NEW APPROACHES ON THE DEVELOPMENT OF THE METHODOLOGY OF THE INTEGRAL INDICATOR FOR ESTIMATION OF THE RESOURCES POTENTIAL AND THEIR RANGE IN AGRICULTURAL ENTITIES

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Abstract

Through organization scientific production and work aims the growth the use of resources. The degree of mobilization of the resource potential, what characterized intensity use their is expressed by two indicators: intensity consuming (spending) the resource potential and efficiency (result) using resource potential. Addressing theoretical and methodological issues evaluation potential units agriculture, which is being discussed in the literature economic agrarian, allows shooting conclusion that the production potential of the units agriculture is a category economic through which it expresses itself characteristic production systematic forces as sets of different combinations of productive resources: land, capital (in form fixed and assets) and labor resources. Evaluation resource potential is performed complicated in the goal determination opportunities potential of the entities in the production agricultural, information obtained. It is used in the development business plans and the development of the enterprise. The authors investigated composition potential resources, which have a share essential in the production potential and are of great importance in the indicators- the result, which is determined through the report from results obtained (output, income, profit) and efforts (or resources used). The authors have developed methodology determination the full potential of resources and return it expressed value, and estimate with their help indices statistics .

Key words: resource potential, resources yield potential, agricultural land, statistical indices

INTRODUCTION

The change in the dynamics of the provision of resources: land, labor, fixed assets and current assets under market economy conditions are different in each agricultural entity, have different production directions and different branches of development [4]. In the current period, the size of production potential in agricultural units in the Republic of Moldova depends to a great extent on the influence of different trends in the change of production resources: first, the reduction of labor resources and agricultural land, secondly, the quantitative and qualitative changes of fixed assets, current assets, and so on.

The notion of resource potential means all the volumes of all resources (natural resource, labor resource, material resource, intellectual resource, informational resource etc.) by separate entities, by groups, territories, branches. In this context, there is a wide range of opinions.

Thus, in the opinion of [2, 3, 7, 8,], "the production resources are represented by the natural, material, financial and human potential of an agricultural unit which, in the context created by the social environment, are attracted and used in the production of agricultural products". [2, 3, 8, 7].

Zahiu Letitia believes that the resource potential of an agricultural enterprise is usually higher than the resources utilized. [11].

The economic resources attracted to the economic circuit, moving as streams, are factors of production. JB Say, a representative of the Classical School, underlined in his paper "The Treaty of Political Economy," that three factors are involved in the production of goods: labor, nature (land) and capital. The

first two factors - labor and nature - are primary or originating factors, as they are the starting point for economic activity. The other factor, capital is the derived factor, resulting from the interaction of premiums.

In the opinion of the authors [1, 3, 10]: "the factors of production are the total of the material and human resources attracted and used in the economic activity, ie the" , the potential of economic resources attracted in the economic circuit ". [1, 10]. Or "production factors represent an active potential of resources attracted in the economic circuit" . [1].

The basis for the estimation and analysis of the factors of production "is the economic resources, the total of the means available and likely to be capitalized for the production of economic goods and services" . In the process of using economic resources (material, financial and labor) it is necessary to consider such features of resources as the property of replacing one another and complementing one another. However, they are resources that are interrelated between them that a resource cannot be used without another (for example, the technique and the fuel).

For resources that are replacing one another there are some ways to use them. For example, one resource can be replaced by another to get it the same purpose (labor and technical resources), or there are different variants and consecutives of their use (in this case it is found in the optimal choice).

Between different resources there is a link of dependence, of mutual conditioning. Knowing these dependencies is of great importance for the economic activity as they are resources that have a particular influence on growth and economic development and the use of other resources. [8].

MATERIALS AND METHODS

Researches in the field of the methodology of the full indicator for estimating the resource potential and its efficiency are carried out with the following methods: the monographic method, the statistical index method, the comparison method, and so on. Practical investigations were conducted on the basis of the data of the agricultural entities. New methodologies are proposed to estimate the full potential of resources and their efficiency.

RESULTS AND DISCUSSIONS

The issue of increasing the yield of using agricultural production resources is very important. To solve it successfully depends directly the economic security of the country and its constant supply with agricultural products.

The increase in the volume of crop and livestock production due to the introduction of new production resources is limited. Thus, agricultural land, which is the main means of production in agriculture, as we know, is limited in space. Due to the improvement measures and other landscaping, the real possibilities of enlarging the agricultural land surfaces due to the inclusion in the intensive circulation of the new land are decreasing each year.

Regarding labor resources in agriculture, their staff gradually decreases. Although national measures for village rehabilitation have taken place in recent years, the migration of the rural population to the city and beyond the country continues and there are no conditions for stopping it in the near future. The real possibilities for increasing the resources of the branches are limited, first, due to the insufficiency of the means that can be allocated for the extended reproduction of fixed and current assets.

Besides the tasks that stand up in front of you society about the need to make agriculture more efficient, there are also other economic, social and political problems, the realization of which requires large expenditures and means. First of all, the manufacturing forces of the industrial branch, which produce means and objects of work for agriculture, have their restrictions. The pace of widening the reproduction of fixed assets and current assets for agricultural purposes is limited by the biological laws governing the process of plant and animal propagation. The latter circumstance entails considerable

limitations, especially with regard to the growth rate of animals.

Secondly, increasing agricultural production due to increased production volume is not the best way to make production more efficient. Thus, the increase in livestock production based on the increase in the number of cattle and poultry necessitates an increase in the number of rooms and the consumption of more fodder.

All the circumstances outlined above make it necessary to recover the already existing agricultural production potential, as well as the increase of the one aimed at attracting capital investments and material resources. This task can only be successfully resolved by using a whole set of factors and mobilizing all existing reserves.

Making a totalizing of the opinions of scientific treatment and practical problem of assessing the full potential of resources, we believe that the value method, one based on the calculation of statistical indicators and methods of economic-mathematical, which allow to determine the exact weight of each resource in the production of production are original, but we would like to we present our own vision, taking into account that partial resources are estimated in different units of measure (agricultural land - in hectares, fixed assets and current assets - in monetary units and labor resources in natural indicators (persons)), for comparability (the surface of the agricultural land and labor) is necessary for their appreciation in terms of value.

For the value estimation of the full potential of resources, it was developed and proposed to apply in the agricultural units the following methodology expressed by the relation [9].

$$V \cdot P \cdot R = S_{a.v.} + MF + FR + Cm$$

$$or \ V \cdot P \cdot R = \frac{S_i t.a._c \cdot B_i \cdot \overline{P}}{\overline{B}} + MF + FR + Cm$$

where:

$V \cdot P \cdot R$ =the full potential resource potential, thousands lei

S_{av} - value of agricultural land, thousand lei / grade-ha

MF - the value of the means of production, MDL thousand

FR - the remuneration fund (the value-equivalent of the labor potential), thousands lei

cm – direct costs of materials **,** thousands lei

We consider, when estimating the value of agricultural land, it is necessary to consider quantifying their productive capacity through land retention.

According to the Law on the normative price and the way of sale-purchase of land no. 147-149 of 2001 [Law, 2001], in Moldova the value of the agricultural land was estimated at the normative price of 289.53 lei per hectare unit. [6].

Therefore, at the level of the republic, the value of the agricultural land can be estimated in the following way:

$$S_{a.v} = S_{ta}(ha) \cdot \overline{B}(grad/ha) \cdot \overline{P}(lei),$$

where:

$S_{a.v.}$ - the surface of the agricultural land expressed in value (the value of the agricultural land), thousands of lei;

S_{ta} - the surface of agricultural land in hectares;

$\overline{B}$ - weighted average grade of bonitation, grade-hectare;

$\overline{P}$ - the normative price for one hectare unit, lei.

The studies on the zoning and the quality of the agricultural land have shown that the productive potential in the Republic of Moldova is appreciated by the average value of 64 hectares of landfill [5].

However, in relation to the fact that the regions, districts, agricultural units are located in different natural - climatic conditions, with different fertility of the soil, we determined the average credit rating on the development regions of the Republic of Moldova.

Thus, the agricultural land in the North development region was appreciated with the highest average score of 70.0 hectare, followed by Chisinau - 64 hectare, the Central region - 59.9 hectares - South - 59.2 degree - hectare and ATU Gagauzia - 56 degree-hectare.

Table 1. Potential of partial and integral production resources in agricultural entities in the Republic of Moldova for two periods 2011-2013 and 2014-2016

Indicator	Average/entity		Average 2014-2016, % compared to 2011-2013
	2011-2013	2014-2016	
The value of agricultural land, thousand lei grade-ha	10,453	10,040	96.0
The average annual value of the means of production, thousands MDL	3,230.5	3,831.1	118.5
Remuneration fund (the value-equivalent of labor potential), thousands lei	535	630.3	117.7
Direct costs of materials, thousands of lei	1,532.4	1,823	118.9
Total value of the full potential of resources, MDL thousand	15,750.9	16,324.4	103.6

Source: calculated by the author and based on the data in the specialized forms on the activity of agricultural enterprises

For each agricultural unit, rayon, region the determination of the value of agricultural land is proposed by the following methodology:

$$S_{a \cdot v} = \frac{S_i ta_c \times B_i \times \overline{P}}{\overline{B}};$$

where:

$S_{a \cdot v}$ = the area of agricultural cadastral land **and** agricultural unit, (rayon, region);

$S_i ta_c$ -the grade (ha) **and the** agricultural unit (district, region).

The calculation of the value of the differentiated agricultural land according to the proposed method takes into consideration the following main components per district (region, enterprise):

-the absolute size of agricultural land in each unit under study;

-soil quality;

-the price of a differentiated degree-ha depending on the soil quality.

Estimation of labor resources is possible from the point of view of the remuneration of the average annual work of a worker employed in the agriculture of the studied units.

This is explained by the fact that the increase in the level of labor remuneration must be conditional on getting a larger quantity of agricultural production.

Hence, the higher the level of pay for an average annual worker, the higher the value of work resources, hence the potential.

Data analysis demonstrates that, compared with the average of 2011-2013, resource potential on average an agricultural changed as follows:

-Value of fixed productive fund resending and direct cost of materials is increasing, corresponding to: 18.5%, 17.7% and 18.9%.

-The value of agricultural land has decreased by 4%.

-The value of the full resource potential increased by 3.6%.

This situation indicates that the growth rate of the main resources (except for agricultural land) was high, but the value of the agricultural land, which in the structure of the resource potential is more than 60%, has influenced an increase of the full potential only 3.6%.

The data from Table 2 demonstrate that all levels of partial resource yields (excluding agricultural land expressed in value) are in decline.

That is, the link between the growth rates of resources and their returns is inversely proportional. With higher provision of fully-potential entities, the partial resource returns diminish.

The full resource potential is up 2% on average, but compared to the full resource potential is down 1.6 p.p.

The situation created allows us to conclude that agriculture in agricultural entities in the Republic of Moldova is characterized by a low efficiency of using the resource potential.

There are not created systems suitable for structural changes and the Department of Agriculture Development did not create conditions for extended reproduction.

Another methodology for estimating the full potential of resources and the performance determination proposes the establishment of the indices, based on the value assessment of all resources, using the mathematical formula presented below Table 2.

Table 2. Return your potential partial and resources in agricultural entities from restored in Moldova for two periods of the years 2011 to 2016

The indicator	On average, an agricultural entity		Average 2014-2016 in% compared to 2011-2013
	The year		
	2011-2010	2014-2016	
The surface of the agricultural land, ha	610	542	88.8
The value of global agricultural production (in comparable prices), thousands lei	2,450.2	2,577.4	105.1
Agricultural land yield, lei:			
-at 1 ha	4,016.4	4,755.3	118
-per 1 leu worth	0.234	0.256	109
The yield of productive fixed assets, lei	0.75	0.67	89.1
Remuneration fund yield, lei	4.57	4.09	89.5
Yield of direct material costs, lei	1.60	1.41	88.1
Return of full resource potential, lei	0.155	0.158	102.0

Source: calculated by the authors based on the data from Table 1.

$$I_{PIR} = \frac{\dfrac{Ri_{t.a}}{\overline{R}_{t.a.}} + \dfrac{Ri_{m.f.}}{\overline{R}_{m.f.}} + \dfrac{Ri_{f.r.}}{\overline{R}_{f.r.}} + \dfrac{Ri_{c.m.}}{\overline{R}_{c.m.}}}{\dfrac{S_{a.v.}}{\overline{S}_{a.v.}} + \dfrac{VMF_i}{\overline{VMF}} + \dfrac{Fr_i}{\overline{Fr}} + \dfrac{Cm_i}{\overline{Cm}}}$$

$$I_{PIR} = \sum \frac{Ri_{integral}}{\overline{R}_{integral}} \div \sum \frac{Pi_{integral}}{\overline{P}_{integral}} = \overline{I}r \div \overline{I}p$$

where:

I_{PIR} - index of efficiency of using the full potential of resources;

$Ri_{t.a.}, \overline{R}_{t.a.}$ - return on agricultural land **and** agricultural units (district, region) and the average for the country;

$Ri_{c.m.}$ -the direct cost of raw materials on the **i** agricultural units (rayon, region) and on average on the republic, lei;

$Ri_{m.f.}, \overline{R}_{m.f.}$ - return on fixed assets goods for farming **and** agricultural units (district, region) and the average for the country, lei;

$Ri_{f.r.}, \overline{R}_{f.r.}$ - return on labor remuneration fund **and** agricultural units (district, region) and the average for the country, lei;

$S_{a.v.}, \overline{S}_{a.v.}$ - the value of agricultural land at 1 enterprise in units and the average for the republic, thousand lei;

$VMF_i, \overline{VMF}$ - value of fixed assets, thousands lei

$Fr_i, \overline{Fr}$ - the labor remuneration fund at 1 enterprise in units and media on the republic, thousands lei;

$Cm_i, \overline{Cm}$ - direct material costs to one enterprise **and** units and the average for the republic, thousands of lei;

$\sum \dfrac{Ri_{integral}}{\overline{R}_{integral}}$ - the sum of the indices u of yield indivisible integral resources used.

$\sum \dfrac{Pi_{integral}}{\overline{P}_{integral}}$ - the sum of the individual indices of the full (potential) global resource potential;

$\overline{I}_r$ - the average of the full yield;

- the average of the total resources;

i - the number of the surveyed population.

If:

$I_{PIR} > 1$, then the full potential of resources is used more efficiently in the units under investigation, the yield exceeds the exiting potential of resources;

$I_{PIR} = 1$, then the full potential resource return remained at the same level, and

$I_{PIR} < 1$, then the rate of return on the full potential of resources has decreased.

On the basis of the data of the agricultural enterprises on the development regions of the Republic of Moldova, the proposed methodology was applied, calculating the main types of resources in an enterprise and the indicators of the yield of global

agricultural production on average per enterprise based on resources, on their basis were determined the following indices (Table 3).

Table 3. Influence the average index of the full resource potential of economic efficiency of use in farm businesses in North Region of Moldova average of the years 2014 - 2016

Indicators	Groups of entities by average index of the full potential of resources				Total, Average
	I	II	III	IV	
	Up to 0.75	from 0.5 to 0.95	0.95 to 1.15	1.15 and above	
Number of entities	52	62	75	56	245
Average resource potential full index	0.52	0.80	1.1	1.55	1
Individual resource indices:					
the value of agricultural land	0.4 2	0.90	1.17	1.63	1
of the fixed assets of agricultural production	0.63	0.69	1.16	1.49	1
material resources	0.54	0.86	1.14	1.43	1
the individual indices of the labor remuneration fund	0.52	0.77	0.97	1,6 8	1
Individual indices of yield					
the value of agricultural land	1.162	0.919	0.947	0.947	1
of the fixed assets of agricultural production	0.7 5	1193	0.953	1,006	1
direct costs	0.915	0,959	0.972	1,074	1
the labour remuneration fund	0.923	1074	1129	0.902	1
Average Resource Efficiency Index	0.94	1036	1.0	0.98	1
Efficiency Index of Full Resources Potential	1, 80	1.29	0.90	0.64	1

Source: prepared and calculated by the author and based on NBS data

The results of the research are presented in Table 3 and Figure 1 and show that in the first two groups of entities accounting for 46% of their total, the average resources of the full resource potential are lower than in groups 3 and 4.
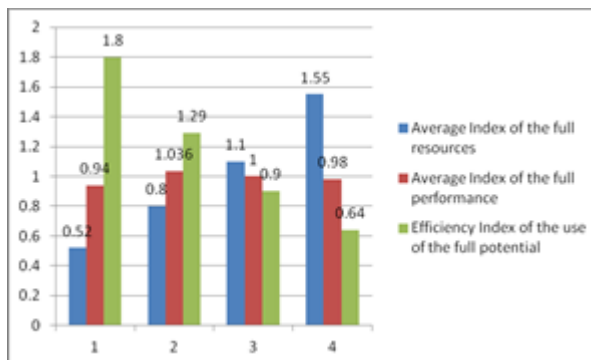

Fig. 1 . Full resource potential influence on the economic efficiency of their use in the agricultural enterprises of Transnistria average of the years 2014 - 2016
Note: 1,2,3, and 4 are the groups of entities by average index of the full potential of resources as mentioned in Table 3.

However, the efficiency index of the potential of total resources are higher, i.e. rhythms of growth of yields exceeds the growth rate of resources, which also confirms the results obtained through the value methodology calculated using traditional indicators.
-the individual indices of each resource;
-individual indices of partial yields;
-the sum of the individual resource potential indices;
-the sum of individual returns on resources;
-average index of full-resource potential;
-the average full yield index;
-the efficiency index of the full resource potential.

CONCLUSIONS

Totally volumes of all resources (natural, human, material, intellectual, etc.) attracted and used in economic activity is potential resources, which are estimated in different units (in hectares agricultural land, capital goods and assets current - in monetary units, and labor resources - in natural indicators, persons) .
For comparability to elaborate full indicator methodology to estimate resource potential and their performance.

Research shows that all levels of partial yields (with the exception of agricultural land expressed in value) are in decline. The link between the growth rates of resources and their ranks is inversely proportional. If the full potential of the resource and average during the years 2011-2013 2014-2016 compared to 3.6% when all of them increased only 2%, or 1.6 percentage difference.

The grouping of the agricultural enterprises from the North Development Region according to the average indices of the full potential of resources shows that the indices of the efficiency of the full potential resource resource efficiency in the first two groups are 1.8 and 1.28, respectively, and in the groups III and IV the indices the efficiency of the full yield is down 10% and 36%, respectively, compared to the average for all the investigated units.

Determining the efficiency indices of utilization of the full potential of resources according to the proposed methodology allows the following:

-on the basis of individual indices it is possible to compare each resource, the partial randament per unit studied (enterprise, rayon, region), with the level of the comparison base;

-based on the full yield index of the resources used , the share of all resources is appreciated used to obtain the result on each unit studied against the basis of comparison ;

-on the basis of the full yield index the efficiency of the use of the full potential of the resources compared to the comparison base is appreciated;

-TAD maintain efficiency index render full potential resource use permits the speed of overcoming (non-passing) the full return on resources;

-estimating the return on the use of the full potential of resources enables us to identify the place of each agricultural unit in the studied hierarchy given that they are harmonized, have a consecutive increase (decrease) and are comparable.

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