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Navigating Peril: Climate Change Impacts and Adaptive Strategies for Coastal Security in Colombo District

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Abstract

As a small island nation, Sri Lanka is highly vulnerable to the adverse effects of climate change including sea level rise, coastal erosion, landslides, flooding, heavy rainfall, and rising temperatures. These changes, as a non-traditional security threat, pose significant challenges to the country's national security, causing coastal infrastructure damage, human displacement, disruption to fisheries and livelihoods, and conflict over resources. Hence it is crucial to identify the specific impacts of climate change on the country, particularly in vulnerable regions like coastal zones, to develop effective adaptation and mitigation strategies. The objective of the study was to identify the risks faced by the vulnerable coastal zones in Colombo District due to climate change and to suggest appropriate measures to adapt these challenges. The study employed a qualitative method, utilizing both primary and secondary data. To gather primary data, semi structured interviews were conducted with key stakeholders, including representatives from the Coastal Conservation and Coastal Resource Management Department, Marine Environment Protection Authority, Sri Lanka Coast Guard, Disaster Management Center and National Aquatic Resources Research and Development Agency. Secondary data were gathered from existing journal articles, case reports and government publications. Thematic Analysis was used to interpret the data, focusing on patterns related to climate impacts on the coastal zone. Key findings highlight that rising sea level, coastal erosion and storm surges are the most pressing climate-related issues affecting the Colombo District's coastal zone. While sea level rise impacts essential facilities and the natural ecosystem, coastal erosion exacerbates loss of land and biodiversity. Additionally, storm surges pose a significant threat to human safety and livelihoods. Most significantly, the study outlined the national security risks posed by climate change, such as the destruction of critical infrastructure, displacement of coastal communities and increased competition over resources. These factors could lead to social unrest and strain national defense capabilities. In conclusion, the study emphasizes the urgent need for coordinated efforts at the local, national and international levels to address climate-induced disasters affecting Colombo District coastal zones. Recommendations include expanding research and development, increasing funding for coastal management and integrating modern technology and community participation in adaptive strategies. Implementing such measures is critical for safeguarding both the region and the country's national security from climate change impacts.

Keywords: *Climate change, Coastal zone, Colombo district, National security*