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## ANALYSIS OF CHANGES IN THE METHODOLOGY FOR DETERMINING THE PRICE OF THE “IRRIGATION WATER SUPPLY” SERVICE IN THE REPUBLIC OF BULGARIA<sup>1</sup>

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**Abstract:** *The present paper focuses on some crucial changes introduced in the methodology for determining the price of the irrigation water (“irrigation water supply” service), provided to the farmers – water users in the Republic of Bulgaria. The methodology for determining the price of the irrigation water reflects the distinctive conditions and specific requirements related not only to the technical parameters of the respective hydromeliorative systems but also to the particular requirements related to their operation and maintenance. With the adopted amendments, the price structure shall be formed on the basis of two components - a constant one, covering the fixed costs of water supply, determined on the basis of the irrigated areas and variable one, calculated on the basis of measured volumes of supplied irrigation water.*

**Keywords:** *Irrigation costs, Price, Methodology, Irrigation water providers.*

### INTRODUCTION

Considered within the scope of the present paper are some critical changes introduced in the methodology for determining the price of the irrigation water (“irrigation water supply” service) provided to the farmers – water users in the Republic of Bulgaria. The structure for determining the price of the service, in compliance with the adopted amendments, shall be formed on the basis of two types of costs - fixed, determined by the size of the irrigated areas and variable costs, estimated in accordance with the volume of the supplied water resource.

*The main objective of the newly adopted methodology is to give the irrigation water providers the opportunity to calculate the price of the service they provide observing the general principles of transparency, sustainability and financial affordability; the price of the service should be based on clearly defined expenditure components; the service should be carried out on the basis of common contractual terms and individually determined regional prices. The methodology for determining the price of the irrigation water supply service is applicable to the existent irrigation water providers, namely:* • *Companies with state and/or municipal participation*, (regional sub-divisions of the state-owned company “Irrigation Systems” EAD), managing and operating principal hydromeliorative systems; • *Irrigation associations*, which have acquired the status of independent “irrigation water supply” service providers, serving the farmers- water users within the boundaries of the irrigation systems (hydromeliorative infrastructure), allocated to them for proper management and utilization.

Prior to the adoption of the two-component structure for determining the price of the “irrigation water supply” service, the basis for determining the price of the irrigation water was the total (cumulative) sum of all the annual expenditures of the organisations responsible for the management and efficient utilization the hydromeliorative systems, as well as the supplied volumes of water, including: the costs of water abstraction, management and regulation of the existing water resources; technical and operational costs associated with the maintenance, management and utilization of the hydromeliorative facilities (the irrigation systems); the costs of personnel, materials, spare parts, electricity; the costs for the organisation, distribution and supply of water resources to farmers- water users, which were formerly compared with the annual amount of the supplied

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irrigation water masses. *In other words, in practice, it was the service providers who determined the cost of expenditures, related to the organisation, distribution and supply of one cubic meter of irrigation water to farmers – water users.*

Applying the principle of standard cost pricing, based on preliminary estimates as regards the range of costs for provision of irrigation water, in accordance with the technical parameters of the respective irrigation systems, the size of the areas declared for irrigation, the structure of the agricultural crops, the type of the exploited water resources, the method of irrigation, as well as the necessary volume of water masses required for the corresponding irrigation season, the irrigation associations were the ones to project prognostic estimates for the price of the irrigation service provision.

## EXPOSITION

### **New approach in the Methodology for determining the price of the “Irrigation Water Supply” service**

With regard to Regulation of the European Parliament (EU) № 1305/2013 on the “existence of a water pricing policy to ensure adequate contribution of the different uses of water as a reimbursement for the cost of water services” (<http://www.strategy.bg/PublicConsultations/View.aspx?lang=bg-BG&Id=2345>) and a subsequent decision of the Council of Ministers of the Republic of Bulgaria as of November 2016, a new Methodology for determining the price of the “irrigation water supply” service was adopted.

In line with the accepted amendments “the pricing of the service rendered is made by separate irrigation water providers, each of whom being entitled to determine the level of the service they provide to their customers. The price reflects the particular conditions and individual needs related not only to the technical specifications of the given irrigation system but also to the particular requirements related to its proper utilization and maintenance. The pricing structure is built on two components—constant, covering the fixed costs for water supply determined on the basis of irrigated area, and variable, based on measured volumes of supplied irrigation water” (<http://www.strategy.bg/FileHandler.ashx?fileId=8057>).

The price of the irrigation water supply service is determined on the basis of projected costs estimates in accordance with the expected demand by the farmers- water users. The expected costs of “irrigation water supply” refer to the:

- costs related to the utilization of the hydromeliorative systems, including: costs of materials and electricity, costs of pumping water, costs for employees’ salaries, administrative and management costs;
- costs for the proper maintenance of the hydromeliorative facilities;
- capital expenditures for the acquisition of tangible and intangible assets.

*In keeping with the regulation of the current Methodology, the regional commercial companies of the “Irrigation Systems” EAD, as well as the irrigation associations with the acquired status of irrigation water providers, submit to the District Directorates of Agriculture and the Directorate “Common policy in the field of irrigation and fisheries” at the MAF, an annual report on the actual costs and the real price of the service during the past irrigation season, as well as the anticipated price for the forthcoming irrigation season. By order of the Minister of Agriculture the prices of the “irrigation water supply” service for the respective irrigation season shall be approved and annually publicized by region and for the individual providers.*

The new approach in the methodology for determining the price of the “irrigation water supply” service requires for the revenue base necessary for covering the projected costs of the service provision to incorporate the fixed costs (price), determined per unit irrigated area and variable costs determined per unit water supplied (cubic meter of irrigation water) – see Fig. 1 and Appendix 1.

In view of the above, the revenue base to cover the costs for the provision of irrigation water should ensure *the reimbursement of the fixed and variable costs components defined by the following equation* (<http://www.strategy.bg/FileHandler.ashx?fileId=8057>):

**RAR = EAFC + EAVC**, where:

**RAR** - Required (Planned) annual revenue, BGN;

EAFC - Eligible annual fixed costs, BGN;  
EAVC - Eligible annual variable costs, BGN.

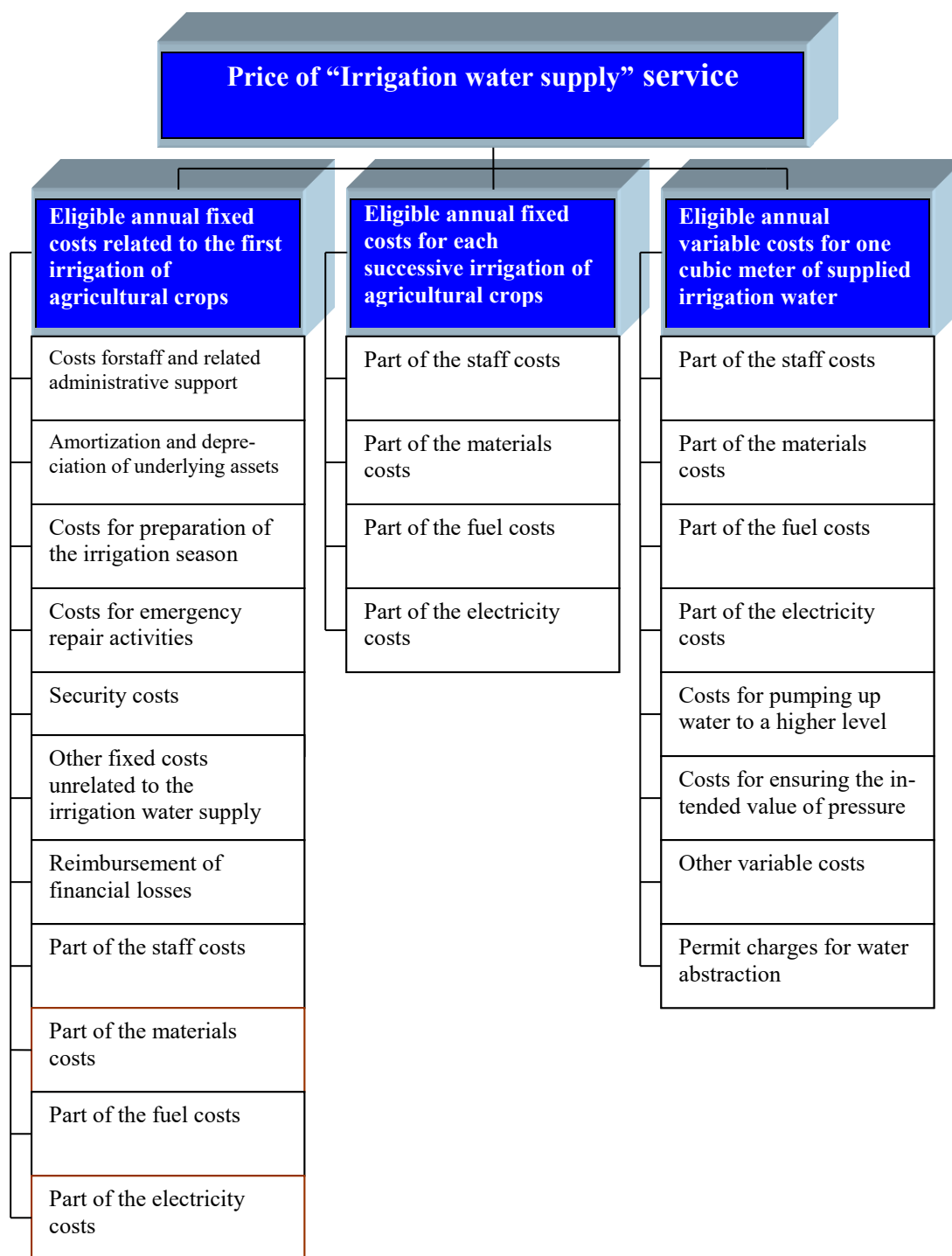


Fig.1. Classification of annual eligible costs for determining the price of the "irrigation water supply" service

### Implementation of the Pricing Methodology by irrigation associations operating on the territory of the North-Eastern Planning Region of Bulgaria

Presented in Table 1, and consistent with the regulations of the Methodology, is the irrigation water price-setting as for the irrigation associations operating in the North-Eastern planning region (NEPR) of the Republic of Bulgaria.

Table1. Price of the "irrigation water supply" service, 2018

IRRIGATION WATER PROVIDER		Fixed price per decare for first irrigation	Fixed price per decare for each successive irrigation	Price for delivered volume of water
IRRIGATION ASSOCIATIONS		BGN/dec	BGN/dec	BGN /m <sup>3</sup>
"Neptune 2006"	Village: Dobrotich, Municipality: Valchi dol, District: Varna	11,19	1,67	0,01
"Izvorite 2007"	Village: Levski, Municipality: Suvorovo, District: Varna	12,16	5,84	0,02
"Aquapoli"	Village: Brestak, Municipality: Valchi dol District: Varna	6,90	1,31	0,03
"Izgrev"	Village: Izgrev, Municipality: Suvorovo, District: Varna	12,00	5,80	0,04
"Iskar"	Village: Iskar, Municipality: Valchi dol, District: Varna	28,00	4,00	0,05
"Nikolaevka"	Village: Nikolaevka, Municipality: Suvorovo, District: Varna	12,11	3,18	0,08
"Durankulak"	Village: Durankulak, Municipality: Shabla, District: Dobrich	15,00	8,00	0,15
"Kaliakra agro"	Town: Kavarna, Municipality: Kavarna, District: Dobrich	9,20	5,00	0,24
"Belgun"	Village: Belgun, Municipality: Kavarna, District: Dobrich	25,33	7,33	0,24
"Elana"	Village: Vranino, Municipality: Kavarna, District: Dobrich	15,37	5,00	0,25
"Irechek"	Village: Irechek, Municipality: Kavarna, District: Dobrich	10,68	5,06	0,33

Source: Minister of MAF's order for an approved price of the "irrigation water supply" service provided by the irrigation associations for the 2018 irrigation season

The data, as to the price of a cubic meter of supplied irrigation water by the irrigation associations operating on the territory of NEPR, confirm the pattern established by individual researchers as regards the categorization of associations relative to the amount of costs, associated with the supply of irrigation water, as listed below (Kubratova, M. 1997):

- Associations managing and utilizing the relevant irrigation systems with low maintenance and operation costs, and respectively, relatively low costs of the irrigation water. This category comprises all irrigation associations managing and implementing *gravity-fed* (surface) irrigation systems;
- Associations managing and utilizing irrigation water pumps and gravity-fed surface irrigation systems. Irrigation associations that belong to this category tend to form relatively higher costs of irrigation water;
- Associations managing and utilizing irrigation water pumps and implementing traditional irrigation by rainwater harvesting systems. For this category of associations, the cost of a cubic meter of irrigation water is the highest when compared to water costs of the irrigation associations from the groups described above.

The categorisation of irrigation associations according to their production and realization costs incurred for provision of irrigation water is given in Figure 2.

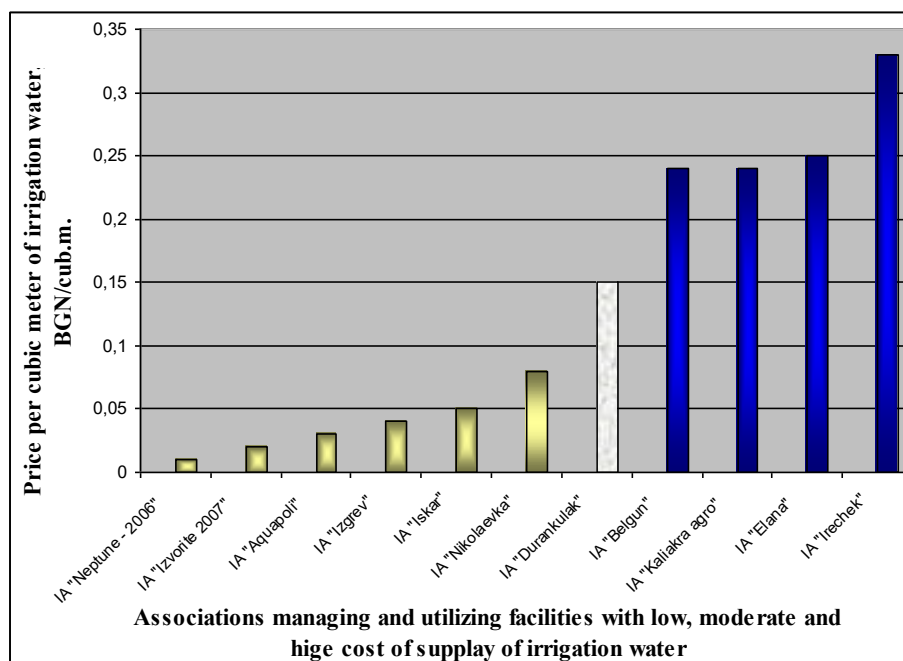


Fig. 2. Categorization of irrigation associations on the territory of NEPR according to the price per

## CONCLUSION

On the whole, it can be summarised that setting the prices observing the current methodology poses, in practice, certain difficulties for irrigation water providers, related to the allocation of costs by components.

Nonetheless, the analysis of the pricing structure helps us reach the following conclusions:

1. Envisaged in the improved Methodology for determining the price of the “irrigation water supply” service is a new price-setting approach to be adopted by irrigation service providers in order for the actual levels of the price of the irrigation water to be taken into account;

2. Provisions are made for the actual irrigation costs incurred by the farmers- water users to be addressed in view of the possibility to determine the price of the irrigation water on the basis of a two-component cost structure;

3. With the amendments in the pricing structure of the irrigation water supply service, the principles of transparency, sustainability and financial affordability, laid down in the regulations of the current methodology for determining the irrigation water price could now be achieved;

4. Setting realistic levels for the price of the irrigation water is a decisive factor for motivating farmers to grow water intensive crops (mostly fruits and vegetables), the demand of which is steadily increasing in both domestic and international markets.

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Appendix 1

To article 10 of the Methodology for determining the price of the “irrigation water supply” service

Planned annual fixed and variable costs for agricultural crops in leva																					
2	Eligible annual fixed costs											Eligible annual variable costs								dec	m <sup>3</sup>
3	a	b	c	d	e	f	g	h	i	j	k	h	i	j	k	l	m	n	o	p	q
4	reimbursement and compensation for past financial losses or gains other fixed costs unrelated to the irrigation water supply security costs costs for emergency repair activities costs for preparation of the irrigation season depreciation and amortization of the required underlying assets costs for administrative irrigation-related personnel											part of the electricity costs part of the fuel costs part of the materials costs part of the staff costs part of the electricity costs part of the fuel costs part of the materials costs part of the staff costs costs for ensuring a load line to the intended value of pressure costs for pumping up water to a higher level other variable costs abstraction permit charges planned payments for water								estimated or feasible irrigable area estimated or feasible volumes of water supply	
5	* Fixed price per hectare for first irrigation 0,00 lv											Price for volume of water supply									
6	** Fixed price per hectare for each successive irrigation 0,00 lv																				

\* The fixed price per hectare for first irrigation covers all fixed costs (line 5, cells from a to k, section **Eligible annual fixed costs**);

\*\* The fixed price per hectare for each successive irrigation comprise only the fixed costs related entirely to the process of irrigation (line 5, cells from h to k, section **Eligible annual fixed costs**);

\*\*\* **The total irrigation price is the sum of:** the fixed price per decare multiplied by the irrigated decares and the price per a cubic meter (m<sup>3</sup>) multiplied by the supplied water volumes.