CHAR SUITABILITY ASSESSMENT FOR MANGROVE AFFORESTATION

> " Mangrove afforestation, which is a nature-based solution, should be included in future embankment designs
>
> **Dr Jiban Kumar Sarker**
> BWDB

CHAR Suitability Assessment for Mangrove Afforestation

Context and problem
Chars in the Meghna Estuary in Bangladesh are vulnerable to erosion and floods, making them unsuitable for human settlement and cultivation. As the chars are in a dynamic coastal zone, the risks will be exacerbated due to climate change.

How can the erosion and flood risks of chars be reduced and made habitable?

Researching this question
Chars that are suitable for mangrove afforestation can be identified, as mangroves can stabilise the chars and prevent erosion. These chars can be developed for human settlement in future.

Mangrove afforestation is a promising solution to reduce the risk of erosion and flooding on the chars of the Meghna Estuary. A screening method helps identify chars where mangroves can be planted so that they can be developed for human settlement and agriculture.
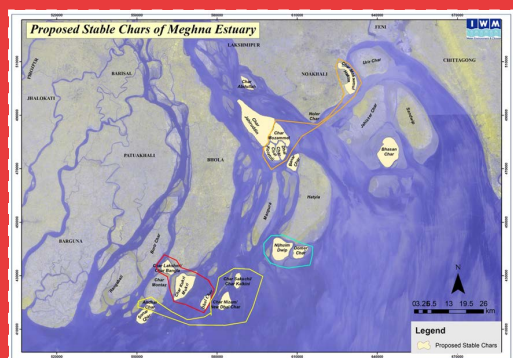
COMPONENTS OF RESEARCH

1. Chars at risk
The Meghna Estuary is an important ecosystem facing rapid erosion due to sea level rise. In some areas the erosion has been severe in the last decade. A 20-year morphological simulation matched this past erosion, and also showed that Noler Char will vanish in 20 years if erosion is not arrested.

Proposed stable chars of Meghna Estuary

2. Nature-based solution
Mangrove afforestation offers the best nature-based solution against flooding and erosion. Taking various factors including the chars' morphological behaviour, storm surge level, salinity and tidal condition, a screening method identifies the chars where mangroves can be planted. Collecting sediment composition data will help in identifying the best suited mangrove species.

3. Selecting potential sites
The screening method is based on the possibility creating a new habitat along the coastline. Potential sites were selected based on the Global Forest Watch (2020) data, and presence of mangrove forests nearby. From the available data, vulnerable sites were prioritised.

Two chars for afforestation
This study has identified Char Mozammel and Dahl Char as the best sites in Meghna Estuary where mangroves can be planted. Avicennia marina is likely to be best suited, given its wide range of tolerance to abiotic conditions.

KEY MESSAGE
Mangroves planted on newly accreted coastline of chars in the Meghna Estuary stabilise the sediment and prevent them from eroding.

For more information contact Upal Mahamud at upm@iwmbd.org

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