Identification and Ranking of the Water Bodies Pollution in the Transboudary Selenge River Basin

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The cross-border Selenge River Basin (SRB) plays a very important role in the formation and functioning of natural systems, socio-economic development in large part of Mongolia and the Republic of Buryatia (Russia). Further economic development in the long term can affect the condition of water bodies. Therefore, at the present time it is highly relevant assessment of pollution of water bodies, which will serve the subsequent analysis of changes in the environmental quality.

The water quality assessment of the Selenga River and its tributaries was carried out for the analysis of the water situation in the territory of Mongolia and the Russian part of SRB and the extent of human impact on water bodies.

In order to measure and rank the anthropogenic impact on water bodies SRB was used α-factor pollution index (CP). The calculation was made according to the cross-sections of hydrological stations of SRB on the territory of the Russian Federation and Mongolia.

After calculating the α-factor pollution index for each cross-section it was conducted ranking of this factor, with the release of the next rank of contamination:

Rank 1 - slightly polluted, CP [0; 0.1];

Rank 2 - contaminated - CP (0,1; 0,5];

Rank 3 - highly contaminated - CP (0,5; 1];

Rank 4 - extremely polluted - CP $(1; +\infty)$.

Pollution coefficient indicates that the excess of MPC observed for iron and COD on all points of observation. Exceeding MPC concentrations for ammonium and nitrate nitrogen (CP above zero) on the territory of the SRB is associated with a high degree of anthropogenic impact of livestock on water resources of Mongolia.

On the territory of Mongolia the Orkhon river water is the most polluted, where the index reached the highest values of the CP, and the rank of contamination corresponds to Group 2. The Kyahtinka river water is the most polluted. The cross-section's Altanbulag average elevation of all the ingredients is more than 272% of MPC, and the water is rated as "extremely polluted", which corresponds to the rank of 4 on a scale of contamination by α-parameter.

Water quality in the observation points on the Russian part of the basin is estimated as "polluted" and "heavily polluted" water, which corresponds to the 2nd rank (RS from 0.1 to 0.5) and and 3rd rank (RS from 0, 5 to 1).

The water quality of the Selenga tributaries can be regarded as "dirty" and "heavily polluted". By the tributaries of rank 2 are Uda River, Dzhida, with rank 3 - River Chikoy, Hillock, Kuytunka. Almost all the rivers of the basin have a significant excess iron concentrations over the MPC, and in river Kuykhtinka excess concentrations over the MPC noted the following number of parameters: COD, BOD, ammonium and nitrite nitrogen.

The calculations showed that most violations are aquatic ecosystems of Hiagt rivers (Kyakhtinka), Modonkul, Selenga in the border zone. The degree of water pollution is increasing in the Russian part of the Selenga River Basin in the industrial areas of Gusinoozersk and Ulan-Ude nodes.

Thus, the evaluation of pollution of water bodies in the whole of the Selenga River Basin in the territory of both states identified key areas in which form and function key hot spots of data objects. Determination of river pollution by various ingredients allows to make a significant contribution to the development of coherent regional policy for the conservation and sustainable use of the natural environment on the territory in question.