IMPACTS OF HYDROCLIMATIC VARIABILITY IN UPPER MADURU OYA SUBWATERSHED IN SRI LANKA

R.D.U.A. Ranasinghe[1*#], N.D.K. Dayawansa[2], and R.P. De Silva[2]
[1]Postgraduate Institute of Agriculture, University of Peradeniya, Peradeniya, Sri Lanka
[2]Faculty of Agriculture, University of Peradeniya, Peradeniya, Sri Lanka
**Correspondence E-mail: rdu14asiri@gmail.com, Phone: +94715686712*
#Presenting Author

Abstract: This study was conducted in the Upper Maduru Oya sub watershed in Sri Lanka to assess the impacts of hydroclimatic variability on water resources and agriculture. The special focus was given to assess the impact on the Maduru Oya reservoir located in the downstream and on the Mahaweli System B. Maduru Oya reservoir is fed by the Maduru Oya and diverted Mahaweli water and it supplies water to the Mahaweli System B. A mixed method approach was used in the study which includes a questionnaire survey of 220 respondents in the upper watershed, key person interviews, and analysis of reservoir flow (Maduru Oya), cultivation data (from 2012 to 2021) and rainfall data (from 1989 to 2021) of Mahaweli system B. In upper watershed, 63%, 72% and 81% of respondents accepted that there was a change in water availability for drinking, household activities and irrigation, respectively. Rainfall is the main source for irrigation. The 66% of farmers experience a decrease in irrigation water availability over time, primarily attributed to delays in the rainy seasons. Area of cultivation, crop production and agricultural income changed by 66%, 90% and 91% respectively due to multitude of factors including rainfall variability, input shortages, and rising costs. During the period of 2012 to 2021, water diverted from Mahaweli to Maduru Oya reservoir has fluctuated, with an overall increase. Total cropping extent has increased (5.5%), while total water issue has decreased indicating increasing rainfall amount in Yala season in Mahaweli system B. A decline in Maduru Oya water usage in the upper watershed, coupled with an increase in Mahaweli diversion for the reservoir, signifies a reduction in Maduru Oya streamflow over time. This study emphasizes the need for adaptive strategies and sustainable development in addressing hydroclimatic challenges in the upper watershed.

Keywords: Hydroclimatic variability; Impacts; Mahaweli system B; Upper watershed