Adaptation Plan Evaluation Report

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Abstract

This section provides a brief summary of the evaluation report, outlining the key question being addressed, methods used, and main conclusions.

Introduction

Climate change in India affects multiple facets of the ecosystem, including oceans (Marathe, Terray, and Karumuri, 2021). coastal regions (Gupta et al., 2019), water resources (Shiva Shankar, A. Kumar, and Mohan, 2021) and forests (Lele and Krishnaswamy, 2019). Additionally, it significantly impacts agriculture (K. N. R. Kumar et al., 2023), urban areas, public health(Rajput et al., 2022), and energy infrastructure (Yarlagadda et al., 2022), creating complex challenges that require coordinated responses. Each of these vulnerabilities will be examined in detail to highlight the specific risks.

Coastal Regions

Climate change is projected to exacerbate the impacts of tropical cyclonic storms by increasing their intensity as sea surface temperatures rise. The North Indian Ocean comprising the Bay of Bengal and the Arabian Sea accounts for only 7% of global cyclones these storms are disproportionately destructive, particularly along the densely populated, low-lying East Indian and Bangladeshi coasts, which are highly vulnerable to storm surges and flooding. Also, while the Arabian Sea has historically experienced fewer high-intensity storms due to factors such as unfavourable wind shear, dry air from the Thar Desert, and cooler sea temperatures, recent years have seen a rise in stronger cyclones in the region. This shift suggests that changing climatic conditions are altering traditional storm patterns and intensifying their impacts, posing new challenges for coastal resilience and disaster preparedness (Gupta et al., 2019)

Water resources

Climate change poses a significant threat to water, food security, and the well-being of India's 1.2 billion people in the 21st century . The country experiences uneven spatial distribution of water resources, with the drier northwest receiving scarce rainfall, while the northeast holds the distinction of being the wettest region on Earth (Goyal and Surampalli, 2018).Agriculture supports 17.2% of the global population despite relying on just 9% of the world's arable land, with more than 56% of agricultural land being rainfed (Mishra and Lilhare, 2016).

This heavy dependence on rainfall makes India particularly vulnerable to climate variability. Precipitation patterns are expected to shift significantly, with projections showing an increase in average annual rainfall by 7–18.7% by 2099 compared to the 1961–1990 baseline (Chaturvedi et al., 2012). Similarly, precipitation in several river basins across India could increase by up to 30% by 2040–2069 and 50% by 2070–2099 from the 1971–2005 levels (Mishra and Lilhare, 2016)

Adaptation Policy and activities

The National Action Plan on Climate Change [NAPCC] (PMCCC, 2008) articulates India's adaptation goals addressing climate vulnerabilities across key sectors while promoting sustainable growth. NAPCC identifies eight National Missions, which form the core of the National Action Plan, out of which five missions are focusing on adaptation, which are:

Methods