

The Impact of Recent Changes in Turkey's Extension System on Agricultural Sector with Respect to 2023 Vision

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Abstract: The objective of this study is to determine the impact of recent changes in Turkey's agricultural extension system on agricultural sector with respect to "2023 Vision". To attain the objectives of this vision, Turkey's agricultural sector needs to perform better. Improved performance needs good agricultural policies as well as extension policies that will facilitate faster growth in Turkish agriculture. The role of extension policies in increasing agricultural production will be questioned by a regression model using time series data indicating the performance of the sector and related policies in the sector. In this model, agricultural gross domestic product is used as dependent variable while per capita income, agricultural export, the crises Turkish economy faced, agricultural and rural development support policies to increase productivity and thus production, and finally important policies on agricultural extension services were used as independent variables. The results of estimated regression model explain the factors affecting agricultural GDP well, with correct signs as expected and goodness of fit with high R^2 . The dummy variable that represents agricultural extension services in recent years have positive and statistically significant impact on Agricultural GDP. Thus it is important to have sound extension policies to increase agricultural GDP to reach the vision of 2013.

Key words: Turkey, extension policies, regression model, 2023 Vision

Introduction

Extension education programs are diverse when countries around the world are compared. Many of them are managed by public sector agencies belonging to the ministry of agriculture, on the other hand, while some others are located in other ministries such as education or rural development. Some are administered by nongovernmental organizations. Private companies and organizations also conduct extension programs. Even within the most typical organizational structure, where extension is part of the government's ministry of agriculture, there is great variation in the degree of decentralization of management of extension services. In some countries, extension is decentralized, but in most developing countries, governmental services are centralized with regional units designed to serve local areas (Evenson 1997). In many developing countries, agriculture is the most important economic activity providing income, employment and foreign exchange. Without an efficient agricultural sector, a country is severely constrained in its ability to feed itself or import foreign products for domestic consumption and development (Birkhaeuser, Evenson and Feder 1991)

Agricultural extension services in Turkey have a long past and are centralized under the Ministry of Food, Agriculture and Livestock with its regional units for the time being. In this respect, first agricultural congress was held in 1931 where many important decisions are made to attract farmers to use modern agricultural techniques. Responsibility of extension services was given to elementary School teachers in the villages in 1937.

Agriculture and Village Congress was held in 1938 and extension was held in 1938 where agricultural extension was put forward in the agenda. Establishing extension associations started taking places in provinces of Ankara, Eskisehir and Manisa in 1948 and was completed in all provinces in 1958. All these organizations were collected under the roof of the ministry of agriculture in 1984 (Kocak 2012). After this date, in order to expand the education and visit system of Daniel BENOR, Agricultural Extension and Applied Research Project (TYUAP) was put in effect first time for 16 provinces in 1984 and for the second time 21 provinces in 1990 (Cinemre ve Demiryürek 2005). Village group agricultural centers, which were one of the most important items of TYUAP started losing their efficiency in the early years of 2000, then the Village Centered Agricultural Production Support Project (KÖYMER) was placed in 2004. This was a first attempt to have extension services provided by non-governmental organizations as a first step to pluralist extension approach but did not last long because those KÖYMER personnel started becoming public workers in 2006. Rural Development Component of Instrument for Pre-Accession Assistance (IPARD) started to provide financial means for the projects to modernize and increase efficiency in agricultural enterprises for the 2007-2013 period and was still in effect for the 2014-2020 period after negotiations started between Turkey and EU in October 2005 (Gülkök 2015).

The problems and inefficiencies in the implementation of agricultural extension and education services decreased the benefits expected from the services. To get rid of the problems, as new extension and education policies, private agricultural consultants started providing extension services that were mainly provided by the Ministry of Food, Agriculture and Livestock after the ministry started supporting Agricultural Extension and Consultancy Services. On the other hand, in order to meet the objectives of 2023 vision of Turkish economy, agricultural extension has to play an important role for efficient and more productive agricultural sector. Regulation of supporting agricultural extension and consultancy services was enacted in 2009 to support agricultural enterprises that purchase agricultural extension and consultancy services (Özçatalbaş et al. 2010). This regulation has changed in 2012 to support those people and organizations who provides consultancy services to agricultural enterprises. This support was 225 TL at first then increased to 500 TL in 2010 and finally 600 TL in 2012. In addition, farmer organization that employ at most two consultants to serve farmers receives support of 20.000 TL per consultant. Moreover, 6,000 of agricultural enterprises that apply Farm Accounting Data Network System receive support of 425 TL per farm (Turkish Prime Ministry 2015).

Regarding the objective of 2023 Vision, which aims at making Turkish economy one of the ten largest economies in the world by 2023, the 100th anniversary of Turkish Republic, it is necessary to review the performance of Turkish economy that has become one of the leading emerging economies in the world in last decade. In 2010, Turkey had the second highest growth rate in the world, 8.9 percent. This growth has been accompanied by other improvements in economic performance. Between 2003 and 2013, loans from the IMF decreased from 25.6 to 0.0 billion dollars, inflation declined from 68 to 6.8 percent, export increased from 25 to 152 billion dollars, per capita income increased from 3,021 to 10,818 dollars, budget for health and education increased about six times and public investment increased from 8.7 to 39.2 billion dollars. These improvements in the general economy are mirrored by improvements in the agricultural

sector. In the last decade, agricultural income increased from 23.7 to 62.0 billion dollars, government support has grown from 1.87 to 9.10 billion TL, and credit provided to farmers has increased by 30 times as interest rates have declined from 59 percent to 5 percent. All these improvements in the economy put Turkey's economy in the 13th place in the world in terms of purchasing power parity (PPP). Given the strong relation between economic growth and agricultural growth in Turkey (Yavuz 2014), these changes put Turkey's agriculture in first among European countries and seventh in the world in terms of agricultural production value.

As it is known, extension services in most of the EU countries have been transmitted from public to mostly private services. The similar process is being implemented in Turkey's extension education system as indicated above. It is important to determine the role of these recent changes in Turkey's agricultural extension system as well as agricultural policies due to harmonization of EU CAP policies on the growth of agricultural sector with regard to the 2023 vision. Therefore, the objective of this study is to determine the impact of recent changes in Turkey's agricultural extension system on the agricultural sector with respect to the 2023 vision. To attain the objectives of "2023 Vision", Turkey's agricultural sector needs to perform better. Improved performance needs better agricultural policies as well as extension policies that will facilitate faster growth in Turkish agriculture, in part by being competitive. The role of extension policies to increase agricultural production will be questioned by a regression model using time series data indicating the performance of the sector and related policies in the sector.

Data

Yearly time series data collected from published statistics by Turkish Statistical Institution (TUIK), Turkish Central Bank (TCMB) and Food and Agriculture Organization (FAO). This data are collected for the period of 1990-2016 on value of agricultural production (GDP), export of agricultural production, economic growth, and per capita income in terms of purchasing power parity. The data set also includes extension policies, the Instrument for Pre-accession Assistance of Rural Development (IPARD) aids and economic and political crises as dummy variables. Agricultural extension and consultancy system implemented in recent year is represented as dummy variables to question its role in increasing agricultural GDP.

Model

Theoretical framework

In developing countries, in order to increase agricultural production, mainly low productivity needs to be increased. There are several ways to increase productivity in the agricultural sector. Rapid productivity gains can be generated by domestic programs such as input subsidies, price support policies and public services such as agricultural education, research and extension (Tweeten 1989). This services, especially extension education makes farmer aware of how to increase productivity and thus profitability. Therefore, extension services have an important impact on farmers' attitudes as to how to increase productivity by adapting new technologies into agricultural activities and thus this impact is long lasting.

The static impact could be measured in several ways, but all methods use the same logic as shown in figure 1. Nonconventional inputs such as agricultural extension shifting the

supply curve for farm crops and livestock from S so S' change equilibrium price from P to P' and output from Q to Q'. Therefore, the quantity of agricultural production increases due to productivity increases hence the low unit cost of production. Price does not decrease in the case of open economy and thus impact of policies becomes more powerful especially in the supply side of the sector.

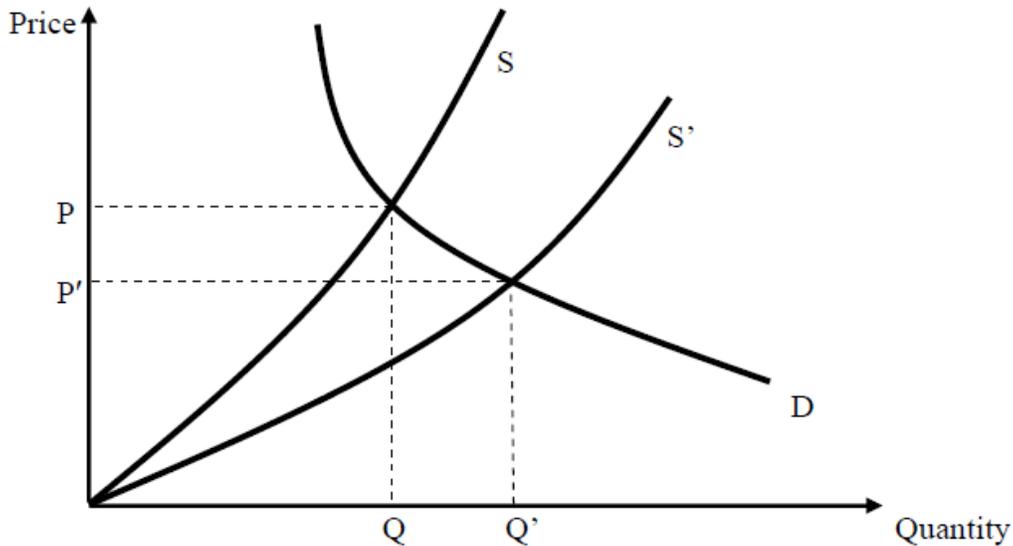


Figure 1. Hypothetical impact of productivity by extension services

In reality, gains to society from extension services are spread over many years. One Turkish Lira invested today on agricultural extension education services tends to have its peak payoff in 8 years and is absolute in 16 years (Braha and Tweeten 1986). Therefore, the impact of extension policies providing non-conventional input to the production are long lasting.

Empirical Model

The empirical model is used in this study mainly to measure the impact of extension services (TYDS) including another non-conventional input such as rural development supports (IPARD) to increase productivity also consists of crises, per capita income and agricultural trade as independent variables to explain agricultural GDP.

$$Y = a + bX + cD + e$$

Where:

Y: total agricultural production value

X: macroeconomic variables that affect total agricultural production value

D: dummy variables such as extension policies, support policies and crises

The changes in extension policies will be analyzed as dummy variables in a regression model to determine the impact of a recent important extension program called agricultural extension and consultancy system on agricultural total value which is agricultural GDP and implications will be drawn to enhance new extension policies aiming faster increase in agricultural production to reach the goal of 2023 vision.

Results

Descriptive analysis

The data used in this study shown in Figure 2 to display the tendency of variables and correlation between them. As it is seen in the figure, there is close relation between agricultural GDP which is dependent variable in the regression model of the study and independent variable. Among independent variables, agricultural export and per capita income in terms of PPP are continuous variable and both have positive correlation with dependent variable especially after 2002 where all of them are increasing fast. Among independent dummy variable, economic crises seem to either decrease or lower the increase of agricultural GDP in those years. Pre-Accession Assistance for rural development (IPARD) dummy variable seem to have positive impact. On the other hand, recent important extension policy named “Agricultural Extension and Consultancy Services Program” seems to have positive impact. This impact is being tested in a regression model in this study.

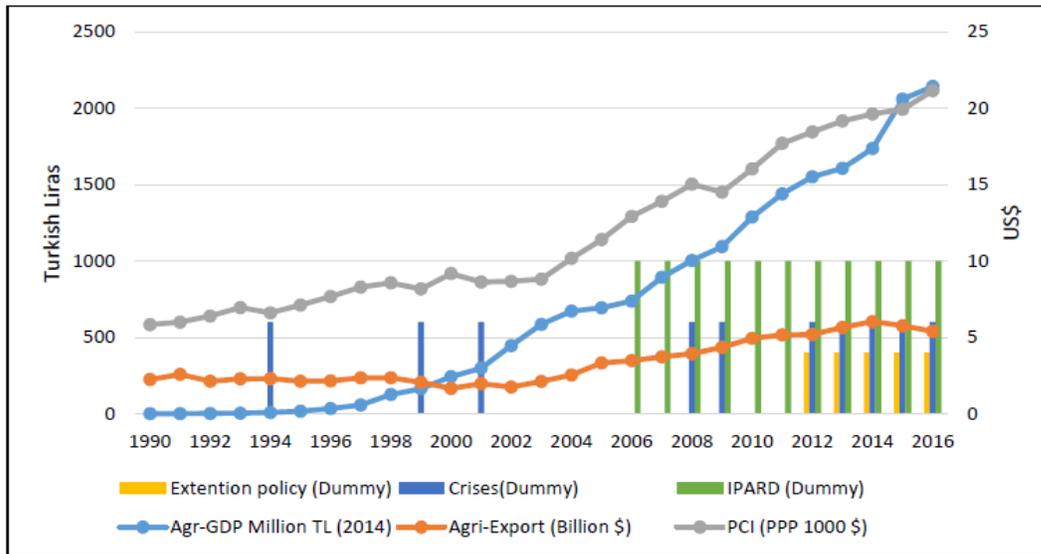


Figure 2. Descriptive analysis of the variables used in the model

Regression analysis

In the regression model, variables assumed to have impact on agricultural GDP were selected as independent variables which are per capita income in terms of purchasing power parity, agricultural export, economic crises, support policies, extension programs and the trend. It is assumed that all variable except crises have positive effect on Agricultural GDP.

Table 1. Estimated coefficients of regression model of Turkey's agricultural GDP

$R^2 = 0.98$				
Variable	Coefficient	Std. Error	t-Statistic	P-Value
C	-39,230,533.0	7,615,065.0	-5.152	***0.000
PPP	2,174.44.0	1,116.3	1.948	*0.065
AG. EXPORT	5,966.3	3,028.81	1.970	*0.062
CRISES	-4,401,740.0	3,949,477.0	-1.115	0.278
IPARD	7,863,207.0	6,137,177.0	1.281	0.215
TYDSP	19,383,445.0	7,992,056.0	2.425	**0.024
TREND	2,805,878.0	556,424.0	5.043	***0.000

Original estimations

*, ** and *** Statistically significant at 10%, 5% and 1%, respectively

According to the results of the model, per capita income which implicitly also consists of economic growth of the economy in terms of purchasing power parity affects agricultural GDP positively and statistically importantly at 5 percent significance level as assumed. Agricultural export that also consists of impact of exchange rates affects the agricultural GDP positively and statistically importantly at 5 percent significance level as expected. Economic crises have negative impact on agricultural GDP but not statistically significantly, as it is assumed that the agricultural sector is usually not negatively affected by economic crises as much as other sectors do. Support policies such as IPARD did affect agricultural GDP positively but not significantly. On the other hand, recent important extension program named Agricultural Extension and Consultancy Services had significant effect on agricultural GDP at 1 percent significance level. The variable trend takes the impact of variables that have continuous increase over the years.

Conclusion

From the results of descriptive and regression analysis of the data, conclusions made as follows:

To attain the objectives of "2023 Vision" whose goal is that Turkish economy be one of the ten largest economies in the world by 2023, the 100th anniversary of Turkish Republic, Turkey's agricultural sector needs to perform better.

Improved performance in agricultural sector needs better agricultural support and extension policies that will facilitate faster growth in Turkish agriculture. The role of extension education policies to increase agricultural production is questioned by a regression model.

In developing countries, productivity gains can be generated by support policies and public services such as agricultural education, research and extension. Especially extension services have impact on farmers' attitudes on how to increase productivity by adapting new technologies into agricultural activities and thus this impact is long lasting.

The model used in this study to see the impact of extension education services on agricultural GDP includes per capita income and agricultural export as continuous, as

well as economic crises, rural development policy (IPARD) and extension policy (TYDS) as dummy.

According to estimation results, there is positive correlation between dependent variable, agricultural GDP and independent variables except crises, as expected. Recent agricultural extension policies have statistically important positive impact.

The dummy variable that represents agricultural extension services in recent years have positive and statistically significant impact on Agricultural GDP. Thus it is important to have sound extension policies to increase agricultural GDP to reach the vision of 2023. This result important indication saying that it could be possible to contribute more through extension policies to reach the goal of 2023 vision by enhancing implementation of this policies. Taking all these into consideration, the followings could be said additionally to enhance these policies.

- In-service training of extension workers must be continuous and focus oriented.
- Problem oriented extension to farmers has to be established in a correct manner.
- Correct timing, application and long lasting relation with farmers must exist.
- The number of good practice examples must be increased and visible.
- Extension activities must concentrate on value added agriculture originated products.

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