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ANALYSIS OF FACTORS AFFECTING FARMERS' SATISFACTION WITH AGRICULTURAL ACTIVITIES AND MAIZE PRODUCTION: A CASE STUDY IN TÜRKİYE

Ayşegül TANIN[1], Sait ENGINDENIZ[1], Görkem ÖZTÜRK[2], Lamiya QULIYEVA[3]

[1]Ege University, Faculty of Agriculture, Department of Agricultural Economics, Izmir-Türkiye, E-mails: taninaysegul@gmail.com, sait.engindeniz@ege.edu.tr
[2]Siirt University, Faculty of Agriculture, Department of Agricultural Economics, Siirt-Türkiye, E-mail: gorkem.ozturk@siirt.edu.tr
[3]Azerbaijan State Agricultural University, Faculty of Soil Science and Agrochemistry, Ganja-Azerbaijan, E-mail: lamiya.quliyeva@adau.edu.az

Corresponding author: sait.engindeniz@ege.edu.tr

Abstract

The main purpose of this study is to reveal the satisfaction levels of farmers in the Izmir province of Türkiye from agricultural activities and maize production, to determine the factors affecting satisfaction and to analyze the future expectations of the farmers. The study data were collected from 93 farmers using proportional sampling and face-to-face survey method. In the analysis of the data, first the socio-economic characteristics of the farmers were examined, then the economic results of maize production were analyzed. The factors that can affect the satisfaction level of farmers were first prepared on a five-point Likert scale based on the literature and then factor analysis was applied to collect the variables that were correlated with each other into one category and obtain a smaller number of factors. According to the results of the study, the average maize yield in the farms was calculated as 14,523.99 kg/ha. The average net return obtained from maize was determined as 11,406.71 TL/ha. Farmers agree that maize has advantages such as easy growing, cost advantage, storability and providing good income. It was observed that the factor that farmers agreed the most in terms of satisfaction in maize production was the profitability factor. The factors affecting the satisfaction of farmers with agricultural activity in rural areas were determined as political, environmental, economic, rural infrastructure, social and personal factors. For farmers to sustain agricultural activities, socio-economic conditions in rural areas should be improved and living in rural areas should be made attractive.

Key words**:** *sustainable agriculture, satisfaction analysis, farmer satisfaction, farmer tendency, maize growing*

INTRODUCTION

The concept of satisfaction in the agricultural sector is expressed as the satisfaction of farmers with the agricultural activities they carry out and the fulfillment of their wishes, expectations or needs [3]. The tendency to sustain agricultural activities explains the tendency of farmers who are satisfied with the agricultural activities they carry out in terms of different parameters (social, economic, cultural, environmental, etc.). In Türkiye, researching the reasons why farmers who are currently active continue agricultural activities and the issues that may positively affect the decisions of young farmers to turn to agricultural activities can make significant contributions to the sustainability of agriculture. Therefore, first, it will be useful to determine the desire and tendency of farmers to sustain agricultural activities and the basic factors that will affect their decisions. The addition, the expectations of farmers that will be satisfied with sustaining agricultural activities should be examined at the regional level and within the scope of the research [32]. There are many factors that can directly affect the decisions of farmers to sustain agricultural activities and the reasons why young farmers turn to agriculture. Therefore, comparisons should also be made with other sectors in terms of social, economic or cultural indicators.

Most studies on the sustainability of agriculture in rural areas in Türkiye focus on rural migration, which is the movement from rural to urban areas [24, 33, 21,18, 17, 19, 6, 13, 20, 29, 30]. It is seen that some studies

have been conducted in recent years on the tendency of farmers to stay in rural areas and sustain agricultural activities [11, 1, 22, 36, 37, 12, 2, 10, 31, 38, 35, 32]. However, it is necessary to reveal the satisfaction level of farmers and their tendency to sustain production based on production branches and in different regions.

On the other hand, maize is the most geographically widespread crop and the third largest crop in the world occupying 13% of the world's cultivated land [28, 16]. Maize is a very important crop also for Türkiye in terms of both its production and use. Maize, with its production as the first and second crop, has an important place in terms of the evaluation of the production area and labor force in rural areas, community nutrition, its use as an input in different sectors and the added value it creates. According to TURKSTAT data, 8.5 million tons of maize were produced in 911,885 hectares of land in Türkiye in 2022. The policies implemented by the Ministry of Agriculture and Forestry and Turkish Grain Board, the application of premiums and other supports, the use of certified seeds and the increase in mechanization in production have positively affected maize production. In 2022, 74% of the total maize production was obtained from main crop maize. Maize yield in Türkiye may vary from region to region. The average maize yield per hectare in Türkiye in 2022 was 9,320 kg [34]. In the same year, the world average maize yield was 5,721 kg/ha and Türkiye were well above this yield level [15]. However, Türkiye meets some of its maize needs through imports.

The public debate on whether GMO (Genetically Modified Organisms) maize is produced in Türkiye, the fact that ethanol can be produced from maize, the high water demand of maize and the effects of climate change on agriculture, and fluctuations in national and international prices necessitate scientific research to identify problems in terms of sustainability of maize production and to produce solution proposals [4, 5, 8]. With research to be conducted in this direction, the decisions of farmers and their tendencies to sustain production at the regional level can be analyzed to develop and increase maize production in Türkiye, and in this way, the necessary concrete data can be obtained to create the most appropriate policies. In addition, contributions can be made in terms of ensuring safe production for domestic and foreign markets, increasing Türkiye's competitiveness, controlling production costs and increasing farmer incomes.

One of the provinces of Türkiye with significant agricultural potential is Izmir province. In 2022, 96,007 tons of maize were produced in an area of 11,200 hectares in Izmir province. Maize (grain) production in Izmir province constituted 20% of the Aegean Region maize production and approximately 1.2% of Türkiye's total maize production [34]. The main purpose of this study is to reveal the satisfaction levels of farmers in the Izmir province of Türkiye from agricultural activities and maize production, to determine the factors affecting satisfaction and to analyze the future expectations of the farmers.

MATERIALS AND METHODS

The material of the study consists of data obtained through face-to-face surveys from maize farmers in the Menderes district of Izmir province. In addition, the results of previous studies were also used.

According to the data of the Izmir Provincial Directorate of the Ministry of Agriculture and Forestry, approximately 80% of the total maize production area and maize production in Izmir province are made up of the districts of Bergama, Menderes, Tire and Torbali. Menderes district alone provides approximately 20% of the maize production in Izmir province. Therefore, Menderes district was included in the scope of the study. Izmir province is in the west of Türkiye, and Menderes district is in the south of Izmir province. Mostly grain maize is produced in Menderes district.

According to the information received from the Menderes District Directorate of the Ministry of Agriculture and Forestry, approximately 90% of the maize production in the district is carried out in the neighbourhoods of Cileme, Tekeli, Cakaltepe,

Karakuyu, Gölcükler and Develi. Therefore, these neighbourhoods were included in the scope of the study. The total number of farmers registered in the Farmer Registration System in these neighbourhoods was determined as 742. It was decided to include some of the farmers in the scope of the research by sampling method and the following Proportional Sample Size Formula was taken as basis [25].

$$n = \frac{Np(1-p)}{(N-1)\sigma^2{}_{px} + p(1-p)}$$

.....(1)

In the formula:
n = Sample size
N = Total number of farmers
p = The ratio of farmers producing maize (0.5 was taken for the maximum sample volume)
σ^2px = The variance of the ratio.

In the study, calculations were made based on a 90% confidence interval and an 8% margin of error, and the sample size was determined as 93. In determining the number of farmers to be interviewed in each neighborhood, the shares of the neighborhoods in the total number of farmers were taken as basis. The farmers to be interviewed in the neighborhoods were determined using the random numbers table. Study surveys were conducted in March-April 2022. The study was found ethically appropriate with the decision of Ege University Scientific Research and Publication Ethics Committee numbered E.668908/2022.

In the analysis of data, farmers are divided into 3 groups according to the size of their maize land. The first group is farmers with maize land of less than 5.0 hectares (36 farmers), the second group is farmers with maize land of 5.0-9.9 hectares (27 farmers), and the third group is farmers with maize land of 10.0 hectares and more (30 farmers) were formed.

First, the socio-economic characteristics of the farmers were examined. At this stage, the age, education period, household size, land size, family labor utilization, capital availability and organizational characteristics of the farmers were determined.

In the study, the economic results of maize production were analyzed. Variable cost items in maize production; labor and machine costs, material (seed, fertilizer, pesticide, water, etc.) costs and interest on the total costs. Fixed cost items are land rent and management costs. Half of the interest rate (5%) applied by Ziraat Bank for subsidized crop production loans in 2021 was used in interest calculations. In calculating the management costs, 3% of variable costs was taken. Maize production costs consist of the sum of fixed and variable costs. Gross production value was determined by multiplying the production amount by the maize price. To calculate the net return obtained from maize, total production costs were subtracted from the gross production value [23].

In the study, satisfaction analysis was conducted to determine the satisfaction levels of producers from agricultural activities and maize production and the factors affecting this. Many factors (economic, social, cultural, geographic, environmental, structural, political, personal, organizational, etc.) can affect the satisfaction level of farmers. The factors that can affect the satisfaction level of farmers were first prepared on a five-point Likert scale based on the literature [36, 31, 35, 38, 32] and then factor analysis was applied to collect the variables that were correlated with each other into one category and obtain a smaller number of factors. With the satisfaction analysis, satisfaction factor tables were created for each sub-factor under each factor created to reveal the satisfaction levels of farmers from their agricultural activities. The average of the scores given by the farmers regarding their satisfaction level with agricultural production was taken with the Likert scale. The averages obtained for each factor group were ranked and it was determined from which factor group the farmers had higher expectations.

Factor analysis is a multivariate statistical technique that combines variables that are related to each other on many data to obtain a small number of unrelated variables. In factor analysis, since many observed variables are tried to be explained with a smaller number of factors, correlations between variables are primarily taken into consideration. Factor

analysis is carried out in four basic stages. First, the suitability of the data for factor analysis is evaluated, factors are obtained, factors are rotated, and factors are named. Three methods are used to evaluate whether the data set is suitable. These are the creation of the correlation matrix, Kaiser-Meyer-Olkin (KMO) and Bartlett tests. In calculating the correlation matrix, a high correlation relationship is sought between the variables. Variables with a very strong correlation relationship will generally be in the same factor [26].

In determining the number of factors, the eigenvalue and scree test graphs are mostly used. In determining according to eigenvalues, factors with eigenvalues greater than 1 are derived. In the scatter diagram (Scree test) method, the eigenvalue graph is examined and the factors up to where the vertical line becomes horizontal are included in the solution. In the varimax method, which is the most widely used rotation process for better interpretation of factors, some factor loadings in each column are brought closer to 1, while the remaining many values are brought closer to 0. In this method proposed by Kaiser, rotation is performed in a way that ensures that the factor variances are maximized [14, 9].

RESULTS AND DISCUSSIONS

Socio-Economic Characteristics of Farmers

Information on the socio-economic characteristics of the farmers is presented in Table 1. The average age of the farmers was determined as 46.47 years, and the average education level was 7.81 years. The average experience of the farmers in maize production was 15.96 years. The average household size was 3.49 people, 50.7% of whom were men. The average family labour potential was found to be 2.46 male work unit and 738 male workdays. The family labour utilization rate was calculated as 45.72%.

The average land size in the farms was determined as 17.95 hectares. 64.27% of the lands are owned lands. The most important products grown in the farms other than maize are wheat, cotton, cucumber, tomato and olive, respectively. The average maize production area in the farms is 9.90 hectares. In farms, 97.27% of the average total active capital consists of land assets. 93.92% of passive capital consists of equity. 68.82% of farmers are partners in at least one agricultural cooperative. Most of these cooperatives are agricultural development cooperatives

Table 1. Socio-economic characteristics of farmers

Characteristics	Farm groups			
	Group 1 (<5.0 ha)	Group 2 (5.0-9.9 ha)	Group 3 (≥10.0 ha)	General
Age of farmer	46.31	48.48	44.87	46.47
Education period of farmer (year)	7.42	7.15	8.87	7.81
Maize production experience of farmer (year)	15.33	16.74	16.00	15.96
Household size	3.08	3.89	3.63	3.49
Family labor utilization rate (%)	30.59	42.56	65.41	45.72
Land size (ha)	9.34	11.20	34.37	17.95
Maize harvested area (ha)	2.99	6.98	20.84	9.90
Equity rate (%)	90.99	93.72	95.52	93.92
Cooperative participation rate (%)	75.00	55.56	73.33	68.82

Source: Results of this study.

Economic Aspects of Maize Growing

Information on the economic aspects of maize production in the farms examined is presented in Table 2. The average maize yield in the farms was calculated as 14,523.99kg/ha, and the average maize price received by the farmer was 2.71 TL/kg. The average gross production value was determined as 39,360.01TL/ha. The average maize production cost was calculated as 27,953.30TL/ha. 83.98% of the maize production costs were variable and 16.02% were fixed costs. The unit maize production cost was 1.92 TL/kg. The average gross

margin and average net return obtained from maize were calculated as 15,885.16TL/ha and 11,406.71 TL/ha, respectively.

Table 2. Economic results of maize growing

Results	Farm groups			
	Group 1 (<5.0 ha)	Group 2 (5.0-9.9 ha)	Group 3 (≥10.0 ha)	General
Yield (kg/ha) (1)	14,701.78	14,325.32	14,539.32	14,523.99
Average maize price (TL/kg) (2) (*)	2.67	2.70	2.77	2.71
Gross production value (TL/ha) (3=1x2)	39,253.75	38,678.36	40,273.92	39,360.01
Variable costs (TL/ha) (4)	23,479.05	22,847.16	24,307.60	23,474.85
Production costs (TL/ha) (5)	27,975.12	27,291.77	28,803.53	27,953.30
Unit maize cost (TL/kg) (6=5/1)	1.90	1.91	1.98	1.92
Gross return (TL/ha) (7=3-4)	15,774.70	15,831.20	15,966.32	15,885.16
Net return (TL/ha) (8=3-5)	11,278.63	11,386.59	11,470.39	11,406.71

*1 US$ = 8.88 TL in 2021
Source: Results of this study.

Satisfaction Level of Farmers Regarding Maize Production and Affecting Factors

The level of participation of farmers in various factors that may affect their satisfaction in maize production was presented in Table 3. As can be seen, farmers agree that maize has advantages such as being easy to grow, cost advantage, storability and providing a good income.

Table 3. Opinions of farmers on factors affecting satisfaction with maize production

Factors	Participation level *
Maize production provides good income	4.10
High yield is obtained from maize	3.83
Maize production is promising	4.04
Maize has a high price advantage	3.84
Maize has a cost advantage	4.13
Maize growing is easy	4.26
It is easy to combat diseases and pests	4.35
Maize has easy marketing	4.04
It contributes to the purchase of new tools and machinery	3.92
It allows the increase of land size	3.81
Land size is suitable for production	3.87
Fertilizer needs can be provided	3.51
Tool and equipment need can be met	3.64
Maize production can be stocked	4.12
It can provide employment within and outside the farm	3.91
Large companies can create demand in the market	3.66
It is suitable for making long-term decisions	3.64
Contracted production can be done	4.07
There is government support for maize production	4.01
Average	3.94

*1. Strongly disagree, 2. Disagree, 3. Undecided, 4. Agree, 5. Strongly agree
Source: Results of this study.

In the study, factor analysis was used to collect the above 19 factors under fewer factors and to reveal which factors are more important to the farmers. According to the factor analysis results, eight factors with high eigenvalues (more than 1) were determined. The first factor explains 15.85% of the total variance, the second factor explains 11.08%, the third factor explains 10.07%, the fourth factor explains 9.12%, the fifth factor explains

7.43%, the sixth factor explains 6.16%, the seventh factor explains 5.97% and the eighth factor explains 5.63%. The cumulative variance amount explained by the eigenvalues is 71.31% of the total variance (Table 4).

Table 4. Results of factor analysis

Variables	Factors	Eigenvalue	Variance	Cumulative variance
Maize production provides good income	1	3.011	15.849	15.849
High yield is obtained from maize	2	2.106	11.082	26.931
Maize production is promising	3	1.913	10.068	36.999
Maize has a high price advantage	4	1.733	9.120	46.119
Maize has a cost advantage	5	1.411	7.428	53.547
Maize growing is easy	6	1.171	6.161	59.708
It is easy to combat diseases and pests	7	1.135	5.975	65.683
Maize has easy marketing	8	1.069	5.628	71.311
It contributes to the purchase of new tools and machinery	9	0.896	4.717	76.027
It allows the increase of land size	10	0.822	4.324	80.352
Land size is suitable for production	11	0.755	3.975	84.327
Fertilizer needs can be provided	12	0.610	3.211	87.538
Tool and equipment need can be met	13	0.547	2.881	90.419
Maize production can be stocked	14	0.506	2.666	93.085
It can provide employment within and outside the farm	15	0.441	2.322	95.406
Large companies can create demand in the market	16	0.350	1.843	97.249
It is suitable for making long-term decisions	17	0.212	1.115	98.364
Contracted production can be done	18	0.193	1.014	99.378
There is government support for maize production	19	0.118	0,622	100.000
Bartlett's Test of Sphericity:χ^2:494.140,df:171,p:0.000 Kaiser-Meyer-OlkinMeasure:0.566				

Source: Results of this study.

According to the factor analysis rotation results, factor 1 consists of large companies can create demand in the market, it is suitable for making long-term decisions and contracted production can be done. This factor was called the **"Marketing opportunities".** Factor 2 consists of it is easy to combat diseases and pests, fertilizer needs can be provided, and tool and equipment needs can be met. This factor was called the **"Input demand"**. Factor 3 consists of maize production is promising, it contributes to the purchase of new tools and machinery and maize production can be stocked. This factor was called the **"Capital accumulation"**. Factor 4 consists of maize production providing good income, maize has a cost advantage and maize has easy marketing. This factor was called "**Profitability"**. Factor 5 consists of high yield obtained from maize and land size is suitable for production. This factor was called the **"Yield"**. Factor 6 consists of maize growing is easy and it can provide employment within and outside the farm. This factor was called the **"Growing technique"**. Factor 7 consists of maize having a high price advantage and it allows the increase of land size. This factor was called the **"Price"**. Factor 8 consists of government support for maize production. This factor was called "**Government support"** (Table 5).

When the values of the variables constituting the factors are considered and their averages are calculated, it is seen that the factor that farmers agree on the most in terms of satisfaction in maize production is the profitability factor, followed by the growing technique factor and capital accumulation factor (Table 6).

Table 5. Rotation results of factor analysis

Variables	Factors							
	1	2	3	4	5	6	7	8
Maize production provides good income	0.166	-0.171	0.030	**0.676**	0.045	-0.442	0.050	-0.037
High yield is obtained from maize	0.184	0.122	-0.204	-0.025	**0.620**	0.319	0.045	-0.200
Maize production is promising	0.191	-0.057	**0.501**	0.112	-0.193	0.136	0.390	0.332
Maize has a high price advantage	-0.016	0.160	0.196	0.033	-0.114	-0.076	**-0.766**	0.099
Maize has a cost advantage	-0.014	0.179	0.005	**0.809**	0.039	0.058	-0.015	0.046
Maize growing is easy	0.189	-0.011	0.113	0.087	0.142	**0.662**	0.076	0.132
It is easy to combat diseases and pests	-0,245	**0.407**	0.273	0.181	0.176	-0.285	-0.153	-0.329
Maize has easy marketing	0.002	0.027	0.142	**0.662**	-0.369	0.301	0.077	-0.003
It contributes to the purchase of new tools and machinery	-0.002	-0.134	**0.682**	-0.004	0.226	0.243	-0.281	-0.093
It allows the increase of land size	0.083	0.207	0.063	0.070	-0.094	-0.075	**0.678**	-0.075
Land size is suitable for production	0.057	-0.098	0.137	-0.072	**0.816**	-0.121	-0.044	0.234
Fertilizer needs can be provided	0.096	**0.857**	-0.155	0.085	-0.061	0.011	0.146	0.064
Tool and equipment need can be met	0.050	**0.894**	0.080	-0.005	0.011	0.061	-0.059	0.079
Maize production can be stocked	0.027	0.076	**0.832**	0.068	-0.092	-0.185	0.003	-0.027
It can provide employment within and outside the farm	0.176	-0.051	0.243	0.043	0.253	**-0.607**	0.174	0.375
Large companies can create demand in the market	**0.927**	0.067	0.039	0.075	0.136	0.063	0.052	0.047
It is suitable for making long-term decisions	**0.900**	0.044	0.036	0.041	0.051	0.074	0.089	0.019
Contracted production can be done	**0.911**	0.007	0.008	-0.022	0.001	-0.030	0.007	-0.045
There is government support for maize production	-0.047	0.145	-0.047	0.026	0.094	-0.001	-0.199	**0.843**

Source: Results of this study.

Table 6. Factors affecting farmers' satisfaction with maize production

Factors	Variables	Participation level *
Factor 1 : Marketing opportunities	Large companies can create demand in the market	3.66
	It is suitable for making long-term decisions	3.64
	Contracted production can be done	4.07
	Average	**3.79**
Factor 2: Input demand	It is easy to combat diseases and pests	4.35
	Fertilizer needs can be provided	3.51
	Tool and equipment need can be met	3.64
	Average	**3.83**
Factor 3: Capital accumulation	Maize production is promising	4.04
	It contributes to the purchase of new tools and machinery	3.92
	Maize production can be stocked	4.12
	Average	**4.03**
Factor 4: Profitability	Maize production provides good income	4.10
	Maize has a cost advantage	4.13
	Maize has easy marketing	4.04
	Average	**4.09**
Factor 5: Yield	High yield is obtained from maize	3.83
	Land size is suitable for production	3.87
	Average	**3.85**
Factor 6: Growing technique	Maize growing is easy	4.26
	It can provide employment within and outside the farm	3.91
	Average	**4.08**
Factor 7: Maize price	Maize has a high price advantage	3.84
	It allows the increase of land size	3.81
	Average	**3.82**
Factor 8: Government support	There is government support for maize production	4.01
	Average	**4.01**

*1. Strongly disagree, 2. Disagree, 3. Undecided, 4. Agree, 5. Strongly agree

Source: Results of this study.

Satisfaction Level of Farmers Regarding Sustaining Agricultural Activities and Affecting Factors

The cumulative variance amount explained by the eigenvalues is 79.40% of the total variance. The level of participation of farmers with various factors affecting their satisfaction with living in rural areas and sustaining agricultural activities was presented in Table 7. As can be seen, farmers mostly stated that they were close to undecided or did not agree. Factors that may be close to the level of agreement are only farming activity can be of interest, climate conditions are suitable, and farming is a popular activity.

Table 7. Opinions of farmers on factors affecting satisfaction with agricultural activities

Factors	Participation level *
There is diversity of agricultural taxes, and their rates are low	2.44
Environmental pollution level is low	3.27
Young farmer supports are implemented	2.82
Government supports are sufficient	2.39
Agricultural insurance pool support is implemented	2.97
Farmer unions in the region work effectively	2.78
Climate conditions are suitable	3.73
Social security premium payment level is low	2.92
Life in rural areas is cheaper	2.92
Farmers can earn sufficient income	2.60
Farming is respected in society	2.70
Information about supports can be obtained	2.41
Infrastructure services in the region are sufficient	3.31
Small family farm support is implemented	2.38
Extension and consultancy support are implemented	2.44
Only farming activity can be of interest	3.81
Cooperative activities are effective	2.95
Farming is a popular activity	3.61
Government support diversity is high	2.34
Average	2.76

*1. Strongly disagree, 2. Disagree, 3. Undecided, 4. Agree, 5. Strongly agree
Source: Results of this study.

In the study, factor analysis was used again to collect the above 19 factors under fewer factors and to reveal which factors are more important to the farmers. According to the factor analysis results, six factors with high eigenvalues (more than 1) were determined. The first factor explains 32.20% of the total variance, the second factor explains 15.45%, third factor explains 10.76%, the fourth factor explains 9.53%, the fifth factor explains 5.81%, and the sixth factor explains 5.65% (Table 8).

The results of the factor analysis rotation were presented in Table 9. Factor 1 consists of there is diversity of agricultural taxes and their rates are low, environmental pollution level is low, young farmer supports are implemented, and government support is sufficient. This factor was called the **"Political conditions"**. Factor 2 consists of agricultural insurance pool support is implemented, farmer unions in the region work effectively, climate conditions are suitable, and social security premium payment level is low. This factor was called the **"Environmental conditions"**. Factor 3 consists of life in rural areas is cheaper, farmers can earn sufficient income, and farming is respected in society. This factor is called the **"Economic conditions"**. Factor 4 consists of information about supports can be obtained, infrastructure services in the region are sufficient, small family farm support is implemented, and extension and consultancy support are implemented. This factor was called the **"Rural infrastructure"**. Factor 5 consists of only farming activity can be of interest and cooperative activities are effective. This factor was called the **"Social conditions"**. Factor 6 consists of farming is a

popular activity and government support diversity is high. This factor was called the **"Personal characteristics"** (Table 9).

Table 8. Results of factor analysis

Factors	Factors	Eigenvalue	Variance	Cumulative variance
There is diversity of agricultural taxes, and their rates are low	1	6.118	32.199	32.199
Environmental pollution level is low	2	2.936	15.450	47.649
Young farmer supports are implemented	3	2.045	10.764	58.414
Government supports are sufficient	4	1.811	9.532	67.946
Agricultural insurance pool support is implemented	5	1.105	5.814	73.759
Farmer unions in the region work effectively	6	1.073	5.645	79.405
Climate conditions are suitable	7	0.836	4.400	83.805
Social security premium payment level is low	8	0.731	3.849	87.653
Life in rural areas is cheaper	9	0.653	3.437	91.090
Farmers can earn sufficient income	10	0.501	2.637	93.727
Farming is respected in society	11	0.445	2.340	96.067
Information about supports can be obtained	12	0.309	1.624	97.691
Infrastructure services in the region are sufficient	13	0.155	0.814	98.506
Small family farm support is implemented	14	0.103	0.542	99.048
Extension and consultancy support are implemented	15	0.079	0.415	99.463
Only farming activity can be of interest	16	0.049	0.257	99.720
Cooperative activities are effective	17	0.030	0.159	99.879
Farming is a popular activity	18	0.016	0.087	99.966
Government support diversity is high	19	0.006	0.034	100.000
Bartlett's Test of Sphericity: χ2:1765.100, df:171, p:0.000 Kaiser-Meyer-Olkin Measure:0.675				

Source: Results of this study.

Table 9. Rotation results of factor analysis

Variables	Factors					
	1	2	3	4	5	6
There is diversity of agricultural taxes, and their rates are low	**0.953**	-0.165	-0.002	-0.039	-0.022	0.015
Environmental pollution level is low	**0.947**	-0.164	-0.050	-0.019	-0.031	0.018
Young farmer supports are implemented	**0.937**	-0.168	0.029	-0.080	-0.030	0.047
Government supports are sufficient	**0.919**	-0.200	-0.104	0.022	-0.062	0.031
Agricultural insurance pool support is implemented	-0.154	**0.955**	0.129	0.028	0.055	-0.010
Farmer unions in the region work effectively	-0.170	**0.938**	0.147	0.007	0.074	0.015
Climate conditions are suitable	-0.170	**0.933**	0.199	0.038	-0.008	0.034
Social security premium payment level is low	-0.184	**0.928**	0.162	-0.001	0.118	-0.031
Life in rural areas is cheaper	-0.107	0.188	**0.931**	0.027	-0.008	-0.028
Farmers can earn sufficient income	-0.088	0.185	**0.910**	0.066	0.015	-0.048
Farming is respected in society	0.094	0.182	**0.831**	-0.052	-0.033	0.109
Information about supports can be obtained	-0.303	-0.044	0.044	**0.698**	0.050	0.040
Infrastructure services in the region are sufficient	-0.243	0.020	0.062	**-0.697**	0.322	0.043
Small family farm support is implemented	-0.215	0.202	0.243	**0.662**	0.276	0.089
Extension and consultancy support are implemented	-0.421	0.014	0.260	**-0.559**	0.191	-0.031
Only farming activity can be of interest	0.080	0.061	-0.345	0.042	**0.708**	0.037
Cooperative activities are effective	-0.148	0.101	0.222	-0.117	**0.694**	-0.085
Farming is a popular activity	-0.111	0.146	0.234	0.048	0.006	**0.825**
Government support diversity is high	0.266	-0.177	-0.275	0.026	-0.063	**0.646**

Source: Results of this study.

When the values of the variables constituting the factors are considered and their averages are calculated, it is seen that the farmers are stuck between being undecided and participating in terms of social and environmental factors in terms of sustaining agricultural activities by living in rural areas (Table 10).

Table 10. Factors affecting farmers' satisfaction with agricultural activities

Factors	Variables	Participation level *
Factor 1: Political conditions	There is diversity of agricultural taxes, and their rates are low	2.44
	Environmental pollution level is low	3.27
	Young farmer supports are implemented	2.82
	Government supports are sufficient	2.39
	Average	**2.73**
Factor 2: Environmental conditions	Agricultural insurance pool support is implemented	2.97
	Farmer unions in the region work effectively	2.78
	Climate conditions are suitable	3.73
	Social security premium payment level is low	2.92
	Average	**3.10**
Factor 3: Economic conditions	Life in rural areas is cheaper	2.92
	Farmers can earn sufficient income	2.60
	Farming is respected in society	2.70
	Average	**2.74**
Factor 4: Rural infrastructure	Information about supports can be obtained	2.41
	Infrastructure services in the region are sufficient	3.31
	Small family farm support is implemented	2.38
	Extension and consultancy support are Implemented	2.44
	Average	2.63
Factor 5: Social conditions	Only farming activity can be of interest	3.81
	Cooperative activities are effective	2.95
	Average	3.38
Factor 6: Personal characteristics	Farming is a popular activity	3.61
	Government support diversity is high	2.34
	Average	2.97

*1. Strongly disagree, 2. Disagree, 3. Undecided, 4. Agree, 5. Strongly agree
Source: Results of this study.

CONCLUSIONS

The agricultural sector in Türkiye sustains its importance in terms of its impact on labor and nutrition, the raw material it provides to the industrial sector, and its contribution to national income. However, farmers in the agricultural sector are gradually aging or moving to other sectors. Ensuring the sustainability of agricultural production depends on the effective and efficient use of production factors. The decrease in the share of production factors in income negatively affects the sustainability of agricultural production. Correct determination of the basic factors affecting the tendency of farmers to sustain agricultural production is extremely important in terms of ensuring food security for the future, ensuring the sustainability of agriculture, and ensuring the socio-economic sustainability of rural areas.

In this study, the tendency of farmers in Menderes district of Izmir province to sustain their agricultural activities and maize production in rural areas was determined. According to the results of the study, the average maize yield in the farms was calculated as 14,523.99 kg/ha. Maize yield may vary from region to region in Türkiye. The average maize yield was determined as 10,804.30 kg/ha in a study conducted in Kahramanmaras province, Türkiye [27] and

13,668.00 kg/ha in a study conducted in Konya province, Türkiye [7]. The average net return obtained from maize was calculated as 11,406.71TL/ha. The results of the study show that maize production can be done economically in the examined farms. Farmers agree that maize has advantages such as easy growing, cost advantage, storability and providing good income. It was observed that the factor that farmers agreed the most in terms of satisfaction in maize production was the profitability factor.

According to the study results, the factors affecting the satisfaction of farmers with agricultural activity in rural areas were determined as political, environmental, economic, rural infrastructure, social and personal factors. Similar results were obtained in another study [32]. However, some of the farmers state that they may not sustain agricultural activities in the future. They believe that especially the young population is not sufficiently encouraged for agricultural activities.

For farmers to sustain agricultural activities, socio-economic conditions in rural areas should be improved and living in rural areas should be made attractive. Agricultural industry investments should be increased in rural areas. In addition, comprehensive information should be provided, and incentive programs should be offered to the population who want to return to agriculture. Young people and women should sustain to be supported in terms of entrepreneurship.

In Türkiye, in addition to production, technology-focused and value-added policies need to be implemented. Reducing input costs and moving to economies of scale to produce products with high export potential and added value, and increasing profits and income in the agricultural sector will be effective in encouraging farmers to sustain agricultural activities. To ensure stability in the agricultural sector, moving to a planned production model based on demand according to domestic and international market research will prevent price fluctuations and prevent farmer grievances.

Most farmers find state support insufficient. Increasing the difference payment for maize production is one of the most important expectations of farmers. Support in this direction should be increased, and support payments should be planned in a timely manner. The Turkish Grain Board should announce the purchase guaranteed crop price early to support farmers, and the necessary financial opportunities should be created for the necessary payments to be made in a timely manner. The compliance of the prices with the international corn market prices should be determined and accordingly, support should be provided through the necessary channels for farmers' production. On the other hand, increases in input prices in maize production increase production costs. In fact, a different study has determined that the biggest problem of maize production is the excess of production costs [27]. For this reason, area-based input support should be increased. In addition, the reduction of taxes paid on input should continue. Maize is a crop that requires a lot of irrigation. Farmers have difficulty in covering water costs. Therefore, farmers should be informed about the use of alternative irrigation techniques and encouraged through financial methods.

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