

Transboundary Artesian Basin of Georgia

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Extended Summary

Alazani-Agrichai artesian basin represents transboundary aquifer resources shared by Georgia and Azerbaijan. Total potential resource of the basin is 39.3 m³/sec, including 20.4 m³/sec in Georgia and 18.9 m³/sec in Azerbaijan. From the view of geotectonic the most part of the area belongs to the folded system of the Great Caucasus. It is built of Paleogene and Quaternary sediments. About dozen water bearing horizons and complexes are marked out and studied in the area including those having value as sources of potable and technical water. These are: water bearing complexes of modern alluvial sediments, not divided Quaternary sediments and Agchagil-Apsheron-Alazani series, Gurjaani and Telavi aquifers. This is a closed catchment of Alazani and Agrichai rivers where all surface waters forming the basin accumulate in one hydrological section. The study area Alazani-Agrichai artesian basin comprises the parts of the north-east Georgia and the north-west Azerbaijan with total area of 6300 square kilometers. Confined groundwater of the basin are, pure streams from the Great Caucasus and that from Tsvigombori ridge (south). At the same time, it should be mentioned that within the debris cones formed by multiple tributaries of Alazani and Agrichai rivers, the main places where natural outlets of groundwater area are observed the risk pollution is high.

Groundwater of Alazani-Agrichai aquifers are of vital importance for population Azerbaijan and Georgia. Complex regional use of water resources of the basin should be created with consideration of water recharge.

The program is to include creation of a computer database, proved water reserve (industrial category), as well as creation and putting in place a proper monitoring network in order to avoid reduction of water reserve and desertification. At the same time, in conditions of intense technogenic impact on groundwater, preservation of a safe environment must be linked to creation of the system enabling performance of "in time" and "in space" qualitative and quantitative control of possible changes in the latter.

International practice of transboundary water use testified that the legal documents regulating resources use are addressing the issue in their own particular way practically ignoring the main requirement set out in the Helsinki charter on transboundary issues aimed for regulating parity distribution of resources between the neighboring states. Ignoring that fact might lead to serious conflicts between the "neighbors". Therefore, a regional legal basis should be worked out with consideration of economical, political and strategic interests of the neighbor states.

In the XX century much problems concerned with study of hydro geological settings of Alazani-Agrichai basin had been studying. However, at present one can observe a necessity of re-estimation of some results from current viewpoint and geoinformation as well. Such problem as legislative and institutional aspects and so on are poorly studied. From the mentioned above it comes that this project re-estimation is extremely important for Georgia and Azerbaijan.

Introduction

Alazani-Agrichai basin represents transboundary water body shared by Georgia and Azerbaijan. This is a closed catchment of Alazani and Agrichai rivers where all surface waters forming the basin accumulate in one hidrological section.

The study area – Alazani-Agrichai artesian basin comprises the parts of the north-east Georgia and the north-west Azerbaijan with total area of 6300 square kilometres (1 million population).

Underground pressure waters of the basin are fed by streams from the Great Caucasus and that from Tsivgombori ridge (south). The recharge area is weakly populated, the slopes covered with deciduous forests which, even today, favour preservation of clean environment for quality drinking water. At the same time, it should be mentioned that within the debris cones formed by multiple tributaries of Alazani and Agrichai rivers, the main pieces where natural outlets of underground water area are observed the risk of underground water pollution is high.

Environmental Aspects

In conditions of intense technogene impact on underground water, preservation of a safe environment must be linked to creation of the system enabling performance of «in time» and «in space» qualitative and quantitative control of possible changes in the latter.

It is well known, that decisive factor in formation of water chemism of Alazani-Agrichai artesian basin of pressure waters is leaching and dilution of waterbearing rocks as well as mixing of water from different aquifers. Within the different areas of the basin intensity of the process is variable. It should be mentioned that underground pressure water formation process is complex and results from simultaneous effect of several factors. Besides, water abstraction level differs by the region.

Joint impact of these two factors creates preconditions for water quality deterioration, exhaustion of the resource and desertification. Hence, a complex program of underground water management is to be elaborated with due consideration of environmental aspects. This will not only let rational use of available resources, but also protect underground water from pollution, help to avoid exhaustion of the resource and as a result safeguard natural status of environment.

Hydrogeological Aspects

From the view of geotectonics the most part of the area belongs to the folded system of the South slope of the Caucasus. It is built of Paleogene and Quaternary sediments. About dozen water bearing horizons and complexes are marked out and studied in the area, including those having value as the sources of potable and technical water. These are: water bearing complexes of modern alluvial sediments, not divided Quaternary sediments and Agchagil-Apsheron – Alazani series, Gurjaani and Telavi aquifers. Overall thickness of the mentioned water bearing rocks is from 250 to 350 metres.

Waters are low salinity (0.3-1 g/l) and are notable for good organoleptical characteristics.

Total potential resource of the basin is 39.3 m³/sec, including 20.4 m³/sec in Georgia and 18.9 m³/sec in Azerbaijan.

Institutional Aspects

Legal form of the use of underground waters of Alazani-Agrichai artesian basin for drinking and technical purposes should correspond to requirements of Helsinki charter transboundary water bodies.

In order to use resources of transboundary water units on parity conditions joint projects should be worked out with consideration of institutional, ethical and cultural features of the neighbour states.

Legal Aspects

International practice of transboundary water use testifies that the legal documents regulating resource use are addressing the issue in their own particular way, practically ignoring the main requirement set out in the Helsinki charter on transboundary issues aimed for regulating parity distribution of resources between the neighbouring states. Ignoring that fact might lead to serious conflicts between the «neighbours». Therefore, a regional legal basis should be worked out with consideration of economical, political and strategic interests of the neighbour states.

Socio-economical Aspects

Underground waters of Alazan-Agrichai artesian basin are of vital importance for population of Azerbaijan and Georgia. Complex, regional program for rational use of water resources of the basin should be created with consideration of water recharge. The program is to include creation of a unified computer database, proving water reserve (industrial exploitation category), as well as creation and putting in place a proper monitoring network in order to avoid reduction of water reserve and desertification.

In conditions of sustainable use of industrial reserves of the deposit not only demand of both states in potable and technical water will be met, but also a certain amount of water can be used for export.