

# Analysis of ecological and economic development of the territories based on the welfare level analysis

## Análisis del desarrollo ecológico y económico de los territorios basado en el análisis del nivel de bienestar

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### Abstract

The current territorial land potential of the rural areas is used very inefficiently and its role is significantly underestimated. The assessment of land resource potential use and management effectiveness is a rather topical issue. The article refers to land resource potential management as a systematic, grounded and purposeful influence of the state and society on land resources along with objective regularities and tendencies in their use aimed to ensure the socio-economic development of the state.

The land resource potential of Ukraine is considered as a spatial basis for the society development and its economic growth factor. The methodological basis of studying management of land resource potential of the territories is determined. The essence of the assessment of the effectiveness of land potential of the territories use and management is revealed. Modern tendencies and new factors of land resource potential of the Ukrainian territory management development are determined.

**key words:** ecological and economic development, land resource potential, investment attractiveness of the territory

### Resumen

El potencial territorial actual de las áreas rurales se utiliza de manera muy ineficiente y su papel se subestima significativamente. La evaluación del uso potencial de los recursos de la tierra y la eficacia de la gestión es un tema de actualidad. El artículo se refiere a la gestión potencial de los recursos de la tierra como una influencia sistemática, fundamentada y deliberada del estado y la sociedad sobre los recursos de la tierra junto con regularidades objetivas y tendencias en su uso para asegurar el desarrollo socioeconómico del estado.

El potencial de recursos de la tierra de Ucrania se considera una base espacial para el desarrollo de la sociedad y su factor de crecimiento económico. Se determinan las bases metodológicas del estudio de la gestión del potencial de recursos territoriales de los territorios. Se revela la esencia de la evaluación de la efectividad del potencial territorial del uso y manejo de los territorios. Se determinan las tendencias modernas y los nuevos factores del potencial de recursos de la tierra del desarrollo de la gestión del territorio de Ucrania.

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**Palabras clave:** desarrollo ecológico y económico, potencial de recursos de la tierra, atractivo de inversión del territorio

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## 1. Problem statement

The combination of land relations with environmental, economic and social problems along with the development of investment and innovation processes on this basis will contribute to a much more efficient use of land and resource potential of Ukraine.

Increasing land use efficiency in settlements is a necessary factor for territorial development and welfare growth. Regulation of land use will contribute to increase in the land use efficiency and to sustainable development of territories.

In the context of implementing a socially oriented development strategy, with achieving European and global living standards in all spheres in Ukraine as one of the most important goals, the issue of improving the approaches to assessing the environmental, economic and social situation is particularly relevant and important.

Currently, specific features of land which reflect its ecological, natural and socio-economic characteristics should be taken into account when using land resources as a general means of production.

Modern production requires considering the processes of management, planning and organization of land use and protection as a set of technical, economic and organizational territorial activities carried out by the state in cooperation with the private sector. It aims at optimal use of land in Ukraine based on socio-economic goals of public welfare optimal level and takes into account the interests of local governments and economic entities in land use development.

### 1.1. Analysis of the latest scientific research and publications

The issues of the territories land and resource potential of management were considered in the papers of leading Ukrainian and foreign scientists, such as D.I. Babmindra, D.S. Dobryak, O.C. Dorosh, A.H. Martyn, L. Novakovsky, A.M. Tretyak and others. However, a number of issues related to the problem still remain unsolved.

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## 2. The aim of the research

The paper aims to analyze the approaches to assessing the land use potential management effectiveness and to study the problems that arise in the field of land management, as well as to analyze the welfare level applying various factors that characterize Ukrainian households.

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## 3. Results and discussion

Currently, the land resource potential of the territories in the country is used extremely inefficiently and its role is significantly underestimated. Peculiarities of land use in Ukraine are unique owing to the large areas of highly fertile agricultural lands and the infrastructure underdevelopment contribute to its devastation. There is virtually no state control over the land rational use and protection (Kireeva E.E., 2015).

Assessing the potential of the territories is necessary to manage the location of productive forces, the allocation of the resources and the environment preservation. In addition to the accounting of the available resources quantity and quality, the assessment of potential includes consumer interest in the resources and the prospective income from their use (Kaminetska O. V. (2017a).

Management of land resource potential of the territories comprises the activities of public authorities addressing the state tasks on land relations transformation and regulation, as well as a purposeful process related to improving land use efficiency and achieving sustainable development (Kaminetska O. V., 2017b).

Land resource potential in our study implies a set of tangible and intangible characteristics of land, which define the opportunities for agricultural production.

Assessment of the territories land resources use and management effectiveness makes the basis for decision-making on the land policy implementation and it includes several stages (Priadka T.M., Drebot O.I., Komarova N.V., (2017). The study considers the assessment of the territories land resources use and management effectiveness at the regional level.

At the first stage of the assessment, the selection and classification of key indicators that affect the land use efficiency and characterize the land resource potential of the territories is conducted. To give the comprehensive description of land use in the region, it is necessary to consider the factors that affect land rent (Kaminetska O. V., 2017c). The developed system of indicators is adapted to the data contained in statistical bulletins and it can be presented three sections.

Section 1 comprises indicators that characterize the distribution of land by ownership, the development of the land market, the distribution of land resources by their functional purpose including:

- share of land used for agricultural purposes, per region area unit;
- share of agricultural land per region area unit;
- share of arable land per agricultural land area unit;
- share of land registered for ownership/lease, per agricultural land area unit.

Section 2 comprises indicators that characterize the land plots fertility and location including:

- soil quality score;
- distance to markets;
- distance to major highways;
- length of service lines;
- distance to the regional center;
- distance to the industrialized areas;
- share of degraded land per agricultural land area unit.

Section 3 comprises indicators that characterize the additional costs of land including:

- number of employees employed in agriculture per agricultural land area unit;
- fixed assets of agricultural enterprises per agricultural land area unit;
- the amount of mineral fertilizers applied for yield production in a year;
- the amount of organic fertilizers applied for yield production in a year.

At the second stage of the assessment, a multifactor regression equation is made to identify the most significant indicators. An indicator that characterizes the efficiency of land use ( $L_{c/z}^{\Phi}$ ), e.g. cereals yield, crop production per agricultural land area unit or pre-tax profit of agricultural producers per unit area of agricultural land lands, is used as a resulting feature (target function). The results of the study are presented in the mathematical model:

$$y = a_0 + a_1x_1 + a_2x_2 + \dots + a_ix_i, \text{ where} \quad (1)$$

$a_0$  - reference зщште;  $a_1...a_i$ - parameters of the regression equation for factors  $x_1...x_i$ ;  $x_1...x_i$ - the main factors that affect the resulting feature.

At the third stage the indicator of the region land resource potential use efficiency ( $L_{c/z}^P$ ) is calculated by substitution of regression of actual values of indicators  $x_1...x_i$ . in the obtained equation. The obtained value characterizes the land use efficiency with full involvement of growth factors in the production.

$$L_{c/z}^P = a_0 + a_1x_1 + a_2x_2 + \dots + a_ix_i \quad (2)$$

The efficiency of land use in the region is evaluated at the fourth stage by comparing the estimated and actual indices.

$$K = \frac{L_{c/z}^\Phi}{L_{c/z}^P} \quad (3)$$

where K - the coefficient of the region land potential use efficiency;  $L_{c/z}^\Phi$  - the actual value of the target function;  $L_{c/z}^P$  - estimated value of land use efficiency (estimated value of the target function).

If the calculated indicator of land use efficiency  $K < 1$ , the land resources are used inefficiently, *i.e.* agricultural producers do not fully involve the main growth factors in the production.

If the calculated indicator of land use efficiency  $K > 1$ , the land resources are used efficiently and the main growth factors are fully involved in agricultural production.

This technique allows to identify the main priority areas in improving the efficiency of land use in municipal districts and in the region, as well as to determine the directions of regional land policy depending on the study results.

To determine the land resource potential of the municipal district, the method of comparison with the average values of the studied factors in the region is used.

$$L_i = \frac{X_i}{X_{cp}} \quad (4)$$

where  $L_i$ - partial  $i$ -indicator;  $X_i$ - the actual value of the  $i$ - indicator;  $X_{cp}$  - the average value in the region of the  $i$ - indicator.

Since the efficiency of land use is influenced by several indicators, it is suggested [6] to calculate an integrated indicator of land resource potential. The indicator is determined according to the formula:

$$I = \frac{1}{n} \sum_{i=1}^n L_i \quad (5)$$

where I - an integrated indicator of land resource potential of the district; n - the number of indicators determining the land resource potential.

If the indicator is  $I \geq 1$ , the the land resource potential in the studied municipal district is above average; if  $I < 1$ , the the land resource potential is characterized as below average.

Apart from the abovementioned, the considered methodology envisages granting regional authorities powers to distribute land payments in the form of rent and payments received from the state lands sale.

In the course of the study, we analyzed the resources of Ukrainian households

According to the study, wages make the largest part of households resources.

The average monthly total income of a household in 2010 amounted to UAH 3,377. An urban household earned an average of UAH 3,507 per month, and a rural household earned UAH 3,087 per month. On average, the total income per household member made UAH 1,304 per month, in urban households it made UAH 1,381 and in rural households - UAH 1,139. The average monthly total income per capita exceeded the average annual subsistence level (UAH 843) by 1.5 times. The growth rate of average per capita total income in 2010 compared to the previous year was higher than the consumer price index for this period: 117% vs. 109%, respectively.

In 2014, the average monthly total income per one household was UAH 4,471. An urban household earned an average of UAH 4,522 per month, and a rural household earned UAH 4,367 per month. On average, the equivalent total income per household member made UAH 2,129 per month - UAH 2,185 in urban households, and UAH 2013 in rural households. The average monthly income per capita exceeded the average annual subsistence level (UAH 1,176) by 1.8 times. The average per capita income of households in 2014 compared to the previous year grew at a slower pace than the consumer price index for this period: 104% vs. 112%, respectively. This was the first time the situation was observed since the economic crisis of 2008.

Inequality of cost distribution is characterized by the Lorentz curve and the concentration ratio (Gini index), which takes values from 0 (uniform distribution among the entire population) to 1 (all costs are borne by one person). Despite the implementation of certain measures aimed to increase household incomes, the inequality in the distribution of expenditures (incomes) of the population has not decreased. The Gini index on total expenditures increased from 0.29 in 2004 to 0.30 in 2005.

Differentiation of the population welfare level was calculated using the monetary expenditures criterion. The Gini index was 0.33 in 2005 compared to 0.32 in 2004; the minimum level of spending among the 10% of the most affluent population exceeded the maximum one among the 10% of the least affluent by 4.5 times, like in 2004. In general, the most well-off 10% of the population spent, just as in the previous year, 8.7 times more money than the 10% of the least well-off.

Due to the implementation of certain measures aimed to increase the earnings, the inequality in the distribution of total incomes has decreased. The Gini total income index decreased from 0.257 in 2009 to 0.253 in 2010. The differentiation of the population welfare level calculated using the criterion of monetary income decreased slightly as well. The Gini index was 0.274 in 2010 against 0.277 in 2009, the minimum level of cash income among the 10% of the most affluent population exceeded the maximum among the 10% of the least affluent by 3.7 times (in 2009 - 3.9 times), and in general, the most well-off 10% of the population received 6 times higher income than 10% of the least well-off (compared to 6.1 times in 2009).

Differentiation of the population well-being level has decreased as calculated using the criterion of monetary income. The Gini index was 0.240 in 2014 compared to 0.251 in 2013, the minimum level of cash income among the wealthiest 10% of the population exceeded the maximum among the least well-off.

Households met their needs at the expense of earnings coming from various sources. The average monthly total resources of the average household amounted to UAH 4,563, with an urban household income of UAH 4,617 and

the rural one - UAH 4,455. It increased compared to 2013 in Ukraine as a whole by 2%, in rural areas - by 8%, and it did not change in urban settlements. On average, these indicators per household member amounted to UAH 2,173, UAH 2,231 and 2,053 per capita, respectively.

The main property object of urban citizens, which can earn a stable income and, consequently, provide a decent living standard today and in the future, is the real estate (apartments, houses) while in rural areas it is a land plot received due to collective farms land unbundling.

The analysis of land plots owned by the population involves determining the share of households that own one, two, three, four or more land plots. In addition to the number the land plots, households were distributed according to their size: up to 0.1 ha; 0.1–0.6 ha; 0.6–1.0 ha; over 1 ha.

The households division into four groups is based on the fact that the size of the plot determines the way (direction) of its use. Thus, a land plot of up to 0.1 ha is usually used as a kitchen garden or dacha. People use it to grow crops consumed by the household and they are not intended for sale. A plot of 0.1–0.6 ha is used for growing agricultural crops intended both consumption and for farming. If the size of the plot exceeds 0.6 ha, but it is not larger than 1 ha, the household usually grows crops in the amount that is sufficient for both sale and its own consumption. One more group comprises land plots with an area of more than 1 hectare. These were given to the population as a result of the collective farms property distribution. The household face certain difficulties to use these: is quite problematic to cultivate such plots due to the lack of machinery in the countryside. In addition, the imperfection of domestic legislation and other reasons do not allow to obtain the appropriate income from their lease.

The analysis reveals that, as a whole, most households have some sort of accommodation, a land plot and at least a minimum set of durable goods. Also, 58.2% of households in the country have both an accommodation and a land plot, and 39.5% of households own an only unit – accommodation or land (36.3% own only their own housing, and 3.3% - only land plots) and only 2.3% of the country's households have nothing at all.

The structure of land plots used by peasants in terms of their area shows that employment on their own land plots is gradually leaving the category of private subsidiary farming and becomes increasingly the principal employment. There is a tendency to increase land use, as evidenced by the growing share of households engaged in agricultural activities on large areas of land. It is likely that a certain part of rural residents who use land plots with an area of up to 10.0 hectares and a significant part of those who run 10 or more hectares of land will organize farms and other types of agricultural entities and carry out their own activities on the basis of large-scale agricultural production.

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#### **4. Research conclusions and further study prospects**

Improving the land use efficiency in municipalities is an essential factor for regional development. Municipalities development can be influenced through the land use regulation and contribute to increased efficiency of the territories land resources use and management as well as to sustainable development of the region and the population welfare increase. The main purpose of management under modern conditions is achieved on the basis of rational use and land protection, effective development of entrepreneurial activity, land resources preservation and restoration.

The analysis of the Ukrainian households welfare level according to various criteria for 2005-2014 shows a negative trend with a decrease in the level of income and public goods necessary for full functioning. Differentiation of the population welfare rate, calculated using the criterion of monetary income has decreased.

Owning a land plot can be an essential characteristics of the material welfare of the population.

The production and social spheres of rural areas are closely linked to the natural environment, which, along with the qualitative characteristics of land resources, climatic conditions, landscape features, etc., determine the characteristics of the living environment and the nature of rural residents' employment. Agriculture is the principal field of rural residents' employment as it significantly differs from other activities and is characterized by a number of specific characteristics, both historically determined and those that have arisen under the influence of current transformation processes.

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