



## **Environmental Flows in Water Resources Policies, Plans and Projects**

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**Abstract:** Environmental flows concern the equitable distribution of and access to water and services provided by aquatic ecosystems. They refer to the quality, quantity, and timing of water flows required to maintain the components, functions, processes, and resilience of aquatic ecosystems that provide goods and services to people.

Environmental flows are central to supporting sustainable development, sharing benefits, and addressing poverty alleviation. Yet allocating water for environmental uses remains a highly contested process. Investments in water resources infrastructure, especially dams for storage, flood control, or regulation, have been essential for economic development (including hydropower generation, food security and irrigation, industrial and urban water supply, and flood and drought mitigation), but, when they are improperly planned, designed, or operated, they can cause problems for downstream ecosystems and communities because of their impact on the volume, pattern, and quality of flow. While aquatic life depends on both the quantity and quality of water, changes in flows are of particular concern because they govern many ecosystem processes. Changes in flow have led to a diminution of the downstream ecosystem services that many of the poorest communities rely on for their livelihoods. In order to achieve sustainable development, downstream impacts will require more attention by all parties, as countries—through both public and private sector investments—expand their infrastructure in many sectors, especially dams for various purposes. Climate change and adaptation to climate change is likely to involve more investment in dams and reservoirs to buffer against increased variability in rainfall and runoff. This will further affect downstream ecosystems, unless the impacts are properly assessed and managed. The presentation summarizes the findings of the 2009 World Bank report to *advance the understanding and integration in operational terms of environmental water allocation into integrated water resources management*.

**Summary:** Environmental flows are central to sustainable water resources development, poverty alleviation, and climate smart water resources planning, design and operations (adaptation) decisions. The findings of the 2009 World Bank report to advance the understanding and integration in operational terms of environmental water allocation into integrated water resources management are presented.