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TITLE: Area Coastal Protection and the Use of Bamboo Breakwaters in the Mekong Delta

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ABSTRACT:

The dynamic coastline of Soc Trang Province in the Mekong Delta of Vietnam is in most parts protected from erosion, storms, and flooding by a narrow belt of mangroves. However, development and the unsustainable use of natural resources in the coastal zone are threatening the protection function of this forest belt and reducing income for local communities. In some places, erosion has destroyed the mangrove forest and is endangering coastal dikes and thus people and infrastructure behind the dike. The impacts of climate change further increase these threats to coastal protection and local livelihoods. Because of the uncertainties related to the impacts of climate change, a viable coastal protection strategy must include a diverse and site-specific range of approaches to ensure that adaptation conflicts and maladaptations can be avoided. In places along the coast of Soc Trang Province, where the coastal floodplains have been eroded and where mangrove forests have been destroyed by erosion, an area coastal protection strategy has been piloted, which uses floodplain management as a sustainable and effective method of coastal erosion and flood protection. The design and construction of structural protection measures must be based on numerical modeling which simulates hydrodynamics and shoreline development, as well as physical modeling, to ensure effectiveness and avoid as much as possible negative effects such as downdrift erosion. Bamboo T-fences, which were used to close eroded gaps between remaining headlands with mangrove vegetation, have been shown to be successful at restoring eroded coastal floodplains because they significantly reduce wave energy (erosion) and increase sedimentation, which is a precondition for mangrove rehabilitation in erosion sites. In places where floodplains provide sites suitable for mangroves to migrate seaward, the subsequent surface elevation could even keep pace with sea level rise to some extent. Such a strategy, which combines ecological, hydrological, and morphodynamic elements, also makes a contribution to local livelihoods through cobenefits from an ecosystem-based approach. A cost-benefit analysis showed that the wealth benefits are five times higher for the mangrove and earth dike approach than using a dike upgrade as the only element of coastal protection.

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