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SOCIAL WATER USE IN ASSESSING ENVIRONMENTAL FLOWS: A CASE STUDY IN DEDURU OYA BASIN

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River ecosystems are interlinked with natural flow functions. Dam constructions can modify the natural flow patterns leading to unpredictable consequences on ecosystems including change of living pattern of riparian community who depends on river for their primary needs. Environmental Flow (EF) releases can restore or reverse the already occurred degradation. EF is defined as the quantity, quality and timing of water flows required for sustaining freshwater ecosystems and the human livelihoods and wellbeing that depend on these ecosystems. The water use of the riparian community for their livelihood, day to day life and customs or believes is described as social water use and has been identified as a component of EF. This study aims to identify the pattern of social water use in downstream of Deduru Oya reservoir and quantify the social water use focusing on basic water needs and livelihoods. At first, the riparian area was segmented in to three according to adjacent land use. The average width of living area of the regular river water users was identified during the preliminary survey as 1 km. Then riparian population was estimated within this 1 km buffer. A questionnaire survey was carried out within the riparian zone for a sample of 30% of the total population in each segment. The questionnaire focused on water uses, water sources, direct water uses from Deduru Oya, required minimum water heights of the river for each water use, frequency of using Deduru Oya, details on direct abstraction by pumping, timing of using water pumps and livelihood details. This study focused on bathing, domestic activities and subsistence agriculture as major water uses from Deduru Oya. Water discharge from the pump was calculated when people use water pumps to abstract water from river for household activities. Pumps used for brick industry and agricultural lands more than 0.25 Ac were ignored from calculations to avoid commercial water use. According to the survey, 25% of the population totally depends on Deduru Oya for irrigation and 18% of the population totally depends on Deduru Oya for bathing and domestic activities. According to the quantified water volumes, the dependency on Deduru Oya is comparatively high in dry months. It is1650 m^3/day in February and 1700 m^3/day in August while 1480m^3/day is the average. In many months water use is below the average.

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However, EFs are allocated to secure the water needs of ecosystems and in-stream living organisms. Though it is not possible to comment on the social water requirement of Sri Lankan rivers as a component of EF due to lack of studies, it is possible to have a high social water dependency in dry zone rivers comparative to the wet zone rivers due to irrigation water use and water shortages for domestic purposes specially in dry months. Since a considerable amount of the riparian community depends on river for their primary needs and subsistence agriculture, especially in water scarce months it is a requirement to release EF from the Deduru Oya reservoir. It is useful to consider the cultural water requirement such as water related religious activities, cultural beliefs and activities which are also components of social waster use.