



AN ASSESSMENT OF ENVIRONMENTAL FLOW RELEASING METHODOLOGIES IN SRI LANKA – A REVIEW

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Abstract

Environmental Flow (EF) is broadly defined as the water required to sustain upstream and downstream habitats, riparian vegetation, human livelihoods and wildlife of a river or stream. River flow regimes have been severely altered by human activities in Sri Lanka over the past decades particularly for hydropower and irrigation. EF maintenance has thus become important to sustain the downstream ecology. Therefore, this study aimed to compare and contrast main EF calculating methodologies available in Sri Lanka. Environmental Impact Assessment reports (n=30; 9 irrigation projects, 21 hydropower projects) for past 50 years related to water resource development projects (WP) in Sri Lanka and related literature were studied for identifying parameters and methodologies adopted for EF calculations. According to the results, three common EF calculation methods namely, Q_{90} method (EF_{Q90}), International Water Management Institute EF calculator (EF_{IWM}) and Central Environmental Authority EF calculation method (EF_{CEA}) were identified as widely used EF calculation methods in Sri Lanka. Using the above three methods, EFs and the mean annual EFs (MAEFs) were calculated and statistically compared for selected thirty WP. The MAEFs for all WP showed; $EF_{Q90} < EF_{IWM} < EF_{CEA}$ indicating that EF_{CEA} method provides the largest EF. In EF_{Q90} and EF_{IWM} methods utilizes forms of flow duration curve analysis while EF_{CEA} method uses an extension of Tennant method with scrutiny of biological, socio economic and hydrological factors. Therefore, EF_{CEA} method is the best method among the studied EF calculation methods owing to integration of biological, socio economic and hydrological factors. However, further development of the same is important for smooth functioning of downstream ecology.

Keywords: *Environmental Flow, Water Resource Development Projects, Flow Duration Curve, Tennant method, Environmental Impact Assessments*