Addressing the intertwined issues that affect water resource sustainability worldwide: Lessons from South America and East Africa

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What are the primary challenges to water resource sustainability worldwide? A freshwater scientist might say that river fragmentation, non-native species introductions, and water pollution greatly stress freshwater ecosystem health. However, according to the United Nations, public health issues, such as widespread poverty, malnutrition, and growing urbanization, are principal factors that affect freshwater systems and management of water resources worldwide. The framework of integrated water resources management (IWRM) offers a space to effectively address the intertwined issues of public health and ecosystem health and facilitate collaboration between freshwater scientists and water resource managers. We present lessons learned from the Global Water for Sustainability Program, a multidisciplinary initiative to promote IWRM as a response to the challenge of water resource sustainability in different geographical contexts. In the Pastaza River Basin, an Andean-Amazon catchment (Ecuador/Peru), an IWRM approach is being implemented to address threats to freshwater ecosystems and human communities resulting from the release of untreated industrial and domestic waste streams directly into surface waters. Here, our efforts have shown that the issue of water pollution and its effects on ecosystem and public health can be addressed through a network approach that links government agencies, universities, the private sector, and the general public in water resources management. In the Mara River Basin of East Africa (Kenya/Tanzania), IWRM is being applied as a means for securing sufficient quantity and quality of water for human populations and for unique ecosystems such as the Serengeti National Park and Lake Victoria which depend on the Mara River. Our efforts in the Mara River Basin have shown that it is essential to first establish a credible prescription for environmental flows to support ecosystem function and basic ecosystem services and then to work closely with upstream users to maximize efficient water use and best land management practices.

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