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Evaluation of Farmers' Willingness to Pay for Agricultural Extension Services in GAP-Harran Plain, Turkey

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ABSTRACT

The purpose of this research was to determine Willingness To Pay (WTP) of farmers and explore the potential factors that contribute to it for agricultural extension services in GAP-Harran Plain in Turkey. A comprehensive questionnaire was conducted face to face with 461 farmers out of 21,094, by the simple random sampling method during the irrigation season of 2011 and validity of the data was checked until 2015 on a yearly basis. The contingent valuation method, binomial probit and maximum likelihood methods were used for analysis. The results indicated the existence of the ability to pay and the average WTP for efficient extension service based on irrigation was 475.8 TL. It is 1.28% of their yearly income and their total WTP was calculated as $6 million per year for the plain. Explanatory factors in the index, such as secondary school, high school, and university graduates from the view pint of educational level, married farmers, and land amounts increased WTP, while gravity irrigation users and proposed increased bid price for extension and training services decreased WTP. The results are important for decision and policy makers, encouraging private sectors to involve in extension and training services. Also, they contain useful information for countries with similar technical and socio-cultural characteristics.

Keywords: Agricultural irrigation, Efficient farming, Farmers' training, Sustainable income.

INTRODUCTION

The 2012 UN projections show a continued increase in population in the near future with a steady decline in population growth rate. The global population is expected to reach between 8.3 and 10.9 billion by 2050 (IFC, 2013) resulting in increased demand for agricultural products. Agriculture is vital for life, at least for food security. And it is also important for employment, especially in developing countries. Together with growing affluence in many parts of the world and accompanying diet diversification, these changes will require an additional agricultural output per person. Thus, the imperative for agriculture is to increase output per unit of resource inputs (Anonymous, 2015a) and this could be achieved by extension and training services.

Countries without agriculture and agriculture without extension services are unthinkable. The extension is becoming more important in rural development in developing countries where agriculture is the main source of livelihood (Temesgen and Tola, 2015). Agricultural extension and training, also known as advisory services, play a crucial role in promoting productivity, increasing food security, improving rural livelihoods, and promoting agriculture as an engine of pro-poor economic growth (IFRI, 2015). The production of new knowledge requires a strong interaction between service providers and the farmers (Laurent *et al.*, 2006). Agricultural extension and training are the functions of providing need and

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demand-based knowledge in agronomic techniques and skills to rural communities in a systematic, participatory manner, with the objective of improving their production, income, and quality of life. Extension is essentially training and it aims to bring about positive behavioral changes among farmers (IFRI, 2015).

Agricultural extension is a non-formal and voluntary training system, pursuing the objective of helping those engaged in agriculture to improve their standing in social, economic, and cultural issues (Ates and Cakal, 2014). On the other hand, agricultural extension has a cost for both sides, for service providers and for the farmers. Many extension professionals and policy-makers are advocating fee-based services, in addressing the fund shortage and sustainable provision of agricultural advisory services (Uddin *et al.,* 2014). Bangladesh is experiencing chronic fund crisis in agricultural extension (Uddin *et al.*, 2014). Two studies from Nigeria found that farmers had WTP if their income from farming would increase and the program and services are relevant and meet their needs (Ajayi, 2006; Farinde and Atteh, 2009). A study from Greece showed that WTP and to spend time in training is influenced mainly by the expected benefits from attending an agricultural educational program (Charatsari and Klavdianou, 2011). Time-saving practices to do works are also within the scope of extension. The services that minimize the time that it takes to perform productive activities are valuable to the household (Holloway and Ehui, 2001). In other words, the extension is a system and to enable this system to be constantly used more effectively and efficiently for service providers and the farmers, each country carries out its own needed number of studies. As a result, various systems and methods have been developed and implemented (Ates and Cakal, 2014). Agricultural extension services can potentially be provided by three ways, namely, the public sector, the private non-profit sector, and the private for-profit sector (Syngenta, 2015). The public sector could have a role in balancing societal interests and promoting extension as an aspect of a knowledge economy (Rivera, 2011) and also true for non-profit sector in terms of social responsibilities. Institutional pluralism and bottom-up participatory approaches are essential and extension services should be demand-driven (Syngenta, 2015) and given in a way that farmers can understand and implement.

Regardless of developmental levels, agriculture and agro-based policies have priority in all countries. The agricultural sector is around 8% of Gross Domestic Product (GDP) in Turkey, it is also important in terms of employment, and has a definite place. The share of agriculture in employment is 37.9% in Turkey (Aydogdu *et al.,* 2014). Southeastern Anatolian Project (GAP, in its Turkish acronym) is a multi-sectorial regional sustainable development project that is mainly based on soil and water resources where agriculture is a dominant sector. Irrigation plays an important role in the crop production. Sustainable development is a global objective that includes efficient multifunctional agriculture (Várallyay, 2010). The scope of the GAP is to eliminate regional disparities among the other regions and increase the living standard of the people of the region. Each society wishes to create favorable living conditions for its members. Life quality criteria are formulated in different ways by various societies or individuals, depending on the given geographical and socio-economic conditions (Várallyay, 2010). Within the GAP's scope, there are 22 dams, 19 hydroelectric power plants, and irrigation of 1.822 million ha of agricultural land. It targeted an increase of 209% in income per capita, 445% increase in regional *GDP* and employment opportunities of 3.8 million (GAP, 2012). In GAP region, 207,590 ha of land is under irrigation by state and approximately 150,000 ha at Harran plain where mainly furrow irrigation exists (DSI, 2013). Harran Plain is the study field and is

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among the lowest altitude locations, which is 375 meters above sea level, in the GAP at the southeastern part of Turkey. Average precipitation is between 300-365 mms. Annual evaporation is 1,848 mms (DMI, 2011). It is located within the borders of Şanlıurfa and agricultural irrigation within the scope of GAP began in 1994.

Since the 1940s, agricultural extension activities in Turkey have been implemented by the Ministry of Agriculture in the form of public extensions. Today, agricultural extension services in Turkey remain the responsibility of this Ministry and, thus, maintain its indispensable role in extension services in the agriculture sector (Ozcatalbas *et al.*, 2010). The private sector has been involved in extension services since the last three decades with limited areas and trained work force. There is a trend to the privatization of public services globally because of many reasons such as social, economic and political aspects, budget deficit, reducing public expenditures, the inefficiency of public services, and optimum use of resources. It is estimated that there are over 800,000 official extension personnel globally, most of whom work in the public sector in developing countries (Benson and Jafry, 2103) and their effectiveness is subject to debate. Legal arrangements accelerated the promotion of non-public extension and transition to private extension services in Turkey in 2006. A study conducted in Turkey showed that 54.37% of the extension personnel believed that extension services should be privatized while 32.14% were of the belief that it should continue as a public service. The study also indicated that 12.19% believed that public services were unsuccessful because of being free of charge (Ates and Cakal, 2014). There is an ongoing argument about user fees in public agricultural extension services (Budak *et al.*, 2010). In order for this to take place, firstly the WTP must be identified. Then the specified fee must not exceed the ability pay of the farmers, too. Otherwise, there will either be no demand for extension services or users would not intend to pay if the service provider is the public. So, it is necessary to know the ability to pay and WTP of a farmer for agricultural extension and training services. This research aimed to determine WTP of a farmer and explore the potential factors that contribute to it. This study was the first of its kind in GAP-Harran plain in Turkey.

MATERIALS AND METHODS

Materials

The basic material of this study came from a sample of 461 farmers out of 21,094 in the Harran Plain who were chosen via a simple random sampling method. There are 22 Water User Associations (WUAs) and 363 settlements in the plain. The farmers residing in 173 of these settlements were interviewed face to face and were given questionnaires at the irrigation season of 2011. Then, validity of data was checked until 2015 by observations, field trip, and face to face interviews. It has been observed that there are a growing demand and more WTP for effective extension services. The sample volume was determined by using the formula of Yamane (2001).

$$n = \frac{Nt^2 pq}{d^2(N-1) + t^2 pq}$$

Where, *n*: Sample size, *N*: Farmers in the main population, which is 21,094, *t*: The sample size is larger than 30, *Z* table value with 5% error margin is a 1.96 in normal distribution table, p: the possibility of farmers accepting the offered proposals is 50%, so, 0.50, *q*: The possibility of farmers not accepting the offered proposals, *1-p*= 0.50, and *d* was taken as 0.05 with 95% confidence level. These values indicated that conducting 377 questionnaires would be appropriate, but to be on the safe side, 461 were conducted. All the WAUs in the Harran Plain were visited. To maximize the reliability of the results, villages that

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represent every WUAs field were purposefully selected, and local interviewers were used.

Methods

The contingent valuation method, binomial probit, and Maximum Likelihood Methods (MLM) were used for analysis. The models are described widely by Maddala (1983), Gujarati (1995, 2006), Greene (2003), Stigler (2007) and Anonymous (2015b). These models are used for estimations of the parameters that maximize the likelihood function of a sample by regressions of variables where the dependent variable can only take two values, yes is classified as 1 and no is 0. The availability of two conditions is dependent on an event. This latent benefit index is connected to a set of independent variables. Each dependent variable has a certain value from an initial value of the event if the respondent says yes to the offered amount. If the farmers' actual WTP amount exceeds the offered amount, the respondent will say yes otherwise, the respondent will say no. The probability values belonging to the parameter set related to the offered amount are obtained by taking the natural logarithm of the maximum likelihood function. When the probability approaches zero, the WTP is gradually decreasing. The opposite is true when it approaches 1. The likelihood of an event increases if the benefit index has a positive value because of the positive responses to the offered amount. There is a randomly determined sample with known distribution coefficients of different population candidates in the MLM.

A particular theoretical market is formed based on a question that was asked for acceptance of given payment amount on a yearly basis, regarding extension services either from the public or private sector for effective, efficient, and sustainable farming. The payment amount is randomly selected for each questionnaire, starting with 25 Turkish Liras (TL), equal to $15 at surveyed time, changing the rate of multiple of 25 TL, increasing to 750 TL (equal to $450). Thus, the demands of farmers are determined. The unit value is obtained from a face to face interview and then it is multiplied by a population factor. The value function is estimated and the values of WTP are calculated at the end. Lastly, to test the model's accuracy and reliability, the obtained values are compared to the values predicted by the model which come from the nature of the model and commonly used (Bilgiç and Eren, 2008). The independent variables are selected according to economic and the socio-cultural structure of the region and are given in Table 1. The data are transferred to Excel by a coding plan. The econometric model is established, and data analyses are performed by using the Limited Dependent package program. The effects and WTP are measured, and statistically significant effects are interpreted.

RESULTS AND DISCUSSION

The surveys were conducted with male farmers due to the patriarchal family structure. A study has shown that gender has an effect on WTP in Rwanda (Haba *at el.*, 2013). The total amount of cultivated land, including the second crop, is 7,660 ha in the surveyed area, and 59% of the farms are 10 ha or smaller. Also, 88.5% of lands are located in the gravity irrigation, and 11.5% are located in the pumping irrigation area, 56.9% of the farmers are willing to obtain water from an irrigation channel, 7.4% from groundwater wells and 35.7% of them from both. Cotton is the main crop in the area by 58.1%, and then wheat by 25.6%, corn by 13.6%. Other crops include vegetables and garden products (2.7%). The average income from agricultural activities was calculated as 37,326 TL $year^{-1}$ and the farmers' average income was 2,517.7 TL ha^{-1}. The index, multiple questions, is developed in order to understand the economic value of water by the farmers. Here, the numerical value of 11 represents the most positive reflection and 7

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Table 1. The descriptive statistics of the variables used in the model.

Variable	Definition (farmer)	Value	Statistics	
			Mean	Std deviation
Primary	If graduated from primary school 1; if not 0	1/0	0.478	0.500
Secondry	If graduated from secondary school 1; if not 0	1/0	0.166	0.372
Highschool	If graduated from high school 1; if not 0	1/0	0.166	0.372
University	If graduated from university 1; if not 0	1/0	0.074	0.263
Married	If married 1; if not 0	1/0	0.945	0.229
Household	The number of dependent people in the family	Number	7.040	3.758
Location 1	If residing within boundaries of Harran district 1, if not 0	1/0	0.348	0.478
Location 2	If residing within boundaries of Akcakale district 1, if not 0	1/0	0.253	0.435
Crop	If cotton and wheat planting 1; if not 0	1/0	0.412	0.493
Livestock	If doing commercial livestock 1; if not 0	1/0	0.599	0.491
Gravity	If located in gravity irrigation area 1; if not 0	1/0	0.885	0.319
Pumping	If wanted to use pumping irrigation 1; if not 0	1/0	0.074	0.263
Mdrnirr	If doing pressurized irrigation 1; if not 0	1/0	0.178	0.383
Index	The multiple questions regarding understandings of farmer about economic value of water	Numerical value	9.454	1.854
Age	Age of the farmer	Year	43.851	10.737
Land	The amount of cultivated land size (Acre)	Number	148.357	214.034
Ownership	If the farm land is own property 1; if not 0	1/0	0.595	0.492
Income	Income of the farmer derived from agriculture (TL $year^{-1}$)	Number	37325.4	66021.55
Exprnce	Farming experience in agriculture	Year	21.241	11.004

Before proceeding to a discussion of the results, a comparison of the probability values resulting from the model and the actual values are given in Table 2. The difference between the predicted values and actual values is low, given MLM in the above scenario. The model estimated an actual value with a margin of error of 1.84%.

represents the most negative response to understanding the economic value of water. The descriptive statistics of the model are given in Table 1.

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The coefficients and values of parameters obtained from the binomial probit model are presented in Table 3, where price is the dependent variable. Statistically significant results have been interpreted according to the outcome of the model.

There is a positive correlation between education level and WTP. When the education level is increasing, WTP is increasing too. Educated farmers are more sensitive about the sustainable farming for their welfare, based on expectations and living standards. A study conducted in Oyo State, Nigeria, also showed that level of education influences accountability of extension services (Omotesho *et al.*, 2015). On the other hand, another study from Adana, Turkey, showed that livestock producers' education had no effect on their WTP for extension service (Budak *et al.*, 2010). Farmers' knowledge, skill, and adequate development are common influential factors affecting sustainable farming (Roy and Chan, 2015). These results are statistically significant for

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Table 3. The coefficients and the values of the probit model.

Variables	Coefficient	*t*-Value	*P*-Value	95% Confidence Level	
				Lower Limit	Upper Limit
Constant	-0.199	-0.24	0.812	-1.843	1.445
Primary	0.314	1.43	0.152	-0.116	0.743
Secondary	**0.481[a]**	**1.79**	**0.073**	**-0.045**	**1.007**
Highschool	0.415	1.54	0.123	-0.112	0.942
University	**1.106[c]**	**3.15**	**0.002**	**0.418**	**1.795**
Married	**0.526[a]**	**1.77**	**0.076**	**-0.055**	**1.107**
Household	0.018	0.72	0.474	-0.031	0.067
Location 1	0.206	1.29	0.198	-0.107	0.518
Location 2	-0.003	-0.02	0.987	-0.381	0.375
Crop	-0.063	-0.40	0.690	-0.372	0.246
Livestock	-0.087	-0.61	0.544	-0.366	0.193
Gravity	**-0.477[a]**	**-1.92**	**0.055**	**-0.963**	**0.009**
Pumping	-0.219	-0.80	0.422	-0.753	0.316
Mdrnirr	0.215	1.21	0.228	-0.134	0.565
Index	0.008	0.21	0.835	-0.063	0.077
Age	0.006	0.89	0.373	-0.008	0.021
Land	**0.195[b]**	**2.06**	**0.040**	**0.009**	**0.380**
Ownership	-0.137	-0.96	0.336	-0.415	0.142
Income	0.090[a]	1.72	0.085	-0.012	0.193
Exprnce	0.194[c]	2.64	0.008	0.049	0.338
Price	**-0.002[c]**	**-7.65**	**0.000**	**-0.003**	**-0.002**
Chi-square				0.000[c]	

[a,b,c,] Indicates, respectively, the degree of statistical significance of 10, 5 and 1%.

secondary school graduates (P≤ 0.10) and for university graduates (P≤ 0.01). A positive correlation between WTP and married farmers has been identified. Married people have more responsibilities and expenditures. Naturally, they need more income. Their unique income source is agriculture. The efficient extension and training services will contribute positively to their income. It is statistically significant at *P*≤ 0.10. There is a negative correlation between gravity irrigation user farmers and WTP. Generally, these farmers are located around the main irrigation canals and have easy access to water without any scarcity. Although this trend has started to change, but there is still the existence of attitudes to the idea that more water means more income. In this sense, access to water is seen as enough for sustainable farming in terms of income. It is statistically significant at *P*≤ 0.10. A positive correlation between the land amount and WTP has been identified, therefore when the amount of land increases, WTP increases, too. The main source of income is land for the farmers. So, effective extension and training services will increase income derived from the land. Depending on the growing amount of land, an active extension will lead to further revenue growth. It is statistically significant at *P*≤ 0.05. A case study from Eastern Ethiopia also concluded the existence of a positive relationship between WTP and farm size (Temesgen and Tola, 2015). There is a positive correlation between income and WTP. When the income of farmers is increasing, WTP also increases. It is statistically significant at *P*≤ 0.10. It is an expected result, because the solvency power is a function of income. A study from Rwanda showed that non-farm expenses

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have an effect on WTP of the farmers (Haba *at el.*, 2013). Another study in the Niger state of Nigeria also concluded that economic values derived by farmers had an effect on WTP (Farinde and Atteh, 2009). These results could be considered as income related. There is a positive relationship between farming experience and WTP. It is statistically significant at $P \leq 0.01$. This result is one of the most curious results of the research. This is because experience could have both positive or negative attitudes towards WTP. Farmers could tend not to pay for extension services by relying on their own experience or a tendency towards learning something new could result in increased revenues depending on new experiences. The negative correlation between the increasing prices for extension service and WTP has been identified. This is an expected result. Increasingly more payments will have a negative impact on farmers' welfare. It is statistically significant at $P \leq 0.01$. A study conducted at Harran plain indicated the existence of a relationship between satisfaction and education levels, knowledge level and status of ownership, land area, age, farming experiences, income, and given service quality (Aydogdu *et al.*, 2015a).

On the other hands, age, household numbers, residing location of the farmers, commercial livestock, pumping, modern irrigation, index and ownership variables had no effect on WTP according to the survey results. A study from Turkey concluded that distance to the main road and farm type has an effect on WTP of the farmers (Budak *at el.*, 2010). Another study from Ethiopia also concluded that age of household head and family size were found to have an effect on WTP in a negative way (Temesgen and Tolia, 2015). Measuring the marginal impact of factors affecting the

Table 4. Measuring marginal impact of factors affecting the probability of WTP.

Variables	Coefficient	*t*-Value	*P*-Value	95% Confidence level	
				Lower limit	Upper limit
Primary	0.100	1.47	0.143	-0.034	0.234
Secondary	**0.148[b]**	**1.93**	**0.054**	**-0.002**	**0.299**
Highschool	**0.127[a]**	**1.66**	**0.097**	**-0.023**	**0.278**
University	**0.294[c]**	**4.45**	**0.000**	**0.165**	**0.424**
Married	**0.174[a]**	**1.79**	**0.073**	**-0.017**	**0.363**
Household	0.006	0.72	0.474	-0.010	0.022
Location 1	0.066	1.30	0.193	-0.033	0.165
Location 2	-0.001	-0.02	0.987	-0.123	0.121
Crop	-0.020	-0.40	0.689	-0.120	0.079
Livestock	-0.028	-0.61	0.543	-0.118	0.062
Gravity	**-0.146[b]**	**-2.08**	**0.038**	**-0.285**	**-0.008**
Pumping	-0.072	-0.80	0.426	-0.248	0.105
Mdrnirr	0.069	1.23	0.219	-0.041	0.178
Index	0.002	0.21	0.834	-0.020	0.025
Age	0.002	0.89	0.372	-0.003	0.007
Land	**0.063[b]**	**2.09**	**0.037**	**0.004**	**0.122**
Ownership	-0.044	-0.97	0.333	-0.133	0.045
Income	0.035[a]	1.74	0.082	-0.004	0.074
Exprnce	0.075[c]	2.75	0.006	0.023	0.128
Price	**-0.001[c]**	**-9.57**	**0.000**	**-0.001**	**-0.001**

[a,b,c] Indicates, respectively, the degree of statistical significance at 10, 5 and 1%.

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probability of WTP based on an efficient extension for sustainable farming is given in Table 4.

The unitary effects of statistically significant variables which are given in Table 4 and analyzed for the probability of maximum WTP. One unit change of extension has an impact effect on secondary school graduates with 14.8% in education levels. This impact is 12.7% of high school graduates and 29.4% of university graduates in a positive way. These results are statistically significant at $P\leq 0.01$. Extension is a kind of dissemination of innovation. Anything that is the first time heard or seen is an innovation (Degirmenci *et al.*, 2012). Educated people are more open and susceptible to innovation. One unit effect brings a 17% increase in WTP over married farmers. It is statistically significant at $P\leq 0.10$. A unit effect on gravity irrigation farmers has adversely impacted up to 15% on WTP and it is statistically significant at $P\leq 0.05$. A unit impact positively affects WTP on the amount of land at a rate of over 6%. It is statistically significant at $P\leq 0.05$. A unit effect on income has positive impacts by 3.5% and it is statistically significant at $P\leq 0.10$. A unitary effect on farming experience has a positive impact by 7.5% and statistically significant at $P\leq 0.01$. The impact of a one-unit increase in price of extension services has negatively affected WTP of farmers. This is an expected result; it will affect negatively the increase in bid prices on WTP. It is statistically significant at $P\leq 0.01$.

Increase in value of the index is created as a combination of variables, impact on the WTP is indicated by the normal and cumulative probability distribution functions. The index estimated the value of the linear model; the probability refers to the changes occurring in the WTP. It has been observed that an increase in the index, results in increase in cumulative WTP and decrease in probability of WTP, as shown in Figure 1. So, the existence of variables such as secondary, high school, and university graduates from the view point of educational levels, married farmers, income, farming experience, and land amounts in the index result in increase in WTP. On the other hand, gravity irrigation users and the proposed increased bid price for extension services have a negative effect on WTP and lead to decrease in WTP, too.

CONCLUSIONS

Extension services are important in agriculture in the technological advancements era. The shifting priorities of agriculture for diversification, commercialization, sustainability and efficiency have made it mandatory for the state extension departments to introspect

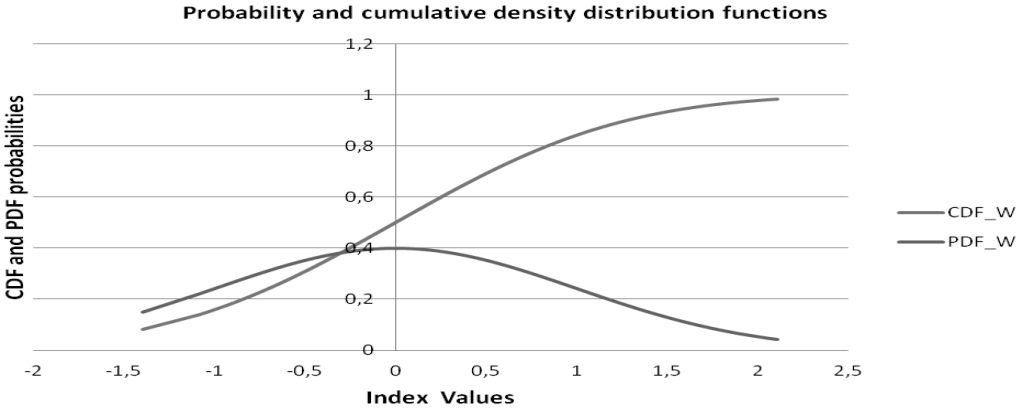

Figure 1. Probability and cumulative density distribution functions.

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their extension approaches, the collaborative activities and tie-up with other agencies that are needed (Dubey *et al.,* 2012). Positive behavior could play a great role in tackling the issues of rural poverty for improving sustainable livelihood and farming (Meena and Singh, 2013). A farmer with traditional knowledge and skills can no longer ensure sustainability, but the ability to learn about innovations will help to develop new skills, ideas and attitudes can guarantee it (Kordnoghabi, 1999), and these could be done by extension and training services.

There are big expectations from the GAP project in terms of increase in income per capita and regional *GDP* and also higher employment. All of these expectations are based primarily on productivity in agriculture and would be ensured by efficient and effective extension and training services. So far, the expected benefits could not get support from the extension and training services that are mainly carried out by the public in the GAP Region. In this regard, new policies are necessary and efficiency could be improved by the participation of the private sector with an appropriate profit margin. The farmers are aware of the benefit of efficient extension services in GAP-Harran plain for sustainable farming, thus increasing income. There is a problem of salinity due to furrow irrigation that results in high water table and high evaporation rates (Aydogdu *et al.,* 2014a). This situation leads to loss of income of the farmers in Harran plain (Aydogdu *et al.,* 2014b). The crop pattern diversity is limited: mainly cotton, wheat, and maize. It is hard to get the expected benefits from the GAP project under these conditions. There should be a more efficient extension and training services at least for irrigation and crop type diversity. Training should be given in the field by experienced staff before cultivation and irrigation season. The language, materials, and contents of this training should be in a manner that would be acceptable and understandable by the farmers. If a suitable combination of crop pattern and irrigation methods can be supported through extension and training programs for farmers, water efficiency, productivity and effectiveness can be increased significantly in the field (Aydogdu *et al.,* 2015b). It also helps to develop skills to promote self-management, self-monitoring, and self-motivating as well (Taqipour *et al.,* 2015). If farmers believe that any of the innovation and practices will lead to growth in revenue, then, they have WTP in GAP-Harran plain (Aydogdu, 2016; Aydogdu and Yenigun, 2016a; Aydogdu and Yenigun, 2016b; Aydogdu and Bilgic, 2016). Public services are mostly perceived as free goods in the research area that is useful to farmers with a zero opportunity cost and needs no conscious effort to obtain these services. This has a two-way influence. The first is that the farmers and extension service staffs are not paying enough attention to these services due to being free of charge. Secondly, there is a financial burden of these services on the public budget. If these services result in a fee that will not affect the farmer's solvency and prosperity negatively, farmers will want to make more use of it, and extension service staff will pay more attention and effort that is simply a win-win situation. The private sector basically offers some services for a certain profit. It is important to know how much the farmers' WTP depending on the costs involved in making a profit. As a result, in both calculations of public and private sectors' cost estimates for efficient management, it is necessary to know the level of the farmers' WTP. This research showed that the farmers have willingness and ability to pay. The average accepted WTP amount was 1.28% of their yearly income and their total WTP was calculated as $6 million per year for Harran plain. These results could be used by policy and decision makers for the involvement of extension and training services. Also, they contain useful information for countries with similar technical and socio-cultural characteristics.

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ارزیابی تمایل به پرداخت برای خدمات ترویج کشاورزی در کشاورزان دشت-GAP Harran در ترکیه

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چکیده

هدف این پژوهش تعیین سطح تمایل به پرداخت (WTP) در کشاورزان و بررسی عوامل مستعد تاثیر گذاردر آن برای خدمات ترویج کشاورزی دردشت GAP-Harran در ترکیه بود. به این نظور، پرسشنامه ای فراگیر تهیه و به صورت رو در رواجرا شد که در آن ۴۶۱ کشاورز از میان تعداد کل ۲۱۰۹۴ نفر به صورت نمونه برداری تصادفی ساده شرکت داشتند. پژوهش در طی فصل آبیاری سال ۲۰۱۱ انجام شد و تا سال ۲۰۱۵ به طور سالانه روایی آن کنترل شد. برای تجزیه تحلیل نتایج ازروش ارزشگذاری مشروط (contingent valuation method)، پروبیت دوجمله ای، و روش احتمال حد اکثر (maximum likelihood method) استفاده شد. نتایج حاکی از وجود توانایی پرداخت بود و میانگینWTP برای خدمات ترویجی کارآمد برای آبیاری برابر ۴۷۵/۸ لیره ترکیه بود که معادل ۱/۲۸٪ درآمد سالانه یک کشاورز بود و مقدار سالانه آن برای کل دشت ۶ میلیون دلار محاسبه شد. وجود عوامل توضیحی (explanatory factors) در شاخص مربوطه مانند سطح تحصیلات در دروه اول و دوم و دبیرستان و دانشگاه، کشاورزان متاهل، و مقدار زمین باعث افزایش WTP شدند در حالی که وجود کار بران آبیاری ثقلی و افزایش قیمت مناقصه ای برای خدمات ترویجی و آموزشی منجر به کاهش WTP می شدند. این نتایج برای تصمیم گیران و سیاستگزاران به منظور تشویق بخش خصوصی برای مداخله در خدمات ترویجی و آموزشی مهم هستند. همچنین، این نتایج برای کشورهای دیگر که شرایط فنی و اجتماعی-فرهنگی مشابهی دارند اطلاعات مفیدی دارد.

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