

ANALYSIS OF INDICATORS OF ADMINISTRATION FOR WATER RESOURCES IN THE REPUBLIC OF MOLDOVA

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Abstract. The waste water evacuation in the hydrographic basins is the same as for the water capture and use, but in the same time several obvious differences are noticed. So, about 88 percent of the used waters are evacuated in the Dniester river basin (table 2). Also, a big part of the toxic substances evacuated together with the waste waters in the tributaries Răut, Bâc and Botna, reach the basin of this river. About 99% of the waters evacuated in the Dniester river basin (except of the tributaries Răut, Bâc and Botna basins) come from the enterprises of Transnistria and Tighina town that are not controlled by the Republic of Moldova authorities.

In the present study, the analysis of water management indices has been conducted on the basis of the annual reports of the National Statistics Bureau [1], as well as of the Ecological Agencies and Inspections [2]. According to the territorial ecological authorities' reports, between 2003-2007 this information was submitted by 820 primary users.

According to the water management indices in the hydrographic basins (table 1), about 90 percent of the total captured waters volume and 80 percent of the used ones flow into the Nistru river basin (except of the Răut, Bâc and Botna river basins). Nevertheless, the biggest shares (80%) in capturing and using the water from this basin are detained by the enterprises from Transnistria (77%), especially the Thermoelectric Power Plant Dnestrovsc, Tiraspol and Râbnîța towns. On the right side of the Dniester, Chișinău city can be mentioned, as well as the towns of Tighina and Soroca [1], (figure 1). Thus, the absolute majority of the captured and used waters of the Dniester river basin are destined for a reduced number of localities. Also, only in Dnestrovsc, Chișinău and Soroca, more than 90% of these waters come straightway from Dniester. The rest of localities situated in the perimeter of the basin capture the water almost exclusively from underground sources, Dniester and its tributaries having only the destination of natural receptors of the waste waters. The realization of the recent programs and projects in the field

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of water provision will contribute to the rehabilitation and extension of these networks and to the increase of Dniester river water role that is, in fact, less

Tab. 1 - Capture and use of waters in the hydrographical basins (thousand m³)

No	River basin	Captured waters				Used waters			
		total	srfc	Underground		total	Potable		techn.
				thnds. m ³	%		thnds m ³	%	
1	Nistru	842600	735500	107080	13	774900	156730	20	618150
	Nistru ²	813550	729900	83630	10	749470	136890	18	612150
2	Prut	29650	16210	13440	45	22610	13120	58	9500
3	Răut	17530	4280	13250	76	15510	11240	72	4280
4	Bâc	8680	300	8390	97	7340	7040	96	300
5	Botna	2840	1020	1810	64	2580	1560	60	1020
6	Ialpug	5680	1510	4070	72	4790	3280	68	1510
7	Cahul	1770	1210	560	32	1650	440	27	1210
8	Cogălnic	3460	840	2620	76	3170	2330	74	840
9	Chitai	380	60	320	84	380	320	84	60
10	Sărata	580	120	460	79	500	380	76	120
11	Hadjider	900	720	180	20	890	180	20	710
	total	884890	756150	128830	15	808860	176770	22	632090

polluted. At the same time, Dniester's waters are used mostly by the industrial enterprises, especially power plants and communal ones. The role of food industry and agriculture is more reduced in comparison to other basins, excepting Criuleni, Anenii Noi and Ștefan Vodă districts, with a traditional irrigation agriculture partially destroyed [2].

About 3 percent of the captured and used waters come from Prut basin. Mostly, the districts from the northern and southern parts of the republic, as well as Ungheni town, are using water from this basin. The agroalimentary and communal sectors, that serve a big part of the food industry enterprises, are predominant in the branch structure. In the northern part, the water is widely used in mining industry, as well as energy (the hydroenergetic dam from Costești-Stânca). In the southern part prevail the agricultural and piscicultural enterprises. In the 80s, irrigation systems were established there, leading to severe ecological problems, such as massive soil salinization, habitats and biotical components damage [3, p. 53-54].

In spite of the surface and big number of traversed localities, Răut basin has a reduced share of 2% of the total used and captured waters. More than ¾ of the

water consume is provided by the underground waters. This basin has a primordial role in the provision of water to the industrial and communal enterprises, especially from Bălți town, Florești, Sângerei and Orhei districts [15]. Among the industrial

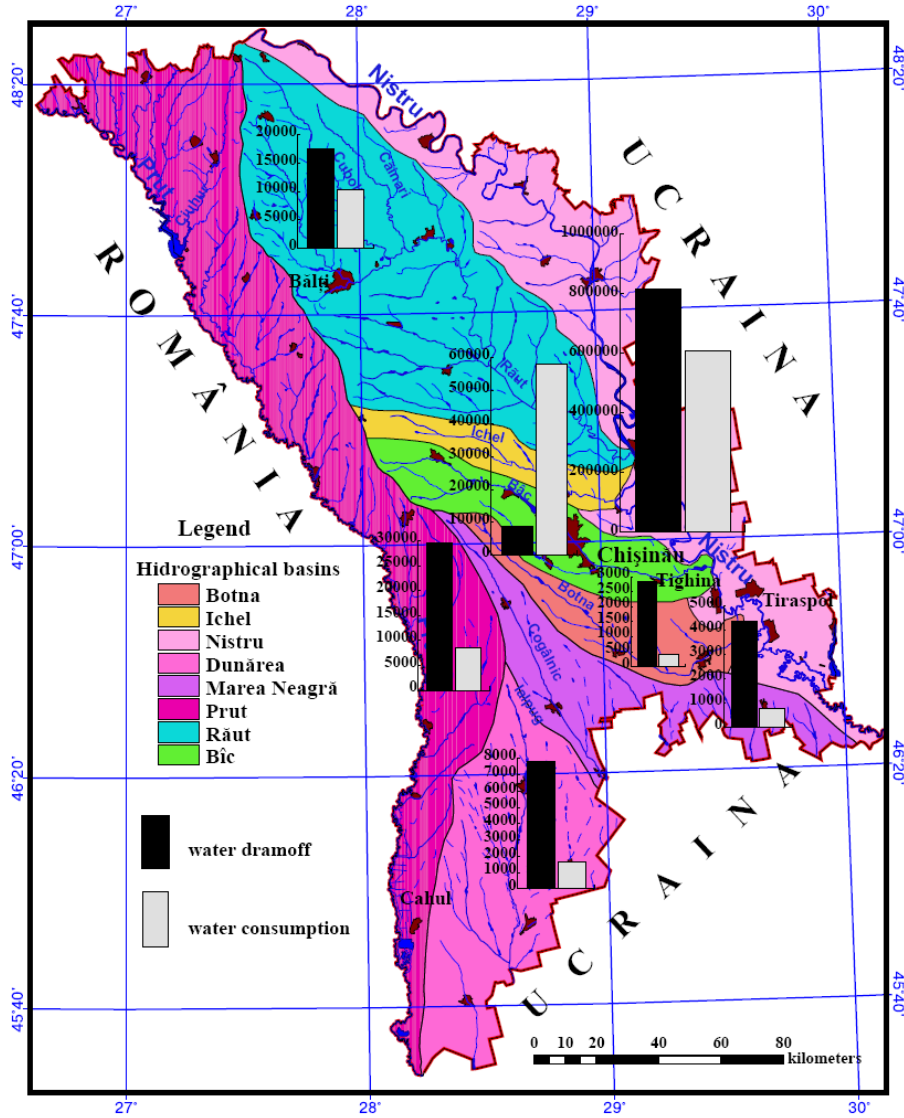


Fig.1 - Capture and use of waters in the hydrographical basins (thousand m³)

branches, the food, mining and construction industry are remarked. Bâc basin's share is 1% of the total captured water volume and 6.5% of the used one. Almost the entire water quantity (97%) is captured from underground sources. At the same time, most used waters, especially in Chişinău are coming from surface sources.

The rest of basins presented in table 1, that have a reduced and very reduced discharge, are situated in the southern part of the republic and travel over most of the important urban localities of the republic (Figure 1). As a result the summary share of these basins is not exceeding 2%. With the exception of Cahul and Hadjider rivers (explained by the presence of lakes), most waters are captured from underground sources. In the branch structure, the agricultural enterprises predominate, especially those for irrigation, food, such as wineries, communal enterprises and medical institutions.

Tab. 2² - Evacuation of the used waters in the hydrographic basins (thousands m³)

No.	River basin	Total evacuated	in receptor natural basins					in the reservation basins
			total	without purification	not enough purified	conventionally pure	enough purified	
1	Nistru	676080	671420	630	7080	546440	117270	4660
	Nistru	608110	604360	560	3520	546260	54030	2950
2	Prut	8590	7130		1370	3980	1780	1450
3	Răut	10290	9060	100	3090	70	5890	1290
4	Bâc	58000	57750	70	340	0	57340	250
5	Botna	420	250	0	130	110	10	170
6	Ialpug	1030	730	20	430	250	20	300
7	Cahul	560	510	0	0	470	40	50
8	Cogălnic	780	550	80	280	0	190	230
9	Chitai	30	0	0	0	0	0	20
10	Sărata	110	0	0	0	0	0	110
11	Hadjider	20	0	0	0	0	0	20
	Total	687200	680850	730	9180	551400	119300	6840

The waste water evacuation in the hydrographic basins is the same as for the water capture and use, but in the same time several obvious differences are noticed. So, about 88 percent of the used waters are evacuated in the Dniester river basin (table 2). Also, a big part of the toxic substances evacuated together with the waste

² Developed by the author after the National Statistics Bureau Report on the water management indicators in 2007

waters in the tributaries Răut, Bâc and Botna, reach the basin of this river. About 99% of the waters evacuated in the Dniester river basin (except of the tributaries Răut, Bâc and Botna basins) come from the enterprises of Transnistria and Tighina town that are not controlled by the Republic of Moldova authorities.

At the same time, according to the official statistics, almost the entire quantity of evacuated water from this area is conventionally pure and doesn't need to be purified (Thermoelectric Power Plant Dnestrovsc), or is enough purified [1]. Unfortunately, on the right bank of the Dniestr the majority of used waters evacuated in the basin of this river are unpurified (Sorooca, Criuleni) or not enough purified³.

In the Prut basin are evacuated only 8,6 mil. m³ (1.3%) of waste waters. Thus, the basin of this river is used mostly (until when?) for water provision. At the same time, in the last two decades, large amounts of unpurified and waste waters evacuated on the entire area of the basin have transformed the water of "one of the cleanest rivers of Europe" in a relatively polluted one. More than 10 millions m³ of used waters (1.5%) are evacuated in the Răut basin, including 7.5 mil. m³ from the enterprises in Bălți town. The river Bâc basin constitutes one of the biggest natural receptor (sink) of waste waters from the right side of Dniester river. Only the enterprises from Chișinău evacuate more than 2/3 (58 millions m³) of the total evacuated water on the territory controlled by the republican legal authorities, most of these waters are not enough purified or unpurified. In Strășeni and Anenii Noi districts, the majority of waste waters are not enough purified, and in Călărași district – unpurified. Additional to these there are pluvial polluted water flows from the localities, zoological complexes, pesticide deposits, landfills etc. As a result, the frequency of the digestive diseases and the mortality caused by chronic hepatitis, cirrhosis and malignant growths from the regions closed to the river Bâc is almost twice higher than the average in the republic [4].

In the basins of other counties there have been evacuated almost 3 million m³ of waste waters (table 2), that is 0.5% of the total evacuated water volume on the territory of the republic or 4% of those evacuated on the territory controlled by the authorities. The largest part of water evacuated in the perimeter of these river basins is not enough purified or unpurified.

The ecological state of the water resources is conditioned not only by the actual inefficiency of the centralized waste water evacuation, analyzed above. It is also caused, mostly, by the increased impact of the animal, mining and domestic wastes, that are located in close vicinity to the water sources or thrown chaotically on the basin and river banks; by the washing of the transport means in these zones; flowing of very polluted pluvial waters from the territory of the enterprises and

³ Data from the ecological territorial authorities and recent researches in this field.

localities; high degree of deterioration of the wells for capturing underground waters and of the Biological Water Treatment Plants etc. Those 95 zoological complexes have a massive impact on the quality of the surface and underground waters, as in their accumulators are kept 1.84 million m³ of animal dejections [5, p. 8-10]. As an addition to this are those 13 millions m³ of livestock manure, chaotically distributed on the small rivers and steep banks, or even close to the wells and springs. They have an increased impact on the underground sources that provide with water more than 70 % of rural population.

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