı olarak beklenenin çok gerisinde olduğu dikkat çekmektedir. Nitekim çevresindeki tarım merkezlerinde meydana gelen değişim ve gelişmeler Pınarhisar ilçesi içinde bir şans görülmelidir.

1.2 Pınarhisar İlçesi'nde Yapılan Hayvancılık Faaliyetlerinin Ana Hatları

Daha öncede belirtildiği gibi, bağlı bulunduğu Kırklareli İl'inin hayvancılık potansiyelinin gerisinde olan Pınarhisar'da; koyun varlığı ve arıcılık dışında diğer hayvancılık kollarının hiçbirinde kayda değer bir gelişme görülmemektedir.

Tablo 1. Seçilmiş Yıllar İtibariyle Pınarhisar'da Büyükbaş ve Küçükbaş Hayvan Varlığı

Hayvan Varlığı	2005	2010	2017
Sığır (Kültür)	3.549	8.377	6.312
Sığır (Melez)	3.815	-	407
Sığır (Yerli)	-	-	3
Manda	-	-	3
Koyun (Merinos)	-	-	1.594
Koyun (Yerli)	17.200	22.100	25.352
Kıl Keçisi	8.000	10.500	13.990

Kaynak: TÜİK, 2019.

Seçilmiş yıllara göre hazırlanan Tablo 1'de de görüldüğü üzere; ilçede büyükbaş ve küçükbaş hayvancılık faaliyetleri çok fazla öne çıkmamıştır. Yerli sığır ve manda varlığı neredeyse hiç olmadığı ilçede, kültür ırkı sığır yetiştiriciliğinin nispeten gelişmiş olduğu görülmektedir. Söz konusu hayvan varlığında ise hayvancılığın kronik problemlerine bağlı olarak (süt fiyatlarındaki istikrarsızlık, başta yem olmak üzere diğer girdi masraflarının artması gibi) son yıllarda düzenli bir gelişme eğiliminden bahsetmek mümkün değildir. Küçükbaş hayvancılıkta ise ilerleyen bölümlerde detaylandırıldığı üzere; ilçede istikrarlı bir gelişimin olduğu görülmektedir.

1.2.1 Büyükbaş Hayvancılık

Genel olarak ilçede çok fazla öneme sahip olmayan büyükbaş hayvancılık faaliyetlerinde, 2005 yılında 3.549 baş olan kültür ırkı 2017'de yani geçen 12 yıllık süreçte % 78 artarak 6.312'ye çıkmıştır. Melez sığır varlığı ise yine aynı dönemde çok fazla bir düşüş yaşamıştır. 2005 yılında 3.815 olan melez sığır varlığı 407'ye gerilemiştir. Bu dikkat çekici bir husustur. 2005-2017 döneminde toplam büyükbaş hayvan varlığı 7.367'den 6.725'e gerilemiştir (Tablo 1).

2017 yılı itibariyle ilçede 607 işletme bulunmakta olup, aynı yıl büyükbaş hayvan varlığı da 7.506'dır. İşletme başına düşen büyükbaş hayvan varlığı 12,4'tür. Pınarhisar'da 1 tane büyük ölçekli et kombinası bulunmaktadır. İlçenin toplam çayır-mera alanı ise 17.740 da. olup, yem fabrikası da bulunmamaktadır. Bu bağlamda büyükbaş hayvancılığın genel karakterinin geçimlik düzeyde olduğu görülmektedir.

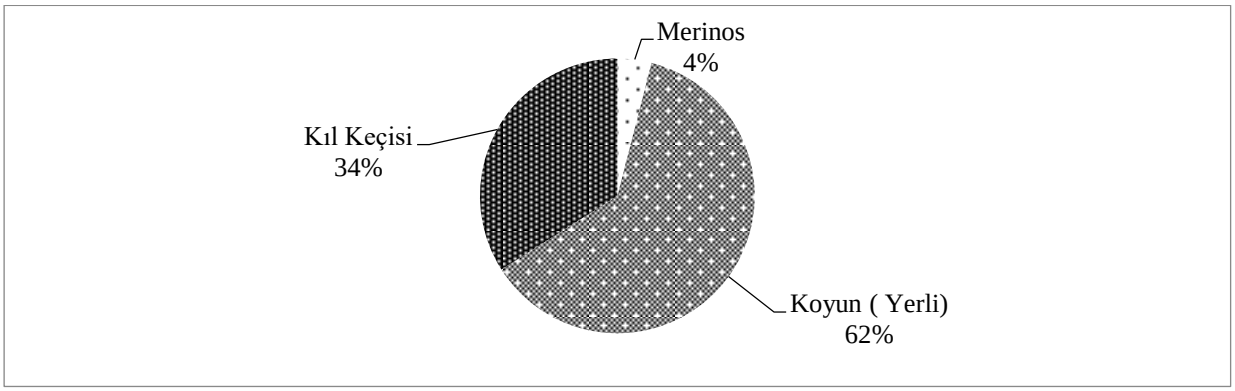
Büyükbaş hayvanları arasında 2017 yılında 6.312 kültür ırkının 2.953'ünün sağımlık sığır, 407 melez ırkın da 68'i sağımlıktır (TÜİK, 2019). 2017'de ilçede toplam 11.731 ton süt üretilmiştir. Süt üretiminin tamamına yakını (11.538 tonu) kültür ırkı sığırlardan elde edilmiştir.

Büyükbaş hayvancılığa bağlı olarak üretilen sütte, hayvan varlığına paralel bir gelişim söz konusudur. İlçede her ne kadar 2000'li yılların ikinci yarısından itibaren süt üretimi artmış olsa da son yıllarda 10 bin tonun altına inmese de yine de küçük ölçekli gerilemelerin olduğu görülmektedir. İlçede 2010 yılında sağılan kültür ırkı sığırlardan (3.373 baş) elde edilen süt üretimi 13.178 ton iken 2017'de sağılan sığır sayısı gerilemiş (2.953) ve buna bağlı olarak elde edilen süt miktarı da 11.731 tona düşmüştür (TÜİK, 2019).

1.2.2 Küçükbaş Hayvancılık

Geçmişten beri Trakya'da en fazla yetiştiriciliği yapılan hayvanların başında koyun gelmektedir. Özellikle de Trakya koşullarında yerli ırk koyun yetiştiriciliği en önemli hayvancılık faaliyeti olarak

süregelmiştir(Taşlıgil,2010:166). İlçede yapılan küçükbaş hayvancılık faaliyetlerinde genel olarak Trakya koşullarında yaygın olarak yetiştirilen kıvırcık ırkı koyun öne çıkmaktadır.

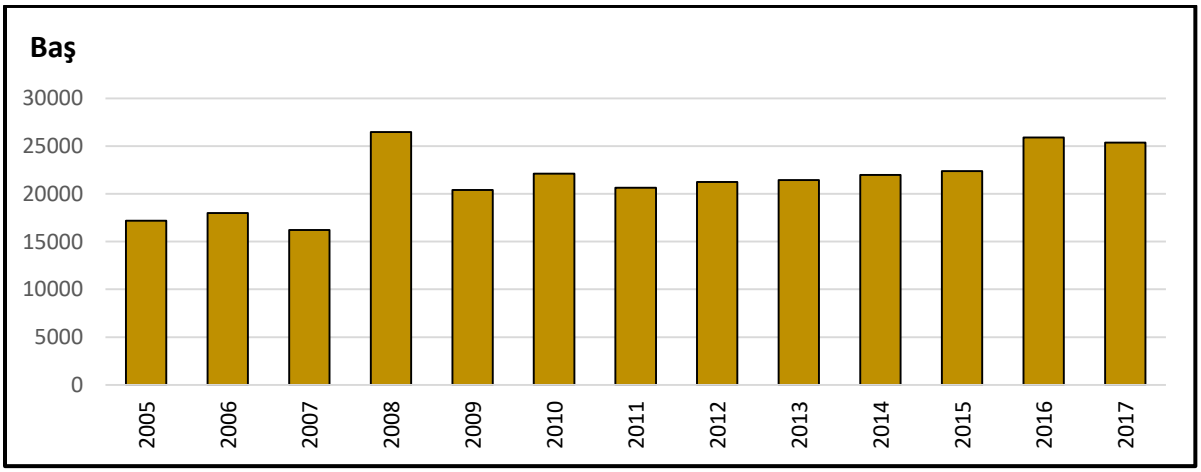


Kaynak: TÜİK, 2019.

Şekil 4. 2017 İtibariyle Pınarhisar'daki Küçükbaş Hayvanların Oransal Değerleri

İlçede 2017'de küçükbaş hayvanlar arasında yerli ırk koyunlar % 62'lik bir paya, kıl keçisi ise % 34'lük bir orana sahiptir (Şekil 4). Pınarhisar'da ilk defa 2017'de merinos koyunu yetiştiriciliği istatistiklere konu olmuş, aynı yıl ilçede 1.594 başlık koyun varlığı tespit edilmiştir (TÜİK, 2019).

Pınarhisar'daki küçükbaş hayvancılığın temelini oluşturan koyun varlığına bakıldığında; yıllar içerisinde bu alanda stabil diyebileceğimiz bir gelişimin söz konusu olduğu görülmektedir (Şekil 5).



Kaynak: TÜİK, 2019.

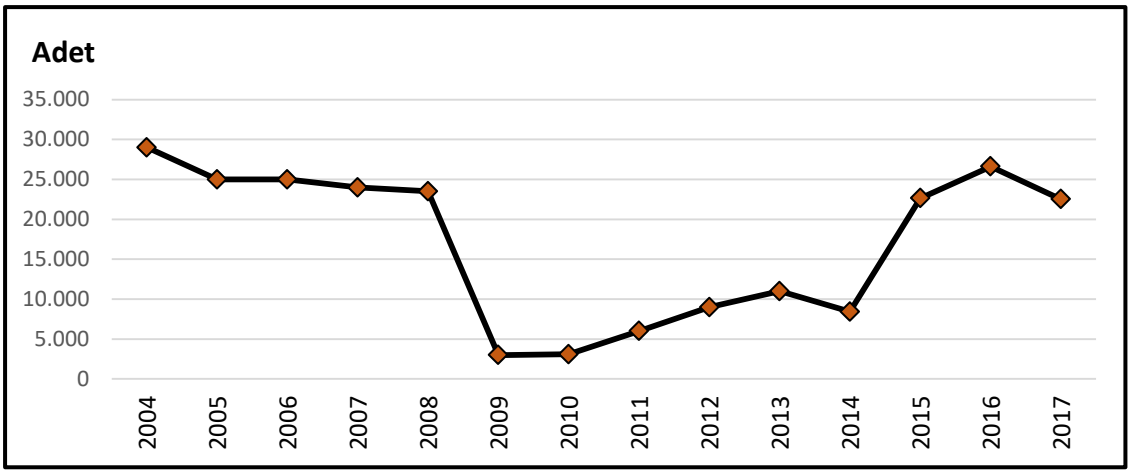
Şekil 5. Pınarhisar'da 2005-2017 Yılları Arasındaki Koyun (Yerli) Varlığının Değişimi

İlçede koyun varlığı 2005 yılında 17.200 iken 2010'da 22.100 ve 2017'de de 25.352 başa yükselmiştir. Son 12 yıllık süreçte ilçenin koyun varlığı sayısı % 47,5 artmıştır. Yine Pınarhisar İlçesi'nde küçükbaş hayvancılığında yerli koyun ırkı dışında kıl keçisi dikkat çekmektedir. İlçede 2017 yılında 13.990 kıl keçisi ve 1.594 baş merinos varlığı bulunmaktadır (Şekil 5).

1.2.3 Kümes Hayvanları Varlığı

İlçede söz konusu faaliyet büyük ölçüde yumurta tavuğu yetiştiriciliği özelinde sürdürülmektedir. 2017 yılında toplam 23.067 adet kümes hayvanının % 97.6'sı yumurta tavuğundan oluşmaktadır. Bunu sırasıyla ördek (257), hindi (157) ve kaz (127) varlığı takip etmektedir. Başta kaz olmak üzere hindi ve ördeğin çok fazla ticari değerinin olmadığı görülmektedir. Et tavuğu yetiştiriciliği olmayan Pınarhisar'da, yumurta tavukçuluğunda öne çıkan 1 modern çiftlik bulunmaktadır. Pınarhisar,

hayvancılığın bu kolu açısından Kırklareli genelinde Vize ve Kofçaz ile birlikte son sırada yer almaktadır.



Kaynak: TÜİK, 2019.

Şekil 6. Pınarhisar'da Tavuk (Yumurtalık) Varlığındaki Değişim (2004-2017)

Kümes hayvancılığının en önemli elemanı olan yumurta tavuğunun ilçedeki son 14 yıllık gelişimine bakıldığında; dikkat çekici bir değişimin yaşandığı görülmektedir (Şekil 6). İlçede 2004-2008 yılları arasında ortalama 25.000 dolaylarında seyreden tavuk varlığı 2009'da 3.000'e kadar gerilemiş ve söz konusu değerle son yılların en düşük değeri kaydedilmiştir. Bu durum Kuş Gribi (H5N1) nedeniyle aynı dönemde Türkiye genelinde de yaşanmıştır.

Söz konusu virüsün yarattığı etki nedeniyle binlerce kanatlı telef olmuştur. Virüsün yaygınlığının azalmasıyla beraber bu alanda Pınarhisar'da yeniden bir iyileşme kaydedilmiş ve tavuk sayısı günümüzde eski değerlerine yaklaşmıştır. 2016 yılında 26.608 olan yumurta tavuğu sayısı 2017'de biraz gerilese de 22.526 olmuştur (TÜİK, 2019).

1.2.4 Arıcılık

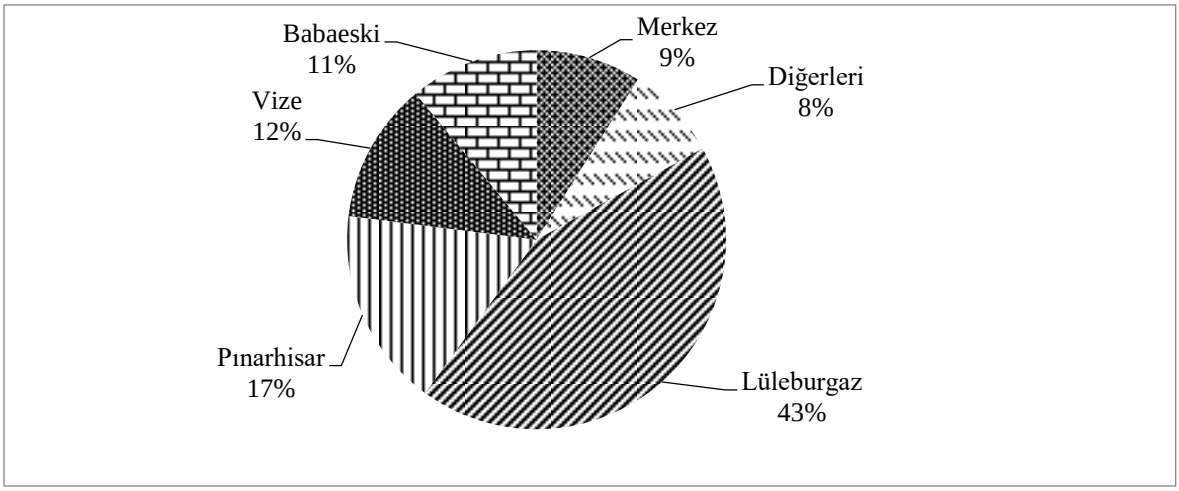
Hayvancılığın pek çok dalında geri olmakla beraber Pınarhisar, arıcılıkta Kırklareli'nin önde gelen ilçelerindendir. 2017'de toplam 6.010 kovanla Kırklareli genelinde % 12.1'lik payı bulunmaktadır. İlçede hem eski hem de yeni kovan sayısı yıllar itibariyle artış göstermiş, buna bağlı olarak bal üretiminde de önemli artışlar görülmüştür.

Tablo 2. Seçilmiş Yıllar İtibariyle Pınarhisar'da Arıcılık Faaliyetine Yönelik Değerler

Yıllar	Kovan Varlığı		İşletme Sayısı	Bal Üretimi	Balmumu Üretimi
	Eski Kovan	Yeni Kovan		Ton	
2005	420	2.450	15	56,3	3,4
2010	300	3.433	15	63,4	4,2
2017	500	5.510	81	120,2	3,6

Kaynak: TÜİK, 2019.

İlçede 2005 yılında 420 eski ve 2.450 yeni olmak üzere toplam 2.870 kovandan 56.3 ton bal üretimi gerçekleşmişken, 2010'da 300 eski ve 3.433 yeni olmak üzere toplam 3.733 kovandan 63.4 ton ve 2017'de de 500 eski ve 5510 yeni olmak üzere toplam 6.010 kovandan toplam 120,2 ton bal üretilmiştir. 2005-2017 yılları arasında geçen dönemde kovan sayısı yaklaşık % 110 artarken toplam elde edilen bal da yaklaşık aynı oranda % 113 artmıştır (Tablo 2). Balmumu üretimi ise seçilmiş yılların verileri göz önüne alındığında 3-4 ton aralığında kalmıştır.



Kaynak: TÜİK, 2019.

Şekil 7. 2017 İtibariyle Bal Üretiminde Kırklareli İl'ine Bağlı İlçelerin Oransal Dağılımı

2017 yılında toplam 120,2 tonluk bal üretimiyle Kırklareli ilinin toplam üretiminin % 17'sini sağlamış olan Pınarhisar ilçesi, Lüleburgaz'dan sonra 2. Sırada yer almaktadır (Şekil 7). İlçede Arıcılık Kayıt Sistemine kayıtlı olan toplam 81 işletme bulunmakta olup 6.010 kovanın tümü de desteklemelerden yararlanmıştır.

Genel olarak Lüleburgaz, Pınarhisar ve Vize ilçelerinde yapılan arıcılık faaliyetleri ayçiçeği yetiştiriciliğine paralel olarak sürdürülmekte ve buna bağlı olarak sahanın ekonomisine de önemli bir katkı sağlamaktadır.

1.2.5 Diğer Hayvancılık Kolları

Pınarhisar'da tek tırnaklı varlığına baktığımızda yıldan yıla at, katır ve eşek sayısının azaldığı görülmektedir. Tarımda makineleşme, hayvan gücüne olan gereksinimin yıldan yıla azalmasının olağan bir sonucu olan bu durum neticesinde ilçede 2017 itibariyle 128 eşek, 51 at ve sadece 18 kadar katır bulunmaktadır (TÜİK, 2019). Trakya genelinde at varlığının bir kısmı yarış atı olarak yetiştirilmektedir. Kırklareli ve Tekirdağ'da da bu amaçla kayda değer oranda at yetiştiriciliği yapılmaktadır. Pınarhisar'da ise söz konusu 51 başlık at varlığı, Kırklareli genelinin sadece % 8.5'ine karşılık gelmektedir.

Tablo 3. Seçilmiş Yıllar İtibariyle Pınarhisar'da Tek Tırnaklı Hayvan Varlığı

Tek Tırnaklı Hayvan Varlığı	2005	2010	2017
At	128	66	51
Katır	48	34	18
Eşek	170	155	123

Kaynak: TÜİK, 2019.

Trakya'nın farklı sahalarında olduğu gibi, Pınarhisar ilçesinde de tek tırnaklı hayvan varlığının yıldan yıla azaldığı bilinmektedir. 2005 yılından 2017'ye geçen sürede tek tırnaklı hayvan varlığının başta at ve katır olmak üzere eşek varlıklarının azaldığı görülmektedir (Tablo 3)

İpekböcekçiliği ve balıkçılık faaliyetinin olmadığı Pınarhisar'da, iki işletmede solucan gübresi üretimi konusunda deneme yapılsa da başarı sağlanamamıştır.

2. Sonuç

Pınarhisar, sahip olduğu konumunu ekonomik faaliyetlere tam olarak yansıtamadığından çok fazla gelişme gösterememiştir. Başta tarımsal üretime bağlı olarak ürünlerini kolay pazarlayabilecek şartları haiz olmakla birlikte beklenen arzu edilen seviyeye ulaşamamıştır.

Pınarhisar için mevcut şartlarda koyun yetiştiriciliği ve arıcılık hayvancılığın başat kolları arasında sayılabilir. Diğer hayvancılık faaliyetleri ise, küçük aile işletmelerinde çok büyük ölçüde geçimlik amacıyla, üreticilerin kendi ihtiyaçlarına yönelik sürdürülmektedir. Bunlar içerisinde de her ne kadar koyun yetiştiriciliğinde kayda değer bir varlığı bulunsa da Kırklareli ili geneliyle kıyaslandığında payının yine de küçük olduğu görülmektedir.

Pınarhisar'ın en fazla gelişme göstermiş hayvancılık kolu arıcılıktır. Kovan varlığının sürekli artması ve buna bağlı bal üretimindeki kayda değer artışlarla yöre hayvancılığında bu anlamda dikkat çekmektedir. Bununla birlikte dünyanın çeşitli yerlerinde zaman zaman kaygı verici seviyelere çıkan toplu arı ölümleri burada da etkisini göstermiş ve üreticiyi çok büyük ölçüde zorlamıştır.

Pınarhisar'ın İstanbul gibi büyük bir tüketim merkezine yakın oluşu, ulaşım açısından elverişli olan konumu, topografik vb. gibi özellikleri çok iyi değerlendirilmelidir. İlçe, gelişen tarımsal koşullar ölçüsünde hem ham hem de işlenmiş ürünlerin pazarlanması açısından büyük avantaj sağlayabilir. Bu açıdan Pınarhisar'ın hayvancılık faaliyetleri ve buna bağlı olarak hayvansal ürünlerin desteklenmesinde doğrudan İstanbul ve diğer büyük merkezlerin pazarına yönelik hareket edilmesi ve üreticiye bu yönde güvence verilmesi çok önemlidir.

Hem Pınarhisar'da hem de içinde bulunduğu Trakya'da yetiştiriciliği yapılan yüksek verimli kültür ve melez ırkların bünyelerine uygun olarak bakılması, beslenmesi ve sağlık koşullarının sağlanması gereklidir.

Pınarhisar'da hayvancılık faaliyetlerinin entansif şartlarla işlerin daha kolay yapılmasına olanak vereceği için verimi, kaliteyi ve hijyen koşullarını da arttıracağından bölge ve ülke ekonomisine daha fazla katkı sağlayacaktır. Elde edilen süt ve diğer ürünlerin mandıralar ve işletmeler tarafından emeğinin karşılığında alınması ailelerin gelirlerini de yükseltecektir.

Hayvancılık faaliyetlerinin aile işletmelerinin dışına da çıkarılması yönünde kontrol mekanizması güçlü yasal teşvik ve yatırımlarla büyük çiftliklerde yapılması hem Pınarhisar hem de ülke ekonomisine katkı sağlayacaktır. Böylece geçimlik olarak yapılan büyükbaş, küçükbaş, kümes hayvancılığı ve tek tırnaklılara ait hayvancılık faaliyetleriyle öne çıkan arıcılık büyük bir ekonomik faaliyete dönüştürülmelidir.

Pınarhisar ilçesinin bağlı bulunduğu Kırklareli ve çevresi farklı turizm olanaklarıyla önemli bir destinasyondur. Turizm ve diğer ekonomik faaliyetler arasındaki ilişki çerçevesinde hayvancılık, çok önemli bir unsur olarak Pınarhisar ve çevresine katkı sağlayacak şekilde düşünülmeli ve değerlendirilmelidir.

Hayvancılık faaliyetlerinde verimin ve kalitenin arttırılması için planlı ve programlı sürdürülebilir politikaların geliştirilmesi öncelik olmalıdır. Bu bağlamda Pınarhisar ilçesinin Trakya bölgesi içinde hayvancılık alanında gen merkezi olarak korunması son derece faydalı olacaktır.

Kaynaklar

Balcı Akova, S. (2002). Ergene Havzasında Mekansal Kullanımlar, Çantay Kitabevi, İstanbul.

Bakırcı, M.(2007).Türkiye'de Kırsal Kalkınma Kavramlar-Politikalar-Uygulamalar, Nobel Yayın Dağıtım, Ankara.

Cidan, A. (201). Pınarhisar'da Şehirsel Gelişim, T.C İstanbul Üniversitesi Sosyal Bilimler Enstitüsü Coğrafya Anabilim Dalı, Yüksek Lisans Tezi, İstanbul.

Doğan, M. (2005). Türkiye Ziraatinde Makineleşme: Traktör ve Biçerdöverin Etkileri, İstanbul Üniversitesi Edebiyat Fakültesi Coğrafya Bölümü Dergisi, Sayı: 14, S: 66-75, İstanbul.

Doğan, M. (2016). "Türkiye'de Tarım, Hayvancılık ve Ormancılık", Türkiye Beşeri ve Ekonomik Coğrafyası, Ed: Doğanay, S. ve Alım, M., S: 111-165, Pegem Akademi, Ankara.

Gültekin, C.(2014). Trakya Bölgesi'nde Büyükbaş Hayvancılık İşletmelerinin Üretim-Pazarlama Sorunları ve Çözüm Önerileri, T.C. Trakya Üniversitesi Sosyal Bilimler Enstitüsü, Edirne.

Kaymakçı, M. (2016). İleri Koyun Yetiştiriciliği, 5. Baskı, İzmir.

Semerci A. (2006). Trakya'da Tarımsal Yapı, Verimlilik ve Gelişmişlik Düzeyi, Tarım ve Mühendislik, Sayı: 76-77.

Sertkaya Doğan, Ö.(2008). Türkiye'nin Tarım Politikalarının Belirlenmesinde Coğrafi Özelliklerin Önemi, İstanbul Üniversitesi Sosyoloji Dergisi, 3. Dizi- 17. Sayı, S: 91- 101, İstanbul.

Şahin, G. (2015). Türkiye Zirai Hayatında Manda (*Bubalus bubalis*) Yetiştiriciliği ve Manda Ürünlerinin Değerlendirilmesi, İstanbul Üniversitesi Edebiyat Fakültesi Coğrafya Dergisi, Sayı: 31, S: 14-40, İstanbul.

Şahin, G. (2017). Saray İlçesinde Arazi Kullanımı ve Tarımsal Faaliyetler, Memleket Pusulası Saray, (Ed. Prof. Dr. Özlem Sertkaya Doğan), S: 203-255, İstanbul.

Taşlıgil, N. (2010). Türkiye Ziraatinin Problemleri, Çantay Kitabevi, İstanbul.

Trakya Kalkınma Ajansı. (2012). "Pınarhisar İlçe Vizyonu", http//www.trakya2023.com/content, 15.03.2019.

TÜİK. (2018). Türkiye Hayvancılık İstatistikleri, https://biruni.tuik.gov.tr/medas/?kn=92&locale=tr (Son erişim: 12.03.2019).