



Methodology of risk assessment of loss of water resources due to climate changes

Yusif Israfilov (1), Rauf Israfilov (2), Hatam Guliyev (3), and Galib Afandiyev (4)

(1) Institute of Geology and Geophysics of Azerbaijan National Academy of Sciences, (2) Institute of Geology and Geophysics of Azerbaijan National Academy of Sciences, (3) Institute of Geology and Geophysics of Azerbaijan National Academy of Sciences, (4) Institute of Geology and Geophysics of Azerbaijan National Academy of Sciences

For sustainable development and management of rational use of water resources of Azerbaijan Republic it is actual to forecast their changes taking into account different scenarios of climate changes and assessment of possible risks of loss of sections of water resources.

The major part of the Azerbaijani territory is located in the arid climate and the vast majority of water is used in the national economic production. An optimal use of conditional groundwater and surface water is of great strategic importance for economy of the country in terms of lack of common water resources.

Low annual rate of sediments, high evaporation and complex natural and hydrogeological conditions prevent sustainable formation of conditioned resources of ground and surface water. In addition, reserves of fresh water resources are not equally distributed throughout the Azerbaijani territory. The lack of the common water balance creates tension in the rational use of fresh water resources in various sectors of the national economy, especially in agriculture, and as a result, in food security of the republic. However, the fresh water resources of the republic have direct proportional dependence on climatic factors. 75-85% of the resources of ground stratum-pore water of piedmont plains and fracture-vein water of mountain regions are formed by the infiltration of rainfall and condensate water. Changes of climate parameters involve changes in the hydrological cycle of the hydrosphere and as a rule, are reflected on their resources.

Forecasting changes of water resources of the hydrosphere with different scenarios of climate change in regional mathematical models allowed estimating the extent of their relationship and improving the quality of decisions. At the same time, it is extremely necessary to obtain additional data for risk assessment and management to reduce water resources for a detailed analysis, forecasting the quantitative and qualitative parameters of resources, and also for optimization the use of water resources. In this regard, we have developed the methodology of risk assessment including statistical fuzzy analysis of the relationship "probability-consequences", classification of probabilities, the consequences on degree of severity and risk. The current methodology allow providing the possibility of practical use of the obtained results and giving effectual help in the sustainable development and reduction of risk degree of optimal use of water resources of the republic and, as a consequence, the national strategy of economic development.