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In the Modern Theory of Construction of Econometic Models of Development of Agricultural Production

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ABSTRACT
The theoretical foundations of the mechanisms for building and forecasting an empirical model using systematic analysis and digital technologies have been improved to ensure macroeconomic sustainability of agricultural production development. Effective use of basic production resources, or in general, the level of utilization of existing potential in ensuring macroeconomic sustainability of agricultural production development is assessed.

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Introduction

Strengthening macroeconomic stability and maintaining high economic growth, increasing the competitiveness of the national economy, improving the business environment in the modernization and accelerated development of agriculture are aimed at further development and liberalization of the economy.

Within the framework of large-scale reforms in all spheres in the new Uzbekistan, special attention is paid to the development of agricultural production and ensuring the sustainability of business processes.

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This article is based on the Resolution of the President of the Republic of Uzbekistan No. PQ-4477 of October 4, 2019, Decree No. PF-6159 of February 3, 2021 "On further development of the system of knowledge and innovations in agriculture and modern services", the Agricultural Development of the Republic of Uzbekistan 2020-2030 The strategy for the coming years, as well as to some extent serve to implement the tasks set out in other regulations related to this activity.

As noted by the President, in the field of macroeconomic stability, it is planned to gradually reduce the annual inflation rate from 9% in 2022 to 5% in 2023, as well as reduce the state budget deficit, which should not exceed 3% of GDP from 2023. The transition to a program budgeting system is also planned. The civic budget was adopted, and based on the proposals of the population, 5% of the budget of each district was directed to address pressing issues [13,14]

Research methods

Agriculture is a very complex system [4]. Therefore, there is a need to create business plans for the process of agricultural production through mathematical description, analytical expression of all the connections. We can see the need to develop a business plan and its digitization in the development of agricultural production. By drawing up business plans for agricultural production, we will be able to quantify the laws of development, identify ways of development and forecasting based on the identification of trends in economic performance [9].

To do this, we use the concepts of relative model and modeling. In econometrics, the concept of relative model depends on the resource consumption (x1, x2, ..., xn) of the gross product (U) in the enterprise, and it is written as Y = F (x1, ..., xn). [5] Here (x1, x2, ..., xn) - free variables - are referred to as factors. If the input factors in the relative model are selected in terms of resource consumption, then it represents a production function. But the factors influencing economic growth are not limited to resource consumption. There are sectors of the economy in which the relative model has to be presented with a wide range of factors.

The search for optimal production options in agriculture is usually based on resource supply [6]. The organization of production on the basis of business plans has not been improved to date. This is because we can cite the computational complexity, the cyclical nature of the problems, and so on when applying mathematical programming methods. The improvement here, in our view, should be based on the limited variability in the use of mathematical programming hardware.

Practical recommendations have been developed for the future introduction of the experience of developed countries and opportunities for future development and management of agricultural production on the basis of econometric models [10].

Improving the quantity and quality of production in the development of agriculture can be justified by the urgency of building a mathematical model of business processes, solving problems, meeting the basic needs of society.

The development of agricultural production and the business process have their own laws. These laws distinguish the component of econometric models of development and management of agricultural production from the relative models of economic processes in other sectors and are expressed on the basis of the interaction of economic indicators of agriculture

$$Y = F(X_1, X_2, ..., X_k) \quad (1)$$

where Xi- i-tour is a set of factors.

In order to increase the practical significance of Equation (1) in the modern theory of building econometric models of agricultural production development, it is necessary to form a complete set of X - free variables using a set of Xi factors to ensure a way out of a state of extreme complexity. In this case, the set X is chosen not in the sense of the mathematical intersection of the sets Xi, but in terms of the interdependence of the elements of each set.

$$Y = F(X = \{x_j^{(i)}, j = \overline{1,n}; i \le k\}) \quad (2)$$

Where n is the number of selected factors.

Numerous factors influencing the business process of agricultural production are characterized by the fact that they are more random in nature than in other sectors of the economy. Therefore, Equation (2) is written as follows when expressing stochastic dependencies:

$$Y = F(X) + \varepsilon \quad (3)$$

Here - the empirical model error. In empirical models developed for the production process of agricultural products, one of the main tasks is to determine their structural variables. Although agriculture is a single sector of the economy, it itself is made up of interconnected sectors. The individual characterization of each of the indicators described in it is rare, that is, concepts that are not interrelated are rarely observed. For this reason, resultant quantities are often used in their valuation as well. This poses a sufficient problem in determining the components (variables) of the model. Therefore, in our opinion, it is necessary to form a separate group of factors in the construction of macroeconomic models [9].

At present, it is expedient to study the laws of future development of agriculture with a new approach and multivariate modeling methods.

In our opinion, in econometric modeling of development and management of agricultural production it is necessary to distinguish the main issues of the process on the basis of a systematic approach and generalize the resulting components. At present, we combine the problems that arise to complex the modeling area into four main objectives. At the same time, as organizers, we distinguish the issues of optimization, determination of production potential, ensuring the stability of the production system and multifactor econometric modeling [10].

There are different interpretations of the concept of optimization in the development and management of agricultural production, and in this study we used ICT as a decisive apparatus for three situations [12].

In case 1, the concept of optimization characterizes the planning of the activities of the smallest unit in the production of agricultural products, ie the producer entity (in our case the farm is selected) aimed at maximizing the benefits of production depending on production resources.

In case 2, it is reflected in the indicators that are assessed by assessing the level of efficient use of basic production resources at the regional level, or more generally, the level of utilization of existing potential.

In case 3, agricultural products had a special meaning in the comparison of econometric models of development and management of production.

One of the most important issues in the study of the process of agricultural production today is the systematic approach [11]. The importance of a systematic approach is that when a systematic analysis of the existing problems and their causes, it is not enough to observe a particular economic process in the network to make a final decision. For example, the agricultural sector uses the production function in national research. At the same time, they are limited to obtaining preliminary conclusions from the production function in the form of Cobb-Douglas on the basis of a model built on labor and capital expenditures. In calculating forecast indicators, although only models using capital and labor resources have high adequacy, it is not possible to conclude that the results obtained are of high accuracy. In modern modeling, the Cobb-Douglas production function has taken the form of linking the growth trend of technical production over time with technical processes, which is determined by the efficiency of organization and management of production.

One of the most important tasks in the development of agricultural production is to increase the efficiency of the use of existing potential. But the key issue here is to express the production potential in a single model and determine the efficiency of potential use through it. The process becomes more complicated if the issue is seen on an entire regional scale. Also, the choice of arbitrary variables of the model, i.e., the identification of potential components, poses sufficient problems. In other words, it is possible to develop a model that describes the laws of agriculture, and that the model must include such free variables that these variables represent the value of the individual factors that play a key role in the production process.

We selected the main production resources and, taking into account the possibility of increasing their costs, developed an overview of the kinetic production function, as well as built specific models of this function for the Kashkadarya region. We also found that the Cobb-Douglas-type production function can only be used without any cost increase.

The general view of the kinetic production function for the agricultural production we propose is as follows

$$Y_k = \frac{A_k \cdot Y}{a_0} = A_k \cdot \prod_{j=1}^{n} x_j^{\alpha_j} \cdot e^{a_j x_j} \qquad (4)$$

is represented by equality. In accordance with (4), we used the following model to assess the effectiveness of the use of existing potential in the production of agricultural products in the private sector

$$Y_k = \frac{A_k \cdot Y}{a_0} = A_k \cdot \prod_{j=1}^{4} x_j^{\alpha_j} \cdot e^{a_j x_j} \qquad (5)$$

Here Y is determined from the following equation

$$\ln(Y) = \ln(a_0) + \sum_{j=1}^{4} a_j x_j + \sum_{j=1}^{4} \alpha_j \ln(x_j) \quad , (6)$$

as well as x1 - area of agricultural land (thousand hectares); x2 - average number of employees; x3 is the annual average value of fixed assets; x4 - the amount of working capital (billion soums); Y - gross agricultural output (billion soums).

In model (5) - the elasticity of the j-free variable (), - the coefficient (), - the proportionality coefficient, which represents the change (increase or decrease) of the resulting magnitude relative to the amount of this factor for a 1 percent change (increase) of the j-factor. The proportionality coefficient has no meaning (does not participate) in the basic model.

Given the structural structure of the linear equation (6), the xj resource in its composition comes with its logarithmic value. In practice, if a state of disparity is observed in any of the production resources, in model (6) this resource comes with its logarithmic value. In this case, it is necessary to reduce or increase resource consumption. This can be expressed in the following relationship

$$c = \alpha_j + a_j x_j, \; j = 1,2,...,4. \quad (7)$$

If, in (7), it is not equal to zero, the optimal state of the amount of j-resource sufficient for the growth of production volume (Y) is determined by the ratio.

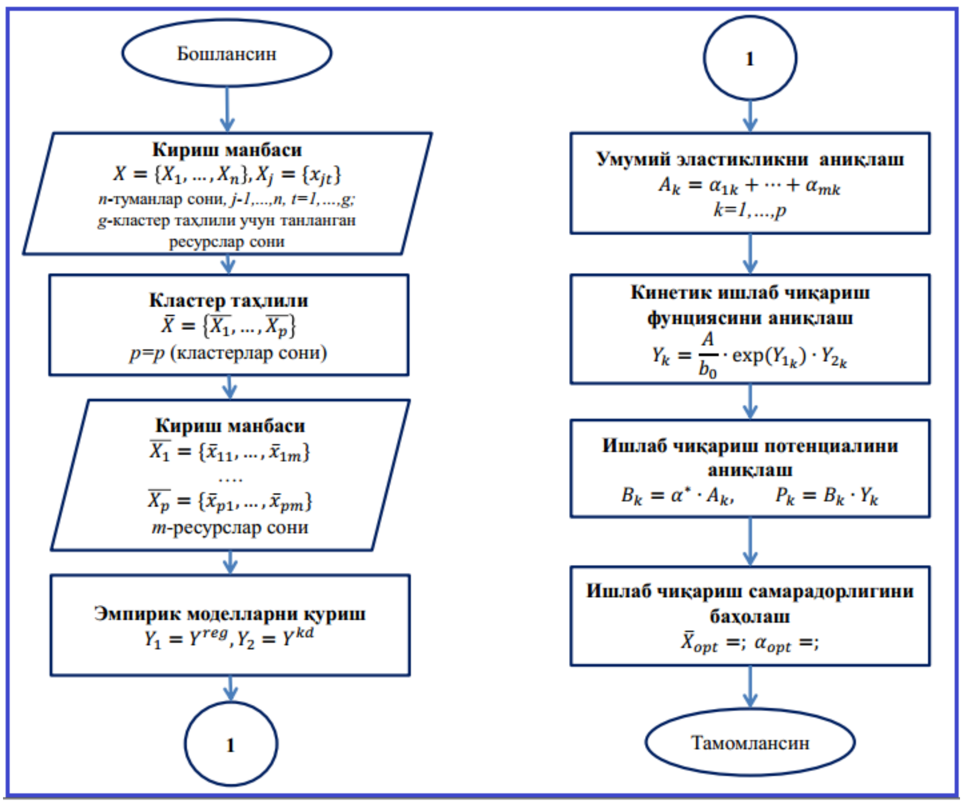

Figure 2. Algorithm block diagram to solve the problem of assessing the efficiency of agricultural production potential

If the product in (7) is zero, a 1 percent increase in the j-resource indicates a direct percentage increase in Y (which should always be positive).

If it is zero, then a 1 percent increase in j-resource means a direct percentage increase (or decrease) in Y. More precisely, if a negative is found, the increase in the amount of resource is accompanied by a decrease in the efficiency of its use (resource use efficiency is moderately low), a 1% increase in j-resource represents a direct percentage decrease in Y. Also, in the model (5), each resource is involved.

Thus, we can describe an algorithm for solving the problem of assessing the level of efficient use of agricultural production potential (Figure 2). The given algorithm is of linear type, which makes it more understandable. While certain conditions and iterations are observed in the problem-solving process, this is not particularly important because it is a small process performed within each algorithm step. This means that the modeling process is based on a linear algorithm.

References and resources used

1. N. F. Korsun, A. S. Markov, M. M. Kondrovskaya.Modelirovanie i optimization in agropromyshlennom complex. Uchebno- metodicheskoe posobie. Minsk: BGATU, 2019. - 252 p.
2. Cobb, G.W. A theory of production /G.W. Cobb, P.H.Douglas // Amer. Econ. Rev., 1928, March, Supp.1., P.139– 165.
3. Alimov R.X., Boltaeva L.R., Ishnazarov A.I. Econometrics-2. Study guide. Iqtisodiyot Publishing House. – T .: TSU, 2012. –115 p. (P. 85)
4. Mukhitdinov Kh. S, Juraev F.D.Methods of Macroeconomic Modeling. International Journal of Trend in Scientific Research and Development (IJTSRD) Special Issue on International Research Development and Scientific Excellence in Academic Life Available Online: www.ijtsrd.com e-ISSN: 2456 - 6470
5. Mukhitdinov Kh. S., Rakhimov A.N. EMPIRICAL MODELS WHICH WERE BUILT FOR EACH SECTOR OF THE SERVICE SECTOR TO THE POPULATION OF THE REGION.South Asian Journal of Marketing & Management Research (SAJMMR) https://saarj.com
6. Mukhitdinov Kh. S., Axmedova B.A. ECONOMETRIC MODELING AND FORECASTING OF EDUCATIONAL SERVICES TO THE POPULATION OF THE REGION. International Journal for Innovative Engineering and Management Research.Vol 10 Issue01, Jan2021 ISSN 2456 - 5083 www.ijiemr.org

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