

SEA LEVEL RISE AND EFFECT ON COASTAL AQUIFER OF THE PIYALI RIVER OF THE SUNDARBANS

Sujana Dhar,
Subhasish Das
Asis Mazumdar

School of Water Resources Engineering
Jadavpur University, Kolkata 700032
Email: sujanadhar@yahoo.com

ABSTRACT

Current sea level rise has occurred at a mean rate of 1.8 mm per year for the past century, and more recently at rates estimated near 2.8 ± 0.4 to 3.1 ± 0.7 mm per year (1993-2003). Rising sea levels inundate wetlands and other low-lying lands, erode beaches, intensify flooding, and increase the salinity of rivers, bays, and groundwater tables. Some of these effects may be further compounded by other effects of a changing climate. Sea level rise may also affect freshwater quality by increasing the salinity of coastal rivers and bays and causing saltwater intrusion, movement of saline water into fresh ground water resources in coastal regions.

Salinity is common problem in the Sundarbans. Sea water contains chlorides with other salts that can be detrimental to agricultural crops and can exceed drinking water standards. During the summer period when the saltwater intrusion becomes more severe due to extensive over pumping in the absence of the development of supplemental water supplies to the area. The problem of sea water intrusion increases as population centres and water demands in localized coastal regions develop. The problem arises whenever a coastal aquifer serves as an important source of water supply.

The Basin of Piyali River, an estuarine river with regular tidal influx, with special emphasis on Kultali block has been chosen for utilizing the water of the Piyali River during dry months and augmenting water supply through rainwater harvesting in the Kultali block down to village level. During flash floods the entire catchment of the Piyali River overflows.

In this paper, an attempt has been made to investigate the extent of the salt water intrusion phenomenon of the Piyali River located in the Sundarbans of India. Water and soil samples from each village of the Kultali block located in the South 24 Parganas district of West Bengal have been analyzed for their contents.