

Interannual Variability of River Discharges to the Vembanad Wetlands

GOPAKUMAR R.¹ and KAORU TAKARA²

¹*Centre for Water Resources Development and Management, Calicut-673571, Kerala, India
Phone: +91-495-2351824, Facsimile: +91-495-2357827 E-mail: gopan65@hotmail.com*

²*Disaster Prevention Research Institute, Kyoto University, Uji 611-0011, Japan*

A number of major human interventions like large-scale land reclamation and reduction in tidal flushing lead to the environmental degradation of Vembanad wetlands in India which is connected to the Arabian Sea through a backwater lake. Knowledge of the spatial changes and changes in hydrology of water system are essential to address major environmental issues like increased flood proneness and water pollution in the wetland. In earlier research, boundaries of wetland and its five associated river basins were delineated and spatial changes in the wetland analyzed [1]. While the wetland covers 2033 sq. km area, its river basins cover a total of 6126.5 sq. km. Hydrology of wetland was analyzed [2, 3] in terms of rainfall pattern, mean annual river flows, flooding characteristics, residence time and overall water balance. These studies indicated the constraints and possible solutions for flood management in the wetland and need to minimize closing period of salinity barrage to restore the health of aquatic ecosystem. This paper presents a study on the interannual variability of river discharges to Vembanad wetlands.

Changes in the annual and monsoon river discharges near outlet of each of the five basins of wetland and corresponding precipitation are analyzed using concurrent datasets, length of which varied from 11 to 22 years until year 2000. In general, in all the five basins, positive trends observed in annual precipitation with similar increasing trend in total annual and monsoon season discharges. In Achencoil basin, discharge per unit rainfall depth shows a minor decreasing trend for annual and monsoon season discharges. Indirect regulations by human activities could be the probable reason for above trend. Discharge per unit rainfall depth is found increasing in Pamba and Meenachil basins, thus indicating increased responses of these basins to rainfall events. No significant change is detected in corresponding river discharges of Manimala and Muvattupuzha basins. The above initial results based on limited length of data are however not adequate to confirm climate changes in the study region.

Keywords: Vembanad Wetland; hydrology; interannual variability.

References

- [1] R.Gopakumar and K.Takara, Analysis of the bathymetry and spatial changes of Vembanad lake and terrain characteristics of Vembanad wetlands, *In Hydroinformatics in*

Hydrology, Hydrogeology and Water Resources. IAHS Publication 331, 402-411 (2009), IAHS Press, UK.

- [2] R.Gopakumar and K.Takara, Water balance and mean water residence time of the Vembanad wetland of Kerala State, India, *In Ecohydrology of Surface and Groundwater Dependent Systems: Concepts, Methods and Recent Developments*. IAHS Publication 328, 222-232 (2009), IAHS Press, UK.
- [3] R.Gopakumar, Flood management in the Vembanad wetlands of Kerala - Constraints and some possible solutions. In Proc. EWRI-ASCE India 2010 Conference, Chennai, India, (2010).