



Are You Happy to Be a Farmer? Understanding Indicators Related to Agricultural Production and Influencing Factors: GAP-Şanlıurfa, Turkey

Mustafa Hakkı Aydoğdu¹, Mehmet Cançelik², Mehmet Reşit Sevinç^{3,*}, Mehmet Ali Çullu⁴, Kasım Yenigün⁵, Nihat Küçük⁶, Bahri Karlı⁷, Şevket Ökten⁸, Uğur Beyazgül⁹, Hatice Parlakçı Doğan¹⁰, Gönül Sevinç¹, Zeliha Şahin¹, Nusret Mutlu¹¹, Celal Kaya¹¹, Ayla Yenikale¹¹ and Akif Yenikale¹¹

- ¹ Department of Agricultural Economics, Faculty of Agriculture, Harran University, Şanlıurfa 63050, Turkey; mhaydogdu@harran.edu.tr (M.H.A.); gsevinc@harran.edu.tr (G.S.); zelihasahiin@gmail.com (Z.Ş.)
- ² Department of Social Science Vocational School, Harran University, Şanlıurfa 63200, Turkey; m.cancelik@harran.edu.tr
- ³ Department of Bozova Vocational School, Harran University, Sanliurfa 63850, Turkey
- ⁴ Department of Soil Science and Plant Nutrition, Faculty of Agriculture, Harran University, Sanliurfa 63050, Turkey; macullu@harran.edu.tr
- ^b Department of Civil Engineering, Faculty of Engineering and Architecture, Kastamonu University, Kastamonu 37150, Turkey; kyenigun@kastamonu.edu.tr
- ⁶ Department of Economics, Faculty of Economics and Administrative Sciences, Harran University, Şanlıurfa 63050, Turkey; nihatk@harran.edu.tr
 ⁷ Department of Applications Faculty of Applied Sciences, Harran University, of Applied Sciences, Harran University, Sciences, Harran University, Sanlıurfa 63050, Turkey; nihatk@harran.edu.tr
 - Department of Agricultural Economics, Faculty of Agriculture, Isparta University of Applied Sciences, Isparta 32200, Turkey; bahrikarli@isparta.edu.tr
- ⁸ Department of Sociology, Faculty of Arts and Sciences, Harran University, Şanlıurfa 63050, Turkey; sevketokten@gmail.com
- ⁹ Şanlıurfa Technology Development Zone, Harran University, Şanlıurfa 63050, Turkey; ugurbeyazgul@hotmail.com
- ¹⁰ Agricultural Education Center and GAP Agricultural Research Institute, Republic of Turkey Ministry of Agriculture and Forestry, Sanliurfa 63330, Turkey; hparlakcidogan@yahoo.com
 - Southeastern Anatolia Project (GAP) Regional Development Administration, Republic of Turkey Ministry of Industry and Technology, Sanluurfa 63330, Turkey; nmutlu@gap.gov.tr (N.M.); celalkaya@gap.gov.tr (C.K.); ayyenikale@gap.gov.tr (A.Y.)
- * Correspondence: rsevinc@harran.edu.tr; Tel.: +90-414-318-3749

Abstract: Recently, agricultural production areas and farmer numbers have been decreasing in Turkey, which has started to cause concern. This study aimed to analyze the satisfaction levels of farmers in different irrigation areas in the Southeastern Anatolia Project (GAP)-Şanlıurfa region, based on indicators related to agricultural production and influencing factors. The data were obtained through face-to-face surveys with farmers in 2020 and analyzed by logistic regression in STATA. According to the results, 43.3% of the farmers are happy to be farmers in the current situation, and 35.6% want their children to continue farming activities. It was determined that the area of irrigation, education level, income, and farming experience were statistically significant at different rates in terms of the happiness of the farmers. On the other hand, livestock, number of households, and land size were not statistically significant. While 27.5% of the participants were fully satisfied with the given public support, 15.7% were satisfied with the market selling prices of their products, and 43.5% stated that effective organizations are needed to live well. To ensure agricultural sustainability in the research area, there is a need for more agricultural support, effective extension services, and the development of rural tourism with the participation of the public and private sectors. This study was the first of its kind to be conducted in Turkey.

Keywords: farmer happiness; sustainable agricultural production; rural development; agricultural supports and extension; GAP-Şanlıurfa-Turkey



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1. Introduction

All living things require energy to maintain their vital activities, which they obtain through nutrients. Regardless of the level of development globally, agricultural production is of vital importance for all countries [1–7]. Today, rapid population growth, ever-increasing and diversifying consumption habits, the availability of natural resources, environmental problems, global warming, and climate change are causing global concerns regarding the amount, quality, diversity, and adequacy of agricultural production and food security [8–20]. Furthermore, agricultural production also has strategic importance due to its direct and indirect effects on the socioeconomic structures of countries [21–23].

All over the world, agriculture is supported in various ways due to its unique structure and importance. Among the most important reasons for supporting agricultural production compared to other sectors are that it has higher risks and uncertainties, lower investment attractiveness, a slow rate of investment capital, limited storage and marketing opportunities in rural areas, and is performed in more natural environments and conditions than other industries [5,24,25]. Support policies may differ according to the social, political, and economic structures of each country. These policies generally serve the purposes of directing the production of agricultural products, supporting the producer, raising the welfare level in rural areas, preventing migration to cities, fighting poverty, increasing the level of national welfare, and ensuring food security, as well as maintaining social, economic, and political balance [5,6,24–28]. It can be seen that poverty is more common in rural areas than in cities in many countries around the world [26]. Whichever criterion is chosen in the evaluation, poverty is higher in rural areas and declines more slowly there than in cities [29,30].

According to the results of the Address-Based Population Registration System, the average household size in Turkey, which was 4 people in 2008, has been decreasing over time, down to 3.30 people in 2020. The province with the highest average household size in Turkey in 2020 was Şırnak with 5.75 people, followed by Şanlıurfa with 5.25 people [31]. Both provinces are located in the GAP region. The annual average equivalent household disposable income in Turkey was 33,428 TL (\$4761.8) in 2020. The average currency exchange rate for 2020 was 1 = 7.02 TL [32]. The highest share of total income was composed of salary and wage income at 47.1%, social transfer income at 21.8%, and finally entrepreneur income at 17.7%. The share of agricultural income of the entrepreneurial income was 20.9%. According to the sectoral breakdown of main business incomes, the lowest annual average income was in the agriculture sector at 25,263 TL (\$3598.72) [33]. While 7.11% of equivalent household disposable income in Turkey consisted of agricultural entrepreneurial income in 2006, this rate decreased to 3.68% in 2020 [34]. Individuals who have income below a certain limit according to the general level of society are considered relatively poor. The poverty rate in Turkey was 15% according to the poverty line determined by considering 50% of the equivalent household disposable median income in 2020. According to the poverty line determined by considering 60% of the median income, the poverty rate was 21.9% [33]. The lowest annual average equivalent household disposable income in 2020 was in the Eastern Anatolia Region, followed by the Southeastern Anatolia Region [35]. Food expenditure in Turkey, which was 2.5 billion TL in 2002, increased approximately 10 times and reached 23 billion TL in 2019. According to the combined results of the Household Budget Survey for 2017, 2018, and 2019, the majority of household consumption expenditure consisted of housing and rent, food and non-alcoholic beverages, and transportation. The region with the highest share of food expenditure out of household consumption expenditure was the TRB (Middle Eastern Anatolia) region at 28.5%. The TRC (Southeastern Anatolia) region was the second-highest region at 26.5% [36]. The TRB and TRC regions both have rural characteristics in terms of vitality, and their economies and culture consist of agricultural activities. In other words, these regions are poor regions and they spend a significant part of their income on nutrition.

The agricultural area of Turkey, which was 40.9 million hectares (ha) in 2001, excluding meadow and pasture lands, decreased by 8.5% to 37.7 million ha in 2020. In the same period, the cultivation areas of field crops decreased by 14.7% [37]. Additionally, a total of 3.5 million TL agricultural support payments made by the state to farmers in 2009 under various headings, which increased to 11.5 million TL in 2020 [38]. However, there has been a significant decrease in the number of farmers in the agricultural sector. For instance, the number of farmers registered with the Social Security Institution was 1,016,692 in 2009, which decreased by almost half to 547,075 people by the end of 2020 [39]. Moreover, the number of farmers who quit their agricultural activities, together with those who are not registered with the Social Security Institution, was around 2 million people [40]. This situation has made Turkey, which was one of the largest exporting and self-sufficient countries in terms of agricultural production in the world, an importer of agricultural products. According to the seasonally adjusted employment data from the Turkish Statistical Institute, 5.2 million people were employed in the agricultural sector in 2014, which decreased to 4.9 million in 2021 [41]. In other words, there significant decreases occurred in both the number of farmers and those employed in agriculture.

Job and life satisfaction, which relates to the development and socioeconomic characteristics of rural areas, is a macroeconomic indicator that has been studied by many [42]. In addition to providing returns to employees, business life causes satisfaction based on the adequacy of income, expectations, and working conditions [43]. Although job satisfaction is personal and differs according to individuals, it is shaped by the work of the employees and the work environment [44]. Job satisfaction is the sum of the experiences and emotional reactions of the employees related to the work they do; it is a key component of life satisfaction, and when integrated properly it helps a person make sense of themselves and form a whole [43]. Happiness is one of the most important subjective values and is associated with pleasure, optimism, and hope. Happiness is an internal state that emerges based on human judgment, expectations, and lived experiences and has a situational nature [45,46]. Recently, there has been a great decrease in the rural population in Turkey, and migrations have caused increases and problems in the urban population. Individuals who are producers in rural areas have become consumers in urban life [47].

For this reason, it is necessary to investigate the satisfaction level of those living in rural areas to ensure the sustainability of agricultural production and to keep farmers from breaking away from agriculture. This study aims to analyze the satisfaction levels of farmers in different irrigation areas in the Southeastern Anatolia Project (GAP)-Şanlıurfa, based on certain indicators related to agricultural production and influencing factors.

2. Materials and Methods

2.1. Study Area

It has been determined that the rural social structure is generally fatalistic and conservative and has region-specific norm values in social relations. In Turkey, it is also a life that is not very open to the outside, dealing with subsistence agriculture, low income, and low education levels [48]. The research area has a complex and traditional structure with a patriarchal culture, strong tribal ties, and varied production relations (property ownership, renting, partnerships, gravity versus pressurized irrigations, etc.). The GAP project is Turkey's most important multisectoral regional development project and is conducted in the Southeastern Anatolia Region, the country's second least developed region [6,49]. The GAP region is located in Upper Mesopotamia, which is one of the most important cradles of civilization in human history. The region is an important center in terms of its rich historical and cultural heritage, monotheistic beliefs, and gastronomy due to regional flavors and dishes [50]. Furthermore, there are also original handicrafts specific to the region that are about to disappear. The research area is quite suitable for development and raising the standard of living, not only due to its water and soil resources but also through its cultural values. Cultural heritage and rural tourism could function as tools for rural development and welfare, taking into account specific regional values and potentials with an appropriate strategy [51], thereby adding economic and social benefits [52].

The main purpose of the GAP is to increase the welfare level of the region by using the water and soil resources through agriculture and agriculture-based industry to increase income and subsequently improve the social and economic structures. Another goal is to reduce migration to cities by increasing productivity and employment opportunities in rural areas and to contribute to national goals such as economic growth and social stability through the effective use of resources [49]. The project area covers approximately 11% of Turkey, both in terms of area and population, and is envisaged to irrigate 1.86 million ha of agricultural land, with 22 dams within the scope of the project [53]. Sanliurfa has the most important agricultural potential of the region and the largest population, with 2.155 million people among the 9 provinces within the scope of the GAP [54]. The main livelihood of the people of Şanlıurfa is agriculture and agriculture-based industry; it has 1.06 million ha of agricultural land and approximately 2.5 million livestock [55]. Irrigation in Şanlıurfa within the scope of GAP started in 1994 in the Harran Plain, and by the end of 2019 irrigated agriculture, including public irrigation, was conducted over an area of approximately 482,000 ha [56]. The locations of GAP and Sanliurfa within Turkey are given in Figure 1. Today, together with the Upper Harran Plain, approximately 166,000 ha of land is under irrigation, with 85% gravity and 15% pressure in the Harran Plain of Sanlıurfa [11,57]. The dominant product in the Harran Plain is cotton, followed by wheat and corn. Irrigation started in 2006, and pressurized irrigation is conducted over an area of approximately 22,000 ha in Yaylak. The dominant agricultural production consists of cotton, fruit trees (pistachio, almond, and grape), and vegetables. The Sanliurfa-Harran Plain and Yaylak irrigation areas are shown in Figure 2.



Figure 1. The locations of Turkey, GAP, and Şanlıurfa.



Figure 2. The locations of the Sanliurfa-Harran Plain and Yaylak irrigation areas.

2.2. Data Sources, Survey Design, and Statistical Methods

The main research information was the primary data obtained from farmers in the Harran Plain and Yaylak irrigation areas. The ethics committee approval and permission number of the study were obtained from Harran University Social and Human Sciences Ethics Committee (E-76244175-752.01.01-37010). The data used in this research were obtained through face-to-face surveys with farmers selected using a simple random sampling method in 2020. The number of farmers registered in the farmer registration system in Şanlıurfa was 59,862 in 2019, of which 15,824 were in the Harran Plain and 3180 were in the Yaylak irrigation area; thus, the number of registered farmers in the main sample in the research area was 19,004. The research sampling volume was found at the 95% confidence limit, with a 5% margin of error by using the table of sample volumes according to population size and tolerable sampling error [58], which was 377, with 432 used in analysis to be on the safe side.

The primary data obtained from the survey were analyzed with logistic regression in STATA via Excel, and the main purpose was to model the relationship between the categorical dependent variable (Are you happy to be a farmer?) and the independent variables (which can be categorical, continuous, or a combination of both). Logistic regression, also called a logit model, is defined by a response variable that can take on only one of two values, typically 1 and 0, which are often interpreted as yes or no [59]. When a dependent variable regression model that takes 0 and 1 values is estimated with least squares, it is made with the maximum likelihood estimation method, since many problems are encountered, such as the non-normal distribution of the residues, changing variance, and the loss of the meaning of the determination coefficient R². In the logit model, assumptions such as the normal distribution of residuals, constant error variance, and linearity are not sought [60]. The dependent variable in the logit model is theoretically the natural logarithm of the odds ratio. The probability of an event occurring divided by the probability of not occurring (Pi/(1-Pi)) is known as the odds ratio. The dependent variable in question takes the value of 1 if the event of interest occurs, otherwise it is 0. As a result, in logit regression, the dependent variable is Ln(Pi/(1-Pi)), with Pi being the probability of occurrence, which is called the logit function [60,61]. The logistic regression model is given in Equation (1) [61].

$$\pi(\mathbf{x}) = \frac{e^{\mathbf{p}_0 + \mathbf{p}_1 \mathbf{x}}}{1 + e^{\beta_0 + \beta_1 \mathbf{x}}} \tag{1}$$

The equation in terms of $\pi(x)$ is expressed by Equation (2), where the logit transformation that defines $\pi(x)$ between $-\infty$ and $+\infty$ in the equation given by (1) is applied [61].

$$g(x) = \ln\left[\frac{\pi(x)}{1 - \pi(x)}\right] = \beta_0 + \beta_1 x$$
(2)

This transformation, called logit, is denoted by g(x). The function g(x), which is linear in its parameters, can be continuous and lies in the range of $-\infty$ to $+\infty$, depending on the independent variable values.

2.3. Uncertainties and Shortcomings

The terms happiness, utility, life satisfaction, and well-being are interchangeable [62]. Happiness is used as a positive evaluation of one's life as a whole [63]. Happiness is a relatively subjective concept with different meanings but can be interpreted as a state of complete fulfillment and well-being. Some have considered happiness to be in the material field, some in the spiritual field, and some as a spiritual state that can be acquired in both material and spiritual fields [64]. Happiness is shaped according to expectations depending on work, life, family, and social structure. In this research, the happiness of the farmers was measured in terms of agricultural production-based material indicators, farming job satisfaction, and income. Job satisfaction and income may vary from year to year depending on production quantities and prices. Farmers who were happy in the previous production seasons may be unhappy in the next production season. The opposite is also possible. On the other hand, the authors acknowledge that many farmers living in the countryside depend on subsistence agriculture and have a low income. However, they also live according to the social dynamics of the geographical regions and tend to have high moral values. Furthermore, living away from the crowds and being intertwined with nature can contribute to feeling happy.

The variables used in the analysis were chosen in accordance with the sociocultural structure of the research area. Many factors affect the happiness of farmers; social, environmental, and cultural elements and spiritual values including beliefs and lifestyle are some of them. The research area has a social structure with strong patriarchal, feudal, and tribal ties, which is not often seen in other parts of the country. Additionally, the majority of the inhabitants have a conservative and fatalistic lifestyle, and sect, religious (sheikhdom), and opinion leaders are the final decision-makers, are still common in the research area. Although this structure and organizational form, which is centuries old, has started to change over time, it still continues to be effective. This situation emerged as a result of the sociocultural structure for reasons such as tradition, belonging, security, existence, and effectiveness, rather than individual or group preferences. Asking questions about these concepts is mostly not welcomed in the region and realistic answers cannot be obtained. Local individuals are prejudiced against researchers and mostly refuse to participate in such surveys. On the other hand, the factors relating to the physical environment show a very large degree of homogeneity in the research area. For these reasons, concepts such as social and environmental beliefs were not taken as variables.

3. Results and Discussion

3.1. The Descriptive Statistics of the Surveyed Farmers

Women play important and active roles in agricultural production processes and activities in the region where the research was conducted. However, due to the existing social dynamics in the region, its unique cultural values, and the fact that the last decisionmakers in the households are men, it was necessary to conduct all interviews with male farmers [6,18,25,65–67]. For the same reasons, only male farmers were interviewed in the research area. Here, 99.5% of the farmers participating in the survey were married and the average age was 48.92 years. The average household participation in the workforce was 3.04 people, of which the number of people working in agriculture was 2.71 and the number of people working outside of agriculture was 0.27. The average household income was 5689.1 TL/ha (\$810.41/ha). The descriptive statistics for the farmers participating in the research are given in Table 1.

Dependent Variable	Definition	Mean	Standard Deviation
Are you happy to be a farmer?	0 for No (56.7%), 1 for Yes (43.3%)	0.43	0.496
Independent Variables	Definition	Mean	Standard Deviation
Location of Irrigation Area	1 for Harran Plain (71.0%), 2 for Yaylak (29.0%)	1.29	0.021
Level of Education	1 for illiterate (4.7%), 2 for literate (15.5%), 3 for primary school (46.1%), 4 for secondary school (15.0%), 5 for high school (14.8%), 6 for University (4.0%)	3.31	0.056
Non-farming income	0 for No (72.0%), 1 for Yes (28.0%)	0.28	0.450
Livestock	0 for No (32.6%), 1 for Yes (67.4%)	0.67	0.469
Income (TL/year)	Minimum 10,000, Maximum 600,000	73,957.87	55,538.803
Farming Experience (year)	Minimum: 2, Maximum: 63	31.84	9.905
Household Number (person)	Minimum: 2, Maximum: 20	8.64	2.830
Amount of Land Cultivated (ha)	Minimum: 1, Maximum: 120	13.0	12.84

Table 1. Descriptive statistics of the surveyed farmers.

Of the surveyed farmers, 43.3% were happy to be farmers in the current situation. The happiness rate was measured at 38.24% in a study of cocoa producers in Trinidad and Tobago [68], while in studies of Vietnam the rates were 62.5% for aquaculture farmers [69] and 52% for those living in rural areas [70].

Here, 93.5% of the survey participants were members of an organized Chamber of Agriculture and Irrigation Association. However, based on this result, it is not correct to conclude that the farmers in the research area are successful at organizing themselves. These memberships are mandatory, with the membership of the Chamber of Agriculture necessary to benefit from agricultural support and membership in the Irrigation Association required to benefit from agricultural irrigation. The rate of those who were members of a truly organized structure such as producer unions and agricultural cooperatives among the survey participants was 12.04%. Not being able to organize agricultural activities is a problem for various reasons in the research area [67]. Effective organization of farmers is an important tool in increasing the welfare level in rural areas due to the positive results from such activities, such as agricultural sustainability and income increase [67].

Furthermore, 63.2% of the farmers chose pesticide, fertilizer, and seed dealers as sources of information for agricultural production. In other words, agricultural consultancy services have not developed enough in the research field. Commercial enterprises, which are seen as a source of information, are those that sell agricultural input products, and their main purpose is to gain profit, not productivity. On the other hand, excessive use of chemicals poses significant hazards and risks in terms of human and environmental health [71]. Excessive and uncontrolled human activities in the environment increase these problems and gradually destroy the habitable environment in rural areas [72]. The formation of income in agricultural production begins with the supply of inputs. Although agricultural product selling prices are low, profits can still be made if qualified input

costs are low. For the inputs to be of high quality and economical, an organized farmers' structure and effective consultancy services are needed.

The following questions, which may affect the agricultural production activities and incomes of the farmers, were asked and the answers received are given in Table 2. According to the results, 27.5% of the farmers who participated in the survey were satisfied with the public product support system and the amounts given, 41.9% did not experience financial difficulties in the agricultural production process, 48.4% could easily access agricultural finance and credit when they needed it, 15.7% were satisfied with the market selling price of the agricultural products they have produced, 31.7% did not have any problems in marketing the agricultural products they produced, and 43.5% considered effective organizations (cooperatives, unions, extension services, etc.,) necessary to live well in rural areas.

I Am Satisfied with the Public Product Support System and the Amounts Given				
Participation Level	Frequency	Percent	Mean	Standard Deviation
No	164	38.0		
Partially	149	34.5		0.804
Yes	119	27.5	1.90	
Total	432	100.0		
I do not experien	ce financial diffi	culties in the a	gricultural p	roduction process
Participation Level	Frequency	Percent	Mean	Standard Deviation
No	90	20.8		0.764
Partially	161	37.3	2.21	
Yes	181	41.9	2.21	0.764
Total	432	100.0		
I can easily access agricultural finance and credit when I need it				
Participation Level	Frequency	Percent	Mean	Standard Deviation
No	112	25.9		
Partially	111	25.7	0.00	0.000
Yes	209	48.4	2.22	0.833
Total	432	100.0		
I am satisfied with the market selling prices of the agricultural products I have produce				
Participation Laval	-	D (34	
ratucipation Level	Frequency	Percent	Mean	Standard Deviation
No	235	54.4	Mean	Standard Deviation
No	235 129	54.4 29.9	Mean	Standard Deviation
No Partially Yes	235 129 68	54.4 29.9 15.7	1.61	0.744
No Partially Yes Total	235 129 68 432	54.4 29.9 15.7 100.0	1.61	0.744
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No Partially Yes Total I do not have an Participation Level No Partially Yes Total Effective organizations a Participation Level No Partially	Frequency 235 129 68 432 y problems in m Frequency 166 129 137 432 such as cooperatilive w Frequency 95 149	Percent 54.4 29.9 15.7 100.0 arketing the ag Percent 38.4 29.9 31.7 100.0 ves, unions, ar rell in rural are Percent 22.0 34.5	Mean 1.61 ricultural pr Mean 1.93 nd extension as Mean	0.744 oducts I produce Standard Deviation 0.836 services are necessary to Standard Deviation
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Table 2. Farmers' statements regarding agricultural production activities.

These results show that more public agricultural supports, organized structures, and effective agricultural extension activities are needed to ensure the income, welfare, and happiness of the farmers. Agricultural extension has critical importance in terms of welfare due to the changes and conditions in agricultural production, as well as social and political factors associated with rural development [73]. There is a need for information and services that will increase production and happiness levels, as well as public financial support for agricultural production, which will hell in adapting to changing conditions and in the development of the socioeconomic structure in rural areas [74,75]. In a study conducted in the research area, it was determined that farmers are willing to pay for an effective agricultural extension and consultancy service that will bring more income [76].

3.2. Results of the Model

The results of the model are given in Table 3. First, the likelihood ratio chi-square statistic was calculated as 41.29 and p = 0.000. According to this result, it is possible to say that the model is significant at the error level of 0.01 and the pseudo R² is calculated as 0.070. In logit regression, assumptions need to be tested after the model estimation is made. First, the correlation matrix of continuous independent variables is checked to see whether there is a multicollinearity problem. It was observed that all correlation values in the matrix were below 0.50. For this reason, it was concluded that the multicollinearity problem will not occur. The link test was applied for the model specification assumption, which is another assumption test. As a result of the link test, it was determined that the coefficient of the variable "_hatsq" in the output was statistically insignificant (coefficient = -0.034, p = 0.833). According to this result, it was concluded that there was no model specification error in the model. Finally, the Hosmer and Lemeshow goodness-of-fit test result was (p = 0.338), showing that the model–data fit was sufficient.

Dependent Variable: Are You Happy to Be a Farmer (0 = No, 1 = Yes)			
Independent Variables	Coefficient (Standard Error)	Odds Ratio (Standard Error)	
Location of Irrigation Area			
Yaylak Region	-0.586 ** (0.258)	0.557 ** (0.143)	
Level of Education			
Literate	1.450 ** (0.566)	4.263 ** (2.413)	
Primary school	1.022 * (0.548)	2.780 * (1.524)	
Secondary school	1.014 * (0.614)	2.758 * (1.693)	
High school	0.716 (0.631)	2.046 1.291	
University	0.970 (0.795)	2.639 (2.098)	
Non-farming Income			
Yes	0.017 (0.240)	1.017 (0.244)	
Livestock			
Yes	0.143 (0.234)	1.154 (0.270)	
Income (TL/year)	$7.2 imes 10^{-6}$ *** ($2.5 imes 10^{-6}$)	1.000007 *** (2.5×10^{-6})	

Table 3. The model results.

Dependent Variable: Are You Happy to Be a Farmer (0 = No, 1 = Yes)			
Independent Variables	Coefficient (Standard Error)	Odds Ratio (Standard Error)	
Farming Experience (year)	0.035 ** (0.013)	1.035 ** 0.014	
Household Number (person)	-0.008 (0.046)	0.992 (0.045)	
Amount of Land Cultivated (ha)	$3.4 imes 10^{-4}\ (9.5 imes 10^{-4})$	$\frac{1.00034}{(9.5\times10^{-4})}$	

Table 3. Cont.

1. N = 432, LR Chi-square = 41.29 (p = 0.000), Pseudo R² = 0.070. 2. Link test: hatsq = -0.034, p = 0.833. 3. Level of importance: *** p < 0.01, ** p < 0.05, * p < 0.1. 4. The basic level for the irrigation area variable is "Harran", the basic level for the education variable is "Illiterate", the basic level for the non-farming income variable is "No", for the livestock variable the basic level is "No".

3.3. Discussions Based on the Model Results

According to the results in Table 3, the coefficient of the Yaylak irrigation area in the irrigation area location variable was calculated as -0.586. This coefficient is negative and statistically significant (p = 0.023 < 0.05). Accordingly, the probability of being happy for the farmers in the Yaylak region is lower than it is for the farmers in the Harran region, which is the basic level. Because of pressurized irrigation in Yaylak, even if all input costs in agricultural production are the same as in the Harran Plain where gravity irrigation is applied, farmers pay approximately 2.5 times more in irrigation fees. This situation directly affects the income of the farmers, and consequently their welfare.

Statistically positive and significant results were obtained for education levels of literate (coefficient = 1.450, p = 0.010 < 0.05), primary school (coefficient = 1.022, p = 0.062 < 0.10), and secondary school (coefficient = 1.014, p = 0.099 < 0.10) for the education variable. According to these results, it is possible to say that the probability of being happy is higher for farmers who are literate and have primary and secondary school educations compared to the illiterate farmers, which is the basic level. The difference was not statistically significant for high school and university graduates. In the research area, the level of education in rural areas is low, and the average time spent in education was calculated as 6.06 years, which is between primary and secondary school graduates. On the other hand, as the level of education increases, individuals tend to prefer cities as living spaces instead of rural areas. In a study on the happiness and life satisfaction of aquaculture growers in South Vietnam, it was found that a large portion of the respondents had high levels of education. In the research, it was stated that more than 75% of the farmers had a secondary or higher education level, so they were more willing to adopt new agricultural technologies, making it easier for them to access information and improve their welfare level [69]. In a study conducted in Senegal, it was determined that the education level of farmers had a positive effect on their declared happiness levels [77]. In a study conducted in China, it was determined that the average education level of the farmers was primary and secondary, and it was suggested that the increase in education level increased the rural satisfaction of the farmers [78]. In studies conducted in India, Ghana, Turkey, West Asia, and Ethiopia, it has been determined that the education level of farmers in agricultural production affects their productivity and income, and consequently their standard of living [76,79-83].

In the analyses, it was determined that non-agricultural income was not a statistically significant factor in farmer happiness in terms of agricultural activities (p > 0.10). During the field interviews, the farmers stated that they mostly used their income from non-agricultural activities to finance their agricultural activities. This situation does not create happiness for farmers if the return amount and speed of non-agricultural financing invested in agriculture is below expectations. In the study Participation in the "Modern Agro-Food Supply Chain and Happiness" in rural areas in Senegal, it was determined that income and indirect income were not effective factors [77]. On the other hand, in the rural life

studies conducted in Ethiopia, Ghana, Pakistan, and Vietnam, it was determined that non-agricultural income is an effective factor in rural household life satisfaction levels, the fight against poverty, food consumption, agricultural production, and income [84–87].

The effect of livestock activities on the happiness of being a farmer is not statistically significant. During the field interviews, the farmers complained about the high cost of feed and stated that they had experienced losses in animal production recently. In a study conducted in the research area, it was determined that approximately 70% of livestock expenses are composed of feed costs [88]. In a study conducted for the FAO, it was stated that livestock represent an important component of the agricultural economy and are a driving force in food security, the fight against rural poverty, economic stability, and sustainable development [89]. In a study on the effects of contract farming on farmer happiness in Senegal, it was determined that animal husbandry is an effective factor in happiness [77].

The coefficient of the income variable was calculated as 0.000007. This coefficient is positive and statistically significant (p = 0.004 < 0.01). Accordingly, it is possible to say that the probability of being happy increases as income increases. In academic studies, it has been determined that there is a very strong relationship in the same direction between the individual or household income and happiness level. The income variable is one of the most used pieces of data to explain the level of happiness [70,90–92]. In studies on the happiness level of farmers producing different products in many different fields, it was determined that there is a positive and strong relationship between income and happiness level [46,69,70,77,78]. In a study covering nine European countries, it was determined that a strong farm financial structure increases the happiness of the farmer [93]. Similar results were found for paddy producer farmers in Malaysia [94].

The coefficient of the farming experience variable was calculated as 0.035. This coefficient is positive and statistically significant (p = 0.010 < 0.05). It is possible to say that as the experience increases, the probability of the farmer being happy also increases. Experience emerges when struggling with problems and life expectancy, depending on age and experiences. Experienced farmers can solve their production-based problems more easily and set their expectations realistically so that they can live happily with what they have. According to the World Values Survey data, it has been revealed that older people are happier than younger people [95]. A similar situation is valid for the elderly who are engaged in agricultural activities and live in rural areas. In studies conducted with cocoa producers in Trinidad and Tobago and aquaculture growers in South Vietnam, it was determined that older farmers have higher levels of happiness and life satisfaction than younger farmers have in agricultural activities [68,69].

For the household variable, as the number increases, happiness decreases, and the coefficient of the variable is negative. However, this result is not statistically significant. This result is interpreted as a concern for livelihoods in crowded families in rural areas. In a study conducted in Trinidad and Tobago, it was determined that the low number of households increased happiness [68]. On the other hand, in the study conducted in Senegal, it was determined that the demographic characteristics of the household (a high number of adults) affected happiness [77].

The amount of cultivated land variable is not statistically significant regarding farmer happiness. As the amount of land increased, it was expected that income would increase, and consequently happiness would increase. However, there was a loss of income in agricultural production recently due to the increased input costs and fluctuations in product sale prices in the research area. In the study conducted in Senegal, it was determined that the amount of land affected happiness [77]. Similarly, it was determined that the amount of land affected research area for the study of happiness and farm yield among corn producers in China [78].

The farmers who participated in the survey were asked whether they wanted their children to become farmers and continue agricultural activities, with their answers given in Table 4.

I Want My Children Also to do Farming Activities and Continue Farming after Me				
Participation Level	Frequency	Percent	Mean	Standard Deviation
No	183	42.4	1.93	0.882
Partially	95	22.0		
Yes	154	35.6		
Total	432	100.0		

Table 4. Do farmers want their children to be a farmer and continue agricultural activities?

While those with higher incomes, land amounts, and experience, along with livestock breeders, expressed their opinion that their children should continue farming, as the number of households increased, those in the Yaylak irrigation area and those with nonagricultural income expressed their opinion that their children should not continue farming.

4. Conclusions

Firstly, agricultural production, which is mostly conducted in rural areas where work and family life are a whole, is a vital issue in terms of food safety. Generally, the income and welfare levels are lower in rural areas than in the cities, and poverty is the most important problem in the lives of those who practice subsistence agriculture. Where and for what reasons the poverty is concentrated, as well as the degree of poverty, are important issues. The most poverty in Turkey is seen in the Eastern Anatolia and Southeastern Anatolia Regions, where farming is the main source of livelihood.

Here, 43.3% of the surveyed farmers are happy to be farmers in the current situation, with the area of irrigation, education level, income, and farming experience being statistically significant at different rates in their happiness. To increase the happiness of being a farmer, special attention should be given to these factors, which will also affect the degree of poverty resulting from the policies implemented by the public. Additionally, 35.6% of farmers want their children to continue farming activities. There is a 7.7% difference between those who are happy to be a farmer and those who want their children to continue farming. People living in rural areas have an extended family structure and prefer their children to stay with them in the research area. The large family structure is a force against external threats and a source of unpaid labor for agricultural activities in rural areas. The difference between the two results is mainly due to their subsistence expectations, which indicates that there is insufficient income in the rural area.

Additional public policies are needed to raise the welfare in rural areas. These policies should include the participation of the private sector. The private sector conducts its activities based on profit. In agricultural activities and rural areas, the profit margins are low and the risk is high. Therefore, if the state provides some subsidies and support, the participation of the private sector will increase. Additionally, this participation could also be achieved within the scope of social responsibility initiatives. The primary way to increase welfare in rural areas is effective agricultural extension activities. In this regard, firstly the employees in the extension service should be qualified in terms of changing natural and climatic conditions and technological innovation. Afterward, it will be necessary to raise awareness of the farmers' problems through extension services, which must be in a way that the farmers can understand and must be based on demand.

On the other hand, it is also important to be aware of the potential profits related to the cultural values and rural tourism created by the farmers due to their rich history, culture, belief, gastronomy, and handicrafts, which will provide potential increases in welfare and happiness. To turn this potential into commercial profit, the participation of the private sector should be encouraged.

More detailed field studies are needed on the agricultural extension needs of the farmers and for their cultural values to be transformed into income. The public policies to be implemented based on the data to be obtained as a result of such detailed studies will increase the social and economic welfare in rural areas, thereby increasing the happiness of

the farmers. This study was the first of its kind to be conducted in Turkey according to the literature review.

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