

Full Length Research Paper

An analysis of the effect of agricultural extension methods on the utilization of agricultural supports: The case of Erzurum Province in Turkey

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To determine the effect of agricultural extension methods on the utilization of agricultural supports, a survey was conducted with 169 farmers in 7 counties, which were considered to represent Erzurum Province in terms of social, economic and cultural aspects. The survey data was analyzed in LIMPED software by using “crosstab” method and Logistic regression analysis. According to the results of the analysis, farmer age and education level were determined to have an effect on the utilization of agricultural supports. In addition, it was also found that extension methods had a positive effect on the utilization of supports and that the utilization of mass and individual extension methods was statistically significant. According to these results, effective use of local mass media means at announcement and introduction stage of supports to farmers was highly important. In addition, some arrangements are needed to get maximum benefit from individual extension methods for raising awareness in farmers so that they can utilize the supports to ensure the sustainability of production.

Key words: Agricultural support, mass extension method, group extension method, individual extension method, Erzurum.

INTRODUCTION

Agricultural sector is in a position of important sector which is different from other sectors in terms of economic, social and strategic aspects. Due to these reasons, countries intervene in agricultural sector in various ways and every country practices different agricultural support policies according to their priorities (Yılmaz et al., 2008; Civan, 2010; Topçu, 2008). The implementation of support policies aims at guiding production, achieving sustainability in production, improving quality, enhancing productivity and encouraging new product variety through alternative production methods (Yavuz et al., 2004). The agricultural sector has been supported with various policies in Turkey for many years (Yılmaz et al., 2008). While the scope of support policies has included market-price support, input support,

incentive and premium payments, productivity and reform policies and foreign trade policies since the declaration of Republic until today, following the treaty of World Trade Organization, the support policies which do not interfere into market business has become popular (Yavuz, 2001; Yavuz et al., 2006). Farmers need to both utilize agricultural supports and use them for their purposes so that support policies can achieve their goals both in Turkey and in the World. The studies report that agricultural extension activities have an effect on the utilization of agricultural supports (Sezgin et al., 2011; Sezgin, 2010).

The methods implemented in scope of agricultural extension activities are classified into individual, group and mass extension methods. Individual methods include practices applied for the farmer and his family. Group extension methods are demonstrations, field days, excursions, courses for farmers, incentive competitions and meetings. On the other hand, mass extension methods involve activities implemented using television,

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Table 1. The distributions of the questionnaires according to the counties.

Counties	Number of questionnaires
Central County	25
Aşkale	19
Pasinler	31
Oltu	23
İspir	22
Çat	23
Karayazı	26
Total	169

radio, circular letter, newspapers, banners, magazines and brochures (Yurttaş et al., 2009).

The overall objective of the study was to determine the factors having an effect on the utilization of agricultural supports, and specifically, discover the effect of different agricultural extension methods. Thus, it was thought that determining the necessary strategies would contribute to the success of agricultural supports and enhancement of their effectiveness.

MATERIALS AND METHODS

169 questionnaires conducted in 7 counties with farmers in Erzurum city made up the primary material of the study. Also materials and methods used in this study has been used in the study by Sezgin et al. (2011) previously related to agricultural extension. The secondary data in the study includes the relevant literature reviews and data obtained from public and private institutions and web sites.

Data collection

The judgment sampling method was used in the selection of counties for the survey. The survey was conducted in 7 counties that could represent Erzurum city in terms of social, economic and geographical aspects. The counties were İspir and Oltu in the north, Çat and Karayazı in the south, Aşkale in the west, Pasinler in the east and the central county in the middle. The survey was conducted in March, 2009.

The sample size was determined considering the land assets belonging to 16.383 farms registered to "Direct Income Support" at Provincial and District Directorates of Agriculture. The farms ranging from 1 to 500 da were considered in determining the sample size. This was because the number of farms smaller than 1 da and bigger than 500 da was less. Thus, diversions were avoided by omitting these extreme ends. The number of questionnaires to be applied for farmers was determined using simple random sampling method. According to this method, the following formula was used to determine the number of farm questionnaires (Çiçerk and Erkan, 1996).

$$n = \frac{N\sigma^2}{N - 1D^2 + \sigma^2} \quad D = \left(\frac{d}{t} \right)^2$$

Where n= sample size, N = unit number in the population, $\sigma =$

Standard deviation, d= acceptable error term ($\bar{x} \times 0.10$), \bar{x} = mean, t = t value of t-distribution table for a certain confidence interval.

The calculations for these variables were as follows:

$$N= 16\,383, \sigma= 64.31, d= \bar{x} \times 0.10, \bar{x} = 84.52, t= 1.65$$

$$n = \frac{16383(64.31)^2}{16382 \left(\frac{8.5}{1.65} \right)^2 + (64.31)^2} = 155 \quad (1)$$

The number of questionnaires to be given to farmers was calculated as 155. An additional number of questionnaires, as much as 10% of the sample size, was added to the total sample size in case there should be some shortcomings or errors in some of the questionnaires and therefore the total size fails to represent the population. Therefore, a total of 171 questionnaires were conducted. Two of the questionnaires had some missing information, so they were omitted and not evaluated. As a result, a total of 169 questionnaires were included in the analysis. The county distributions of the questionnaires are presented in Table 1.

Data analysis

The raw data obtained from the farmers was transferred into computer in order to implement the necessary calculations and analyses. The LIMPED software was used for the analysis of the data. Crosstab and logistic regression analysis methods were used in data analysis. The results were presented in tables. In econometric studies, the categorical models whose dependent or explained variable is made up of responses like yes-no or successful-unsuccessful and coded as "0" and "1" are called as two-tailed methods with limited dependent variable (Kalaycı 2006). "Limited Dependent Variable Regression Models" are used in cases where the dependent variable is qualitative. Two-tailed dependent variable defines the occurrences; that is, whether the incident has occurred or not. The dependent variable is assigned "1" when the event occurs and "0" when the event does not occur (Yavuz, 2001a; Gujarati, 1995). Three methods are used to estimate such models. These are Linear Probability Model, Logit Model and Probit Model. The Probit Model is used as an alternative to the Logit Model. As both Logit and Probit Models yield similar results, both can be used (Gujarati, 1995; Kalaycı, 2006; Sarımeşeli, 2000). But, the choice between the two generally stems from ease of use and available software. Thus, the Logit Model is generally preferred over the Probit Model (Gujarati, 1995; Sarımeşeli, 2000).

Table 2. Some characteristics of the respondents.

General features (name of variable)	Variable and its code	N	%
Age	< 24=1	13	7.7
	25-34 =2	30	17.8
	35-44 =3	43	25.4
	45-54 =4	50	29.6
	55-64 =5	22	13.0
	65 > =6	11	6.5
	Total	169	100.0
Income (Turkish Lira (TL) /year)	3000 – 4999 =1	39	23.1
	5000 – 6999 =2	60	35.5
	7000 – 8999 =3	41	24.3
	9000 – 14999 =4	22	13.0
	15000 < =5	7	4.1
	Total	169	100.0
Education	Illiterate =1	13	7.7
	Literate =2	15	8.9
	Primary school =3	111	65.7
	Secondary school =4	19	11.2
	High school =5	9	5.3
	University =6	2	1.2
Total	169	100.0	

Source: Original calculations.

The functional form of the regression model used to estimate the factors which are effective on this issue is:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}).$$

Where: Y; utilization of agricultural supports Yes;1, no; 0 (Dummy), X₁; dummy variable (Central counties:1, others:0), X₂; Age, X₃; Income, X₄; Education, X₅; Purpose of the farm, X₆; Utilization of mass media means, X₇; Utilization of individual extension methods, X₈; Utilization of group extension methods.

RESULTS

General features of farmers

To determine the general features of farmers participating in the survey, age, income and education level of farmers were examined. The results are given in Table 2. In this context, 55% of the farmers participating in the survey were determined to be in 35 to 54 years old group. While the rate of the young farmers under 35 was found 22.5%, the rate of those over 55 was 19%. It was determined in the study that about 58.6% of the farmers had an annual income below 7000 Turkish Lira (TL). The rate of those with annual income between 7000 and 15000 TL was 37.3%. The annual income of 4.1% was over 15000 TL.

While 65.7% of the farmers participating in the survey

were primary school graduates, 11.2% was secondary school graduates. 8.9% was only literate and 7.7% was illiterate. While the rate of high school graduates was 5.3%, university graduates made up 1.2%. Studies in this field report that the socio-economic features of the farmers (age, income, education, etc.) had an effect on the utilization of agricultural supports (Topçu, 2008; Sezgin, 2010; Sezgin et al., 2011).

The utilization of extension methods by farmers was examined. The results are given in Table 3. The mass media means widely used in the research area were banner, advertisements, and local television and radio broadcasts. In this context, 33.7% of the farmers stated that they utilized mass media means to get informed. Another widely used individual extension method by farmers was one to one meetings with extension staff working in the related public institutions. In this context, 89.3% of the farmers stated they utilized individual extension methods. Training meetings were held in the region as group extension method. It was determined that 44.4% of the farmers participating in the survey utilized group extension methods.

Table 4 presents the utilization of agricultural supports by farmers. In this context, about 54% of the farmers participating in the survey stated they utilized agricultural supports.

Table 3. The distributions according to the utilization of extension methods by farmers.

Extension methods	Variable and its code	N	%
Utilization of mass extension methods	No =0	112	66.3
	Yes =1	57	33.7
	Total	169	100
Utilization of individual extension methods	No =0	18	10.7
	Yes =1	151	89.3
	Total	169	100
Utilization of group extension methods	No =0	94	55.6
	Yes =1	75	44.4
	Total	169	100

Source: Original calculations.

Table 4. The distributions according to the utilization of agricultural supports by farmers.

Utilization of supports	N	%
No	78	46.2
Yes	91	53.8
Total	169	100

Source: Original calculations.

Table 5. The results of logistic regression analysis for the utilization of agricultural supports by farmers.

Name of variable	Coefficient	Standard error	P Value
Constant	-1.8405	1.7124	0.2825
Regional differences (Central counties:1, Others:0)	-0.0903	0.3886	0.8163
Age	-0.2725	0.0997	0.0063***
Income	0.0192	0.0208	0.3557
Education	0.0002	0.0001	0.0620*
Purpose of the farm (private :0 commercial:1)	-0.1474	0.1863	0.4287
Utilization of mass extension methods	1.4844	0.3787	0.0001***
Utilization of individual extension methods	1.7456	0.8489	0.0398**
Utilization of group extension methods	0.0725	0.2256	0.7478

Log likelihood: -89.4115, McFadden R square: 0.2335, X^2 (8): 54.4598***. Source: Original calculations ***: $P < 0.01$ **: $P < 0.05$ *: $P < 0.1$.

RESULTS OF ANALYSIS

To determine the factors having an effect on the utilization of agricultural supports, 8 independent variables were used and the Logit model was applied. The results of the analysis are given in Table 5. The coefficients of all parameters were found to be significant. In parallel with the studies carried out by Topçu (2008) and Sezgin et al. (2011), it was determined that farmer age affected the utilization of agricultural supports negatively and that it was statistically significant ($P < 0.01$). In addition, in parallel with the studies carried out by

Topçu (2008) and Sezgin et al. (2011), this study found that the level of utilization of agricultural supports by farmers increased as the education level of farmers increased. This variable was determined to be statistically significant, too ($P < 0.01$).

The effect of different agricultural extension methods on the utilization of agricultural supports were also examined in the study area. In parallel with the study carried out by Sezgin (2010), it was determined that utilization of mass extension methods had an effect on the utilization of agricultural supports. This variable was also found to be statistically significant ($P < 0.01$). Another effective

variable on the utilization of agricultural supports was individual extension methods. It was found to be a statistically significant factor ($P < 0.05$). Group extension methods were also found to affect the independent variable positively. However, it was not statistically significant.

DISCUSSION

One of the tools used for providing solutions to the structural problems in agricultural sector is agricultural supports. The objective of support policies is to guide the production, provide sustainability, improve quality and ensure the effective use of scarce resources (Topçu, 2008). In this context, in order to achieve the expected benefits from supports, the farmers need to be aware of the supports implemented and utilize them. It is thought with this respect that knowing the factors effecting the utilization of supports and utilizing the agricultural extension as a powerful tool will contribute to the effective use of the resources.

In the current study conducted in parallel with this aim, it was determined that as the farmer age increased, utilization of supports decreased. On the other hand, the utilization of supports increased as the education level increased. Young farmers are exerting more effort in developing their businesses and they are more energetic therefore can be expressed when a certain outcome surface. Similarly farmers who have higher education levels are more aware, so they are more willing to be expressed.

It was found that the agricultural extension methods affected the utilization of supports positively. Mass and individual extension methods regarding the utilization of agricultural support were found to be effective and statistically significant. The status utilization of agricultural support increases to be effective in the announcement and introduction stages of supports to farmers mass and individual extension methods.

It can be stated according to the results of this study that agricultural extension can be used as a powerful tool for raising awareness in farmers in terms of utilization of agricultural supports and improvement of farms appropriate for their purpose. In the announcement and introduction stages of supports to farmers, the effective use of local media means are thought to be fruitful. In addition, some arrangements are needed to get maximum benefit from individual extension methods for raising awareness in farmers so that they can utilize the supports to ensure the sustainability of production. In short, it can be stated that maximum utilization of low cost extension methods is a practice easing the use of resources effectively and achieving objectives. In this way, the agricultural policies implemented and supports in this scope can achieve their objectives. The studies carried out in this field report that agricultural extension is

a powerful tool in ensuring agricultural development (Bernet et al., 2001; Olgun, 1994; Oktay et al., 1995; Boyacı, 1998; Wadsworth, 2003; Sezgin, 2010; Sezgin et al., 2011). Therefore, it can be stated that agricultural extension should play its role as an important component in putting almost every policy, project and plan into practice.

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