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ENVIRONMENTAL IMPACT OF ECONOMIC ACTIVITY IN THE ROS RIVER BASIN

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The impact of economic activity on the territory of the Ros River basin is significant and affects various aspects of the natural environment and socio-economic development of the region. The river basin can be defined as a developed economic complex dominated by agricultural production. In addition, there are food, light and petrochemical industries that have prospects for further expansion. The population of the basin reaches 66 people per square kilometer, and the total population is 831 thousand, of which 400 thousand are urban. Urban residents live in 10 cities and 8 urban-type settlements. Over time, the urban population is expected to increase while the rural population is expected to decrease [1-3].

To provide water resources for the population and economic needs, 2,322 ponds and 66 reservoirs have been created in the basin, accumulating 352.3 million cubic meters of water. This makes the Rosa basin one of the most heavily regulated in Ukraine. There are 10 reservoirs on the river itself, including Kosiv, Shcherbakiv, Bohuslav and Stebliv. The Ros River's tributaries, such as Roska and Rostavitsa, have the largest number of artificial reservoirs, which slows down the natural water exchange in the riverbeds. The high degree of regulation of the river and its tributaries creates a wide range of hydroecological problems. It affects the internal processes of the water system, disrupting the natural balance of ecosystems. The level of water pollution is growing, eutrophication of low-

water bodies of water and deterioration of water quality, especially during the low-water period, are occurring.

The ecological status of surface waters in the Ros River basin largely depends on the water management activities carried out in the region. There are 326 entities operating in the area, using both surface and groundwater resources. The main water management activities are concentrated along the main river channel, near the towns of Volodarka, Bila Tserkva, Rokytne, Bohuslav, and Korsun-Shevchenkivskyi. The share of water withdrawals from the Ros River varies over the years and ranges from 50 to 70% of the total basin resources. Most users of this resource are located directly on the banks of the river.

In view of the above, the purpose of our work was to study the environmental impact of production activities in the Ros River basin.

The results of the analytical search indicate that the main consumers of water resources in the region are the housing and communal sector and agriculture, especially the food and petrochemical industries. Domestic wastewater accounts for the largest share of emissions into surface water bodies. At the same time, some of the 18 enterprises in the basin discharge their wastewater into the river without prior treatment. The highest level of anthropogenic load is observed in the city of Bila Tserkva, where many industrial facilities are concentrated and the housing and communal infrastructure is well developed [1-3].

According to statistics, only 25% of the urban population is provided with centralized water supply and sewerage within the basin, while the situation in rural areas is even worse. Domestic wastewater is usually biologically treated, but only a portion of it is sent to additional filtration stages. Wastewater treatment plants are mostly inefficient.

In the industrial sector, the food industry is the largest consumer of water, using more than 50% of water intake resources from surface sources among all enterprises. The petrochemical industry and the transportation sector are second, accounting for 25% of process water intake from the river.

The food industry is represented by enterprises engaged in the production of sugar, oil, cheese, and fruit and vegetable preservation. Sugar factories have a significant impact on the ecology of the Ros River basin, being second only to the housing and utilities sector in terms of pollution. Waste from sugar production, including sugar, ammonia (ammonium salts), beet residues, and soil particles, gets into the river and its tributaries. At the same time, oil and cheese production facilities discharge wastewater saturated with suspended solids, emulsions, and organic compounds such as proteins, fats, and carbohydrates.

The light industry is represented by fabric and textile manufacturers. The wastewater from these companies contains starch, dye residues, tannins, synthetic surfactants, and inorganic acids. Despite the availability of local treatment facilities, their efficiency often leaves much to be desired.

The petrochemical industry, in turn, generates wastewater containing petroleum products, aromatic hydrocarbons, and other chemicals. This contaminated water is first treated at local wastewater treatment plants and then sent to municipal sewage systems for additional treatment. This approach reduces the content of oil products and oily components in wastewater by 80-90%.

In rural areas, surface water sources are important: they are used for domestic needs, irrigation, processing of agricultural products, maintaining humidity and even for fishing. Although agricultural enterprises rarely discharge waste directly into water bodies, they are obliged to ensure that wastewater is treated before it is discharged, for example, in the livestock sector. However, in some cases, there are hidden discharges that can negatively affect the quality of water resources.

Not all of them are equipped with treatment facilities, use imperfect manure storage facilities, unauthorized and environmentally hazardous storage of pesticides and other toxic chemicals, their unsuitable residues, etc. This leads to constant discharges (uncontrolled or controlled) of used and very dirty water into local water bodies and watercourses, and pollutants into water bodies in the surface slope through filtration into underground aquifers that drain the river network. Quite often, surface natural waters are also polluted by volleyed or accidental wastewater discharges.

The combination of these anthropogenic factors with natural phenomena (climatic, hydrological, hydrochemical, etc.) causes a significant deterioration in water quality in the Ros River and its tributaries, especially in large ponds and reservoirs in terms of trophosaprobiological indicators. High water temperatures, changes in nature, and a decrease in the intensity of water exchange in these reservoirs have dramatically increased eutrophication processes, and as a result, the hydroecological condition of the Ros River and its tributaries in almost the entire river basin has deteriorated significantly [1-3].

Conclusion. Waste pollution, excessive use of fertilizers and pesticides lead to soil degradation and eutrophication in water bodies. In addition, the construction of hydraulic structures and mining change the natural landscape and affect the water regime of the river. To preserve the ecological balance, it is necessary to implement effective measures aimed at minimizing the negative impact of economic activity and rational use of the Ros River basin resources.

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