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Article



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## ASSESSMENT OF STRUCTURAL CHANGES IN THE AGRICULTURAL NETWORK BY STATISTICAL METHODS

**Abstract:** In this article, a scientific proposal and practical recommendations have been developed regarding the statistical evaluation of the structural changes in the agricultural sector of the Republic of Uzbekistan and the determination of their prospects. Also, based on the specific characteristics of the country, the system of indicators for the comprehensive statistical evaluation of the agricultural sector was analyzed, using the indicators that evaluate the structural changes in the economic activity of agricultural entities.

**Key words:** agriculture, structural changes, statistics, evaluation, perspective, agrarian sector, system of statistical indicators, analysis, innovation, food industry, water industry, agricultural industry.

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### Introduction

In the context of intensifying global competition in the world, the importance of the processing industries and the agricultural sector, which meets the needs of the population for agricultural raw materials and food products, is increasing.

According to statistical data, "today, world agriculture is economically active population of 1 billion. It provides employment for more than 100,000 people, and about 5% of the total products produced in the world are contributed by this industry. Forecast data shows that by 2050, the world's population will reach 9.1 billion. can reach a person.

In this case, the demand for meat and dairy products of the world population is expected to increase by 2.5-3.0 times compared to today. In this process, according to the experiences of the countries of the European Union, the USA, Japan and Israel, the development of the activities of farms specializing in the sector, increasing their economic efficiency, introducing advanced innovations, ensuring the implementation of state programs adopted through economic and statistical research of the sector, their systematic formation, clustering of the agrarian sector Farming is being carried out in modern forms such as.

The occurrence of global instability in the world requires paying special attention to the study of problems related to food security and conducting extended scientific research in this regard.

In these studies, development of the strategy of economic development of the agrarian sector, ensuring the proportionality of the growth of the population and demands with the increase in the production volume of agricultural products, sustainable development of the agrarian sector, specialization of production processes, increasing the level of economic efficiency of economic entities through the use of modern innovative technologies and methods, comprehensive statistical research of the factors affecting their activity, ensuring their competitiveness appear as the priority directions of scientific research in this regard.

In Uzbekistan, the agrarian sector serves to increase the country's export potential while ensuring the population's demand for food and agricultural products, and over the past years special attention has been paid to the promotion and development of specialized farms.

In particular, in the Development Strategy of New Uzbekistan in 2022-2026, "...one of the most

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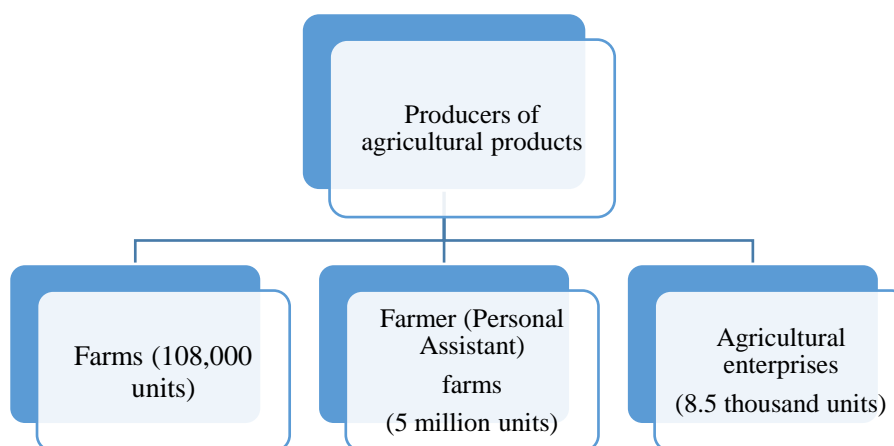
priority tasks to be implemented within the framework of the development strategy is to fundamentally increase and diversify the efficiency of agriculture for the development of the national economy, that is, to develop the agrarian sector, to process agricultural products on a cluster basis and priority tasks such as ensuring food security, improving the standard and quality of life of the population living in rural areas, creating the necessary conditions for doubling the income of farmers and peasants, and bringing the annual growth rate of agriculture to at least 5%.

Effective implementation of these tasks requires economic-statistical analysis of structural changes of agricultural sector farms, comprehensive statistical assessment of factors affecting their development, development of scientific proposals and recommendations based on medium-term forecasting of development prospects.

### *Analysis of literature on the subject*

PF-60 of the President of the Republic of Uzbekistan dated January 28, 2022 "On the Development Strategy of New Uzbekistan in 2022-2026", PF-5853 of October 23, 2019 "On Approval of the Strategy for the Development of Agriculture of the Republic of Uzbekistan for 2020-2030" decrees of June 7, 2022 "On additional measures to effectively organize the implementation of the tasks set in the strategy for the development of agriculture of the Republic of Uzbekistan for 2020-2030", Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 104 of February 26, 2021 "Statistics in the field of agriculture serves to a certain extent in the implementation of the tasks defined in the decision "On measures to expand and improve the database" and other regulatory legal documents related to the field.

Farms, peasant (personal assistant) farms and enterprises performing agricultural activities operate in the agricultural sector in our country (Fig. 1).



**Figure 1. Types of producers of agricultural products in the Republic of Uzbekistan (as of January 1, 2022)**

At a time when serious negative effects on the well-being of the population are being observed due to various crises that put the developed countries in economic disadvantageous situations in the countries with developed agricultural sector, the positive state of the level of well-being of people's life is maintained. This shows that the agricultural sector is gaining the most importance in all countries at the present time.

The development of the agricultural network creates the basis for the development of the processing system in the country by growing environmentally friendly products in the network. In addition, it serves to increase the number of jobs for rural residents. Based on these, due to the serious problems related to the global economic crisis that is still ongoing in the world, the sharp decrease in the volume of gross demand in the world market, the strengthening of competition in serious indicators, the qualitative

structural change of our national economy and the deepening of the diversification of industries, supporting multi-sectoral production and service activities - support, ensuring employment by creating new jobs, requiring the introduction of the most effective and systematic ways of improving the income and well-being of the population in our country.

The agricultural sector is one of the most important sectors of the economy of Uzbekistan, which serves to ensure the stability of Uzbekistan's export potential in foreign trade processes, as well as being a source of raw materials for food products, processing industry and service sectors of the population of our country.

### *Research methodology*

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Table 1 below shows the changes in agricultural products and cultivated areas of our country over the years.

**Table 1. Changes in agricultural products and cultivated areas of the Republic of Uzbekistan over the years.**

Indicators	2000	2005	2010	2015	2020	2021
Cultivated area, thousand hectares	3778,3	3647,5	3708,4	3694,2	3396,1	3260,7
Agricultural products, at the current price, bln. soum	1387,2	5978,3	30856,7	99604,6	250250,6	303415,5

According to the end of 2021, the total volume of products (services) produced by agriculture, forestry and fisheries is 317781.6 billion. made up soum. According to the results of 2017, agriculture accounted for 19.7 percent of the GDP, and in 2021, this figure will be 26.9 percent, and the impact on the absolute growth rate of GDP will be 1.1 p.p. organized the Agrarian industry achieved such growth rates mainly due to meat (104.8%), vegetables (104.1%), potatoes (104.7%), grapes (105.5%), caught fish (120.7%) it can be seen that the growth rate has been positively affected. In terms of regions, the highest share was observed in Jizzakh region (53.4%), the lowest share was observed in Navoi region (15.0%).

Table 1 shows the changes in the volume of products grown with cultivated areas, in which it can be observed that the production of agricultural products has increased over the years and the cultivated areas have decreased. According to the end of 2021, the sector of small business and private entrepreneurship made up 96.7% of the network, and the highest share in this region was Jizzakh (99.1%), Kashkadarya (99.1%), Bukhara (98.1%) and Khorezm (98.1%) regions.

#### **Analysis and results**

Table 2 below shows the growth dynamics of agricultural products in the regions of Uzbekistan compared to last year.

**Table 2. Dynamics of growth of agricultural products on the scale of the regions of the Republic of Uzbekistan compared to last year, in percent.**

Areas	2000	2005	2010	2015	2020	2021
<b>Total</b>	<b>103,1</b>	<b>105,4</b>	<b>106,3</b>	<b>106,1</b>	<b>102,7</b>	<b>103,9</b>
Karakalpakstan Resp.	65,6	104,6	121,3	109,8	102,3	104,2
Andijan region	110,2	104,7	108,0	106,3	101,1	104,5
Bukhara region	106,3	109,2	107,6	107,1	101,9	104,7
Jizzakh region	100,1	104	106,4	106,7	102,7	104,2
Kashkadarya region	89,4	109,6	107,0	106,1	103,7	101,3
Navoi region	105,0	107,5	105,9	106,6	103,3	104,4
Namangan region	111,5	103,1	105,8	106,3	104,0	107,0
Samarkand region	104,8	103,9	107,0	107,1	102,5	103,1
Surkhandarya region	106,7	100,5	105,2	106,3	105,3	104,2
Syrdarya region	101,9	112,9	105,6	105,5	101,8	103,8
Tashkent region	114,9	103,8	102,9	103,3	100,1	104,1
Fergana region	113,5	107,2	106,1	105,7	104,9	103,2
Khorezm region	82,8	103,2	102,5	105,5	101,7	102,9

Agriculture accounted for 49.9 percent of agricultural production, and livestock farming for 50.1 percent. It can be seen that cultivation of agricultural products in Andijan region had the highest share (61.9%, 38.1%), while Navoi region had the lowest share (34.2%, 65.8%).

Agricultural products grown in our country are distributed in the form of the share of peasant (personal assistant) farms (65.9%), the share of farms (29.3%), and the share of organizations engaged in agricultural activities (4.8%).

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**Table 3. Cultivated in agriculture of the Republic of Uzbekistan dynamics of products, in thousand tons.**

Product type	2000	2005	2010	2015	2020	2021
Cereals and legumes	4 101,4	6 540,9	7 504,3	8 173,5	7 636,0	7 634,6
Potatoes	731,1	924,2	1 694,8	2 586,8	3 143,8	3 285,6
Vegetables - total	2 644,7	3 517,5	6 262,4	9 390,0	10 431,4	10 850,2
Food policy	451,4	615,3	1 182,4	1 853,6	2 134,4	2 285,3
Fruits and berries	790,9	949,3	1 676,3	2 467,9	2 812,6	2 852,6
Grapes	624,2	641,6	979,3	1 518,2	1 606,9	1 695,3
Cattle and poultry for slaughter (live weight)	841,8	1 061,5	1 461,4	2 033,4	2 519,6	2 635,1
Milk	3 632,5	4 554,9	6 169,0	9 027,8	10 976,9	11 274,2
Obtained eggs, mln. piece	1 254,4	1 966,7	3 061,2	5 535,4	7 781,2	7 788,4
Honey, tons	2 685,0	2 115,7	3 171,9	10 157,0	13 357,8	14 066,9
Cocoon, ton	16 479,0	16 211,0	25 151,8	26 293,0	20 941,9	22 769,9

From the data of Table 3 above, it can be seen that the production of agricultural products in our country has had a growing trend over the years.

It expresses the main goals of state regulation of agriculture and state agrarian policy. At the same time, the development of the network depends on the

attention given by the state and the creation of economic and social conditions and legal protection. In order to regulate agriculture by the state, the state conducts agrarian policy for various purposes (Table 4).

**Table 4. State regulation of agriculture of the Republic of Uzbekistan and the main goals of state agrarian policy**

State regulation of agriculture	State agrarian policy
1. Increasing the competitiveness of agricultural products	1. Ensuring the volume of production of property resources to meet the needs of the population for food products. Ensuring the quality of local food products by producers
2. Ensuring the financial stability of agricultural entities at the expense of income growth and credit resources	2. To preserve and increase the use of natural resources used for the production of agricultural products
3. To ensure rapid development of the priority areas of agriculture	3. Formation of an efficient market of agricultural products, raw materials and food products, ensuring the increase in the profitability of agricultural sector entities and the development of this market infrastructure
4. Updating the basic funds of agricultural sector entities, ensuring technical and technological modernization of the sector	4. Creating a favorable investment environment and increasing the volume of investment in agriculture
5. Regulation of foreign trade and anti-monopoly	5. Stimulation of innovative activities of agricultural producers
6. Ensuring sustainable development of agriculture, increasing the employment and living standards of the rural population	6. Staffing of agriculture
7. Provision of consulting services to agricultural producers, stimulation of innovative activities	7. Ensuring the use of land and property complex of agriculture
8. Information provision in the implementation of the state agrarian policy	8. Formation of the information base on the agrarian sector and its continuous maintenance

At the new stage of the economic development of the Republic of Uzbekistan, the comprehensive statistical study of the structural structure of the economy and the directions of changes in it in all sectors is of great importance, and in the conditions of

modernization and diversification of the economy, it is of urgent importance to develop effective ways of structural changes based on statistical methods.

Dynamic analysis of structural indicators is one of the most important means of studying the laws of

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development of economic processes over time. It is known that various statistical methods are used to quantitatively assess the structure and measure the impact of changes in it on economic indicators: summary statistical indicators, grouping of various forms, multidimensional grouping method, factor analysis methods (including index, correlation-regression analysis method, dispersion analysis), zoning and etc.

Usually, the method of variational indicators is used to quantitatively evaluate the difference between the shares that make up the structure, that is, the speed and intensity of structural changes, or the difference between the color of the shares (position according to the serial number) in a statistically generalized way, correlation-regression analysis and especially the index when evaluating the impact of structural

changes on indicators of economic efficiency method is widely used.

### Conclusions and suggestions

The statistical evaluation of the structural changes of two periods in the agricultural economy is carried out on the basis of the following goals: to determine the change of the share of the agricultural sector in one period compared to another period; Quantitative evaluation of the strength and severity of structural shifts. Two groups of indicators are used for statistical evaluation of structural changes that occurred in two or more periods:

1. Indicators based on the difference between the shares representing parts of the same type of the set.

2. Indicators based on the ratio of shares representing one type of parts of the set.

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