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Efficiency of Agricultural Resources and Methods of its Evaluation

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Abstract: The purpose of this article is to develop scientific proposals aimed at improving the effective use of economic resources and the mechanism of economy. It analyzes theoretical views on the economic essence of thrift, identifies the role, necessity, and principles of thrift in the national economy, and studies methods and criteria for assessing the level of thrifty use of agricultural resources.

Key words: thrift, modernization, workforce resources, law of saving time, agriculture, efficiency, scientific and technical progress, level of economy.

INTRODUCTION.

One of the key factors for increasing the efficiency of economic management in the current conditions is thriftiness. To ensure rapid rates of economic growth, the resolution of pressing issues such as the modernization of the material and technical foundations of social production and the effective employment of labor resources largely requires adherence to the principles of thriftiness.

It is well known that our republic possesses significant economic potential. During the early years of the transition period, the export of raw materials and natural resources was a major direction of economic development. However, this has led to increased dependence of our economy on fluctuations in the global market and has resulted in the outflow of many valuable resources.

Although the category of thriftiness is theoretically recognized, its mechanism of implementation has not been thoroughly studied. The lack of a well-founded scientific-theoretical concept has hindered the effective resolution of this issue.

Research shows that in some developed countries, along with the "law of time saving," the term "law of thriftiness" is also used. According to this concept, the law of thriftiness is currently more important and relevant than the law of time saving. Since the dawn of humanity, the law of time saving has been adhered to in economic practices to varying degrees, driven by competition, supply and demand, and the pursuit of profit. However, since the law of thriftiness did not pose

immediate threats, obstacles, or problems for humanity, it was not recognized in a timely manner. Today, however, the consequences of violating this law have become apparent to everyone.

The point is that while the violation of the law of time saving may affect the activities of certain economic entities—resulting in their inability to withstand competition and eventual collapse—the consequences of violating the law of thriftiness have a destabilizing effect not only on individual entities but on all of humanity and the global economy as a whole. In other words, failure to recognize the law of thriftiness leads to the disruption of balance and proportionality in both the economy and the environment. Therefore, this law is of universal importance. In the context of ongoing globalization, it is inevitable that countries will have to come closer together and jointly address the issues related to thriftiness. These problems cannot be solved at the level of individual countries alone—they must be addressed globally.

Hence, the scientific-theoretical and practical study of the category of thriftiness is both highly relevant and critically important.

METHODOLOGY.

As research methods, the dialectical method of cognition, scientific observation, logical and comparative analysis, induction and deduction, monographic observation, social surveys, mathematical and statistical grouping, and graphical methods were used.

DISCUSSION AND RESULTS.

Certain aspects of thriftiness and how to achieve it have been highlighted in the theories of international division of labor by prominent figures in global economic science such as A. Smith and D. Ricardo.

Under the conditions of a planned economic system, the issues related to the use of material resources were studied by scholars such as V. Semyonov, A. Nevelev, V. Sirenko, and V. Gab. In their research, they placed significant emphasis on the role of thriftiness in reducing production costs.

The organizational aspects of establishing a system of thriftiness at the state level were examined by V. Yefimov. The issues of labor-saving were addressed by a group of authors led by V. Andrienko. The law of time saving was studied by A. Goryunov, while the impact of cost standards on thriftiness was explored by V. Stepanov, A. Meshkov, and other scholars. However, their developed methods and recommendations for increasing the level of thriftiness cannot be considered comprehensive. This is because most of these studies were conducted under the conditions of the former planned economic system, where the solution to the problem was approached from a class-based perspective, with efforts to theoretically justify the planned economy as the most optimal system. These theories did not pay due attention to the scarcity of resources, and instead presented social ownership as the economic basis for thriftiness.

Moreover, in these theories and recommendations, there were no well-founded proposals or considerations regarding the improvement of efficiency in the economy of our republic—particularly in agriculture—which supplied the Union with raw materials and inexpensive resources. In addition, most of the studies carried out on this issue focused mainly on general theoretical matters, while practical aspects of thriftiness received minimal attention.

Thus, the insufficient theoretical investigation of this economic category in scientific literature, the necessity for its further deepening, and its practical significance all contribute to the increased relevance of this research.

When assessing the level of efficient use of resources, it is first and foremost advisable to define the principles by which it operates. This is because the multifaceted nature and varying interpretations of the concept of efficiency require a broader understanding of its functioning.

Accordingly, when defining these principles, efficiency is approached as a general economic process within society.

1. **Efficiency must be based on economic benefit.** Efficiency is a form of human behavior aimed at achieving a specific goal, and at its core lies the concept of benefit. Initially, efficiency manifests as the reflection of an individual's personal interest and appears at varying levels within different economic units (families, enterprises, sectors, society). For example, personal efficiency is linked to the highest level of benefit for the individual. In families, although the interest is group-based due to kinship ties, it may not always be equally beneficial for every member. At the enterprise and sector level, this benefit appears even weaker. Achieving efficiency at the societal level requires harmonizing diverse interests.

Nowadays, to promote efficiency in the use of various resources at the societal level, various campaigns and advocacy efforts are being implemented. For instance, public awareness regarding saving drinking water, natural gas, and electricity used to rely on visual materials and media advertisements. However, the effectiveness of these methods was limited. In recent years, the installation of metering devices has immediately instilled a sense of accountability. Therefore, ensuring efficiency at any level requires aligning it with mutual benefits and striving for that alignment.

2. **Efficiency must not negatively affect product quality.** Efficiency must be within specific limits and norms. Above all, it should not harm the quality of the product being created, the work being performed, or the level of technological readiness.
3. **Efficiency must be purposefully directed.** Efficiency is not a static or unchangeable process or behavior. It can be created where it previously did not exist, expanded in limited areas, and directed towards purposeful goals. For instance, to enhance the sense of efficiency among members of society, various influencing tools and measures can be utilized.
4. **Methods and tools for fostering efficiency must be diverse.** Various tools and methods must be used to develop and instill efficiency in individuals and socio-economic units (families, labor collectives, etc.). In general, we can distinguish between economic and non-economic methods of fostering efficiency.

Economic methods involve material and non-material incentives and the harmonization of efficiency through different economic mechanisms.

Non-economic methods include various educational tools—parental guidance, preschool and school education, religious teachings, personal example, explanation, advocacy, and propaganda.

5. **Efficiency must be connected with scientific and technological progress.** The finite nature of human life encourages people to gain the maximum satisfaction within the time given. Efficiency must naturally align with scientific and technological progress (STP). Often, innovations and inventions arise during the pursuit of production or labor efficiency. For example, the invention of a remote control was driven by the need to save the time spent walking to the television. Likewise, elevators were invented to save energy, time, and health for residents of multi-story buildings.

In turn, inventions and conveniences born from scientific and technological progress further enhance and promote efficiency. For example, elevators have enabled the construction of not only 5–6-story buildings but also buildings with 30–40 or more floors. Thus, the pursuit of efficiency drives the advancement of STP, opening new avenues and forming a cyclical, interlinked process.

Based on these principles, we now consider quantitative assessments of resource efficiency within the study object. In the analysis of resource efficiency in agriculture, evaluating the use of land and water resources plays a significant role. First, it is essential to examine changes in the

structural composition of available land in a specific region. Furthermore, it is also important to study the inclusion of unproductive lands into economic circulation through additional cultivation.

To assess land resources, data from the State Land Cadastre is used. These data are categorized by farm, district, and region according to land condition. Land is economically evaluated using a point system, where the most fertile land is rated at 100 points. Lands with lower productivity are rated accordingly lower. The implementation status of land and water conservation measures is also used to evaluate the efficiency of resource use in a given region.

It is important to note that calculating water resources currently presents several challenges. Until recently, water use was free in many regions. Annually, nearly 150 km³ of water is used for crop production. One of the most challenging aspects of evaluating water usage is determining its price. Analyzing the key performance indicators of water user associations is also crucial for assessing the efficiency of water resource utilization.

Furthermore, achieving production efficiency also requires the efficient use of material resources, especially production means. During the analysis period, changes in the composition of fixed production assets in enterprises are examined.

The types of production means required for efficient organization of production are determined based on scientifically established norms. In Uzbekistan, such norms were last developed in 1996 as a guideline titled *"Norms of Labor and Material Resources Required for Agricultural Production"*, approved by the Cabinet of Ministers.

However, the number of available machines does not necessarily indicate their working condition. Therefore, it is necessary to separately assess their operational readiness.

Calculating conditional savings (T_f) from fixed production assets is an essential part of efficiency assessment. It results from improved utilization and productivity of fixed assets due to organizational and technical measures, and is calculated using the formula:

$$\mathbf{T_f = F_o * I_{YaM} - F_j}$$

Where:

- ✓ F_o - is the annual value of fixed assets in the previous period
- ✓ I_{YaM} - is the gross product volume growth index
- ✓ F_j - is the annual value of fixed assets in the current period

Alongside fixed assets, the efficient use of material resources (seeds, fuel and lubricants, mineral and organic fertilizers, chemicals, etc.) plays a critical role in achieving agricultural efficiency. To do this, indicators such as material cost savings (T_{msp}) and total material savings (T_m) are used:

$$\mathbf{T_{msp} = (M_1 - M_2) * H * MM}$$

Where:

- ➢ M_1 - material consumption per unit of product in the previous period (or before efficiency measures)
- ➢ M_2 - material consumption per unit of product in the current period (or after efficiency measures)
- ➢ H - unit price of the material resource
- ➢ MM - total product volume in the given period

Additionally, examining the impact of material resource use on the financial results of major product types provides insights into efficiency. In particular, evaluating the conformity of material consumption to scientific norms by product type is crucial.

The next step in evaluating production efficiency is assessing the adequacy of labor resources in the sector. The conformity of the available labor force to the number of workers required for reproduction based on established norms is a clear indicator of efficiency.

Accurate determination of the number of workers needed is especially important. Past experience under administrative-command systems shows that unclear job requirements and qualifications resulted in surplus labor and hidden unemployment.

Thus, it is necessary to assess compliance with labor norms over the years using the 1996 guideline on labor and material norms. This guideline specifies labor usage norms for:

- ✓ Labor per hectare and per quintal of produce
- ✓ Labor for livestock with varying productivity
- ✓ Maximum number of workers per hectare of irrigated land by district and region

While quantitative compliance is important, today qualitative aspects—such as worker qualifications and specialization—are increasingly vital. Inappropriate use of labor based on qualification and specialization undermines efficiency principles...

After analyzing the quantitative and qualitative composition of the labor force and assessing their level of adequacy, the main focus shifts to studying the degree of utilization of the employees' working time fund. This is because ensuring the labor force in terms of quantity and quality does not necessarily mean that it is being used efficiently.

When calculating the annual working time of able-bodied employees, it is necessary to take into account the specific characteristics of the production process.

The peculiarities of the sector must also be considered when using labor resources. In particular, the lifestyle of the rural population, their worldview shaped over many years, the mentality of our people, and other socio-psychological and economic factors contribute to the low mobility of the labor force in this sector. This, in turn, hinders the reduction of surplus labor in the sector.

In general, the level of efficiency is a relative indicator, determined by comparing the results achieved in the current period with those of the previous one.

Coefficients used in assessing the level of efficiency in agricultural production

Name of the coefficient	Method of determination	Conventional symbols
Readiness Coefficient of Technical Equipment (K_T)	$K_T = \frac{M_T}{M_Ж}$	M_T – Ready-to-Work Machines; $M_Ж$ – Total Available Machines.
Tractor Fleet Utilization Coefficient ($K_Ф$)	$K_Ф = \frac{M_И}{M_Ж}$	$M_И$ – Total number of machines that participated in work on average per year; $M_Ж$ – Total number of available machines on average per year
Coefficient of Workforce Provision in Production		$ИС_x$ – The number of workers actually engaged in production; $ИС_{к.х.}$ – The number of workers required for production

(Кн.к.)	$К_{н.к.} = \frac{ИС_х}{ИС_{к.х.}}$	
Coefficient of Workforce Specialization Matching (Кн)	$К_н = 1 - \frac{\sum_{i=1}^{n}(ИС_i - ИС_{мі})}{\sum_{i=1}^{n} ИС_i}$	$ИС_{мі}$ – The number of workers available in a specific i-specialization (profession); $ИС_i$ – The required number of workers in i-specialization (profession); n – The number of existing i-specializations (professions)
Coefficient of Utilization of Employees' Working Time Fund (КИВФ)	$К_{ИВФ} = \frac{ИВФ_с}{ИВФ}$	$ИВФ_с$ – The annual work time fund spent by employees; $ИВФ$ – The work time fund that can be utilized during the year
Coefficient of Reduction of Excess Labor Force (КОИК)	$К_{ОИК} = \frac{КИК}{ЖОИК}$	$КИК$ – The number of reduced workforce in the current period; $ЖОИК$ – The total number of excess workforce available
Coefficient of the Rate of Creation of New Jobs in Rural Areas (КЯИУ)	$К_{ЯИУ} = \frac{ЯИУ}{МИУ}$	$ЯИУ$ – The number of new jobs created in the current period; $МИУ$ – The total number of available jobs

However, when assessing the level of resource efficiency, the following characteristics of using these coefficients should also be taken into account:

- These coefficients cannot fully reflect the efficiency of using economic resources directly;
- The need for additional analytical processes when using these coefficients;
- Based on the goals and directions of efficiency analysis, the possibility of developing and using additional coefficients, and so on.

CONCLUSION.

- It is appropriate to study the concepts and approaches to efficiency in a historical context, organizing them into the following system: the moral education element and human qualities; factors driving economic activity development; results of labor division, specialization, and exchange; the international competitiveness factor; the basic principles specific to a planned economy, etc.;
- Efficiency is the ensuring of the rational use of various economic resources and goods according to specific standards to achieve the highest benefit and well-being at all stages and levels of social and economic development;
- When revealing the essence of efficiency, approaches can be made from the perspective of the individual, the business entity, and at the societal level;
- When evaluating the degree of resource-saving efficiency, it is appropriate to define the following principles: the economic interest basis of any efficiency; the absence of a negative impact on product quality in achieving efficiency; the possibility of directing efficiency

towards specific goals; the diversity of methods and tools for shaping the efficiency contribution; the relationship of efficiency with scientific and technical progress.

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