

## SYSTEM OF INDICATORS FOR ASSESSING THE ECONOMIC EFFICIENCY OF AGRICULTURAL PRODUCTION

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*Abstract: This article explores the theoretical and methodological foundations for assessing the economic efficiency of agricultural production. The necessity of developing a comprehensive system of indicators that objectively evaluate production efficiency is substantiated. The study analyzes both specific and generalized indicators that reflect the interrelated aspects of resource utilization, including land, labor, material resources, and fixed assets. The criteria and key indicators for evaluating the efficiency of these resource groups are identified. Furthermore, existing challenges in resource provision within agriculture, their impact on production outcomes, and causes of declining efficiency are revealed. Based on the analysis, scientific conclusions and practical recommendations are proposed to enhance agricultural economic efficiency through rational and efficient resource management and ensuring proportionality in the production process.*

*Keywords: agriculture, economic efficiency, production efficiency, land resources, labor resources, material resources, fixed assets, resource conservation, labor productivity, capital productivity.*

### Introduction

It is impossible to continuously increase production efficiency in agriculture under conditions of intensification without objectively assessing the various economic and production processes taking place. Conducting such an assessment solely based on a single criterion of economic efficiency is insufficient. This is because the factors affecting the production process are diverse and require a comprehensive system of indicators that can fully reflect them. A system of indicators allows for a thorough analysis of production activities and enables the formulation of reliable conclusions regarding the main directions for improving the economic efficiency of agricultural production.

Using an indicator system makes it possible to identify key (generalized) and auxiliary (specific) criteria, as well as to provide both a qualitative and quantitative description of economic processes related to production efficiency.

In economic literature, there are different approaches to the issue of whether economic efficiency should be assessed based on a single criterion or multiple criteria. Advocates of a single criterion argue that it can be applied at all levels of management. Other economists consider it appropriate to use different criteria depending on the level of economic management. At the same time, the widely accepted general criterion for the efficiency of resource use is the principle of maximizing production results with minimal resource expenditure. This does not negate the existence of a single criterion that comprehensively evaluates economic

processes but emphasizes the need to supplement it with other indicators that quantitatively reflect various aspects.

It is essential to clearly distinguish between criteria and indicators of production efficiency. A criterion represents the main economic characteristic that reflects the essence of production efficiency, thereby expressing its qualitative content. Indicators, on the other hand, represent the manifestation of this essence and serve as an external measure of the criteria, providing the means to analyze the economy - and specifically the expanded reproduction process—both qualitatively and quantitatively.

Effective utilization of land, labor, energy, material, financial, and bioclimatic resources in the reproductive process of agriculture plays a decisive role in increasing production performance. Therefore, it is appropriate to categorize resources for evaluating the economic efficiency of agricultural production as follows:

- Land resources allocated for agricultural use;
- Labor resources, expressed through the average number of workers, working hours, and wage payments;
- Fixed assets, described by their average annual value and depreciation allowances;
- Circulating assets and material resources, expressed through their average annual value, inventory volumes, and production costs.

It is not advisable to separate financial resources as a distinct category of production resources, as they primarily ensure the movement of material resources and the continuity of the production process [3]. Financial resources are mainly reflected in expenditures related to purchasing seeds, fertilizers, feed, and other material inputs. At the same time, in the process of expanding production, the use of both own and borrowed funds becomes important. In such conditions, it is necessary to evaluate the profitability of financial investments and determine the most efficient directions for their allocation. In particular, directing financial resources toward purchasing high-quality seeds, additional fertilizers, high-yield machinery, and other fixed assets is considered economically efficient.

Using a systematic approach, indicators of economic efficiency can be formed as an interconnected set of elements. This system includes specific efficiency indicators reflecting certain aspects of the production process, the efficiency of utilizing particular types of resources (land productivity, labor productivity, value of fixed assets per hectare), as well as generalized indicators of overall economic efficiency.

Based on these approaches, a comprehensive system of indicators for assessing the economic efficiency of agricultural production has been developed. The proposed system of agricultural production efficiency indicators allows for a detailed analysis of the role of each key production resource and its contribution to improving production efficiency (Table 1).

**Table 1**  
**System of Indicators for Assessing Agricultural Production Efficiency<sup>1</sup>**

Indicator Group	Land Resources	Labor Resources	Material Resources	Fixed Assets
<b>Resource Availability</b>	1. Land structure 2. Dynamics of land area	1. Staff composition 2. Dynamics of labor resources	1. Structure of material resources 2. Dynamics of material resources volume	1. Structure of fixed assets 2. Dynamics of fixed assets value
<b>Degree of Utilization in Production</b>	1. Land use coefficient 2. Land productivity (yield)	1. Employment level 2. Land area per worker 3. Labor costs per 1 ton of main products	1. Level of material resource provision 2. Consumption norms by resource type	1. Level of fixed asset provision 2. Fixed asset utilization coefficient
<b>Indicators Related to Output Volume</b>	Gross output volume (by main product types, at current prices)	Gross output per worker	Gross output volume (by main product types, at current prices), working capital	Gross output volume (by main product types, at current prices), fixed assets value
<b>Profitability and Financial Results</b>	Profit per land plot	Net profit per worker	Profit per 1 unit of material costs	Profit per 1 unit of fixed assets
<b>Main Efficiency Criterion</b>	Increase in gross output volume	Increase in labor productivity	Reduction in material intensity (resource efficiency)	Increase in fixed asset profitability (reduction in capital intensity)

**Indicators of production efficiency can be expressed in two interrelated components.** The first component includes **specific efficiency indicators** that reflect individual aspects of the production process as well as the degree of use of particular types of resources. The second component consists of **generalized indicators** that describe the overall efficiency of specific types of resources, which are directly influenced by the specific indicators. Such a classification of performance indicators allows for **scientifically grounded grouping of indicators** and enables their rational use in evaluating the overall efficiency of an enterprise's activities, as well as the effectiveness of resource utilization.

When assessing the efficiency of land use (including arable land intended for agriculture), the **increase in gross output** is considered the main criterion. Indicators for evaluating land use include the **volume of gross output**, the main

<sup>1</sup> Developed by the authors

types of products per unit of land (for example, milk and meat per 100 hectares of agricultural land, or grain per 100 hectares of arable land), as well as **crop yields and livestock productivity**. Yield is significant as an economic indicator because it fully reflects the level and efficiency of land use, and changes in yield directly affect the values of other economic indicators.

When assessing the efficiency of labor resources, the **main criterion is the increase in labor productivity**. This is measured by the gross output per average annual worker, both in physical and value terms, as well as the labor costs incurred in production (labor intensity). Additional indicators include the **employment level of labor resources** (average annual number of working days, working hours per worker) and the **average agricultural land area per worker**.

When assessing the efficiency of material resources, indicators that describe their **return on use** are important. These include the **gross output per 100 units of material costs** (material consumption) and the **material costs per 100 units of gross output** (material intensity). These indicators are inversely related and serve as the main criteria for evaluating the efficiency of material resource utilization.

When assessing the efficiency of fixed assets, the **increase in capital productivity** or the **reduction in capital intensity** is the main criterion. Indicators of fixed asset efficiency include gross output, gross and net income, and **profit from product sales per 100 units of fixed assets**.

Analyses indicate that over the past decades, the main resources of agricultural production have been decreasing, which negatively affects the production process. In particular, the **reduction in land resources** has led to a decline in production intensity and a consequent decrease in agricultural output. One of the main reasons for the decline in crop yields is the insufficient use of **mineral and organic fertilizers**.

The efficiency of land use is closely related to the level of **fuel and energy resources** utilization. A decrease in the consumption of these resources, as well as issues in the use of labor resources, has led to a decline in agricultural production. In recent years, **labor potential in agriculture has decreased by approximately 21%**. Insufficient use of energy resources has caused a decline in labor productivity. Despite an increase in land availability, the low level of energy provision and reduced employment in primary production have intensified this negative trend.

In the reproductive process of agriculture, **material resources** (seeds, feed, fertilizers, fuel and lubricants, electricity, spare parts, construction materials, etc.) play an important role. Their share in production costs is 66–68%, and in recent years, rising purchase prices have further increased this share. This directly affects **product costs and production efficiency**. Insufficient use of certain resources

(mineral fertilizers, plant and animal protection products, electricity, machinery spare parts, etc.) leads to below-norm returns on costs.

Inefficient use of material resources slows the **growth of agricultural and livestock products**, reduces labor productivity, and prevents the **return on expenses**, leading to low efficiency and, in some cases, loss of profitability.

Experience from agricultural enterprises shows that the efficiency of material resources can be improved through the following measures:

- Implementing **resource-saving technologies** to reduce the specific consumption of fuel and lubricants, seeds, fertilizers, and electricity;
- Directing **material resources to the most economically efficient priority areas**;
- Ensuring **optimal ratios in resource utilization**.

The efficiency of material and labor resource utilization is directly related to the **availability of production capital**, the **capital-labor ratio**, and the proportionality between **fixed assets and working capital**. In recent years, the provision of agricultural equipment and machinery has remained relatively stable, with the value of fixed assets per hectare almost unchanged. However, the reduction in agricultural labor has led to a significant increase in the **capital-labor ratio**.

### Conclusion and recommendations.

Analysis shows that imbalances in the provision of fixed assets and material resources lead to a **decline in their utilization efficiency**. All types of resources determine agricultural production costs and directly affect productivity indicators. Therefore, **optimizing resource use and ensuring balance among them** is one of the main directions for improving agricultural production efficiency.

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