

Fresh ground water resources in Georgia and management problems of the transboundary artesian basins

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ABSTRACT

As it is known fresh water represents conditioned factor for human body's life. That's why the superiority of drinking water is recognized (acknowledged) as human body's priority according to the international declarations. In spite of this nowadays annually caused by low quality water diseased number of people is more than 500 million in the world and material loss is more than 1 billion dollar. World is experienced deficit of quality water today, therefore 1.5 billion people don't have means to use it. Future prognosis is disturbing – according to the data of UN for 2025 year 2/3 of world population will be under the water deficit conditions. Above-mentioned show how important is fresh water for humanity. Below we present briefly review about the situation of fresh ground water resources and the analysis of the problems in transboundary artesian basins of Georgia.

Keywords: Groundwater; Transboundary; Artesian basins; Georgian regions; Quality drinking water; Hydrogeological structure; Exploitation resources, Two-way movement

Rational mastering and defence of fresh groundwater resources is in the national importance and considerable qualifies health of Georgian population, ensures the development of almost all fields of agriculture and follow this, presents as one of the factor of independent state's safety guarantee and economic activity success.

Natural recourses of fresh ground water in Georgia compiles 573 m³/sec (49, 5 million m³ in day-night) and with its side it is redistributed in the 4 big hydro-geological system:

- 295 m³/sec (25.5 million m³/day-night) comes on big Caucasus wrinkled water stand system;
- 165 m³/sec (14.3 million m³/day-night) comes on south Caucasus artesian basin;
- 54 m³/sec (4.67 million m³/day-night) comes on small Caucasus water stand basin;
- 59 m³/sec (5.1 million m³/day-night) comes on Artvin-Bolnisi Hydro-Geological massive;

Territorially fresh ground water recourses are distributed unequally. Particularly: 65% comes on West Georgia, East Georgia – 25% and 13% comes on South Georgia.

Fresh groundwater resources not only by territorially and hydro-geological structures, but according to the location in the earth crust still is distributed distinctly (unequally). To the scale of the country circulation length of the cold (average 20⁰ C) groundwater fluctuates from several ten meters until 500 meters and on the whole it changes between 100-300 meters. Thus we can conclude, that formation of fresh groundwater natural recourses clearly expresses as territorially (regional), as vertical and hydro-geological zonation.

For the future perspective demand for drinking-economic water for the whole Georgia compiles 60m³/sec (with the norm of 500 liter water for one person in family). In spite of this according to the current norms, exploitation resources of fresh groundwater must not be higher than half of their resources. So in Georgia's case it must not be higher than 286 m³/sec. It is clearly shown that Georgia has excess exploitation supply about 226m³/sec. Here we also want to note that fresh water existing in

the country is distinguished with high quality, best drinking features and not rarely with the medical features.

As we mentioned above there is the deficit of quality drinking water in Georgia and therefore it is possibility that drinking water deficit should become reason of big social dissatisfaction with its negative results. This problem is more acute and strained in the assimilation conditions of fresh ground water from artesian basins existing in transboundary zone, because in such zones there is not rare such hydro-geological situation, when the area of groundwater feed and formation is in the area of one state and the load-shedding area is in another state, or on the contrary.

In case of Georgia, problems with Russia Federation are less, because the border of this 2 country practically coincides with big Caucasus ridge, that's why groundwater overflow has the less scale. There are situated 3 big Hydro-geological structure – Artesian basins of Alazani, Iori and Marneuli-Gardabani within the Azerbaijan border zone. Hydro-geological researches conducted in last period, demonstrated that fresh groundwater is overflowing from the area of Georgia to the area of Azerbaijan. There are also few difficulties with the Turkey. Border between 2 countries (Georgia and Turkey) goes between the Caucasus system and Samckhe-Javakheti Hydro-geological massive. Because of different reasons this region is less studied and researched with the hydro-geological view and that's why we abstain (refrain) for evaluating. As for the Armenia, the state border goes on the centre of Hydro-geological system of Samckhe-Javakheti highland. The Hydro-geological picture shows us that fresh groundwater have two-way movement, as from Georgia to Armenia, also on the contrary.

Follow from above mentioned, we considered that it is inevitable, to conduct hydro geological researches with the border countries of Georgia by common methodic along the border zone and on its base arrange hydro monitoring observation network for carrying out together future monitoring researches. This will indisputably conduce to remove the tensity in the region caused by different reasons, to stabilize the peace and maybe considered as one of the important political decisions.

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