

## ECOLOGICAL PROBLEMS OF WATER RESOURCES IN UKRAINE

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Ground water is widely utilized in the national economy of Ukraine and represents an important reserve in terms of the economic and social development of the country, and the stabilization of its economic situation. On the whole, the ground water resources are projected according to regional evaluations at a level of 61,690,000 m<sup>3</sup> a day. Their distribution in the territory of the country is very uneven because of peculiarities of structural-geological and physical-geographical conditions of water resource formation and chemical composition of the underground hydrosphere in different regions. The bulk of the projected resources are located in the northern and north-western oblasts. The southern oblasts of Ukraine have limited ground water resources. Deterioration of the ecological-hydrogeological situation in the southern part of Ukraine prevents the standard use and protection of ground water, and has in a number of regions resulted in contamination and exhaustion of water resources. Ground water is utilized in different regions of Ukraine for various purposes. In 11 oblasts out of 25, ground waters provide more than 50% of potable water demand. Ground waters account for nearly the entire water supply in such oblast centres as Lugansk, Lviv, Poltava and Khmelnytskyi. In Ternopil, Kherson and Chernivtsi, ground waters account for more than 50% of the water supply. Many towns and villages (Glukhiv, Kovel, Mirgorod, Nizhin, Novololynsk, Sarny and others) in the southern and western oblasts of Ukraine fully depend on ground waters for their water supply.

The present ground water intake does not correspond to possibilities of maximal use in keeping with the availability of projected resources. In the largest part of the territory of Ukraine, except for the extreme south, there are favourable hydrogeological conditions for an increase of the ground water supply for the continuously growing needs of the national economy, with an obligatory rational regime of usage and necessary water protection measures. Besides, increased use of the protected ground waters for domestic and economical needs helps decrease the ecological risk conditioned by the consumption of contaminated surface water. At the same time it is necessary to pay attention to the unfavourable conditions of exploitation of ground water resources in the southern part of Ukraine, first of all in Donetsk, Zaporizhzhia, Lugansk, Kherson, Dnipropetrovsk and in the Autonomous Republic of the Crimea. Water intake volumes in these regions exceed projected resources. At some water sites one can observe a decrease in ground water levels with the creation of depression funnels, and a deterioration of the hydrochemical situation, which may put some ground water sites out of operation. In the southern regions, complicated hydrochemical conditions make it necessary to prospect for new ground water resources. It is also necessary to continue to work on artificial replenishment of ground water resources, especially in Crimea and Donbas, with the aim of increasing productivity and preventing depletion of ground waters.

High population density and the focus of industrial and agricultural production on wasteful technologies requiring large amounts of water have conditioned a considerable technogenic impact on the environment of Ukraine, including the water environment. This impact is 10-15 times higher in Ukraine than in the neighbouring countries. Limited and uneven location of water resources in the territory of the country makes the problem of stable water supply with minimal ecological and economic losses extremely crucial. Scales and rates of changes in the ecogeological state of ground waters are particularly important in highly populated regions with an intensive economical activity. A large number of water intake systems in these territories work under conditions harmful to the natural regime. This is conditioned by a correlation of replenishment and consumption of ground waters under the impact of technogenic factors, which has resulted in a depletion of ground water resources, with the creation of large depression funnels as a result of intensive water intake and a lowering of the water level in the openings, penetration of salted waters through intensive pumping out of ground water, hydrostatic head of ground water related to hydraulic-engineering construction,

flooding of the territories under the influence of natural technogenic factors, and increased or decreased levels in the reclamation systems.

As a result of intensive exploitation of ground waters, depression funnels have developed in the valley of Siverskyi Donets River and in Kyiv, Melitopol, Poltava and Kharkiv (decrease of the level in the centre of depression in Kyiv is 70 m, in Poltava 80 m, in Kharkiv 100 m). Deterioration of the ground water quality as a result of local contamination related to technogenic loads on aquifers (depression formation, intrusion of contaminated waters) and almost total contamination of landscapes and surface waters (entry of chemical substances into arable land, radionuclides, etc.) are some of the most pressing ecological problems. A sharp decrease in the use of pesticides and mineral fertilizers has been observed lately. Most contaminated are the ground waters in Donetsk and Odesa oblasts and in the Crimea. Unfortunately, lack of finance does not permit continued research of the impact of residues of agricultural chemicals on the ground water.

Summing up, the present situation with regard to ground water in Ukraine is satisfactory in most of the territory, with local exposure of technogenic impacts. However, there is a tendency of a correlated process of contamination of landscapes, and surface and ground waters in industrial, urban, agricultural and mining regions, which is a proof of an the excessive technogenic load on the environment, thus deteriorating the most protected water systems, the aquifers, which are the last ecological reserve of human water supply.