

METHODOLOGICAL APPROACHES ON DETERMINING THE CHARGES FOR DEVELOPMENT AND ARRANGEMENT OF THE TERRITORIES IN THE LAND APPRAISAL OF THE SETTLEMENTS

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Formulation of the problem. Appraisal of the land plots of urbanized territories has a great socio-economic importance, as if it allows to solve a number of life-supporting problems of development of the separate settlements and of the state as a whole. First of all, it concerns the issues of pumping up local and state budget from the land tax and lease payments for the land based on normative monetary valuation of land, component of which the charges for development and arrangement of the territories of the settlements are.

On the other hand, getting more affordable and objective data on the value of lands in urbanized territories makes it more likely to satisfy the interests of certain individuals and entities, and of governmental and public authorities on the development of the territories, budget revenues and creation of sustainable investment business-climate.

Unsolved sides of a general problem. In the basis of calculations of the base value of lands of a particular settlement were put the quantitative and qualitative indicators of reconstructive construction estimate of engineering and technical infrastructure, incidental to the given territory.

The information base for determining these indicators is the data about the book value of engineering and technical communications of special services and organizations, on which's balance these communications are.

The research of the resulting values of the charges for development and arrangement of the territories from the use of different approaches is an important element of the general problem of assessment of land resources in the settlements.

The problem definition. The research of time history index of development and arrangement of the territory by engineering and technical communications, taking into account different methodological approaches, and, in particular the Land Price System (LPS) software system, which is a collection of aggregated indices of replacement value, taking into account the degree of wear and tear and the residual value is the subject of this publication.

Analysis of recent researches and publications. The issue of monetary value of lands is an important part of social and economic

development of the state. On the one hand, the land tax is a significant economic factor of filling the state and local budgets, and on the other is an important element of social development and material well-being of the population. Thus, in money equivalent of the land are combined two socially relevant factors: welfare of the population and economic development of certain areas, of the state.

In Ukrainian realities of the land valuation activity there are two basic types of monetary valuation of land:

- first - normative monetary valuation;
- second - expert monetary valuation.

Since the beginning of the establishment of private ownership of land in Ukraine there were put the appropriate Procedure [1]; Method [2] of calculating of normative monetary value of land of different functional purpose. The need to develop and implement in practice this type of evaluation was dictated by the need to pay land tax, rent payments, etc. in acquiring the rights to own or use of separate land plots in the terms of absence of market relations on land.

On the legislation level in Ukraine there was allowed the sale of non-agricultural land, which led to the creation of market of the lands of specific purpose and the application on this basis of the second type of land appraisal - expert monetary valuation. We will note that the results of expert valuation in accordance with Ukrainian legislation can only be used for transactions of purchase and sale.

In international practice in developed market economies there is no concept of normative monetary evaluation, but instead in all sectors of the economy market (expert) value of the land called *mass valuation* (mass estimation) is used.

To the improving of methodological approaches on normative monetary valuation of the settlements there are dedicated research works of Dehtyarenko Yu. D., Lyhogrud M.G., Mantsevych Yu.M., Palekha Yu. M., Stupen` M.G. and many others [3-6, 8].

The basic material of the research. Normative monetary valuation of the lands of settlements is given by [7]

$$U_n = B \frac{H_{II}}{H_K} \times K_{\Phi} \times K_M, \quad (1)$$

where Π_H - normative monetary valuation of 1 square meter of land (UAH)

B - charges for development and arrangement of the territory per square meter (UAH)

H_{Π} - rate of return (6%);

H_K - the capitalization rate (3%);

K_{Φ} - factor of functional use of land plot;

K_M - factor of location of land plot.

The charges for development and arrangement of the territory are defined as replacement equal to the original cost which is changed as a result of realization of revaluation of engineering training of water-supply system; sewerage; electricity, gas, heating systems; street and road network; green space of general use and so on.

We will stop at deciding two issues in normative monetary valuation: first - the calculation of the replacement cost of charges for development and arrangement of the territory; second - differences in valuation results according to the data of replacement and residual cost, taking into account the degree of wear.

Full replacement cost of development and arrangement of the territory is calculated by natural and cost parameters taking into account indexing of fixed assets and construction works during the land appraisal. To make a reassessment of engineering infrastructure we use the Collection of consolidated rates of replacement cost and appropriate instructions and legislative materials on indexation factors in fixed assets, changes of the indexes of value of construction works and so on.

In order to automate the process of calculating of replacement cost The State Agency for Land Resources of Ukraine recommends to use the software package LPS. This software package allows you to:

- define the norms of charges for development and arrangement of the territory in three modes: all input data is; presence of consolidated indicators and the complete absence of input data;
- calculate the basic cost of lands of the settlement;
- implement the land appraisal zoning of the territories;
- calculate the appraised value of a particular land plot.

As a result of comparative analysis it is showed that LPS software system has a limited set of components of engineering networks of buildings and equipment, which does not reliably allow to determine the charges for development and arrangement of the territory. Instead the Collection contains a large range of engineering infrastructure, its components and its cost.

We will note that in LPS software system for the calculations of charges the data are taken from Collection taking into account the inflation at the assessment date.

However, one should take into account the dynamic changes in the technology of construction of engineering networks, their components, design features of materials and etc., that are not always

reflected in the Collection. Consequently, the feasibility of building replacement calculation pitch toast engineering networks built earlier is a prerequisite for evaluation of both the networks and their significance and assessment of land resources.

On the other hand, the calculation of the replacement cost of charges for development and arrangement of the territory as a function of the new just built network is not quite correct, because they do not take into account the wear of engineering structures and their components. Thus there is a paradoxical situation: with increasing lifetime of engineering networks (decreasing their reliability) increases their replacement cost in connection with rising costs of construction engineering and materials. During the period from 1991 to 2011 only factor of value indexing of construction works was 20,13 [6]. Probably, when calculating the value of land plots the degree of wear of engineering communications should be taken into account. Hence, for the calculation of the factor of development and arrangement of the territory we can use the value of the residual cost of engineering services or value of their cost taking in the account the wear. Under the current regulations warranty period of exploitation of the pipelines is 25 years [9], overhead power lines on metal and concrete pylons - 10 years, man-made structures and subgrade roads - 10 years and pavement - 3 years [10]. Taking into account the fact that engineering networks are part of the property to the calculation of the degree of their physical deterioration, i.e. the loss of initial feasibility and social qualities under the influence of operational factors and natural forces, we can use the expression:

$$3_{\Phi} = \frac{T_{\Phi}}{T_H} \cdot 100\% , \quad (2)$$

where 3_{Φ} - physical deterioration of engineering service;

T_{Φ} and T_H - factual and normative lifetime of engineering structure.

We will note that the physical deterioration in money equivalent is calculated as a share of the replacement cost of this type of engineering services.

We will perform the research for calculating the cost of development and arrangement of the territory for the Krychka Village, Bogorodchany district of Ivano-Frankivsk region. According to data of special services in the territory of the settlement there are electricity, street and road network and gas-pipe line. The residual cost is: power engineering objects – 564,49 thousand UAH, including 30,27 thousand UAH - the main constructions and 534,22 thousand UAH - backbone networks; street and road network – 1302,19 thousand UAH; gas-pipe line – 59,37 thousand UAH, including engineering structures - 16,26 thousand UAH.

Total area of the settlement, for which we calculate the charges for development and arrangement of the territory is equal to 61,45 ha.

We will show in Table the charges for development and arrangement of the territory

obtained using LPS software complex and Collection of consolidated rates on determining the replacement

cost of engineering networks, as well as the residual cost and the cost, taking into account depreciation.

Table

The charges for development and arrangement of the territory

| № | Title of parameters | Unit of measure | Number of units | The cost, thousand UAH | | | |
|-----------------------------------|--|-----------------|-----------------|------------------------|----------------------------------|----------------|--|
| | | | | LPS | Collection of consolidated rates | Residual cost | Replacement cost, taking into account depreciation |
| 1 | Power supply: - main constructions; - backbone networks 0,4 mW; | kW | 920 | 107,71 | 100,52 | 30,27 | 80,42 |
| | | km | 18,34 | 1638,71 | 1456,76 | 534,22 | 728,38 |
| 2 | Street and road network | km | 3,85 | 7735,61 | 7690,10 | 1302,19 | 5383,07 |
| 3 | Gas supply: | | | | | | |
| | Gas control unit | items | 2 | 146,98 | 135,13 | 13,75 | 108,10 |
| | Cabinet-type regulation point | items | 1 | 18,32 | 14,22 | 1,61 | 11,38 |
| | Cathodic protection system | items | 3 | 30,46 | 21,97 | 0,90 | 17,58 |
| | - backbone networks of high pressure | km | 1,26 | 118,10 | 115,66 | 4,40 | 92,53 |
| | - of medium | km | 3,31 | 259,90 | 239,02 | 30,78 | 191,22 |
| - of low | km | 8,60 | 1190,01 | 1133,84 | 7,93 | 907,07 | |
| Total (B₀), UAH | | | | 11245,80 | 10907,22 | 1926,05 | 7519,75 |
| | $B = \frac{B_0}{\Pi}$, (UAH/m ²) Π=614500 sqr.m. | | | 18,30 | 17,75 | 3,13 | 12,24 |

When calculating the cost of engineering infrastructure the physical deterioration factor for the major constructions of power supply and equipment and networks of the pipelines is adopted equal to 0,2, which corresponds to the lifetime for 5 years under their warranty of 25, for main networks of power transmission lines – 0,5 (lifetime for 5 years under their warranty of 10 years), street and road network – 0,3 (lifetime for 3 years under its warranty of 10 years).

The analysis of the results of calculations which are given in the table shows that the replacement cost B for development and arrangement of the territory is obtained using a LPS software system is on 3,1% higher than the similar parameter obtained directly on the basis of the Collection of consolidated rates.

The parameter of development and arrangement of the territory calculated with the residual cost gives low results because it does not take into account the current state of market relations on the value of engineering and technological equipment of communication networks, up-to-date construction technologies and materials, the value of construction works and so on.

Probably, the most useful in the methods of normative monetary valuation the value of the charges for development and arrangement of the territory should be calculated taking into account the degree of wear of engineering communications. In this case, the newest data on the cost of equipment,

materials and works are used, also it takes into account the degree of wear of engineering communications.

On the other hand, currently in Ukraine land market of the settlements of different functional purpose is quite well developed, that allow us to create a proper land appraisal structuring of urban territories of the state, thus applying the method of "mass valuation".

Conclusion. As a result of researches it was found that the difference in calculations of the charges for the development and arrangement of the territory in the software complex LPS and in the Collection of consolidated rates is about three percent, which is a permissible value.

It was offered to use for the calculations of charges for the development and arrangement of the territory the method based on accounting the wear of replacement cost of engineering communications, which corresponds to the current approach to the real estate market conditions.

At sufficiently developed market of lands of the settlements of different purposes as the main base of establishment of fees for the land we can use land the appraisal zoning of the territories according to the data of market (expert) valuation of lands in Ukraine.

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Methodological approaches on determining the charges for development and arrangement of the territories in the land appraisal of the settlements

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Research is executed for the purpose of application during the calculations of the charges for development and arrangement of the of settlements in the normative monetary valuation of LPS software complex, of the Collection of consolidated rates of replacement cost of engineering communications taking into account their wear and residual cost.

It is suggested to use in the normative assessment of the lands of settlements the methodical approach based on shortchanging of index of replacement cost of engineering communications taking into account the degree of their wear or the approach related with land appraisal zoning of the territories by market (expert) valuation.