

PUBLIC ADMINISTRATION

CONSOLIDATION OF ENTERPRISES OF WATER SUPPLY AND WASTEWATER OF UKRAINE WITHIN THE RIVER BASINS: OPPORTUNITIES AND PROSPECTS

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ABSTRACT

The article describes the peculiarities of implementation of the watershed management of water resources management in Ukraine under the conditions of reforming the state water management system, the sphere of water supply and wastewater. The connection between the implementation of the basin principle of water resources management and the search for an effective model of management of water supply and wastewater enterprises are determined. The article deals with the peculiarities of the existing management of the water supply and wastewater system of the country according to the administrative-territorial principle, presents a map of Ukraine by regional division, shows the population of the regions, the number of water supply and wastewater companies operating in the regions, lists the basic water supply and wastewater enterprises. The hydrographic map of Ukraine is presented, it is stated that the modern administrative-territorial division of the territory of Ukraine does not coincide with the hydrographic boundaries of the basins of water bodies of Ukraine, which also complicates the implementation of integrated management in the water sphere. The author of the article proposes to solve the issues of management and production efficiency of water supply and wastewater enterprises by consolidation of water supply and wastewater companies within river basins, separate territories (or regionalization of water supply and wastewater services) and creation of regional water companies on their basis. The article describes the advantages of consolidation of water supply and wastewater companies and gives examples of such consolidation in Ukraine and the prospects for its further implementation.

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Introduction. In terms of available water resources, Ukraine belongs to poor countries in Europe and the world. Water resources of the country are the main source of drinking water for the population (drinking water supply to Ukraine is almost 80% provided by surface water), are used in various industries, agriculture, energy, shipping, domestic and more. Almost all of the country's water resources have been heavily polluted in recent years as a result of haphazard economic activity, violating the permissible limits of territorial development, excessive intensification of the use of natural resources, siltation, pollution and overgrowing of rivers, as well as failure to comply with the

regime of restricted coastal protection. According to the State Agency of Ukraine, the list of the largest pollutant companies in 2018 includes enterprises that discharge natural (non-purified) water after treatment or after treatment facilities and whose quality does not correspond to the maximum permissible discharges established in permits for special water use. The ten major pollutants included PJSC «AK «Kyivvodokanal», PJSC «Metkombinat «Azovstal», PJSC «Dneprovsky Metkombinat" (Kamyanskoe), PJSC «Zaporizhstal», KP «Dnirovodokanal», LLC VKF (Dnipro city), SCC «Lvivvodokanal», MCC «Mykolaivvodokanal», Branch of PRAVOKS PJSC «DTEK Pavlogradugol», KP «Chernihivvodokanal». The total number of enterprises discharging contaminated wastewater is 539, the total volume of discharge of contaminated return (wastewater) is 952 million cubic meters. m (of which 918.6 million cubic meters are dumped by the enterprises included in the rating). Almost two-thirds of the enterprises included in the list are located in the territory of 5 regions: Dnipropetrovsk - 24; Donetsk - 19; Lviv - 7; Kharkiv - 7; Lugansk - 6. Most polluting enterprises belong to the municipal sector - 74, industries - 18 (of which the largest are the enterprises of ferrous metallurgy - 6). In total, about 30 water supply and wastewater companies are published [20].

The use of water resources without environmental requirements in the process of economic and social development has led to a radical restructuring of water systems, reducing the sustainability of river basin ecosystems, their ability to self-purify and self-renewal, and modern water management and hydro-ecological problems in Ukraine have acquired obvious consequences. Increasing problems with providing the population with quality drinking water, the emergence of problems of physical access to water bodies, increasing diseases associated with lack of access to safe water and lack of proper sanitation, especially in rural areas, adversely affect social and economic development opportunities of the state [15]. In the conditions of increasing anthropogenic loads on the natural environment, development of social production and growth of material and socio-economic problems in Ukraine there was an urgent need to develop and adhere to special rules for the use of water resources, their rational use, restoration and ecologically directed protection [11]. An urgent task for public policy was to define an effective system of ecological and economic management of the country's water management complex, to organize a balanced mechanism for the use, reproduction and protection of water resources, including the definition of an effective model of water supply and wastewater management.

Purpose of the study. The purpose of this article is to analyze the current state of management of water supply and wastewater companies in the conditions of implementation of the principles of watershed management and to determine the prospects of consolidation of water supply and wastewater companies within river basins or districts, regions.

Research results. European principles were based on the development of the state water policy of Ukraine: ecological management - solution of problems of water supply and protection of waters within aquatic ecosystems, beyond which are basin spaces, and in accordance with the requirements of their holistic and sustainable development; public administration - through specially authorized basin bodies for managing the use and protection of water and water bodies; economic regulation of water use and protection - according to the principle «water should pay for water», i.e. «pay by water user» or «polluter pays» - the total amount of investments in water management is paid by users of water [9].

At present, the management of the water and wastewater system of the country is carried out according to the administrative-territorial principle, laid down in Soviet times for the convenience of centralized state administration, and enshrined in the Constitution of Ukraine (Articles 132-133) (1996, June 28). According to the Constitution of Ukraine, the administrative-territorial structure of the state is determined by geographical, historical, economic, ethnic, social, cultural and other factors of the internal territorial organization of the state with its division into components - administrative-territorial units, according to which the system of state bodies and local government system. It is these administrative-territorial units that are the «spatial basis» for the organization and activity of the respective local executive bodies and local self-government bodies [14, p. 98].

Ukraine includes: Autonomous Republic of Crimea, Vinnytsia, Volyn, Dnipropetrovsk, Donetsk, Zhytomyr, Transcarpathian, Zaporizhia, Ivano-Frankivsk, Kyiv, Kirovograd, Lugansk, Lviv, Mykolaiv, Odessa, Poltava, Rivne, Sumy, Ternopil, Kharkiv, Kherson, Khmelnytsky, Cherkasy, Chernivtsi, Chernihiv regions, cities of Kyiv and Sevastopol. Figure 1 shows a map of Ukraine's regions.



Fig. 1. Map of regions of Ukraine [3]

In fact, all existing water supply and wastewater companies, as well as large infrastructure networks, were created and built within the settlements during the Ukrainian SSR with the laid down perspective of development of settlements, their founder was the state, and in 1991 the decision of the Government was transferred to local self-government bodies. Table 1 provides information on the total number of water supply and wastewater companies by section of regions, cities of Kyiv and Sevastopol as of 2017 (created on the basis of [15], *data on the ARC and Sevastopol are given in 2012-2013 prior to the annexation of the ARC [16], data on the number are given on the basis of [10]).

Table 1. Water supply and wastewater companies by section of region

Region	Total number of WSS enterprises (as of 2017)	The basic enterprise of the region	Population (million as of 2017)
1	2	3	4
Vinnitsya	77	KP «Vinnitsaoblvodokanal».	1,584
Volyn	44	KP «Lutskvodokanal»	1,039
Dnipropetrovsk	84	KP Dneprovodokanal DMR	3,242
Donetsk	42	KP «Company« Donbass Water»	4,218
Zhytomyr	86	KP «Zhytomyrvodokanal»	1,236
Transcarpathian	16	KP «Vodokanal of Uzhgorod»	1,258
Zaporizhzhya	141	KP «Vodokanal» (Zaporizhzhya)	1,731
Ivano-Frankivsk	30	KP «Ivano-Frankivskvodoekotehprom»	1,378
Kiyv	147	Belotserkovvoda LLC, Bila Tserkva	1,742
Kirovohrad region	70	OKVP «Dnipro-Kirovohrad»	0,962
Lugansk	9	KP «Popasnyansky District Water Channel»	2,177
Lviv	51	MCC «Lvivvodokanal»	2,531
Mykolaiv region	222	MKP «Nikolaevvodokanal»	1,145
Odessa	303	Infoxvodokanal Branch of Infox LLC	2,383
Poltava	334	KPPP «Poltavavodokanal».	1,420
Rivne	39	ROVKP of VKG «Rivneoblvodokanal»	1,162
Sumy	495	KP «Miskvodokanal» SMR	1,099

Continuation of table 1

1	2	3	4
Ternopil	34	KP «Ternopilvodokanal».	1,056
Kharkiv	91	KP «Kharkivvodokanal" KhMR	2,700
Kherson	267	ICCU «VUVKG, Kherson».	1,052
Khmelnitskyy	39	KP «Khmelnitskvodokanal»	1,280
Cherkasy	41	KP «Cherkasyvodokanal».	1,226
Chernivtsi	19	KP «Chernivtsi Vodokanal».	0,907
Chernihiv	23	KP «Chernihivvodokanal».	1,027
Kiyv	1	PJSC «AK «Kyivvodokanal»	2,928
* ARC	111	Water of Crimea	-
* Sevastopol	1	KP «Sevmiskvodokanal" SMR	-

In 2017, the coverage of centralized water supply and wastewater services in Ukraine was as follows (except Lugansk and Donetsk regions and the Autonomous Republic of Crimea): for cities - 99.3%: 402 cities out of 405 were provided with centralized water supply; in the Lviv region, there was no centralized water supply in 2 cities (Sudova Vyshnia and Turka) out of 44, in Chernivtsi region - in one city (Vashkivtsi) out of 11; for urban settlements - 89.1%: 598 urban settlements with 671 are provided with centralized water supply; for rural settlements - about 30%: 7,811 rural settlements with 26,080 are provided with centralized water supply [15]. In each region there is a basic enterprise of the region and several largest enterprises of water supply and wastewater, each of which caters to an average of 200 thousand consumers (except for the powerful enterprises of PJSC «AK «Kyivvodokanal» - up to 3 million consumers, KP «Kharkivvodokanal» - up to 1.5 million, etc.). Small businesses and district water and wastewater businesses, on average, serve up to 20,000 customers and are too small to reach a sufficient level of professional capacity, efficiency and sustainability. According to World Bank calculations, the minimum amount required to provide an acceptable saving effect by scaling up water and sanitation is between 50,000 and 100,000 consumers [13]. Ukrainian economists divide the water supply and wastewater companies, depending on the volume of work, into: large, with a productivity of more than 200 thousand m³ per day; average, with productivity from 20 to 200 thousand m³ per day; small, with a capacity of up to 20 thousand m³ per day [3, p.27; 21, p.16].

State regulation in the field of centralized water supply and drainage is carried out by the NKREKP and local authorities. The allocation of regulatory powers is carried out according to the following principle: NKREKP licenses economic activities for centralized water supply (production and / or transportation and / or supply of drinking water to consumers) and / or drainage (drainage and / or sewage treatment) in the case of centralized water supply systems and / or drainage of economic entities located in one or more settlements within the territory of one or more regions (including the city of Kyiv), the total number of us the supply of which is more than 100 thousand people and the volume of services provided are respectively: from centralized water supply - more than 300 thousand m³ / year; from centralized drainage - more than 200 thousand m³ / year; all others region and Kyiv city state administrations. As of December 31, 2018, the state, represented by the NKREKP, regulated the activity of 3% of the enterprises of centralized water supply and wastewater in Ukraine, which accounted for 74% of the national market of services in this field, the activity of the other 97% of enterprises is regulated by local self-government bodies, which is only 26% of the market [12; 19].

In accordance with the EU Water Framework Directive, adopted in 2000, which regulates a number of basic principles of water resource management, it outlines promising ways to improve water quality and improve the environmental security of Ukraine's water resources. One of the most important principles presented in the above document is the introduction of an integrated basin model of water resources management, which requires close interaction between states located in river basins. This Directive provides: a comprehensive approach to the protection of all waters - rivers, lakes, coastal and groundwater; achievement of "good" status for all waters by 2015 (purposeful management); basin water management; enhancing cross-border cooperation in coastal countries (one river basin is the only management plan); effective use of water resources on the polluter pays principle; large-scale involvement of citizens, stakeholders; improvement of legislation [5]. A prerequisite for the functioning of the basin principle is the openness of the procedures for discussing and making financial decisions for participants of all stakeholders, public information on the basin

water policy and environmental programs at all stages of their development and implementation [22, p.218]. According to Art. 13 of the Water Code of Ukraine (1995, June 6), which takes into account European principles, public administration in the field of water use and protection and reproduction of water resources should be carried out on the basin principle on the basis of state, targeted, interstate and regional programs of water use and protection and reproduction of water resources, as well as management plans river basins [6]. However, the modern administrative-territorial division of the territory of Ukraine does not coincide with the hydrographic boundaries of the water bodies of Ukraine. Figure 2 shows a hydrographic map of Ukraine.



Fig.2 Hydrographic map of Ukraine [23]

There are 9 river basin districts and 13 sub-basins in Ukraine: 1) Dnieper River Basin District: 5 sub-basins (Upper Dnieper; Middle Dnieper; Lower Dnieper; Pripyat River; Desna River); 2) the Dniester River Basin District; 3) Danube River Basin District: 4 Sub-basins: Tisza River; Prut River; Siret River; Lower Danube; 4) the area of the Southern Bug River Basin; 5) Don River Basin District: 2 sub-basins: Siverskyi Donets River; Lower Don; 6) Wisla River Basin District: 2 sub-basins: Western Bug River; the San River; 7) the area of the river basin of the Crimea; 8) the Black Sea basin area; 9) the region of the Azov River Basin [23].

Thus, with the adoption of a number of legal acts on the implementation of integrated approaches to watershed management in Ukraine, legislative prerequisites were created for reforming the water management system through the transition from administrative-territorial to basin management, in which the river basin district is a management unit. However, despite the initial legislative changes, water resources management is still carried out at the level of administrative units: regions, districts or interregional interactions of the water management complex, without taking into account the main natural factors of formation and interconnection of water (surface and underground) resources within the river basin - catchment area [11; 15]. In addition, the country has not approved the Water Development Strategy and the Water Supply and Wastewater Development Strategy, which would clearly formulate the principles of functioning and development of these spheres, taking into account the country's institutional features and international obligations.

The regulatory model in the field of water supply and wastewater in Ukraine contains the characteristics of three different European models of regulatory structures (English, French and German), parts of which are not always consistent with each other in practice: municipal management of water supply and wastewater enterprises under centralized state regulation. A detailed analysis of the possibility of adaptation of European models of management and regulation in the field of water supply and wastewater of Ukraine is given in the article (Krylova I., Oliynyk N., 2019) [2, p.10-18]. Many years of

experience in reforming the water supply and wastewater sector in Ukraine have shown that management models should be built on the principle of communal ownership of water supply and wastewater companies (except for new water supply and wastewater systems that can be built at the expense of private investors) with the introduction and development of a contract legal culture. right. Accordingly, the model of regulation in the field of water supply and wastewater can be revised depending on the strengthening or weakening of the position of local governments and the state [2, p.10-18]. The existence of the state regulator in the field of public utilities (NKREKP) is today explained by the insufficiently strong position of local self-government bodies in the issue of effective regulation of the activity of water supply and wastewater companies (74% of the market of water supply and wastewater services). Accordingly, the weaker the position of local governments, the stronger the position of state intervention, and vice versa.

Decentralization of local authorities reduces state influence on the sphere and is an integral part of the responsibility of local authorities for efficient management of municipal property, for ensuring sustainable and safe water supply and wastewater. The effectiveness of decentralization depends on the local social and political context and state policy of the country, especially the existing institutions and the quality of governance [8]. Ten years of experience in tariff regulation of local self-government bodies in the field of water supply and wastewater in Ukraine has shown the use of regulatory functions to satisfy their own political interests of representatives of local self-government bodies. And the introduced decentralization reform in Ukraine is still not delivering the right results. Thus, it is too early to talk about the possibility of introducing a model of corporate governance in Ukraine with the regulatory functions of local governments. Possibly, in some years of implementation of the decentralization reform, local governments will take an active and strong position in the field of water supply and wastewater, which will change the existing state policy [2, p.10-18].

However, some issues of management and production efficiency of water supply and wastewater companies can be addressed today, for example, by consolidating water supply and wastewater companies within river basins, separate territories (or regionalization of water supply and wastewater services) and establishing regional water companies on their basis. Consolidation of water supply and wastewater companies can lead to: 1) economies of scale; 2) improve the level of service; 3) optimizing the activity of enterprises by combining production facilities, facilities and resources; 4) providing access to funds, investments; 5) introduction of a unified tariff policy in the region (equalization of tariff for all consumers irrespective of distance from the source of water supply); 6) improvement of financial and technical condition of «weak» enterprises at the expense of more powerful enterprises; 7) improvement and development of water supply and wastewater infrastructure of the region. Consolidation of water supply and wastewater companies preserves communal property, responsibility of local self-government bodies for providing public services with water supply and wastewater services, as well as access of enterprises to international loans, grants and investments. According to numerous empirical studies, it is the powerful enterprises with high performance characteristics that are of interest to investors, public-private partnerships [1].

Council of Europe experts have also recommended the consolidation of water supply and wastewater companies within water areas. Inter-municipal co-operation could be a good way of organizing the responsibility for providing water supply and wastewater services at the proper level, while retaining the competence of local governments. But such cooperation cannot be based on voluntary agreements between local communities with the support of central government. Water management requires consideration of geological and geographical components. The design of water areas should be based on scientific data and not on political arrangements. This is important for both water management and networking. Zone planning may derive from supply areas, since the availability of river basins should be taken into account when planning the zones. Proper planning will help to properly regulate the different and competing uses of water resources and protect them from negative impacts such as urbanization. France has for many years created a two-stage water planning system. This was the basis of the EU directives: the basin planning and management guidance scheme for the basin and the management scheme for each reservoir [7].

There is some practice in Ukraine of consolidating (consolidating) water supply and wastewater companies in order to create an effective model for managing the water supply and wastewater of the regions. In particular, through the consolidation of small water supply and wastewater companies, one powerful company went to the Kirovohrad region, where in 2012, through the unification of water supply and wastewater companies Kropyvnytskyi, Znamyanka, Alexandria and Svitlovodsk, one large enterprise

was set up in OKVP «Dnipro-Kirovohrad» [18]. The merger of enterprises made it possible to apply a unified approach to the technological mode of operation of the whole system: the pumping equipment was moved between the objects of the enterprise in the most expedient place, which allowed to bring the energy-consuming equipment to the emergency reserve and to carry out the modernization (re-equipment) of fixed assets. As a result of the optimization of the scheme of operation of the equipment, there was a reduction of the specific costs of electricity, even though the volume of services was increased. In a similar way, the unification of water supply and wastewater companies of Donetsk region (before the occupation) took place. In 2007-2008, the integrated property complex of the state-owned enterprise «Ukrpromvodchermet» was transferred to the regional municipal property through the formation of the municipal enterprise «Company» Water Donbass». KP «Company» Water Donbass» also included the regional municipal enterprise «Donetskoblvodokanal». Thus, KP «Donbass Water Company» became the only water supplier in the region [17]. A similar experience of merging 12 water supply and wastewater companies took place in the ARC (before annexation). In 2012-2013, the Crimean Republican enterprises of water supply and wastewater of Alushta, Bakhchisarai, Dzhankoy, Yevpatoria, Kerch, Krasnoperekopsk, Saki, Sudak, Feodosia were reorganized by joining KPPKHK in Simferopol. This association included all the largest water supply and wastewater companies in the ARC, with the exception of the republican enterprise of the water and wastewater system of the city of Yalta, which at that time was implementing the project of modernization of the infrastructure of the water and wastewater system of the Southern coast of Crimea under a loan agreement with the EBRD. One of the conditions of the loan agreement was the prohibition of reorganization of the enterprise. Thus, in these regions, a single technical, environmental, financial and economic, personnel policy was provided, and, accordingly, a single tariff for water supply and wastewater services for those settlements that were united by the geography of the companies.

Conclusions. Summarizing all of the above, we can conclude that the sustainable development of the water management system is one of the priority directions of the state policy of the country and is an important factor in the successful socio-economic development of the country. Most countries in the world have gone a long way in reforming and improving their water management and management systems, creating effective models for regulating and managing the water and wastewater industry. Currently, first steps have been taken in Ukraine to create ecosystem-optimized models of parts of the basin territories based on their ecological-hydrological and architectural-landscaping and define common approaches to basin water management systems. One of the biggest drawbacks of the basin management system in Ukraine is the lack of real mechanisms for economic regulation of water relations, as is the case in developed countries, where the profitable part of payments for the use of water bodies and resources in the basin is matched by the total costs of achieving environmental quality standards water and rehabilitation of water bodies [9]. Another important issue is the strengthening of the position of local self-government bodies in management and regulation in the field of water supply and sanitation and responsibility. The basic principles of effective and democratic decentralization of Ukraine must be taken from and consistent with the European Charter of Local Self-Government [7]. Consolidation of water and wastewater companies within an area, district or river basin should not be a political decision. This process should be gradual, balanced, pre-processed by various environmental, economic and legal experts, discussed with all stakeholders (so the merger of enterprises in the ARC took place within a year after agreement with the state authorities, local self-government, public, trade union, with full information openness). The implementation of the consolidation process should not impede production and customer service and should be accompanied by information coverage. Integrated management of water resources by basin principle, the principle of comprehensive protection of all waters and wide involvement of local self-government bodies, public, taking into account the effective model of management and regulation in the field of water supply and wastewater, should be reflected in the strategies of water state policy, strategies for the development of water supply, wastewater and development to prevent depletion of water resources and to achieve and maintain water quality, ensuring a sustainable, safe and secure water supply and wastewater.

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