

Identification of the Flow Dependent Ecosystems and their Services in the Indian Sundarbans

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ABSTRACT

The Indian Sundarbans, located in the south western end of Ganges delta, is a part of deltaic West Bengal. It hosts the world's largest mangrove ecosystem and supports almost 5 million population. The region is characterized by its mangrove forest, mudflats, estuaries, creeks, floodplain, freshwater wetlands and these land covers are modified from time to time by river action. Freshwater is a scarce resource in Sundarbans, though it is crisscrossed by numerous rivers and creeks. The river water and shallow groundwater are saline in the Sundarbans. Scarcity of freshwater during dry seasons, high salinity of surface water and soil, siltation and drainage congestion are major constraints of livelihood security in this area. The people of the region depend on the ecosystem services of Sundarbans which are directly linked with upstream freshwater flow, rain and groundwater. The present study is therefore designed to identify the flow dependent ecosystem services in the region for their sustainable management.

I. Introduction

The Millennium Ecosystem Assessment (MEA) report 2005 defines Ecosystem services as benefits people obtain from ecosystems. The ecosystem services are classified as (i) Provisioning services, i.e. products obtained from ecosystems, (ii) Regulating services, benefits obtained from the regulation of ecosystem, (iii) Cultural services, i.e. non-material benefits that people obtain through spiritual enrichment, recreation etc. and (iv) Supporting services i.e. necessary for the production of all other ecosystem services. Food, fiber, fuel are provisioning services, water regulation, pollution control are regulating services, spiritual enrichment, cognitive development, recreation are cultural services and soil formation and retention, nutrient cycling, primary production, water cycling are

supporting services. Ecosystem functions result in the generation of such benefits. These benefits are very significant to the wellbeing of human beings. The present study is designed to identify the ecosystem services of the Indian part of the world's largest mangrove ecosystem, Sundarbans, which is located at the south western end of the Ganges-Brahmaputra-Meghna delta was formed during 11000-3000cal year BP [1] by the interaction between upstream fresh water from the river Ganges and saline sea water of the Bay of Bengal.

The Sundarban Biosphere Reserve (SBR) of India extends from 21°33'32.62" N to 22°38'15.66"N and 88°2'27.42"E to 89°5'46.06"E, is a part of deltaic West Bengal and includes the districts of North 24 Parganas and South 24 Parganas. The area is bounded by River Hoogly in the west, Ichamati- Raimangal- Harinbhanga in the east, Dampier-Hodges line in the north and the Bay of Bengal in the south. Total area of SBR is 9630 sq km. comprising the block region of 5367 sq km. and reserve forest area of 4263 sq km. The forest area is

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