



# Commentary: Climate Adaptation Interventions in Coastal Areas: A Rapid Review of Social and Gender Dimensions

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## A Commentary on

### Climate Adaptation Interventions in Coastal Areas: A Rapid Review of Social and Gender Dimensions

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## INTRODUCTION

In a review piece Prakash et al. (2022) have raised a thorny issue concerning gender dimensions of climate adaptations in coastal areas of India. The context of this paper is of enormous importance. Yet some sub-issues might still need a further careful analysis, which prompts us to write this general commentary. We will highlight some of the missing pieces in the jigsaw puzzle in the role of gender in climate adaptation strategies for Coastal India, especially the Bay of Bengal region.

The Bay of Bengal coastal area ranges along the Northeast segment of the Indian Ocean stretching from Sri Lanka to the northern part of the Malay Peninsula. The Bay is a shallow embayment - about 1,600 km wide with an average depth of 8,500 feet. It occupies an area of 2,173,000 square km. The coastal area of the Bay has faced some of the major consequences of climate change, especially the Indian coast along the Bay, with the hastening of sea erosion and climatic shocks like deadly cyclones (see Kankara et al., 2018; Kulp and Strauss, 2019). Several villages in the Coastal India along the Bay are now ghost villages as coastal residents were forced to abandon their villages ravaged by severe climate events (see Danda et al., 2019; IDMC, 2020; Panda, 2022). Early work of Panda (2010) and World Bank (2014), among others, anticipated such dire consequences of climate shocks for the Coastal India.

Sea levels rose along the Bay by more than 8.5 cm over the last 50 years and more than 30 million people will live in the endangered coasts of the Bay by 2100 (see Mohanty et al., 2017; Rajalakshmi and Achyunthan, 2021). Sandhani et al. (2020) highlight that a 1°C rise in temperature causes a 4.7% contraction in the growth rate of the district per capita GDP in the Coastal India, which unleashes a series of economic and social crises - highlighted in the following section.

## HUMAN RESPONSES TO THE CONTINUING CRISIS: GENDER DIMENSIONS

One of the immediate impacts of the rising sea level and sea erosion is the livelihood crisis along the coastal belt of India, which prompts outmigration. It has been noted that the rising

temperature causes severe dislocations in the regional economies of the Coastal India - especially for those regions with limited access to credit, energy and (development) infrastructure and slow urbanization (see Sandhani et al., 2020). Mani et al. (2018) also highlights a need for special investment in human capital to moderate the consequences of livelihood crisis in the Coastal India. In earlier work Shenoï et al. (2004) and Brierley and Kingsford (2009), among others, have anticipated how climate shocks can weaken marine ecosystems and send shockwaves through coastal economies. In recent work Dineshbabu et al. (2020) and Mujumdar et al. (2020) document how the adverse impacts of climate shocks have jeopardized the livelihoods of people living in the Coastal India. In response to continuing livelihood challenges, male population chose to migrate intrastate and interstate from the Coastal India, as anticipated by Panda (2010) among others. At the same time, some families are forced to move to the resettlement colonies away from the coast under the planned relocation scheme of Government of India (see Danda et al., 2019). Both the resettlement strategy and outmigration of males have created gender-specific problems along the coastal belt of the Bay of Bengal in India (see Mortreux et al., 2018; IDMC, 2020). The outmigration of males has left women living precariously close to the endangered coastal areas (Danda et al., 2019). In these villages in houses after houses women are entrusted with the additional duties of nursing the young and the old against the backdrop of regular climate-related adversities related to sea erosion and severe cyclones (see Panda, 2022).

## DESKILLING AMONG SKILLED WOMEN OF VILLAGES ALONG THE BAY OF BENGAL AND IMPLICATIONS

The main economic activity in coastal villages along the Bay is fishing. Though actual fishing activities are male-centric and undertaken by males, women traditionally help their family members in the ancillary activities to the fishing, like cleaning and storing fish along with marketing. Dineshbabu et al. (2020) argue that the rising temperature of the Bay of Bengal has increased frequencies and severities of algal blooms and, consequent, poisoning of fish stocks. Mujumdar et al. (2020) evidence that continuing climate shocks, along with deteriorating marine ecosystems, have led to severe decreases in fisheries productivity in the Coastal India. The complex interactions between climate and ecosystems, as argued by Brierley and Kingsford (2009) in an earlier study, severely lowered the regional GDP and fisheries productivity of the Bay of Bengal region (see Mujumdar et al., 2020; Rajalakshmi and Achyunthan, 2021). The traditional village economy along the Bay relies heavily upon the complementarity of fishing-related activities between male and female members of households (see Panda, 2022). The outmigration of male members, or resettlement of families in non-coastal areas, is a major source of women's

disempowerment as their skills in the coastal, household-based, economic activities have become redundant (see Mani et al., 2018; Danda et al., 2019; IDMC, 2020). In some households, the cash flows might have improved due to outmigration from the coastal areas, yet the female workforce participation has declined, as anticipated in the work of Panda (2010). The role of women in most of the climate adaptation strategies along the coastal areas has been well-articulated in the current work of Prakash et al. (2022). Disempowerment of female workers, with their diminished role in the workforce, can create stumbling blocks for the overall climate adaptation strategies (see Rigaud et al., 2018; Danda et al., 2019; Sandhani et al., 2020). Furthermore, the outmigration of males can also diminish the bargaining power of females in the (village) local government (called Panchayat) for enforcing the climate adaptation strategies (see Mortreux et al., 2018).

## DISCUSSION

India faced the mammoth task of relocating displaced Indians from climate change. From 2008 to 2020, each year about 4 million Indians were displaced. This displacement is due, mainly, to sudden weather emergencies like flooding and cyclones. Yet, there is little coherence in national and subnational policies to rehabilitate displaced people from coastal areas driven by coastal erosion (Mortreux et al., 2018; Rigaud et al., 2018; Panda, 2022). Especially, due to the long-term displacement of people and outmigration of males from the coastal regions of the Bay of Bengal, the voice of the female stakeholders from coastal areas is apparently muted. This is anticipated in the work of Ginoya et al. (2019). It is also imperative to highlight that India has chronic problems with human development as well as gender inequality: in terms of the Human development index (HDI), India ranked 135th – one of the lowest in the region. The gender-based inequality is extremely high: gross national income (GNI) per capita for females is US\$2116 while the GNI per capita for males is US\$8656. Hence, the rising disempowerment of working women in coastal areas indicates further deterioration of the situation.

## AUTHOR CONTRIBUTIONS

AS: literature review on the climate shocks in the Bay of Bengal. TA: literature review on the adaptation policies in the Bay of Bengal coast. ND: literature review on the gender issues in the coastal region of West Bengal and Orissa and discussion section. PG: writing the rest of the commentary on the basis of the research and discussion of others. All authors contributed to the article and approved the submitted version.

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