

Does River Flow Regulation Change the Composition and Diversity of Riverine Vegetation?**Rajakaruna S.L.^{1*}, Ranawana K.B.², Gunarathne A.M.T.A.³ and Madawala H.M.S.P.³**¹*Postgraduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka*²*Department of Zoology, Faculty of Science, University of Peradeniya, Peradeniya, Sri Lanka*³*Department of Botany, Faculty of Science, University of Peradeniya, Peradeniya, Sri Lanka***shalini.rajakaruna@gmail.com***Abstract**

River regulation as a result of construction of dams caused global-scale ecological changes to riverine ecosystems. Studies have shown that vegetation alterations may take place due to changes in the water flow, flooding frequencies, and fluctuating water table associated due to dam construction. The Accelerated Mahaweli Project (AMP) which started in 1970's involved construction of five major dams across the Mahaweli River. However, no study has been undertaken so far to assess the dam-induced impacts on downstream riverine forests. The present study was aimed to investigate any dam-induced impacts on the riverine vegetation in the immediate downstream areas of the AMP. In order to achieve this objective, a stretch of Mahaweli River with a regulated water flow (in Minipe area) and a tributary of Mahaweli river with an unregulated water flow Badulu Oya was selected for the study. A complete vegetation sampling was carried out using eight 10 m x 30 m belt transects laid perpendicular to the river flow. Each belt transect was divided into three 10m x 10m zones (hereafter named as lower, mid and upper slopes). The vegetation was quantified under three categories canopy vegetation, understory and ground vegetation. Paired t-test (95% CI) in Minitab 16.0 revealed that the canopy vegetation abundance in the lower slope is significantly higher ($p \leq 0.039$) at Badulu Oya than that of Minipe. However, no significant difference was observed in other two zones in between the two rivers. The lower slope showed similar trend in terms of canopy vegetation diversity though it was not significant. *Terminalia arjuna* and *Ficus racemosa* dominated the canopy vegetation in Badulu Oya and Minipe, respectively. Both abundance and diversity of the understory vegetation was significantly higher at Badulu Oya than that of Minipe and this effect is more prominent in the lower- and mid-slopes than in the upper slope. *Dimorphocalyx glabellus* dominated the understory vegetation at Badulu Oya while at Minipe it was *Cipadessa baccifera*. Riverine vegetation in both rivers was dominated by native species, however no significant difference observed in the abundance of invasive plants. Interestingly, at Badulu Oya the abundance of the riverine vegetation decreased towards the upper slope but at Minipe no such trend was observed. The preliminary findings of the research indicate that the regulation of rivers through damming can have long-term impacts on the riverine vegetation by changing its composition and diversity. However, further studies will authenticate this inference.

Keywords: Riverine vegetation, River regulation, Dam-induced impacts