



Multipurpose Projects for water resources as adaptation measure in high mountain regions

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Climate change and the increasing water demand from multiple users might exacerbate the conflicts for the water use in high mountain regions and dependent lowlands. Glaciers buffer potential water scarcity and river streamflow variability, particularly during the dry season. However, strong glacier shrinkage on the one hand and expanding water demand on the other hand increasingly alter river discharge and might lead to local water scarcity. In this context, efficient long-term adaptation measures need to be promoted within a water resources and risk reduction management framework.

Multipurpose Projects (MPPs) can be defined as projects, which provide multiple benefits to different water users. Initially mainly associated to hydropower and irrigation needs, MPPs progressively cover other purposes, such as tourism, aquaculture, ecosystem services as well as flood and drought management. MPPs for water resources help to simultaneously tackle three issues, which used to be managed separately: (1) conflicts among competing water activities or users, (2) efficient use of economic resources, and (3) negative long-term effects of climate change. Important characteristics of MPPs are their comprehensive understanding of water issues addressing current and future scenarios, transdisciplinary and participatory approaches involving all the actors and decision-makers within a basin scale, and the implementation of structural (e.g. dams and reservoirs) and non-structural (e.g. green infrastructure and water resources management) measures. However, an optimum benefit is not expected to be achieved by all involved water users.

For long-term implementation of MPPs, the role of governments is fundamental including necessary institutional instruments and policies. However, other sectors, such as the private sector, NGO's and international cooperation, also play a key role. For hydropower and dam companies, it can also be a promising investment. Since these projects are thought to pursue more than one interest or benefit (e.g. prevent disasters, supply water during the dry season and provide energy), different alternative sources of financing exist. Moreover, public-private partnerships and funds channeled by the international cooperation and development banks can be explored as complementary feasible financing mechanisms, while gaining social acceptance and preventing conflicts. Therefore, MPPs build upon different water resources management strategies and the engagement of each stakeholder.

However, with this new approach, the implementation of MPPs still face challenges depending on the region and the country: e.g. unstable political context; non-inclusive top-down processes for decision making; lack of articulation between actors on different levels; and prevalence of individual short-term needs and interests over territorial, risk and water resources management. In view of growing water demand, and changes in water availability in high mountain regions, the commitment of all the stakeholders is necessary to prevent water shortages, disasters, such as floods or mass movements, and ensure equitable access to water quantity in the appropriate quality for populations and economic activities.