

## Trends of environmental flow calculation at Georgian rivers

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The methodologies acting in Georgia contain very detailed information on all hydrological characteristics, as well as on different options of determination and calculation of hydrodynamic and hydromorphological characteristics of the stream. However, the elements of determination and calculation of environmental (ecological) flows are not given anywhere at least in indirect form, and hydrologists were not restricted anyhow in water intake from river beds. Starting from the beginning of the XXI century the determination of ecological flows became necessary, first episodically and afterwards in a mandatory manner.

Since there is no methodology of ecological flow calculation in Georgia, solution of this complicated problem occurs through very simple method that in some cases implies the leaving of minimum 10 percents of 50% provision of average multiyear water flow in the river bed and in other cases 10% of average monthly expenditures. There are cases (very seldom, but anyway), when ecological expenditure is calculated as equal to 90 or 95% of 10-day expenditure. Taking into account hydrological regime and HPP capacity, in some cases the first or second methodology is used for calculation of ecological flows, but obtained value is equal to 13 or 15%. The practice of 10% value accepted in Georgia in some cases exceeds the practice and methodology, which is routine for other countries.

Non-availability of standards causes disagreement between designers, developers and permitting structures. At that, all parties treat with maximum caution to mentioned issue, since submission of conclusions is difficult without proper methodology.

Determination of environmental flows for various water consumers is very complicated problem, which is predetermined by non-availability of data on water habitats, scarce hydrological data and influence of natural and anthropogenic factors on water resources, that is why the analysis, refinement and adaptation of water consumption for various water consumers is considered as a topical issue.