ISSN 2228-9860 eISSN 1906-9642 CODEN: ITJEA8

International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies

http://TuEngr.com

Assessment of the Value of Land Tenure of Protected Shoreline Shelterbelts

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Paper ID: 13A2T

Volume 13 Issue 2

Received 24 August 2021
Received in revised form 09 February 2022
Accepted 15 February 2022
Available online 25 February 2022

Keywords:
Land development; Land valuation; Natural resources; protected shoreline shelterbelts; land tenure.

Abstract

The land is the basis of the real estate market, therefore it is very important and relevant to determine its value. The presence of various safe areas, sanitary protection zones, floodable zones, water protection zones and protected shoreline shelterbelts, zones of protected facilities, affects the value of land plots and other natural resources located in these zones. The impact of zones with special conditions of land tenure (depending on their types) is in the range of 20-30% of the value of land plots of different purposes and functional use. However, it is necessary to take into account the specific subtype of land tenure and the type of zones with special conditions for the use of land plots and other natural resources. In particular, according to Ukrainian legislation, protected shoreline shelterbelts are the conservation territories and belong to the category of water fund lands. Accordingly, the assessment of the value of land tenure of protected shoreline shelterbelts requires special methodological approaches.

Disciplinary: Land Valuation and Management, Environmental & Ecology Protection.

Cite This Article:

Tretiak, A., Tretiak, V., Hunko, L., Hetmanchyk, I., Kravchuk, T., Yusypenko, O. (2022). Assessment of the Value of Land Tenure of Protected Shoreline Shelterbelts. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies, 13*(2), 13A2T, 1-9. http://TUENGR.COM/V13/13A2T.pdf DOI: 10.14456/ITJEMAST.2022.41

1 Introduction

The issues of objectivity of land valuation in Ukraine are the most urgent at this stage of development of land relations, as they are directly related to the regulation of land relations, land tenure mode and land payments. The relevance of these issues is confirmed by studies conducted in

the field of land valuation [1]. For different categories of land plots and types of target use in Ukraine, methodological approaches to the normative monetary valuation of lands were developed.

The formation of the structure and composition of the agreed value is influenced by pricing factors, the composition of which is determined by the appraiser in accordance with the legislation. Such factors usually include the following: location, physical characteristics of the facility, economic characteristics, environmental condition and social situation. It is obvious that land tenure with the presence of various safe areas, sanitary protection zones, floodable zones, water protection zones and protected shoreline shelterbelts, zones of protected facilities, as well as other zones established in accordance with the legislation of Ukraine, is characterized not only by a different mode of functional use of land and other natural resources, but also different rental income and, accordingly, value.

An important issue is to take into account the impact of encumbrances (restrictions) on the value of land plots that are fully or partially located in zones with special land tenure conditions, whereas any restriction (encumbrance) that reduces the value of land plots, which is imposed against the will of the owner of the rights, shall be a restriction of rights of ownership and should be reimbursed in the case of private property (including additional expenses), for example, through direct reimbursement or through the establishment of coefficients, to adjust land payments for land tenants who use system-forming (classified) facilities in their activities (up to full exemption from them in the prohibition of any economic activity in protected zones), etc. .п. [2]. The impact of zones with special conditions of land tenure (depending on their types) is in the range of 20-30% of the value of land plots of different purposes and functional use. However, in our opinion, it is necessary to take into account the specific subtype of land tenure and the type of zones with special conditions of the territory usage (this study considers an example of taking this factor into account in protected shoreline shelterbelt) and the nature of activities in this territory, since the zones with special conditions for the use of protected shoreline shelterbelts may not have a negative impact on a particular subtype of aquaculture land tenure.

Matters of methodological approaches to land valuation in Ukraine are reflected in the works of many well-known scientists. However, many aspects of the problem remain controversial and require research and justifications. Therefore, this article presents the results of a study of the peculiarities of methodological approaches to assess the value of multifunctional land tenure of protected shoreline shelterbelts in cities.

2 Methodology

The methodology of researching the problem of assessing the value of land tenure of protected shoreline shelterbelts determines that the subject of the study is the change in the value of land plots of different purpose and functional use depending on the presence of zones with special land tenure conditions and types of zones. In the process of research, abstract logical, economic statistical and monographic methods are used. With their help, the methodical approaches of assessing the value of land tenure of shoreline protected zones are substantiated.

3 Results

According to Article 1 of the Water Code of Ukraine [3], a water body is a natural or artificially created element of the environment, in which water is concentrated (sea, estuary, river, stream, lake, reservoir, pond, canal, and aquifer).

The procedure for assessment of assets is regulated by the Laws, regulations of the Cabinet of Ministers of Ukraine and National Standards of Ukraine [4]. The existing legal framework is sufficient to provide the conditions for the assessment. There are certain features that require clarification of generally accepted standards in the field of water management.

To determine the value of land plots and land tenure of water bodies, the laws provide for regulatory and expert monetary valuation [5]. According to Article 3 of the Law of Ukraine "On Land Valuation" [4], normative monetary valuation of land plots are used to determine the amount of land tax, state duty on exchange, inheritance and donation of land plots in accordance with the law, rent for land plots of state and communal property, losses of agricultural and forestry production, the value of land plots with an area of more than 50 hectares for the placement of outdoor sports and fitness facilities, as well as in the development of indicators and mechanisms for economic incentives for the rational use and protection of lands. Also, according to the same Article, expert monetary valuation of land plots is used in the implementation of civil law agreements on land plots and rights thereto, except as provided by the law on land valuation, as well as other laws. Expert valuation of real estate, while water bodies are agricultural (fisheries) or natural (all other water bodies except energy) real estate, is mandatory in cases of creation, reorganization, bankruptcy, liquidation of enterprises; privatization, lease, exchange of state property, taxation and other operations.

According to Article 1 of the Water Code of Ukraine [3], a protected shoreline shelterbelt shall be a part of a water protection zone of appropriate width along a river, a sea, around reservoirs, where stricter anthropogenic activity control arrangements than in the rest of the water protection zone are established. Since, according to Article 4 of the Code, protected shoreline shelterbelts along seas, rivers and around water bodies, except for lands occupied by forests, belong to water fund lands, the assessment of the value of their land tenure is carried out according to methodological approaches to water bodies assessment [6].

Given that, according to Article 81 of the Water Code of Ukraine [3], the creation of protected shoreline shelterbelts belongs to a set of measures to preserve the water content of rivers and protect them from pollution, the normative monetary assessment of the value of land plots of protected shoreline shelterbelt, as components of land tenure of water bodies, should be carried out on the rental income for the category of lands of the water fund.

However, land tenure of shoreline protection zones according to Article 89 of the Water Code of Ukraine [3] is a protected territory with limited anthropogenic activity control arrangements and can be used for siltation and afforestation, beaches, hydro-engineering, navigation, hydrometric and linear, as well as engineering facilities and fortifications, fences,

border signs, border clearings, utilities. Accordingly, the rental income from land plots of protected shoreline shelterbelts will be different from those from underwater plots. Since the main function of land tenure of protected shoreline shelterbelts is conservational, the basic and multifunctional land tenure is the conservational use of land and other natural resources.

Accordingly, the normative monetary valuation of land tenure of protected shoreline shelterbelts should be carried out taking into account its multi-functionality using the data of rental income depending on the category of land or functional use. According to paragraph 12 of the Procedure for Normative Monetary Valuation of Non-Agricultural Lands (except for lands of settlements) [7], the land plots of water fund located within settlements used for fish farming shall be assessed, since the rental income from this type of land tenure is different than for built-up land plots. Since the land tenure of protected shoreline shelterbelts is conservational and in cities, mostly used for public needs, rental income is different from built-up lands.

Let us consider this hypothesis on the example of the normative monetary valuation of land tenure of the protected shoreline shelterbelt of Lake Verbne, the ichthyological botanical reserve of local significance, which is located in the Obolonskyi district of the city of Kyiv, see Figure 1.

Normative monetary valuation of lands of settlements shall be determined by

$$Цн = \frac{В \times Нп}{Нк} \times Кф \times Км, \quad (1),$$

where *Цн* is a normative monetary valuation of a square meter of land plot (in UAH);

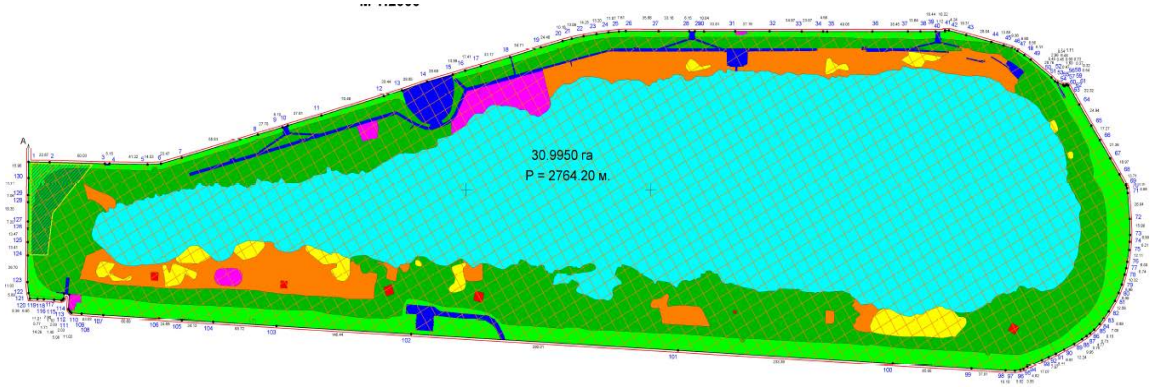
В is the expenses for development and arrangement of the territory per square meter (in UAH);

Нп is a rate of profit (6%);

Нк is a capitalization rate (3%);

Кф is a coefficient that characterizes the functional use of land plot (for housing and public buildings, for industry, transport, etc.);

Км is a coefficient that characterizes the location of the land plot.



Legend:

border of the Lake Verbne reserve

beach land plots

water mirror of the lake

forest lands

territory of the ichthyological botanical reserve

Figure 1: The study area of land tenure of the protected shoreline shelterbelt of Lake Verbne.

According to the normative monetary valuation of lands of the city of Kyiv (Annex 2 to the Resolution of the Kyiv City Council) [Resolution of the Kyiv City Council of the session II of the convocation VII dated July 3, 2014 No. 23/23 "On approval of technical documentation on the normative monetary valuation of lands of the city of Kyiv". Electronic resource: https://ips.ligazakon.net/document/MR140023] the basic value of 1 m^2 (Цнб) of public lands in the economic and planning zone, where the land tenure of the protected shoreline shelterbelt of the Lake Verbne, the ichthyological botanical reserve of local significance, was located, was – 1,269.95 UAH/m^2.

Given the fact that the land tenure of the protected shoreline shelterbelt of the Lake Verbne, the ichthyological botanical reserve of local significance, by functional use refers to the lands of the nature reserve fund, we calculate the value according to the formula (2) taking into account the coefficient (*Кф*) (Table 1),

$$Цн = Цнб \times Кф, \text{ or} \quad (2)$$

$$Цн = 1269{,}95 \times 0{,}5 = 634{,}75 \text{ UAH/m}^2$$

Table 1: Normative monetary assessment of the value of land tenure of the protected shoreline shelterbelt of the Lake Verbne, the ichthyological botanical reserve of local significance

Indexes	Values
Cadastral number of the land plot:	absent
Land plot purpose code:	04.08
Basic type of land tenure	nature reserve
Land tenure area, ha	31.00
Auxiliary subtype of land tenure	recreational
Land tenure area of the protected shoreline shelterbelt, ha	4.54
including: beaches (recreational subtype of land tenure), ha	0.85
Number of the economic-planning zone where the land tenure is located	388
The value of one square meter of land of the city of Kyiv by economic and planning zone, UAH/m-^{2}:	1,269.95
Local coefficients for the location of the land plot:	-
functional and planning factors: the pedestrian access zone to the land tenure	1.15
engineering and infrastructural factors: a land plot adjacent to a paved street	1.00
engineering and geological factors: in artificially created territories	1.05
historical and cultural factors: location of the land plot within the protected zone	1.10
natural and landscape factors: weighted average coefficient	1,073
location of the land plot within the area of conservational purpose	1.08
location of the land plot within the area of recreational purpose	1.07
sanitary and hygienic factors: location of the land plot in the water protection zone	1.05
Total coefficient Км3:	*1.50*
Кф coefficient:	0.5
Normative monetary valuation, UAH/m2	*952,125*
Normative monetary valuation, UAH/ha	*9,521,250*
Indexation ratio of normative monetary valuation	1,897
Normative monetary assessment, UAH/ha as of 2020	*18,061,811*
Total value of land tenure of the shoreline shelterbelt, thousand UAH (area 4.54 ha)	82,001
including the beach, thousand UAH (area 0.85 ha)	15,352

The indexation coefficient from 2014 till 2020 amounts to (1,249 x 1,433 x 1.06 x 1.0 x 1.0 x 1.0 x 1.0) 1.897. Accordingly, the value of 1 ha of land tenure of the protected shoreline shelterbelt

of the Lake Verbne, the ichthyologic botanical reserve of local significance, as of 2020 is 18,061,811 UAH/ha. The total value of land tenure of the protected shoreline shelterbelt, as a conservational area of 4.54 ha will be 82,001 thousand UAH.

To confirm the objectivity of the obtained data on the value of land tenure of the protected shoreline shelterbelt of the Lake Verbne, the ichthyologic botanical reserve of local significance, we will calculate the market value by the method of expert monetary valuation of land plots [8], a methodological approach based on comparing sales prices of similar land plots, where the value of the land plot is determined at the level of market prices. In this case, the value of the land plot is established by amending the sale prices of similar land plots, which take into account differences in the terms of agreements and features that affect the value.

Table 2 shows a list of land plots for various purposes, which are offered for sale in the city of Kyiv as of February 15, 2021 [9].

Table 2: Land plots of various purposes offered for sale as of February 15, 2021

Seq. No.	Location	Features (land)	Area, m^2	Offer price, UAH	Value, UAH/ha
1	Podilskyi District	Gardening	604	1,405,000	23,261,589
2	Podilskyi District	Gardening	873	2,810,000	32,187,858
3	Troieshchyna, Desnianskyi District	Gardening	1,200	1,686,000	14,050,000
4	Raiduzhnyi, Dniprovskyi District	Construction & maintenance of a residential building	1,000	1,124,000	11,240,000
5	Osokorky, Darnytskyi District	Gardening	1,200	703,000	5,858,333
6	Osokorky, Darnytskyi District	Construction & maintenance of a residential building	3,400	3,506,000	10,311,765
7	Bortnychi, Darnytskyi District	Conducting personal agriculture	220,000	179,280,000	8,149,091
8	Dniprovskyi District	Construction & maintenance of a residential building	2,000	2,529,000	12,645,000
9	Osokorky, Darnytskyi District	Construction & maintenance of a residential building	43,000	14,500,000	3,372,093
10	Rusanivka, Dniprovskyi District	Gardening (*the plot is located near the lake*)	600	1,068,000	17,800,000
11	Rusanivka, Dniprovskyi District	Gardening	600	1,546,000	25,766,667
12	Osokorky, Darnytskyi District	Lands for residential & commercial use	1,200	118,000	983,333
13	Osokorky, Darnytskyi District	Construction & maintenance of a residential building	2,500	112,000	448,000

The basis for determining the value of land plots by comparing the sale prices of similar land plots shall be the sale prices of those land plots, which, according to the factors influencing their value, sufficiently coincide with the plot being assessed. Therefore, for further calculations, 5 analogous objects were selected from the 13 proposals found.

When calculating the market value of 1 ha, land plots that have critical values of the sample list (maximum and minimum value) were excluded from the sample of analogues. Next, the size of the discount on the auction of land for sale was analyzed.

The discount on auction in its economic essence is a kind of indicator of the state of the market of similar (analogue) land plots. The presence or absence of such a discount, as well as its absolute value, allow optimizing the actions of the parties when buying or selling land in specific economic conditions, taking into account the type of alienated land plots, their value, projected market trends and market size and activity of the market itself at a specific time within a specific region. That is why the question arises as to the correctness of the definition and further justification of the absolute value of the discount on the auction.

It is known that for each specific type of purpose of the land plot there is a typical exposure period, i.e. the period, for which such a plot is usually sold on the open market. The exposure period shall be defined as the time from the date of submission to the open market (public offer) of the assessment object to the date of the transaction therewith. In other words, it is the period, during which the object is on the open market has time to attract several potential buyers, one of whom makes the transaction as a result. For example, for residential real estate (private houses, cottages and summer houses) – usually from 6 to 12 months.

Adjusted value (item 7 of Table 3) shall be calculated by reducing the offer price per 1 ha (item 6 of Table 2) by % of the average discount on auction.

Given the fact that in the Dniprovskyi District, the increase in value was 4.6% according to the survey of the private housing market [10] for the period from December 2019 till December 2020, we will accept a discount on sale as absent for calculations in our study.

Table 3: Sample list of analogous land plots

Seq. No.	Location	Features (land)	Offer price, UAH	Value, UAH/ha	Value, UAH/m^2	Adjusted value, UAH/m^2
1	Raiduzhnyi, Dniprovskyi District	Construction and maintenance of a residential building	1,124,000	11,240,000	1.124	1.124
2	Osokorky, Darnytskyi District	Construction and maintenance of a residential building	3,513,000	10,332,353	1.033	1.033
3	Bortnychi, Darnytskyi District	Conducting personal agriculture	179,280,000	8,149,091	815	815
4	Dniprovskyi District	Construction and maintenance of a residential building	2,529,000	12,645,000	1.264	1.264
5	Rusanivka, Dniprovskyi District	Gardening (the lot is located near the lake)	1,068,000	17,800,000	1.780	1.780

The obtained sample of analogous objects is presented in Table 3. To confirm the accuracy and reliability of the sample list (analogues used for calculations), the coefficient of variation is calculated (Table 4). The coefficient of variation shows the degree of homogeneity of the sample, having analyzed what conclusions it is possible to arrive at from the selected analogues and decide on the possibility of their use in further calculations.

At v <0.17, the sample is considered completely homogeneous (ideal case).

At 0.17 < v <0.33 – the sample is quite homogeneous and can be taken into account.

At 0.33 < v <0.6 – the sample is not homogeneous enough and cannot be taken into account.

Table 4: Calculation of the variation coefficient

Analogue plot No.	Adjusted value, UAH/sq.m *Xi*	Average amount of adjusted value, UAH/sq.m *Xcp*	(*Xi* – *Xcp*)	σ	*v*
1	1.124	1.203	-79	0.447	0.0004
2	1.033		-170		
3	815		-388		
4	1.264		61		
5	1.780		577		
Total	6.016		1		

The variation coefficient (*v*) is the ratio of the standard deviation to the arithmetic mean of the measured values.

As a result of comparing the assessment object, land tenure of the protected shoreline shelterbelt of the Lake Verbne, the ichthyological botanical reserve of local significance, with five selected land plots, the average value of 1 ha will be UAH 12.030.

Given the fact that according to the method of normative monetary valuation, the value of land tenure of the protected shoreline shelterbelt of the Lake Verbne, the ichthyological botanical reserve of local significance, is 18.062 thousand UAH, which is almost 6.000 thousand UAH or 33% more.

4 Conclusion

Taking into account the fact that the land tenure of shoreline shelterbelts is conservation and multifunctional, its value is proposed to be calculated according to the methodological approach of the method of normative monetary valuation of lands of settlements and comparison of the obtained value data with the market value of land plots by the comparative method of sales. In particular, if the deviation of the normative monetary assessment is more or less than 30% of the market value, the local coefficients shall be adjusted (refined) to the location of the land plot, which characterizes the subtypes of land tenure. The determined value of land tenure of shoreline shelterbelts according to the proposed methodological approach is deemed to be more objective.

5 Availability of Data and Material

Data can be made available by contacting the corresponding author.

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