World Academy of Science, Engineering and Technology
International Journal of Civil and Environmental Engineering
Vol:17, No:08, 2023

River Offtake Management Using Mathematical Modelling Tool: A Case Study of the Gorai River, Bangladesh

Authors : Sarwat Jahan, Asker Rajin Rahman

Abstract : Management of offtake of any fluvial river is very sensitive in terms of long-term sustainability where the variation of water flow and sediment transport range are wide enough throughout a hydrological year. The Gorai River is a major distributary of the Ganges River in Bangladesh and is termed as a primary source of fresh water for the South-West part of the country. Every year, significant siltation of the Gorai offtake disconnects it from the Ganges during the dry season. As a result, the socio-economic and environmental condition of the downstream areas has been deteriorating for a few decades. To improve the overall situation of the Gorai offtake and its dependent areas, a study has been conducted by the Institute of Water Modelling, Bangladesh, in 2022. Using the mathematical morphological modeling tool MIKE 21C of DHI Water & Environment, Denmark, simulated results revealed the need for dredging/river training structures for offtake management at the Gorai offtake to ensure significant dry season flow towards the downstream. The dry season flow is found to increase significantly with the proposed river interventions, which also improves the environmental conditions in terms of salinity of the South-West zone of the country. This paper summarizes the primary findings of the analyzed results of the developed mathematical model for improving the existing condition of the Gorai River.

Keywords : Gorai river, mathematical modelling, offtake, siltation, salinity
Conference Title : ICFGRE 2023 : International Conference on Fluvial Geomorphology and River Engineering
Conference Location : London, United Kingdom
Conference Dates : August 17-18, 2023