

Impacts of Climate Change on Water Resources Management in the Mahi River Basin of India

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Abstract : This research project examines a 5000 cal yr BP sediment core record to reveal the consequences of human impact and climate variability on the tropical dry forests of the Mahi river basin, western India. To date there has been little research to assess the impact of climate variability and human impact on the vegetation dynamics of this region. There has also been little work to link changes in vegetation cover to documented changes in the basin hydrology over the past 100 years - although it is assumed that the two are closely linked. The key objective of this research project therefore is to understand the driving mechanisms responsible for the abrupt changes in the Mahi river basin as detailed in historical documentation and its impact on water resource management. The Mahi river basin is located in western India (22° 11'-24° 35' N 72° 46'-74° 52' E). Mahi river arises in the Malwa Plateau, Madhya Pradesh near Moripara and flows through the uplands and alluvial plain of Rajasthan and Gujarat provinces before draining into the Gulf of Cambay. Palaeoecological procedures (sedimentology, geochemical analysis, C&N isotopes and fossil pollen evidences) have been applied on sedimentary sequences collected from lakes in the Mahi basin. These techniques then facilitate to reconstruct the soil erosion, nutrient cycling, vegetation changes and climatic variability over the last 5000 years. Historical documentation detailing changes in demography, climate and landscape use over the past 100 years in this region will also be collated to compare with the most recent palaeoecological records. The results of the research work provide a detailed record of vegetation change, soil erosion, changes in aridity, and rainfall patterns in the region over the past 5000 years. This research therefore aims to determine the drivers of change and natural variability in the basin. Such information is essential for its current and future management including restoration.

Keywords : human impact, climate variability, vegetation cover, hydrology, water resource management, Mahi river basin, sedimentology, geochemistry, fossil pollen, nutrient cycling, vegetation changes, palaeoecology, aridity, rainfall, drivers of change

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