

The Potential Fresh Water Resources of Georgia and Sustainable Water Management

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Abstract : Fresh water is the major natural resource of Georgia. The average perennial sum of the rivers' runoff in Georgia is 52,77 km³, out of which 9,30 km³ inflows from abroad. The major volume of transit river runoff is ascribed to the Chorokhi river. Average perennial runoff in Western Georgia is 41,52 km³, in Eastern Georgia 11,25 km³. The indices of Eastern and Western Georgia were calculated with 50% and 90% river runoff respectively, while the same index calculation for other countries is based on a 50% river runoff. Out of total volume of resources, 133,2 m³/sec (4,21 km³) has been geologically prospected by the State Commission on Reserves and Acknowledged as reserves available for exploitation, 48% (2,02 km³) of which is in Western Georgia and 2,19 km³ in Eastern Georgia. Considering acknowledged water reserves of all categories per capita water resources accounts to 2,2 m³/day, whereas high industrial category -0.88 m³/day fresh drinking water. According to accepted norms, the possibility of using underground water reserves is 2,5 times higher than the long-term requirements of the country. The volume of abundant fresh-water reserves in Georgia is about 150 m³/sec (4,74 km³). Water in Georgia is consumed mostly in agriculture for irrigation purposes. It makes 66,4% around Georgia, in Eastern Georgia 72,4% and 38% in Western Georgia. According to the long-term forecast provision of population and the territory with water resources in Eastern Georgia will be quite normal. A bit different is the situation in the lower reaches of the Khrami and Iori rivers which could be easily overcome by corresponding financing. The present day irrigation system in Georgia does not meet the modern technical requirements. The overall efficiency of their majority varies between 0,4-0,6. Similar is the situation in the fresh water and public service water consumption. Organization of the mentioned systems, installation of water meters, introduction of new methods of irrigation without water loss will substantially increase efficiency of water use. Besides new irrigation norms developed from agro-climatic, geographical and hydrological angle will significantly reduce water waste. Taking all this into account we assume that for irrigation agricultural lands in Georgia is necessary 6,0 km³ water, 5,5 km³ of which goes to Eastern Georgia on irrigation arable areas. To increase water supply in Eastern Georgian territory and its population is possible by means of new water reservoirs as the runoff of every river considerably exceeds the consumption volume. In conclusion, we should say that fresh water resources by which Georgia is that rich could be significant source for barter exchange and investment attraction. Certain volume of fresh water can be exported from Western Georgia quite trouble free, without bringing any damage to population and hydroecosystems. The precise volume of exported water per region/time and method/place of water consumption should be defined after the estimation of different hydroecosystems and detailed analyses of water balance of the corresponding territories.

Keywords : GIS, management, rivers, water resources

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