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B03. Incorporation of eco-engineering technology in coastal protection: Opportunities and challenges

Coastal protection is not a recent science. The shorelines have always experienced gigantic nature brutality. Massive sand volume is transported offshore as a part a natural cycle, a phenomenon called erosion. Storm surges and wave energy are two important factors that threaten the natural features of a coast. They both attack infrastructure and ecological elements, existing near shore. Nearly one third of world population resides in coastal areas and as the sea level rise evolves as a consequence of global warming, an alarm has been triggered to protect shorelines in more natural ways.

A conventional method that might be considered is “Hard Structure” such as dykes, revetments or break waters. However, introduction of artificial measures would cause horrifying damages to ecology of coasts. In fact, as natural process is intervened by human efforts, in the long term, various imbalances might happen in a natural system. Yet again, it is viable to consider managing natural undesirable forces; however it must be remembered that men cannot be triumphant over nature. Ecological engineering is a practice, which integrates the forces of nature and human engineering, endeavors for the benefit of human society while preserving the environment.

This paper deals with approaches that augment “Soft Intervention” and “Hard Structure” in coastal protection. Hard engineering measures together with ecological features such as mangroves plantation and fauna growth are introduced to assess their impacts on the protection of shorelines. This study looks into the different engineering approaches in coastal protection. Methods that incorporate ecological concepts to conventional engineering design will be reviewed. Finally, the findings of the study conducted by the authors will be discussed. It is hoped that lessons learned will lead to improved remediation techniques to overcome the harsh forces of nature and readapt existing coastlines which have been under the direct influence of human-beings.