

ECONOMIC ASSESSMENT OF FACTORS AFFECTING INCOME FROM THE ACTIVITIES OF HOUSEHOLD FARMS IN RURAL AREAS: A CASE OF SAMARKAND PROVINCE

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Abstract. The study examines the specifics of household (*tomorka*) farms, the role and importance of income from household (*tomorka*) farms activities in rural areas, economic assessment of the factors affecting income from activities. The factors influencing the formation of income from business activities were economically assessed using the Tobit model, and a VIF (Variance inflation factor) test was conducted to determine their multicollinearity. The age of landowners, the amount of arable land, the cost of organic and mineral fertilizers, the cost of seeds and seedlings, the cost of preparing the land for planting, and the cost of land and household services impact the increase in income from the household activities, and $<.01$) was found to be statistically significant. It was scientifically based on the data of landowners, the presence of family members aged 0-3 years, the satisfaction of landowners with water supply in the irrigation of arable land at a statistical significance of 5% ($p <.05$). The results were showing that scientifically based proposals have been developed to increase the income of the rural population from the household (*tomorka*) farm activities.

Keywords: household (*tomorka*) farms, household income, agricultural products, Tobit model, VIF test, SWOT.

JEL code: Q13.

Introduction

In the long run, the policy of rural development (Berdegue *et al.*, 2001) is reflected in the strategy of action for the development of agriculture, especially measures aimed at increasing the population in rural areas, reducing poverty (Janvry, Sadoulet and Zhu, 2005). Nearly 46 percent of the world's population lives in rural areas, and poverty has declined significantly over the past two decades. However, the pandemic has had a negative impact on the world's population, with declining incomes and a poor population of 150 million by 2021. 80 percent of the world's poor live in rural areas, and their main source of income is agriculture (Haggblade, Hazell and Reardon, 2010). In this regard, it is important to diversify the risks of agricultural activities, changes in seasonal incomes and financing the purchase of agricultural products (resources), the sustainable development of production efficiency.

Sustainable development of household (*tomorka*) farms is important in ensuring food security, protecting and preserving the environment, and reducing poverty. However, the livelihoods of about 1.5 billion rural households require the identification of opportunities to make efficient use of available resources to meet the growing needs of the world's population.

The share of household (*tomorka*) farms in the production of agricultural products in Uzbekistan is 70.1%, which plays an important role in the country's economy. Today, the number of household (*tomorka*) farms is more than 5 million, which is 1.5 times more than in 2000. The area of agricultural land in Uzbekistan is 3686.7 thousand hectares, of which 13.0% is arable land.

A household (*tomorka*) farm is a labour activity related to the cultivation (processing) of agricultural products on private plots of land for family needs and for sale on the market (McGuire, 2013). Land management is not an entrepreneurial activity, it is not required to register with the state. However, in accordance with the procedure established by the legislation on employment, a self-employed person (Canagarajah, Newman and Bhattamishra, 2001) may obtain the status of a self-employed person.

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Household (*tomorka*) farms are a major source of income for people living in remote rural areas (Iqbal et al., 2018), as well as contributing to the country's food security. The level of production activity of household (*tomorka*) farms and the interest in the results obtained from them is higher than in other forms of agricultural activity (Shukrullo, 2021). As a result, in 2019, the main part of the population's household (*tomorka*) farms in the country grew vegetables, melons, potatoes, fruits and grapes, the volume of output amounted to 19153.5 thousand tons. 70.7% of these vegetables, 83.7% of potatoes, 59.7% of melons, 60% of fruits and 56.2% of grapes were grown by landowners. At the same time, the average yield of vegetables was 27.6 tons per hectare in household (*tomorka*) farms, 21.0 tons per hectare in farmers. However, while farmers are better off than household (*tomorka*) farms with fertilizers, water, machinery, funds, and other necessities, the average yields from farmers are lower.

On 26 April 2018, the President of the Republic of Uzbekistan established a management system to ensure the efficient use of public lands and the full planting of high-value crops. In the end, all conditions are created for the citizens to use their lands efficiently and earn a living, first of all, for their families, and then for the supply of cheap and high-quality agricultural products to the farmers' markets. In addition, the Law of the Republic of Uzbekistan "On Land Management", approved on 1 April 2021, further strengthens the legal interests of landowners. Although the average area of arable land in the country (Pardaev, 2021) is 0.089 hectares, the efficiency of the use of more than 480 thousand hectares of arable land remains low. In addition, 63.3% of the able-bodied population in rural areas is employed informally, and more than 15% of them are poor. However, despite the fact that all arable lands have the potential to grow agricultural products, their efficiency remains low. In this case, it is important to study the factors that affect the income of household (*tomorka*) farms, their economic evaluation.

The main purpose of our research is to study the specifics of household (*tomorka*) farms, to develop scientifically based conclusions and recommendations through economic assessment of the factors affecting income from activities.

Materials and methods

The object of study of this research is the household (*tomorka*) farms located in the rural areas of the Samarkand region of the capital of the Republic of Uzbekistan. Samarkand region is located in the middle part of the Zarafshan river basin and is one of the largest and most ancient irrigated areas in Central Asia.

In Samarkand region there are 14 districts, 2 large cities, the Zarafshan river divides into two suburbs of Samarkand - *Akdarya* and *Koradarya* rivers, and reunites near the Khatirchi district of Navoi region.

Pastdargom, Payarik, Narpay and Katta-Kurgan districts are the largest districts in the region in terms of the area of irrigated crops. However, Jambay, Toylak, Urgut and Samarkand districts are the largest producers of horticultural crops in the region.

Located around the Zarafshan River, this valley is located at an altitude of 2000-3000 meters above sea level, and in some lowlands at an altitude of 980-1400 meters, with an annual rainfall of 320-360 mm. The sun is shining, and the length of summer days is up to 15 hours. In general, the climatic conditions in the region correspond to the generally accepted soil-climatic classification. According to the agro-climate, the irrigated area is divided into two parts: the largest part of the territory is typical grey soils, and the smallest part is light grey soils. Irrigated ice soils are located in the temperate-thermal zone and the annual effective temperature is 2140-2300 C, the length of the growing season is 208-212 days.

Peculiarities of household (*tomorka*) farming. It is known that the results obtained from the activities of the production and service sectors are directly related to the specifics of the activity (Table 1). Among the forms of activity in agriculture, their peculiarities affect the efficiency of activity.

Table 1

Characteristics of household (*tomorka*) farms

Nº	Indicators	Contents
1	Land	The right to use, own and dispose of land resources
2	Labour	Labour is based on the work of family members
3	Production activities	The landowners independently carry out the production activities
4	Activity financing	The activity is mainly financed by itself and the landowners
5	Government order	There is no government order to carry out production activities. However, with the consent of the landowners, the household (<i>tomorka</i>) farm can operate on a contract basis
6	Income	The income from the activity is distributed by the landowners to the family members freely, for family purposes. Income received is the main or additional income of family members directly
7	Prices	The prices for agricultural products grown on the farm are set freely by the landowners on the basis of market demand and supply

Source: created as a result of scientific research of the authors

Land is the main tool in agricultural production (Kakungulu *et al.*, 2021), and the economic relationship to land affects production. If land resources are to be leased to farmers for a period of up to 50 years, but not less than 30 years, land resources on household (*tomorka*) farms will be transferred to landowners on the basis of the right of lifelong ownership. However, if the landowners have the right to use the land resources allocated for the household (*tomorka*) farm for the production of agricultural products, housing construction and home improvement, then the land plots on the farmers are fixed.

While labor in household (*tomorka*) farming is based on the personal labor of the landowner and family members, labor relations on the farmers are regulated on the basis of an employment contract in accordance with the law. However, the owner of a private plot of land or a family member who owns a private plot of land with at least 0.04 hectares of land or owns at least fifty head of poultry on this plot of land may be able to pay a social tax.

When determining the production activity on the household (*tomorka*) farm, it is determined primarily on the basis of the needs of family members in agricultural products. However, the main income of a family is the income of the landowner or the income of the able-bodied family members, if they do not have income from non-farm activities. In other words, the landowner is free to grow any type of agricultural products, taking into account changes in the supply and demand of the population for agricultural products. The efficiency of production on household (*tomorka*) farms is directly related to the financing of activities. Financing of agricultural production on household (*tomorka*) farms is mainly based on the income of landowners or family members from agricultural or non-agricultural activities.

In a single farmer, there is a difference not only in the cultivation of different types of products, but also in the calculation of the cost of their cultivation. Incomplete accounting of agricultural production costs is reflected in the scale and volume of production, as well as other economic activities. As a result, the low level of production costs and the fact that most of the costs are not involved in production activities are characteristic of the household (*tomorka*) farms. In other words, the costs of agricultural production are derived from their own activities or from close relatives of landowners who receive agricultural seeds at a low price or free of charge. However, the consumption of resources used by landowners is not clearly documented. However, this process is directly related to the size of the field. Also (Saydullaeva, 2021),

although most household (*tomorka*) farms have a high probability of using secondary products from livestock activities, the amount and value of resources are not clearly defined.

However, landowners buy mineral fertilizers or pesticides from specialized outlets. He or she uses his own personal or hired transport service to bring the purchased resources. Landowners pay land and property taxes in the manner prescribed by law. Given the small size of land on household (*tomorka*) farms, landowners are constantly monitoring the cost of production or the cost of production.

Household (*tomorka*) farming in Samarkand region. In order to study the composition of arable lands and crop yields of *tomorka* farms in Samarkand region, the collection of statistics of the Statistics Department of Samarkand region for 2013-2020 was used in the research. In 2017, there were 482088 household (*tomorka*) farms and dekhkan farms in the Samarkand region, of which 99.86% were household (*tomorka*) farms. However, the increase in the population of the Samarkand region has also affected the increase in the number of landowners. As a result, the number of landowners in 2020 was 538540 an increase of 11.8% compared to 2017. The increase in the number of landowners directly affected the growth of arable land. In other words, the total area of arable household (*tomorka*) farms in Samarkand region changed during 2013-2018.

In 2013-2018, the area under crops increased, while in 2019-2020 it decreased. During this period, landowners in rural areas may be associated with the construction of additional housing for private or individual entrepreneurial activities instead of arable land, due to the increase in the number of family members. However, the decrease in the area of arable land in the region directly affected the decrease in the area under cereals (wheat) and fodder crops, while the area under potatoes and vegetables increased compared to other agricultural areas. The increase in the area under potatoes and vegetables may have had a direct impact on the family's need for food or income from activities. However, during 2013-2020, the yield of vegetables grown on farms: vegetables, grapes, fruits and berries significantly decreased.

The role of 'Household (*tomorka*) service' LLC in the activities of household (*tomorka*) farms. Establishment of a system that works with landowners, provides material resources, finances activities and controls the cultivation of land with high yields and income from the household (*tomorka*) farms, is one of the most important activities of LLCs 'Household (*tomorka*) service' in the regions. This activity helps landowners to grow crops on their land and serve them until they deliver the harvest to the buyer. It is also planned to plough the lands, supply the necessary seeds and seedlings, build a compact greenhouse for households and provide other services by 'Household (*tomorka*) service' LLC.

Efficient use of land, strengthening the material and technical base of 'Household (*tomorka*) service' LLC, further expanding its activities and increasing the coverage of the population with land services, as well as to further increase the opportunities for export and increase, according to the calculations based on the verb, the allotment of land area is determined. However, in Samarkand region, on average, one 'Household (*tomorka*) service' LLC covers an area of 1.77 hectares, while in Samarkand, Jombay, Payariq and Pstdargom districts, 'Household (*tomorka*) service' LLC covers 0.2 hectares. However, a large part of the fruits and vegetables grown on household (*tomorka*) farms in Samarkand region falls on these districts. However, today it is important to what extent the activity of LLC 'Household (*tomorka*) service' affects the income from arable land and its economic evaluation. In particular, in the economic assessment of the relationship between the two activities, the distance from the area where the household (*tomorka*) farm is located to the LLC 'Household (*tomorka*) service' was formed in a public survey.

Data. As a result of the research, a public survey was conducted on household (*tomorka*) farms in Samarkand, Jambay, Toylak and Urgut districts, which have achieved high results in agriculture in the districts of Samarkand region. 43 respondents from Samarkand district, 45 respondents from Jomboy

district, 44 respondents from Toylak district and 38 respondents from Urgut district took part in the public survey. Questionnaire: Income from arable land, their age, level of education, number of family members, arable land, resource consumption, the factors that directly affect the activities of the household (*tomorka*) farm, the state of water resources supply, service station.

The survey was conducted among respondents who are planning to sell agricultural products (potatoes, fruits, vegetables, grapes), most of which are grown in the fields. However, it is used an unconventional approach to determining the income from household (*tomorka*) farm's own crops. In this case, the landowners considered the costs that could be spent on food for family members in the absence of agricultural production on the farmland. As a result, according to the survey, 102 out of 170 respondents, or 60%, earned up to 10 million soums a year from arable land. However, 68 or 40% of the participants had up to 5 hectares of arable land. 59 or 34.7% of landowners were 51-60 years old. However, we do not know how the age of the landowners affects the income from the land.

However, the distribution of children aged 0-3 in the family may affect household income, which may limit the number of family members working on the household (*tomorka*) farm.

An increase in the number of family members in the household can affect the ability of able-bodied family members to work on the household (*tomorka*) farm and keep them engaged in poor household activities. 60 landowners or 35.3% of the landowners had 6 family members. However, we can see from the model analysis how family members affect their income from their farmland. In most cases, the income from the field depends on the use of resources that are directly involved in the production process. The costs of growing organic and mineral fertilizers, seeds and seedlings, as well as preparing the land for planting, were high in the cultivation of agricultural products. Also, since most of the organic fertilizer used for arable land is derived from livestock raised on the household (*tomorka*) farm, its cost is expressed in terms of the sale of organic fertilizer by the landowner. In addition, the preparation of the field for sowing, cultivation and other work processes in the area were also evaluated.

Income from arable land is directly related to arable land, with landowners earning an average of 9,605 million soums from an average of 0,076 hectare of arable land (Table 2).

Strong, weak, opportunities and threats on household (*tomorka*) farms. In econometric analysis, these indicators are expressed in quantitative terms. Also, the age of landowners, the number of family members and the consumption of resources (organic and mineral fertilizers, seeds and seedlings, preparation of land for planting) were expressed in quantitative (value) indicators. However, the distance to 'Household (*tomorka*) service' LLC and the mineral fertilizer station was expressed in terms of quality to eliminate "bias" in the use of the model. In addition, the quality of landowners was expressed in terms of gender, education, availability of family members under 0-3 years of age, and whether or not the water supply for irrigation is satisfactory.

The level of education of landowners is important in the conduct of production activities on household (*tomorka*) farms or the effective use of resources. However, an increase in the number of family members on a household (*tomorka*) farm can lead to certain family members working in another field or a decrease in labour productivity on the *tomorka* farm. According to a survey of respondents, the largest number of family members in households was 9 people.

Table 2

Statistical classification of variables

Variables	Mean	St.Dev	Min	Max
Income from arable land (<i>Income</i>)	9,605	6,489	1,2	32,2
Age of the landowner (<i>Age</i>)	48,335	9,111	31	65
Gender of the landowner (<i>Male</i>)	0,917	0,275	0	1
Education of landowner (<i>Education</i>)	0,929	0,684	0	2
Presence of family members aged 0-3 years (<i>Members 0-3</i>)	0,452	0,499	0	1
Number of family members (<i>Members</i>)	5,694	1,245	3	9
Arable land (<i>Land</i>)	7,670	4,450	2	23
Cost of organic fertilizer (<i>OF</i>)	209,782	154,866	35	850
Cost of mineral fertilizers (<i>MF</i>)	112,164	80,132	20	425
Cost of seeds and seedlings (<i>SS</i>)	324,623	268,620	45	1500
Crop field preparation costs (<i>CFP</i>)	225,205	171,249	40	900
Distance to 'Household (<i>tomorka</i>) service' LLC (<i>HTS</i>)	2,135	1,273	0	4
The distance to the mineral fertilizer station (<i>MFS</i>)	0,411	0,493	0	4
Satisfaction with water supply in crop irrigation (<i>WS</i>)	0,411	0,493	0	1

Source: author's calculations based on survey data

The Action Strategy for the Further Development of the Republic, proposed by the President of the Republic of Uzbekistan, states that such issues have been identified as a sustainable task. Implementation of these tasks shows the need to develop the activities of farmers and gardeners in the cultivation of agricultural products.

Landowners may use the land allotted to them for the cultivation of agricultural products, construction of houses and improvement of housing. The study of the organizational and economic basis of crop production on farms requires attention to its strengths, weaknesses, opportunities and threats (Table 3). Unlike other forms of household (*tomorka*) farming, a natural resource (land) is a private plot of land.

The efficient use of land resources used in the household (*tomorka*) farm is determined by the results obtained from the activities, which directly affect the attitude of members to the property. Unlike other forms of *tomorka* farming, a natural resource (land) is a private plot of land.

The efficient use of land resources used in the household (*tomorka*) farm is determined by the results obtained from the activities that directly affect the attitude of members to the property.

Also, other resources spent on production are freely used by landowners. However, as with other farmers, the contractual relationship associated with the purchase or supply of resources used in production is not clearly defined. However, the government is interested in attracting innovative technologies on the basis of soft loans to landowners, the use of resources spent on production activities.

The allocation of short-term and long-term loans has not been fully implemented. As a result, the landowners are limited in their ability to use all of their available land throughout the year.

It is established that the cultivation of agricultural products on household (*tomorka*) farms is carried out directly by the landowners. However, there is no systematic system of scientifically based data or predictions of product prices for landowners in terms of current or future demand for agricultural products in order to achieve productivity. As a result, the growth of supply in the market due to the production of one type of agricultural products by landowners has led to a sharp decline in prices. If we look at the

numbers, in 2020, the average price of vegetables (tomatoes) grown by landowners in the districts of Samarkand region decreased by an average of 1.5 times compared to 2019.

Table 3

Strong, weak, opportunities and threats (SWOT) analysis on household (*tomorka*)

Nº	Indicators	Attitude
I	<i>Strengths</i>	
1	Expenditure of resources	carried out freely by family members
2	Labour	costs are mainly based on the labour of family members
3	Cultivation of the crop	carried out freely by family members
4	Contracting	Implemented freely by family members
5	Product prices	Product prices are formed on the basis of supply and demand in the open market
II	<i>Weakness</i>	
1	Financial resources	Lack of financial resources to attract innovations to production activities
2	Crop area	Limited crop area in the cultivation and diversification of agricultural products
3	Contractual relations	Lack of contractual relations in the procurement of production resources and production
4	Cost accounting	Lack of accurate accounting of costs incurred in the production process
5	Skills	Lack of skills in the implementation of agro-technical measures
6	Market diagnosis	Lack of information on changes in the balance between supply and demand for a particular type of farm product in the future
III	<i>Opportunities</i>	
1	Bioproduction	There is a high probability of using organic fertilizers in the production of bioproducts for family consumption and the market
2	Arable land	It is possible to use arable land throughout the year
3	Diversification	High potential for growing a variety of agricultural products
4	Sale of products	Direct economic relations with the consumer on the basis of supply and demand
IV	<i>Threats</i>	
1	Demand and supply	Change in the balance between supply and demand for agricultural products grown on the household(<i>tomorka</i>) farm
2	Insurance	Lack of effective insurance services in response to changes in market prices
3	Contractual relations	Poor economic relations between producers and consumers and avoidance of entering into contractual relations with landowners

Source: Created as a result of scientific research of the authors

However, the increase in the volume of agricultural production will meet the demand of the population for food products. However, due to the production of one type of agricultural products, it is possible to reduce the efficiency of production on household (*tomorka*) farms and limit the demand of the population for other types of agricultural products.

The implementation of contractual relations in the field of production or services has a positive impact on the efficiency of operations. However, contractual relations have not been strengthened in strengthening

economic relations between landowners and consumers or suppliers. The implementation of contractual relations directly increases the possibility of efficient use of arable land by landowners and reduces the risk of changes in market prices for crops.

Multicollinearity of changes. Multicollinearity is an interdependent phenomenon of the prophecy of two or more independent variables (Nevin *et al.*, 2017), and the stronger the connection between them, the greater the increase in standard errors. In other words, by exaggerating standard errors, multicollinearity makes some independent variables statistically insignificant. In order to determine this situation, a diagnostic test was conducted to ensure that the results obtained were stable.

A VIF (Variance inflation factor) test was performed for independent variables to determine multicollinearity. The VIF test (Alauddin and Nghiemb, 2010) is a measure of the amount of multicollinearity in a set of multiple regression variables. Mathematically, for a variable of the regression model, the variance of the VIF general model is equal to the variance of the model, which includes only one independent variable. This ratio is calculated for each independent variable. The higher the VIF, the more the dependent independent variable interacts with other variables in the model.

However, according to the results of our VIF test, its average value is 2,595, which shows that there is no multicollinearity among the variables.

Tobit model. Since the dependent variable (Y) is expressed as a quantitative indicator, the Tobit model was used to assess the extent to which the independent variable (X) affected the economic income, the factors influencing the income from the household (*tomorka*) farm.

The Tobit model is zero in the separate variable of the dependent variable or is useful in cases where the border is cross-border. It also requires not only the inclusion of all observations in the model (Chinwuba, 2015), but also the evaluation of the responses obtained as a result of the change of each independent variable (Cai, 2015).

Using this method, an economic assessment was made based on the results of the analysis of income from the farm and the factors influencing it in the STATA16.

The results of the analysis do not mean that landowners have effectively used the costs of growing agricultural products. This is because the results of the analysis provide a statistical and economic assessment of the importance of resources spent on the growth of income from household (*tomorka*) farming.

Results

According to the results of the analysis (Table 4), the increase in income from household (*tomorka*) farms is due to the age of landowners, the amount of arable land, the consumption of organic and mineral fertilizers, the cost of seeds and seedlings, the cost of preparing land for gardening and the distance to the mineral fertilizer station is statistically significant at 1 percent ($p < .01$).

However, the share of family members aged 0-3 years is statistically significant at 5% ($p < .05$), and the presence of family members aged 0-3 years reduces household income by 59.7%. In other words, the fact that able-bodied family members are engaged in the upbringing of children aged 0-3 years is due to the reduction of labour costs on the household (*tomorka*) farm. Also, the landowner's data and the water saturation of the landowners in the irrigation of crops at 5% ($p < .05$) are statistically significant. According to the results, the increase in the age of landowners by 1 year increases the income from landowners by 6.3%, that is, the increase in the age of landowners increases the income from land. Retired and able-bodied landowners can also increase their income. However, the income of landowners of retirement age who are unable to work may decrease. Revenues from household (*tomorka*) farms depend on the size of

arable land, and the increase in the area of arable land per hectare by landowners increases the income from it by 35.2%. However, the area under orchards is limited, and the possibility of extensive reproduction is low. This is due to the fact that the size of housing, infrastructure, and livestock facilities for family members in the fields can be affected by the landowners. However, intensive use of arable land depends on organic and mineral fertilizers, fertile seeds and seedlings, as well as field preparation.

Adequate increase in the consumption of organic and mineral fertilizers by landowners can increase household (*tomorka*) farm income by 0.8:1.7%. In addition, the increase in the cost of seeds and seedlings per hectare by landowners will have a positive impact on the increase in income from the household (*tomorka*) farm by 0.4%, and the cost of land preparation by 0.6%.

'*Tomorka* service' LLC and the distance to the mineral fertilizer outlet are directly related to the increase in income from *tomorka* farms. In other words, a 1-unit reduction in the distance to 'Household (*tomorka*) service' LLC and the mineral fertilizer station could increase farm income by 44:47.4%.

Table 4

Economic assessment of the factors influencing the income from the household (*tomorka*) farm

Income	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Age	.063	.018	3.47	.001	.027	.099	***
Education	.452	.225	2.01	.046	.007	.897	**
Male	-.161	.455	-0.35	.724	-1.06	.738	
Members 0-3	-.597	.269	-2.22	.028	-1.128	-.067	**
Members	.161	.118	1.37	.173	-.071	.394	
Land	.352	.058	6.13	0	.239	.466	***
OF	.008	.002	4.77	0	.004	.011	***
MF	.017	.003	5.47	0	.011	.023	***
SS	.004	.001	4.65	0	.002	.006	***
CFP	.006	.001	3.91	0	.003	.008	***
HTS	.44	.159	2.77	.006	.126	.753	***
MFS	.474	.15	3.16	.002	.177	.77	***
WS	.671	.303	2.21	.028	.072	1.27	**
Constant	-5.307	.966	-5.50	0	-7.214	-3.4	***
var(e.Income)	2.535	.275	. b	. b	2.046	3.14	
Mean dependent var		9.605	SD dependent var			6.489	
Pseudo r-squared		0.427	Number of obs			170.000	
Chi-square		476.733	Prob > chi2			0.000	
Akaike crit. (AIC)		670.554	Bayesian crit. (BIC)			717.591	

*** $p < .01$, ** $p < .05$, * $p < .1$

Source: author's calculations based on questionnaire data

Conclusions and suggestions

According to the research, an average annual increase in the age of landowners ($p < .01$) increases the income from the activities of household (*tomorka*) farms by 6.3%, data ($p < .05$) by 45.2%. However, the number of landowners and the number of family members did not play a statistically significant role in the

growth of household income. The presence of family members aged 0-3 years ($p < .05$) reduces income from household (*tomorka*) farms by 59.7%.

In rural areas, an increase in the volume of arable land ($p < .01$) by 1 unit increases the income from it by 35.2%. In addition, an increase in the consumption of organic and mineral fertilizers by 1 unit on household (*tomorka*) farms has a positive effect on the growth of income from agriculture by 0.8:1.7%. Expenditure on seeds and seedlings is of statistically significant value ($p < .01$) in the production of high-quality crops on household (*tomorka*) farms, and an increase in expenditure per unit has a positive effect on an increase in income by 0.4%. Expenditures related to the preparation of arable land for sowing are also statistically significant ($p < .01$), and an increase in expenditures per unit of income increases by 0.6%. It was found that the service sector is of statistical importance in the growth of income from farming, ie the distance from the 'Household (*tomorka*) service' LLC and the mineral fertilizer station ($p < .01$) is on average 1 of the average income per square meter: 47.4 percent increase. Satisfaction of landowners with water supply in the irrigation of arable lands is of statistical importance ($p < .05$) and has been found to have a positive impact on the growth of income from household (*tomorka*) farming by 67.1%.

According to the results of the analysis, there is an opportunity to increase the income from the activities of household (*tomorka*) farms in 4 districts of Samarkand region. In the future, landowners will focus on improving their skills and literacy, increasing soil fertility, using high-yielding varieties, and using mineral and organic fertilizers. In addition, the government needs to expand the activities of 'Household (*tomorka*) service' LLC and mineral fertilizer sales outlets in rural areas, to develop effective measures for the use of water resources.

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