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Today is World Environment Day

## Opinion

**Today is World Environment Day**

# Managing environment to meet the needs of nature and people

By Dawn Rodriguez

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Countries like Sri Lanka provide an ideal opportunity for establishing nation-wide programs and policies on "Environmental Flows", which represent a compromise between water resource use and developments on the one hand and keeping rivers in a healthy or reasonable state on the other. Sri Lanka is small and faces no international water sharing issues. Its aquatic environment remains still relatively undisturbed. This needs to be maintained in a healthy condition to ensure a stable income from tourism, to safeguard the natural beauty of the country and to maintain services that rivers and wetlands in Sri Lanka provide to our people. Policy makers need to recognize the urgent need to allocate water to satisfy environmental demands. A balance must be struck between allocating water for direct human use such as agriculture, industry, power generation and domestic supply, and allocating it for indirect human use through the benefits that well-maintained ecosystems provide.

## The challenge

New research shows that in many parts of the world, not enough water is being left in rivers to sustain the valuable environmental services they provide to society. Excessive withdrawals of water for irrigation and other uses causes many rivers to dry up even before they reach the sea, thereby jeopardizing the bird, animal, fish and plant species that depend on freshwater, as well as the livelihoods of farmers, fishers and downstream water users.

The overuse of freshwater resources reduces the ability of aquatic ecosystems to clean up wastewater flows and in the case of wetlands, to reduce flooding - both of which are services that benefit society as a whole. Apart from damaging the health of rivers, lakes, wetlands and coastal lagoons, overexploitation of freshwater resources is harmful to poor people who depend on them for clean drinking water, irrigation and fishing. To safeguard the benefits of freshwater resources, it is important to safeguard the flow regimes needed to keep ecosystems healthy and productive. This type of maintenance becomes necessary when freshwater flows that feed rivers and wetlands are regulated and when multiple users such as farmers, industrial enterprises and urban and rural water users are competing for the water.

Dr. Vladimir Smakhtin, Principal Researcher at the International Water Management Institute (IWMI) based in Colombo points out the complex nature of Environmental Flows: "Environmental Flows are not just some prescribed constant minimum flow in a river. They have to vary at different times of the year. The variability is very important to the health of ecosystems. Low flows, for example, trigger migration and reproduction within different animal species. High flows help some riverside plants to reproduce and also ensure that river channels keep their shape and do not get silted up," he says. Assessment and maintenance of environmental flows in Sri Lanka is important in view of new water resources development projects (particularly in the southern, semi-arid parts of the country), and for the maintenance of coastal lagoons which provide a habitat to migratory birds.

Unfortunately, environmental flow requirements are not being met and even not being estimated in many parts of the world. This includes Sri Lanka, where not even a crude assessment of Environmental Flows has been done to date. River basins where current water use is already in conflict with water resources needed to maintain freshwater ecosystems, cover over 15 percent of the world's land surface and are populated by over 1.4 billion people. Until very recently, studies have only considered agricultural, domestic and industrial water needs in relation to the total amount of water available. The water requirements of ecosystems and the needs of people dependant on them have not been taken into account. Studies carried out by IWMI have pinpointed "danger areas" where environmental needs are not being met because too much water is being withdrawn.

## The costs

There are many factors at stake. The costs of not maintaining environmental flows are numerous. There are public health risks due to less drinking water being available and more concentrated pollution of water bodies. The lack of water and its poor quality in some cases may impact the traditional water use – in religious festivals, for example, like the Katharagama festival on the Menik Ganga. There is a lack of food security and

River fishing

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damage to livelihoods because there is less water for agriculture and less water for healthy fisheries, which damages both commercial and subsistence fishing. The impacts for the poor are immense as they have few assets and depend on common property resources such as rivers and wetlands. Wild fish are often their only source of protein. The loss of biodiversity and resource degradation also prevents countries from taking advantage of the revenue-earning options offered by recreation and tourism. In addition, the degradation of freshwater resources often results in conflict between users as they compete for a scarce resource to satisfy their needs.

## Policy priorities

What then are the priorities for policymakers to reverse the negative impacts of freshwater overexploitation? First of all, they need to recognize the importance of allocating water for the environment. They should also ensure that water management is holistic, taking into account the needs of all sectors including agriculture, industry and the environment. They need to identify the desired environmental status of a river and establish, using models, the amounts of water and the timing frequency and duration of flow needed to achieve the desired environmental status. These flow regimes should be implemented by controlling discharges and withdrawals and monitoring the resulting flows and their environmental effects. Areas where water resources are just beginning to be developed offer a real opportunity to avoid past mistakes. Already the environmental flows' concept is being applied in some form in around 72 countries in the world and some of these countries such as South Africa and Australia have a wealth of practical experience which decision makers in developing countries like ours can tap into.

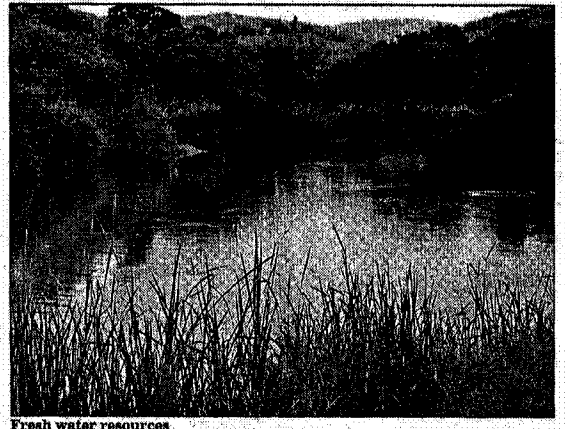
## How much water does a river need?

Studies show that in general, the amount of water required by each river to keep it relatively healthy ranged from between 20 percent to 50 percent of its mean annual flow. These volumes of water can maintain an ecosystem in a fair or moderately modified condition. (To keep it in its pristine state would require as much as 60 -80 percent of its total annual flow). Unfortunately, most water resource models and scenarios underestimate water scarcity because they do not take environmental water into account. As water withdrawals increase, more river basins will move from the "environmentally safe" category to the "environmentally water-stressed " and "environmentally water-scarce" categories. Water needs to be used more efficiently and environmental flow allocation must be integrated into river basin management plans for this situation to be remedied.

## Delivering environmental flows

Freshwater systems have a complex ecology. There are no hard and fast water volume thresholds below which the system will collapse. Like aquifers, each river has its own countdown to destruction. Degradation happens gradually over a period of time. One way of delivering environmental flows is through the use of dams, channels and pumps to add or remove water. Water can be released into rivers to increase dangerously low flows. Dams and pumps can regulate flows into other environments, for example by simulating natural floods that flush out salty coastal lagoons or by restricting the water supplied to wetlands to mimic the dry periods that affect them naturally. In basins where flows are not regulated, land-use management options can be used to mange water flows indirectly. For example, appropriate management can replenish groundwater which in turn increases outflows from aquifers into rivers.

In recent decades, various environmental flow assessment (EFA) methods have been developed that are suitable for planning purposes. However, problems have arisen because the detailed hydrological data needed to apply these methods is often lacking in developing countries. There are nevertheless hydrology-based "desktop" assessment methods that are being successfully applied by IWMI in countries like Nepal and India. Once these methods are adapted, planners in developing countries like ours will be able to use them to effectively estimate water allocations for the environment, even when little hard data is available. This will help to safeguard some of the environmentally and socially important functions of Sri Lanka's rivers.



Fresh water resources