The favourable influence valuation of land covered by water

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Abstract
This article emphasizes the steps required for the application an valuation methodology for land covered by water. This process is addressed to the public institution in Romania, that manages this type of land (swamp areas, artificial lakes or floodable areas). In the article are followed the rules and the legislation of Romania, and the principles presented may have large scale applicability.

Key words:
lands covered by water, CMBU (the highest and the best use), market value, valuation report.

1. Generalities

Water is important for life and for the achievement of all human activities, being used in alimentation, agriculture, industries, transportation, navigation, fishing, etc. Long regarded as an inexhaustible resource, water is not yet available in sufficient quantities, appropriate for certain times and regions of the country.
The demographic bursts, urbanization, industrial development, they all lead to a higher water consumption and determined the emergence of water usage in various ways.
For these reasons, the protection of waters is a must, together with a rational usage and a balanced management of all water resources.

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In 1968 was founded the first international document, named "The European book of water", which was adopted by the Council of Europe and it included a series of rules and principles, as follows:

- the water resources are not inexhaustible;
- the quality of water must be preserved;
- water doesn't have borders;
- water is a common heritage of all nations;
- water pollution is prohibited [1];

The main normative acts that establish the legal status of water, regarding the administration, management and protection of waters and watery ecosystems are: the Water Law no. 107/1996, as amended by Law no. 192/2001 and by the Government Decision no. 107/2005 , Law no. 18/1991 republished in 1998 regarding the land fund, Law no. 137/1995 republished in 2000 concerning the environmental protection and the Government Decision no. 188/2002 on the regimen of waste waters, the Romanian Constitution of 2003, etc.
Law no. 107/1996 establishes the following objectives and standards in this field [2]:
– preservation, development and protection of the water resources;
– protection against all forms of pollution and alteration of the characteristics of water;
– complex harness of water as an economic resource, and its rational and balanced distribution;
– preservation and protection of watery ecosystems;
– protection against floods and other dangerous hydro-meteorological phenomena;
– meeting the water demands for industry, agriculture, tourism, transportation and other human activities.

1.2 Considerations regarding the water public domain

Under the legislation in force, the administration, management and use of water in a complex and rational way, must rely on principles according to which, the quantity and quality of water must constitute an integrated whole. According to the provisions of the Water Law no. 107/1996, the water may belong to the public or private domain.

The regimen for utilization of the water resources is established by the Government and is carried out by the Competent Ministry, regardless of the property type (an exception being the geothermal waters).
The administration of the national public water domain, its management in terms of quantity and quality, the water management exploitation works, the implementation of the national strategy and policy in this field, are carried out by the Autonomous Administration "Romanian Waters" and its regional water branches. [3]
Both the Competent Ministry and the National Administration "Romanian Waters" are able to take decisions in order to limit or temporary suspend the water, in certain situations (ecological accidents, droughts, floods).
The use of water can be free (for drinking, watering, etc.) or authorized (for irrigation activities, fishing, navigation and energy production, for procurement of drinking and industrial water).
Due to the bond between water and soil, all the works which are done on water or in relation to it, shall be subject to the provisions of the land fund Law no. 18/1991, republished, and to the Law no. 137/1995, republished in 2000; the works for the adjustment of water courses, irrigations, impoundments, drainage, etc., shall be done simultaneously with the works for soil protection and amelioration.

2. Valuation methods

The interest in assessing such lands is fundamental to the whole valuation process. In order to determine the problem as accurate as possible, the ownership rights over the real estate are studied and taken into account, and, where appropriate, the water management process is also considered.
The question that arises is the following: "Can only the rights for water management be assessed?" In this situation, is there an assessment methodology that can be applied only for the rights of use? Can lands, which by their nature offer this possibility, be evaluated?
An assessment methodology of these rights is to compare the value of the property, which includes the water management rights, with the value of the property which doesn't include them. The difference resulted from the two values, indicates the contribution it brings to the property, the value of the lands covered by water, which by their nature can produce incomes.
Situations are encountered, when it is desired to use only part of a real estate, in order to create an artificial lake. It must be taken into account, that the previously mentioned methodology measures the market value impact over the full ownership rights, as well as over the dismemberments of the ownership rights. The estimated value of the impact may or may not coincide with the market value. For instance, such an analysis can indicate what impact we can have in a situation in which an owner loses or gives up the right for water management. We assume that the loss of this right might prevent adequate water usability (e.g. impossibility to irrigate agricultural lands during draught periods). Finally, it can lead to a significant decrease in the market value of the property.
The rights for water management are not transmittable.
The analysis regarding the best usability should include enough information in order to obtain the market value derived from the water management rights. This value can provide or not the benefits of the real estate property.
Depending on the obtained value, for example, if the value is lower than what can be found on the market, the property keeps its right to use, but if the value is greater than the ones existing on the market, the potential increases, while the utilization manner may change. In such situations, the seller can obtain a higher net value, if he would concession the right to use water.
In the situation in which, we would individually evaluate the water management right then, the assessment report should mention the values of the indicators for the parcels covered and/or not covered by water. This information will help us draw conclusions, while taking into account that we are assessing the rights for water management.
In such situations, a second opinion from an assessor is recommended, provided that he has experience in this field. Assistance from lawyers, engineers, water engineers, etc., can also be sought.

2.1 Types of valuation approaches

The three types of approaches used in assessing a real estate property, in order to reach an opinion on the market value, may also apply for the lands covered by water.

The market approach
In order to apply the market approach we must make sure there are comparable real estate goods available. The comparable elements include the best use, transferred ownership rights, location, water quality, the period when the water is used. The conclusions concerning the best use will always be indispensable.
In the market approach, the transferred real estate property rights should be similar to the ones of the property in subject. For example, by using a real estate transaction for which the right to use water is established under a lease, concession etc. The conditions and terms stipulated in the agreement, which can be intangible, might raise issues, and for this reason a careful review is recommended.
Another important comparison element is the location. Ideally, the comparable properties should be in the same water basin. Rational water management, depending on the season, could result in obtaining benefits throughout the entire year.
Depending on the way in which it is used, water can be transported for instance, to be utilized in agriculture. We must take into account that in such situations, the use of water in various projects cannot be considered

comparable when applying the market approach.
The potential water users will also consider the quality of water. In case the water quality is not within the normal parameters, treating it involves additional costs in order for the water to be used for irrigation. Using untreated water in various projects, can lead to completely unfavourable results. This can have a devastating impact over the entire hydrological system in the area.
In the assessment report should be included information regarding the history of water management, during different seasons and fields of activity.
If the owner wants to change the water management, for example he wishes to switch from irrigation to transportation of water supply, for a farm, this might produce some changes in the optimal use of water on the local market. However, other aspects that must be considered in order to obtain appropriate results are demography, main designation of lands, and water use trend in the area.

The cost approach
The cost approach was more often used in evaluating locations, rather than in evaluating the rights over lands covered by water.
The lands covered by water should be considered to have an improvement in terms of land value; for instance the cost approach can be applied in certain situations, although it can be noticed that the cost approach is not used in the assessment reports as much as the market approach.
Through the cost approach we can obtain additional information; for example, we can encounter situations when only this type of approach is recommended, due to the lack of comparable properties existing on the market.
If we consider that it would be possible to replace the lands covered by water with clear lands, then the cost of developing the underground resource could be considered a substitute for the above the ground land resources.
When using this approach, the assessors should consider the following aspects:

- The legal restrictions associated with the rights for water use;
- The depth of the water and its variations depending on the season, must be taken into consideration;
- The amount of water extracted during pumping;
- Changes in the level of water which appear during a period of several years;
- Rates amortisation for the use of water in order to estimate the depreciation.

To reach a credible market value, it's recommended to work in collaboration with several experienced assessors, who activate in that area. Information can be obtained from local distributors, districts, farms, associations, local city hall councils, etc.
The costs may be associated with preservation measures, in order to obtain indicators regarding the value of the lands covered by water.

The income approach
An analysis of the net foregone income from the agricultural production, can serve as an indicator of the value of lands covered by water. The cause can be assumed from various reasons, such as income, which cannot be associated with water.
The net global income derived from the operations of a company, involves all the production factors, including the efforts of the manager or administrator to produce an income.
One way to determine the value of the land covered by water is to compare the income obtained from the lease of the lands covered by water. In this way the contribution value of the land covered by water is isolated from other production factors.
The following aspect shall be taken into account: assessments involve the reflection perspective of both sellers and buyers. The income approach is generally applied when real estate properties are seen as income generating properties.

3. Valuation methodology

Description of the subject property
The subject property is made up of two parcels, out of which one is covered by water. The purpose of the assessment is to establish the market value of the land in order to administer the water for various activities. The period during which the water is used is between 1st May and 1st September. The volume of water transported for irrigation is of $4m^3/s$. The amount of water helps irrigating an area of approximately 100 ha, during 214 calendar days. In that area, the lands are cultivated especially with wheat, corn, barley, oat, sunflower, etc. Due to the fact that the property in discussion is often flooded by the Danube, pipes will be used for water transportation to the lands which require extra water.

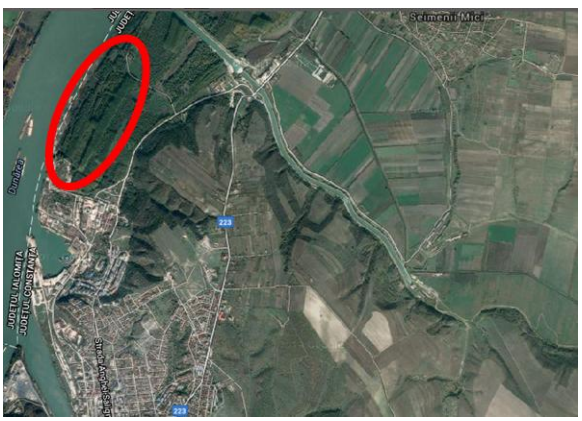

Figure 1 Subject property location

Preliminary analysis
A preliminary analysis of the subject property, as well as of the comparable properties, will be made. This analysis consists of water protection methods and enforced

obligations. The legal protection of water is accomplished through quantitative and qualitative protection.
The quantitative protection of water resources is achieved through rational use and protection against dewatering.
The legal regulations enforce the following obligations on:
– water users to rationally use the water resources;
– central and local authorities, economic operators, companies, to take measures in order to reduce the water consumption, the repeated use of water and the maintenance of water facilities in a proper condition, to help avoid losses;
– persons who administer and use water, to take measures and provide adequate water flow measurement facilities;
The qualitative protection of water aims to maintain the quality and purity of water. To this end, the legislation establishes that any kind of pollution of water resources is forbidden. The Ministry of Environment and Water approves the drinking water quality standards, issues regulations, water quality standards, standards for emission, water treatment and discharge, authorization procedure for water exploitation, regulations for development of hydro-technical constructions used for impoundments, irrigations, regulations, drainage, etc.
The water management bodies, local bodies of the public administration, natural and legal persons have the obligation to perform fit-up works, cleaning and maintenance of the water resources.
The natural and legal persons, as water users, have de following obligations [4]:
– to seek environmental approval and authorization for activities such as water navigation, energy production, etc.;
– to comply with the emission and water quality standards, and also with the provisions of the environmental approval / and authorization;
– do not throw or deposit waste, dangerous or explosive substances, narcotics, etc., on the water banks or beds;
– do not use electric energy or dangerous substances for fishing;
– do not wash motor vehicles, machineries, packaging with oily contents, toxic or dangerous substances, etc., in natural waters;
– if they poses vessels, they should equip with floating platforms, marine pumps, etc.;
– do not put into service economic objectives or residential complexes, without sewerage and adequate water treatment facilities.
Water protection includes beds' protection, water management works (hydro technical constructions) and construction works made on water or related to water. Another tool for water protection, pollution prevention and control, is the check up in advance of all the activities impacting on water, such as:
– site and water management approval notice, are necessary for the execution of construction works that are developed on water or related to water;
– the water management authorization, is the legal and technical regulation which determines the implementation or exploitation of both the existent and new objectives, that are built on water or related to water;
– environmental approval and authorization, for the required activities.
The great importance of water as a natural resource of economic value derives also from the fact that for its protection (qualitative and quantitative)[5] are applied economic incentives, for those constantly preoccupied to protect it, as well as sanctions and penalties for those who pollute it.

3.1 Case study

Considering that the water management right is entirely conceded to an association responsible to provide the needed water for crops, over a determined period of time, which is established together with the other contractual terms, we will apply a methodology taking into account certain aspects related to the market comparison. The income approach can be applied, given that there are investors who would buy/lease these types of land, action from which an income would be obtained. The cost approach has no contribution, since there is no possibility to replace the water source or there are no feasible preservation measures.
Two types of analysis will be made, one which will consider the water management rights, and the other one which will not consider them. [6]
For the first analysis, the comparable properties would have to be adjacent, in terms of location, and the water management approach should be the same. If the existing number of such real estate goods is not enough, then all the properties that are similar size-wise to the subject property can be used. The applied adjustments will be taken into account.
In the second analysis, we will only consider the neighbouring properties, which are not entirely or partially covered by water. In this analysis, both the subject property, as well as the comparable properties must have the same results after applying the best use analysis. The analysis of the best use will require two sets of properties, one set which will contain the properties partially covered by water, and one set containing the properties not covered by water.
For the completion of the assessment report, it is very important to take into account the opinion of an experienced assessor.
Below are presented the three comparable properties used to determine the market value:
Comparable property A is similar to the subject property in many respects. It has some improvements in the mechanisms of water transportation, but only 30% of the total can be used for irrigation, compared to the subject property which can transport about 70% from the water quantity.

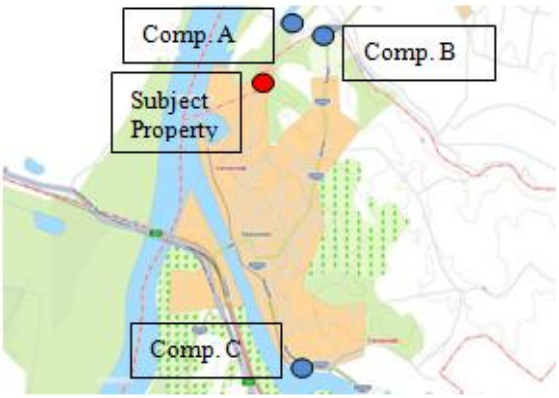

Figure 2 Case sudy location

An adjustment will be applied for this difference in percentage.
First, we assume that for the comparable property A the value of the land is estimated at 10 euro/sqm. By multiplying this value with 30 ha, which are considered to be non-irrigated, we will apply a negative adjustment of 30.000,00 euro. The final resulted value, after the adjustment is made, will be of 270.000,00 euro, meaning 9 euro/sqm.

Figure 3 Location for A comparable property

The comparable property B is noticeably inferior to the subject property, being situated in a peripheral area, more precisely at the border between two townships. It is located at a considerable distance from the subject property. It's the kind of property that is purchased solely to help extend the neighbouring property. The seller was constrained to sell and made a discount on the selling price. All these data require adjustments. The water transportation percentage is approximately equal to the one of the subject property. The only disadvantage is the much too difficult location, thus its use being significantly reduced. However, the comparable property B is an indicator of poor value, but it is not unprecedented in an analysis.

Figure 4 Location for B comparable property

Comparable property C requires adjustments made to the property ownership rights, because the water management right is conceded for a period of 15 years. The water management is done in the same way as for the subject property. However, we can consider the comparable property C to be similar in many ways to the subject property.
Comparable property C consists of 4 parcels with high potential for development. The potential for development of a real estate property depends greatly on location, access, road opening, supply and demand, and the period during which water is used.

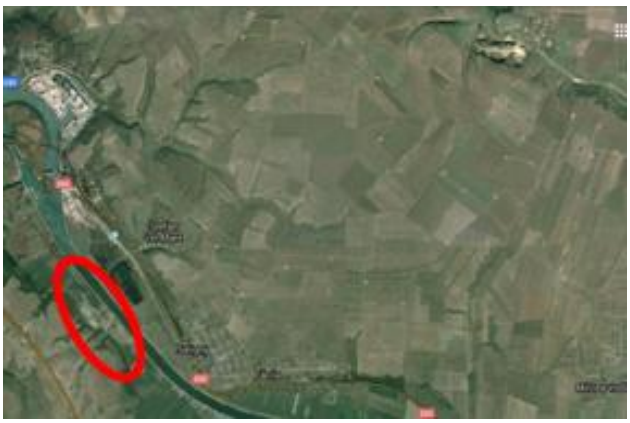

Figure 5 Location for C comparable property

4. Conclusions

In this paper was presented an assessment method of lands covered by water, from the idea that the water management rights can be established under an agreement and in accordance with the law in force.
We can obtain reliable results, if we find information regarding properties having similar characteristics. In fact, these will negatively or positively influence the value of the property.

The analysis of the best use provides information regarding the best use of water. As I have previously mentioned, these uses can vary from one area to another, depending on climate conditions, geographical location, and hydrology. According to the study case, the best use for the subject property is to be a vacant land. The best use helps the assessor to identify the water management trends within the area of interest, and also to easily obtain the necessary information.

Tab.1 – **Case study – the highest and the best use**

Crit no.	Calculation element	U.M.	Calculation Method	Vacant land	Storage space
1	Requested rent (C)	€/month		900	1.500
2	Potential gross income (VBP)	€/year	C*12	10.800	18.000
3	Vacancy rate (Gn)	%		10	40
4	Actual gross income (VBE)	€/year	VBP*(1-Gn)	9.720	10.800
5	Owner's expenses (Ch)	€/year		2.402	2.568
	Tax	€	1,2%*CIN	996	996
	Insurance	€	0,2%*CIN	166	166
	Management	€	2%*VBE	194	216
	Maintenance costs	€	1%*CIN	830	830
	Real Estate Agency Fee	€	2%*VBP	216	360
6	Net operating income (VNE)	€/year	VBP-Ch	7.318	8.232
7	Capitalization rate (c)	%		5,0	6,0
8	The value of capitalized property (V)	€	VNE/c	146.360	137.200
9	Conversion cost (Cc)	€		0	5.000
10	Final value (Vf)	€	V-Cc	**146.360**	142.200

We can see from the above table that the risk to rent a space as storage space is higher than the risk of vacant land, while the value of the property used as a storage space is lower than the value of the property as a vacant land.

In conclusion, the best use of the subject property is to be utilized as a vacant land.

These reports can vary in terms of execution time, from 14 working days, to weeks or even months.

The assessors need to have good knowledge of the legal terms regarding water management. The time spent for the analysis and inspection of the property, may vary, depending on the case.

The evaluation of these types of land represents a method to determine the value of the real estate property, when these lands represent a source of income, provided that they are used rationally and according to the requirements of the respective area. By applying the real estate assessment principle and in compliance with the regulations in force, the results obtained will be more reliable. Also, we have to take into account the requirements of the area and the trend of the urban development.[7]

The differences obtained, by evaluating lands which can be used for irrigation and those which cannot be use in this purpose, helps us have a starting point in order to have continuity in the assessment of the lands covered by water.

In conclusion, we notice that the applied methodology and the selected methods are appropriate. The available information for the analysis is considered to be enough. Moreover, the property in questions is not typically an income generating one (e.g. commercial space, storage space, industrial space, etc.) but it is a property with the designation of vacant land, without any developments, and the estimation of revenues for comparable properties, available on the market, may account for poor quality information on rental values, as it doesn't rely on a safe level required to accurately estimate the capitalization rate, given the actual economic environment and its implications on the real estate market.

Therefore, it is considered that the value which indicates the most likely correct price of the assessed property, is the value obtained from the sales comparison approach.

Based on a hypothetical analysis, we can estimate the market value between 8 and 10 euro/sq.m. After reconciliation, we estimate the market value which is closest to the truth to be of 9 euro/ sq.m. Following the results obtained, comparable property A meets most of the conditions.

5. References

[1] Water law no.8/1974 and Law no.5/1980, concerning rational management, protection and water quality ensuring.

[2] Art.2 of the Water Law no. 107/1996.

[3] Art.7 para.2 of the Law no. 107/1996 (Autonomous Administration "Romanian Waters" is now called the National Administration "Romanian Waters").

[4] These obligations are stipulated by article 40 of the Law on Environmental Protection no. 137/1995, republished.

[5]Published in the Official Gazette no. 691/20 September 2002, whereby sets-up the National Administration "Romanian Waters", by reorganizing the National Company "Romanian Waters" which is dissolved.

[6] www.appraisalinstitute.org/

[7] Basis of evaluation - IROVAL 2014

[8] www.google.ro/maps