

## Forecasting water quality and eutrophication processes in Khudon water reservoir

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Construction of Khudon hydropower plant is an urgent task for the country to gain independence in the field of power engineering. However, during the hydropower plant construction and exploitation, the versatile influence of the water reservoir on the natural environment is to be considered, with water quality and eutrophication processes being most important of them. Hudon hydropower plant is planned to construct across the river Enguri, in the environs of village Khaishi. The dam of Hudon hydropower plant will be constructed past village Khaishi, in about 4 km along the river current and up the existing dam of the river Enguri, in about 34 km against the river current. The height of the concrete arch dam is 200,5 m; the total volume of the dam at normal flooding is 64,5 mln m<sup>3</sup> and the area of its water level 5.28 km<sup>2</sup>.

Forecasting hydro-chemical regime of Khudon water reservoir is important for the efficient functioning of the water reservoir. Changes in the hydro-chemical regime of the water reservoir depend on many different factors, such as temperature, sources of feeding, physical and geographical peculiarities of the basin, its economic use, etc.

We used a segment-stratification method to forecast the water quality in Khudon water reservoir. This model is based on a simple geometric representation of a system. The whole volume of the water reservoir is divided into segments, which on their turn are divided into horizontal strata. The water-dissolved oxygen, biochemical consumption of oxygen, nitrate nitrogen, nitrite nitrogen, ammonium nitrogen, phosphate, as well as principal ions and quantitative properties of mineralization of each stratum are calculated by using the relevant mathematical model.

The calculation gained by the above-mentioned method gives a maximally efficient picture of forecasting as close to the real picture as possible.