

Developing tools to link environmental flows science and its practice in Sri Lanka

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Abstract The term “Environmental Flows (EF)” may be defined as “the quantity, timing and quality of water flows required to sustain freshwater and estuarine ecosystems and the human livelihoods and well-being that depend on these ecosystems”. It may be regarded as “water for nature” or “environmental demand” similar to crop water requirements, industrial or domestic water demand. The practice of EF is still limited to a few developed countries such as Australia, South Africa and the UK. In many developing countries EF is rarely considered in water resources planning and is often deemed “unimportant.” Sri Lanka, being a developing country, is no exception to this general rule. Although the country underwent an extensive irrigation/water resources development phase during the 1960s through to the 1980s, the concept of EF was hardly considered. However, as Sri Lanka’s water resources are being exploited more and more for human usage, ecologists, water practitioners and policymakers alike have realized the importance of EF in sustaining not only freshwater and estuarine ecosystems, but also their services to humans. Hence estimation of EF has been made mandatory in environmental impact assessments (EIAs) of all large development projects involving river regulation/water abstraction. Considering EF is especially vital under the rapid urbanization and infrastructure development phase that dawned after the end of the war in the North and the East of the country in 2009. This paper details simple tools (including a software package which is under development) and methods that may be used for coarse scale estimation of EF at/near monitored locations on major rivers of Sri Lanka, along with example applications to two locations on River Mahaweli. It is hoped that these tools will help bridge the gap between EF science and its practice in Sri Lanka and other developing countries.

Key words water resources; environmental flows; flow duration curve; natural flow; time series