Practical Steps for Mitigating Climate Change-Induced Risks: A Guideline for Enhancing the Resilience of Vulnerable Egyptian Coastal Regions

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Abstract:

Climate change is a global crisis with profound environmental, social, and economic consequences, necessitating immediate action to mitigate its effects. Coastal regions, particularly Egypt, face significant risks due to climate change-induced sea-level rise (SLR) and flooding, with the Alexandrian region being one of the most vulnerable coastal areas. Despite heightened awareness of these threats, adaptation and mitigation measures remain fragmented and insufficient, leaving many coastal areas exposed to escalating, harsh risks. This paper addresses this gap by proposing practical steps for mitigating climate-induced flooding through adaptation and mitigation strategies that enhance resiliency. Through reviewing the existing literature, international case studies, and the progress of the national adaptation policies (NAPs). Thus, the study evaluates current strategies and identifies key areas for improvement by synthesizing successful adaptation practices and their applicability to the Egyptian coastal context. Through the evaluation of the current paradigms, the paper highlights the need for a multi-faceted approach that integrates both (a) nature-based solutions (NbS), such as mangrove restoration and wetland preservation and (b) engineering solutions, such as seawalls, breakwaters, and structural retrofitting. Key recommendations include enhancing institutional coordination, updating urban policies and building codes to incorporate climate resilience, and prioritizing community engagement for preparedness. This paper contributes to the ongoing discourse on coastal resilience by providing practical, actionable guidelines for enhancing coastal

resilience and mitigating the long-term impacts of climate change on Egypt's vulnerable Alexandrian Region. Furthermore, it offers valuable recommendations to guide policymakers, urban planners, and architects in adapting to the growing risks of climate change.

Keywords:

Climate Change, Sea-level rise (SLR), Coastal Flooding, Adaptation, Mitigation, Coastal Resilience, Alexandria, Egypt.