

Encountering Gendered Spaces in Climate Change Policy in India: Migration and Adaptation

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Background

In India, as elsewhere in South Asia, climate variability and extreme weather conditions are responsible for exacerbating the risks confronting people. The Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report acknowledges the intersecting nature of hazard risks by using the terms ‘geophysical’, ‘agro-ecological’ and ‘socio-economic’ (IPCC 2014). Vulnerabilities to such changes are observed to be gendered (Patel 2019; Rao and Hans 2018; Rao et al. 2017; Goodrich et al. 2017; MacGregor 2010; Agarwal 2000). Among the vulnerable groups, women are disproportionately impacted by climatic changes. Compared to the magnitude of impacts, however, the pace at which women are being included in governance systems and policy formulation about climate challenges, migration and adaptation is rather slow. Arguably, the barriers to social engagements in these processes include a lack of political action as well as social norms and expectations (Lorenzoni et al. 2007, 451; Hossen et al. 2019).

The government’s focus on gender in the context of climate change can be assessed and analysed from policy commitments and the norms of gender equality (Vincent and Cull 2015; Held et al. 2011; Agarwal 2010; Terry 2009; Hemmati and Röhr 2009; Giddens 2009; Kelkar 2009). A wider dimension of governance is also built on the roles of stakeholders like ‘non Governmental organizations and epistemic societies’ (Jagers and Stripple 2003, 385). To aid the processes of migration and adaptation and to ensure that women are placed at the core of decision-making and action, all involved parties must work in coordination.

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Indian Climate Change Policy: A Research Enquiry

Existing global and national researches, as noted, have expressed the growing concern that women are unduly affected by climate change (Ahmed and Fajber 2009; Nagel 2016; Parikh et al. 2012). We, however, know little about women's participation in climate-change governance at present or about the sensitivity of inclusive policies in India, as gendered research for such instances are scarce (Dubash 2012; Parikh et al. 2012). While it is assumed that climate change affects everybody, there is a need to acknowledge that it also embodies a range of social and economic inequalities that link gender to class, caste and ethnicity.

Gender has been recognized as a dynamic cultural and ideological construct, and women face social, economic and political impediments to accessing means of livelihood, food and natural resources, including water and energy, as a result of climate change (Nathan et al. 2018). This research on the Mahanadi Delta of India is an attempt to address this silence about the experiences of women, including those with specific vulnerabilities, such as women heading their households and widows, in research and governance. This is in keeping with the notion that any comprehensive solution to climate change must be all-inclusive, and hence, while recognizing women's vulnerability, this article also notes their contribution in meeting the challenges of climate change as evidenced by an analysis of their responses (Rao and Hans 2018; Denton 2002)¹.

In the analysis of gendered climate-change policy implementation in the Mahanadi Delta, an understanding of the perception of gender rights and migration, which is on the rise and projected to increase further, is imperative (Hazra et al. 2020).

The data given below (Table 1) shows future climate scenarios in the Mahanadi Delta, which may well encourage the movement of people:

Change in	Mahanadi Delta: Mid Century	Mahanadi Delta: End Century
Surface temperature (°C)	+0.8 to +4.2	+2.6 to +6.3 +
Precipitation (%)	-45 to +2	-8 to +25
Maximum wind speed (ms-1) i	-0.2 to +1.3	-0.5 to +0.4
Frequency of high wind events (days per decade) ii	-50 to +30	-37 to +13

Table 1: Future climate projections for the Mahanadi Delta, for the 21st century adapted from Nicholls et al. 2017, 31

- i. Maximum wind speed is defined as the 98th percentile of the daily mean wind speed.
- ii. High wind events are defined as daily mean wind speed exceeding 13 m/s

In analysing the effects of climate change on women in India, and the policy response to it, it must be realized that Indian policy-making is based on a federal structure: policy is formulated at both national and state levels. However, implementation is at the community level. Within such a framework, effective linkages between the national and local levels can be challenging (Scott and Huq 2014). The National Action Plan on Climate Change (NAPCC), with eight National Missions (*Government of India Report*, 2008) monitored by the Prime Minister's Council, though not a policy, has the significance of one. The NAPCC 2008 recognized that climate change notably affects women and can be particularly harsh on them due to scarcity of water, reductions in yields of biomass, and increased risks to human health (*Government of India Report* 2008, 14). However, the policy betrays a minimalist approach by merely voicing concern for women's problems and not taking into account their contribution to climate-change-policy implementation, especially in adaptations.

The states play an important role in the Indian federal structure². As the Mahanadi Delta is situated in the State of Odisha, an examination of the state's policy *vis-a-vis* women affected by climate change is necessary. The Odisha State Climate Action Plans formulated in 2010-2015 (*Government of Odisha Report* 2010) have been extended to 2018-2023 (*Government of Odisha Report* 2018)³. The state's Climate Change Action Plan 2010 recognizes women as the drivers of change in building community resilience to climate change. The plan also specifically calls for capacity-building to meet the challenges of mitigation and adaptation, as well as sensitization of frontline health workers. As in the NAPCC, the State plan identifies reduction in biomass and water scarcity as important components of women's experiences. Adaptation figures prominently in the promotion of women's collectives through women's self-help groups (SHGs) (*Government of Odisha Report* 2010). The new Action Plan for 2018-2023 has a whole chapter dedicated to gender and climate change (*Government of Odisha Report* 2018, 160-163), providing a gender-sensitive approach of empowering women as agents of change and not victims (DECCMA,2017). However, since the plan has only recently been introduced, it is not reflected in practice yet. This article will therefore examine the application of Action Plan 2010-2015 which, ironically, has found no place in the government's own progress report (*Government of Odisha Report* 2015). This implies an exclusion of women's voices from decision-making and financial processes, thus further disengaging them from policy which directly impacts their lives. An understanding of this implication creates a context for women having to cope with climate stress and shocks when the men of the households migrate in search of livelihoods.

Research Approach and Methodology: Women on the Frontlines

Existing literature indicates an increasing global understanding of the gendered impact of climate change on local communities (Goh, 2012; Moosa and Tuana 2014). However, the questions raised by existing research around rapid climate change in the Mahanadi Delta have been largely overlooked in policy-formulation. This study draws from the Deltas, Vulnerability and Climate Change Migration and Adaptation (DECCMA) project that analysed the future of people living in the deltas affected by coastal erosion. The study area of the project was coastal deltas which are susceptible to climatic factors like storm surges, a rise in sea level and changing socioeconomic factors (Cazcarro 2018; Van Ruijven et al. 2014, Nicholls et al. 2007). A local Odisha Coastal Vulnerability Index (CVI) study by the Indian National Centre for Ocean Information Services specifically identified that loss and damage from rising sea level, coastal geomorphology, tidal range and elevation in the Odisha coastline create vulnerability (*Government of Odisha Report 2018*, xii).

A Feminist Approach to Climate Change

This article adopts a feminist methodology (Kannabiran and Swaminathan, 2017) to draw attention to the gender inequalities inherent in how climate change affects people (Agarwal 2010, 2000; Elmhirst, 2011). This is put in perspective by the knowledge that while women exercise individual agency in responding to climate change, their reactions are located within political and socio-economic contexts. The feminist approach in this chapter is drawn from the writings of both academics and activists (Shiva 1988; Patel 2019; Nathan et al. 2018; Rao and Hans 2018; Chanda et al. 2017). The writings initially linked the environment to nature (Bose 2010; Shiva 1988) before shifting course to analyse the ground-level realities of climate change, including gender norms and changing gender roles (Chanda et al. 2017; Rao and Hans 2018; Kelkar, 2009). Examining the role of policy in promoting gender equality remained sidelined since existing policy was weak: incorporating UNFCCC gender directives in the policy was not a priority⁴. International commitments by India's policy-makers had little impact on women who continued to be vulnerable and excluded from decision-making (DECCMA 2017). Our use of a policy framework must accompany an acknowledgment that climate change is a political phenomenon and hence, strongly linked to women's location within the power structure which determines their access to resources and agency to effect positive change in their social and material conditions. A question yet to be asked in the context of climate change is: where are women situated in the body politic? It is not an easy question to answer because the climate policy has relied on a scientific approach, with the focus being on mitigation, instead of a socio-political one. This has kept the majority of women out of discussions on climate change (Subramaniam 2016; Held 2011). This article agrees with Joni Seager's view that climate change must now be approached with an eye to "privilege, power and geography" (Seager 2009). From a feminist perspective, privilege and power are important components of patriarchy.

Encountering Gendered Spaces in Climate Change Policy in India: Migration and Adaptation

A feminist approach, involving an understanding of women's experiences, is required for equality-construction in climate research. Bee and co-authors argue that climate policy "is not a grand global narrative, but rather a series of small-scale decisions made at varying scales that affect individuals in disparate ways" (Bee et al. 2015, 6). This includes intra-household relationships and gendered power differentials. This article will, therefore, balance the consideration of a national policy based on the global climate-change narrative with an analysis of local actions, to ascertain if policy-implementation is sensitive to concerns regarding gender disparity and women's lack of control over resources.

Area of Study: Mahanadi Delta

The Mahanadi Delta is formed by a network of three major rivers draining into the Bay of Bengal: Mahanadi, Brahmani and Baitarini. The coastline of the delta is approximately 200 km, from near Chilika in the south to Dhamra River in the north. The study area includes five coastal districts in Odisha⁵ state: Bhadrak, Jagatsinghpur, Kendrapara, Khordha and Puri, and 45 administrative blocks (sub-districts) inhabited by 8 million people (Census, 2011). Among the five districts, the population density is highest in Khordha (800 persons/sq km) and lowest in Puri (488 persons/sq km).

Figure 1

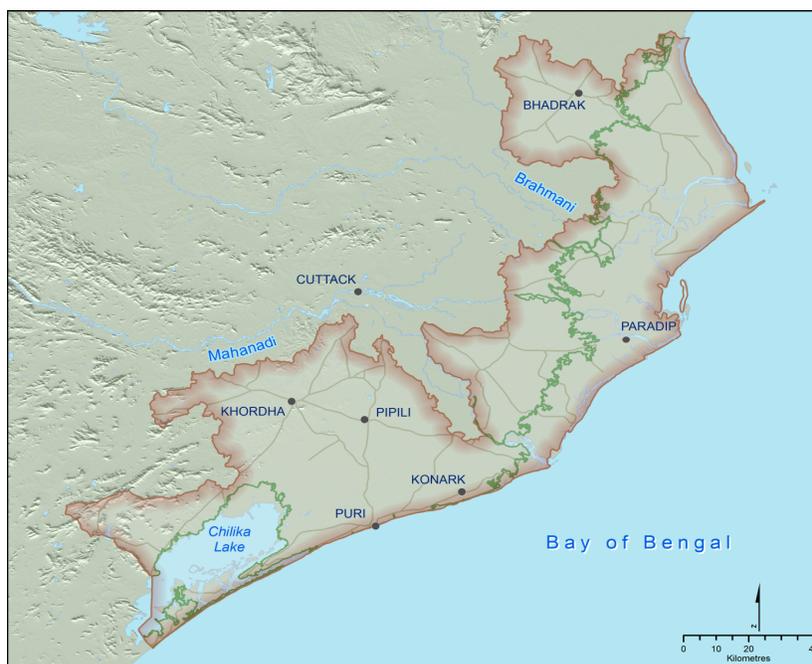


Figure 1: Study area in the Mahanadi Delta (map courtesy DECCMA, 2018). Green line indicates 5m contour.

The methodology for the DECCMA project, on which this chapter is based, focused on migration due to climate change, to identify climate ‘hot spots’ in the Mahanadi Delta from where risk-induced migration occurred. These markings took into account the 5 m contour of five districts in the Mahanadi Delta of Odisha through a local administrative structure of block-level risk mapping (for instance the Puri District risk hot spot) and village-level multi-hazard mapping⁶ (Figure 1). The findings highlighted that hot spots coincide with areas where people’s vulnerability to climate risks and migration were highest (66.67 percent of the affected lived in higher-risk zones)⁷. Recurrent floods, high-intensity cyclones, storm surges and coastal erosion have substantially contributed to migration, as block-level data in this region indicate (Figure 2).

Figure 2

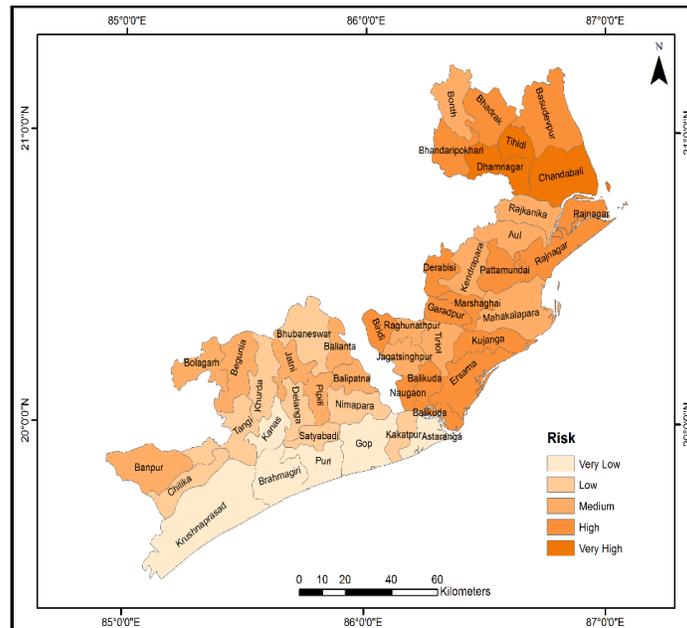


Figure 2: More vulnerable costal blocks identified are: Dhamnagar, Tihidi, Chandabali, Marshaghai, Bhadrak, Ersama, Balakuda blocks. These are bio-physically and socio-economically at very high risk (map courtesy: DECCMA, 2017).

The study methodology includes a household survey⁸ in migrant-sending (source) and receiving (destination) areas. This article focuses only on the sending area of migration. Another important source of information which is relevant to the discussion of governance in this chapter is the stakeholder (government officials, academics, NGOs and climate change activists from the region under study) workshop conducted to understand the role of governance structures (DECCMA 2017). A village-level Focus Group Discussion in a survey village provides insights into men's and women's perceptions of climate change (DECCMA 2018) as does the field research conducted by the authors in April 2017 in Kendrapara to study planned relocation.

Based on the specifics of the hot spots of climate risk and hazard mapping (Hazra et al. 2020), a stratified household sample survey was carried out in the sending areas, selecting fifty villages distributed over five hazard zones of diminishing risk in five coastal districts of the delta. From the 1500 household surveys attempted, responses could be collected only from 1414 households. Of these, 22 percent were found to be migrant-sending households. Among the respondents were 189 women-headed households, of which 43.3 percent were found to be migrant-sending households. Heads of around 60 percent of the women-headed households were widows. Among the women heading households, 32 percent were young: below the age of 40 years.

Risks of Migration and Climate Change: Impact on Women's Lives

Agriculture and fishing are the two major sources of livelihood for the coastal communities in the Mahanadi Delta. With accelerating storm surges, rising seas and salinization of agricultural fields, these communities are faced with the loss of means of subsistence and are left with no livelihood (Samling et al. 2015). A recent study (*UN Report 2019, 5*), has observed that extreme climatic events during the last two decades have inflicted serious damage upon the coastal ecosystem as well as the health and well-being of the local population, especially the women, the children, the elderly and the disabled. The DECCMA study was able to link the loss of livelihood due to cyclone, flood, salinization and coastal erosion (which has resulted in outmigration of large numbers of people) with a potential to generate permanent displacement and radical social change. Migration is being increasingly politicized, globally and in India, owing especially to conflict over scarce resources like water (Udas et al. 2018).

Migration in Climate Change

People living on the coast have been moving in a planned as well as an autonomous manner. All climate-induced migration in the Mahanadi Delta is forced as few people can stay on in their original homes due to coastal erosion and other disasters.

i. Planned Relocation

There has been only one instance of a planned relocation of coastal communities: it was undertaken by the Government of Odisha in 2016 to resettle 650 families of the coastal village of Satbhaya in Kendrapara district displaced by the rising sea level and coastal erosion. In the last thirty years, a total area of 165 sq km in the villages of Govindpur, Mahnipur, Kuanrora, Kharikula and Sarpada in the Rajnagar block of Kendrapara district have been lost to coastal erosion (Das et al. 2016)⁹. Since 2016, the Rehabilitation and Resettlement (R & R) Department has started moving the most affected families to Bagapatia under Gupti Panchayat, about seven kilometres away¹⁰ from the coast. The process was complicated by the fact that, by 2013, most of the families had shifted to another nearby town, Rajkanika, and were subsequently provided land in the newly-formed colony in 2016.

The aim of planned relocation is to improve the wellbeing of the community. While some positive socioeconomic changes have taken place, with people being safer, families having access to health facilities (Giri 2017; field work in Kendrapara 2016, December) and even the appointment of a woman as priestess of a relocated temple (unlike most temples in Odisha), many administrative issues remain unresolved at the resettlement colony. A class division is apparent in the construction of houses. The State does not build houses but provides INR 1,60,000 and INR 12,000 to each family for the construction of a house and a toilet, respectively. Besides, labour conversion is being provided for under the Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGA) which provides for the payment of wages to people for building their own homes on land provided by the Government. Irregular supply of money to this scheme leads to time and cost overruns. In two years, only the few people with additional sources of income could build and shift to their new houses, while others, especially the female-headed households, live in half-built houses. Food security, nutrition and children's access to schooling remain restricted. For instance, the women are unable to even grow a kitchen garden due to the poor soil quality of the area (the relocated colony is situated on a previous brackish water aquaculture area). While in Satbhaya they had access to fish and crabs, their new location lacks this source of dietary protein. Most of these families also had to leave their livestock behind as Satbhaya is cut off from the coast. A majority of the households had previously owned 5-10 acres of land which has been lost to coastal erosion; they have been provided only 405 sq.m at the resettlement site. Some go back to tend to their cattle and grow vegetables in the greener pastures of their previous homes—they feel bound to their land for economic as well as emotional reasons. Also, 'paucity of land' in the new settlement has prevented seventy-five people from relocating. Planned relocation, which began as a good initiative, now appears to not be the most appropriate example of migration strategy.

ii. Autonomous Migration

The state and district-level workshop in the Mahanadi Delta revealed that outmigration from the region is mostly seasonal and results from adult males searching for employment elsewhere. Most of the outmigration is autonomous. A few instances of outmigration of young, single women who have undergone skill-development for specific jobs through the Government-aided capacity-building programme have also been recorded (DECCMA, 2017).

The push factors for such migration are deterioration of livelihood options and quality of life due to rainfall irregularity, land loss, sea water ingress in reservoirs, etc. The pull factors are the interrelated socioeconomic and political factors in sending and receiving areas. Seasonal migration from Mahanadi Delta is thus a survival migration, the frequency and extent of which depends on the frequency and intensity of fast and slow-onset climatic disasters in the coastal region, often taken up two to three times a year, with each period extending from three to six months.

As the DECCMA research shows, the phenomenon of men migrating and women staying back reinforces gender inequality and women's vulnerability (Payo et al. 2015; Lazar et al. 2015). While migration becomes an adaptive strategy for men, women stay behind and cope with disasters, and attend to their household and agricultural work without help from the men. As Vincent argues, migration is expensive and requires financial networks with people in destination areas, thus preventing women from migrating (Vincent 2015, 6-7). Being caregivers for children, elderly parents and disabled family-members are the other socio-cultural norms that obstruct women's mobility independence (Field work in Kendrapara 2016, October).

Female-Headed Households

An increase in male migration results in a larger number of women-headed households, which raises a critical question—does this change make women more vulnerable or does it empower them? The Mahanadi Delta survey identified that 13 percent of the total households were headed by women. Though 38 percent reported a willingness to migrate in the future, socio-cultural factors had impeded such a movement till date. The discourse on migration has so far neglected to investigate the multiple challenges and critical compromises women must make when single-handedly running a household. Binary gender analyses are not effective in addressing gender issues in climate change, as neither women nor men belong to homogenous categories. A broader framework must be conceived (Carr and Thompsons 2014). In the context of Mahanadi Delta, widows, divorcees and those further disconnected due to class, caste and tribal differences may face even higher socio-cultural risks than married women.

Extending the Gender Profile: Moving away from Homogenisation

i. Widows and Heightened Risks

Widows constitute a large proportion of women at the head of households (60.32 percent). The situation of widows and women abandoned by husbands or divorced remains problematic (Gabrielsson 2013). Having little or no income of their own certainly contributes to their dependent status.¹¹ Among widows, 54.4 percent of those above the age of sixty years are highly vulnerable, with a meagre widow pension of INR 300 (approx. 4 \$) per month from the Government. Displaced widows without a home or relevant papers cannot even access the pension. Feminist discourses have failed to adequately address widowhood with regard to patriarchal oppression and victimhood. Nearly fifty percent of the widows in Mahanadi Delta are young, with children and having to work to make up for the lack of familial support. Absence of an adult male in the family further means that migration-remittances are unavailable to these households.

Widows, however, often overcome social exclusion to work and exercise their own choices. An in-depth analysis of their agency and contribution to climate resilience would be interesting.

ii. Caste, Gender and Perceptions

Gender transactions in India are marked by underpinnings of class, caste and ethnicity. The women interviewed for this paper are all Odiya (linguistically), and more than one-third belong to higher castes and not indigenous communities. As such, the Mahanadi Delta is not inhabited by indigenous people. Amongst the women-headed households interviewed, only 2.65 percent belong to the indigenous (Scheduled Tribe) community while 20.63 percent belong to Scheduled Castes (SCs) and 43.39 percent to Other Backward Classes (OBCs; economically poor). Despite facing deprivation, SC women revealed high levels of self-confidence and self-esteem. Women from the socioeconomically higher castes labour under stronger patriarchal control and restricted mobility; they find personal access to livelihood options more limited. The SC women, on the other hand, struggle with a higher work load and fewer resources, but can shrug off patriarchal limitations and acquire mobility with greater ease than their higher-caste counterparts, often without even realizing it.

Migration and Female-Headed Households: Socio-Economic Dimensions

Socio-economic relations are altered significantly due to climate change. In the instances of migration, it can be assumed that women become more vulnerable when they are left behind (Rao and Mitra 2013). Rao argues that perceiving women only as being vulnerable and marginalized in the context of climate change is a misrepresentation (Rao2019).

i. Women and Work

In a delta facing a continuous decline in livelihood provisions, women have to cope with increasing vulnerability and difficulty in accessing assets and work, both of which are essential components of gender equality. In any average household with approximately five members (4.2 to be exact), 20 percent of the members were found to be old, 34 percent were children and 73 percent were chronically ill or injured. In the absence of men, the responsibility of such a vulnerable household adds to women's already high workload. They often take up additional, paid work to secure the family's food requirements. Some of the major daily responsibilities of women include unpaid home care (36.51 percent), daily-wage labour etc. (43.39 percent), farming/fishery and salaried employment (5.29 percent each), construction work (4.76 percent) and small business (4.76 percent). As much as 43.4 percent of female-headed households could only afford one or less than one meal a day. With malnutrition resulting from food insecurity being widespread, women's health becomes a major concern, as previously noted in the section on planned relocation. Scarcity of sexual and reproductive care facilities exacerbates the problem.

ii. Land and Agriculture

Access to land is crucial in agricultural societies, and in the Mahanadi Delta, 95 percent of the households are dependent on agriculture and fishing. It has been observed from the survey of 1414 households that 70 percent had lost their crops and 58.73 percent their material assets due to climatic variability and disasters in the last five years; this had intensified their poverty. Of these 1414 households, 31 percent had no land to cultivate and 61 percent had less than one hectare for cultivation.

As declining agricultural production forced the men to migrate, the women were left behind to cultivate the usually small land-holdings, under increasingly uncertain climatic conditions. In 2019, the incidence of cyclone Phani necessitated the evacuation of a large number of people but scant attention was paid to how it decimated their livelihoods for years.

iii. Remittances to Reduce Adversities

When social structures are stressed, the economics of migration emerges with varied dimensions. Migrant males leave behind household members dependent on their earnings. Migration brings in remittances, and the survey found that 42 percent of the female-headed households received remittances from the husbands. The husband's migration usually transforms the household from a patriarchal to a matriarchal unit where the wife or her mother-in-law assumes headship. In the case of the latter, the mother-in-law may receive

remittances and decide upon the expenditures. However, in the event that remittances are sent to a male family-member who has stayed behind (father or brother), the gender hierarchy remains intact. Having observed that, one must note that patriarchal hold may remain robust even if a woman receives remittances herself. In the female-headed households 73.68 percent of remittance-money is spent on daily expenses like food and rent, 39.29 percent on education of children and 40.74 percent on health. Female-headed households without remittances struggle to meet expenses with the lower monthly wages women receive compared to men (INR 1364.95 per month for women compared to INR 6077.68 per month for men). These challenges call for newer adaptation techniques for women.

Women and Adaptation in Mahanadi Delta

Migration as adaptation was a key research component of the DECCMA research, taking a broader view of the migrants' adaptation to environmental hazards. Within this broad objective, we must take into consideration the fact that women's roles in migration are shaped by their socio-political location and identity. An understanding of their vulnerability, coping and response to adaptation is only possible when their experiences of hardship and their capacities to respond are recognized. Equity can be attained only when policy-makers take steps to explore women's agency, by opening up opportunities based on climate equity and justice. Absence of in-depth and rigorous gender analyses, in relation to women's vulnerability and adaptation in the climate discourse, has prevented the realisation of gender equity in this context (Chapman et al. 2016; Alston 2013). To understand the conditions that promote migration and its outcomes, the gender-specific adaptation options available to the trapped population require a feminist interpretation.

Within the context of the Mahanadi Delta, women with migrant husbands often join collectives such as Women's Self-Help Groups (WSHGs), in order to build familial and non-familial networks that provide them with new socioeconomic opportunities. An examination of such adaptation strategies will give us a clearer understanding of women's adaptive responses, through which they seek to fill the gaps in their own and their household's needs.

Data on twenty-one adaptation activities (based either on government or corporate policy, or on civil society initiatives) carried out in the Mahanadi Delta was collected by the DECCMA project. It revealed that female-headed households working in extreme distress and without remittance-support were using loans for the improvement of their livelihoods. The introduction of new climate-resilient crops and increased irrigation facilities also improved their conditions. Between 24 and 25 percent of female-headed households, with and without migrants, were found to have received assistance from the Government or NGOs.

At this point, it becomes imperative to note that Government databases have failed to recognize women's household and agricultural duties as work which has contributed to a rather reductionist view of migration with regard to policy. Gendered differences in adaptation strategies is visible in the replacement of paddy with vegetables, table land farming and mushroom cultivation, often linked to the activities of SHGs. Women's work experiences are also undergoing a distinct change as crops such as coconut, which were previously not considered a woman's crop, are being increasingly cultivated by women in the Mahanadi Delta; there is also a shift towards non-farming activities like rearing livestock (DECCMA, 2018). Adaptation in the form of protective measures against natural hazards, including tree plantation and mangrove protection are also being taken up.

Inland intrusion of sea-water and increase in floods have resulted in changes in agriculture practices and technology. The introduction of climate-resilient crops also calls for changes in women's agricultural labour. SRI¹² techniques, which increase the need for dweeding, call for technological adaptations like cono-weeders which women-headed households with financial constraints cannot afford. In the same way, transplantation, earlier considered a woman's job, now demands technical methods and the involvement of men in SRI farming. During the Focus Group Discussion, some women revealed that lack of access to technology or information on its usage had led to the loss of whole crops of lentils from fungus; availability of technological support could have prevented such situations.

Supported Adaptation Activities

There are some examples where NGOs, the Government, United Nations bodies and the corporate sector have contributed to support women's diverse adaptation activities. The United Nations Development Project (UNDP) has introduced floating gardens in areas afflicted by water-logging (in Sufala Village). Vegetables grown with help from SHGs not only indicate the success of a local adaptation strategy but also of women's inclusion in decision-making. In Bhadrak, women's collectives have united to generate solutions to secure potable drinking water in the face of increased salinity in local groundwater due to a rise in sea level and decreasing monsoon (DECCMA, 2018).

An example of the introduction of technological innovation to livelihood strategies is people being provided solar hybrid dryers by agencies working in the affected areas. It was introduced in Kendrapara and Puri by the Integrated Coastal Zone Management Project (ICZMP) of the Government of Odisha. When used in the fishing industry, it increased both the hygiene component and income. This strategy was also implemented by ninety-four WSHGs. Another example is the installation of Model Fish Drying Unit at Penthakota, Puri by the Directorate

of Research on Women in Agriculture (DRWA) with support from National Fishery Development Board (NFDB) as part of a network project on “Capacity building of coastal fisherwomen through post-harvest technology in fisheries”. Though such initiatives are proven to be successful on a small-scale, they must be up-scaled to create abiding change and ensure that women are not left behind in grovelling poverty and frustration (DECCMA 2017).

Migration, Adaptation and Changing Gender Roles

The 2018 DECCMA report has again linked migration and adaptation strategies, drawing attention to women’s vulnerabilities, their dynamic efforts to reduce them and the need to further build the spirit of agency and resilience amongst them.

In spite of social constraints, with men being unavailable to manage outdoor work, women have learnt to visit banks, attend meetings, ride bicycles and scooters, and take children to school and older people to hospitals. While training to upgrade women’s knowledge (and to thereby promote gender equality in employment) was imparted to women by the Government and NGOs, an inquiry into their efficacy is in order, especially in the light of women’s complaints that they were never taught about cold storage facilities and other such technology. Men, on the other hand, are not trained; this caused a festering of resentment against women having access to both training and loans at lower rates of interest. While the Government’s strategy of promoting the non-familial support structures provided by SHGs has been advantageous to women, there is a need to also make men the beneficiaries of such initiatives to promote equality in productivity.

The field research that informs this study has also observed notable gender differences in what drives the decision-making in male and female-headed households when adaptation decisions are made. Decisions in male-headed households are influenced by cash flow (income/expenditure-based financial capital), which means that their adaptive responses are contingent on financial capital. However, in female-headed households it is associated with physical capital indicators (e.g., material of roof): they are more aware of long-term financial capabilities (i.e., asset quality) and have a lower number of adaptations (Ayamga et al. 2019).

i. Successful Adaptation

In the case of women, a successful adaptation involves their capacity to respond to the effects of climate shocks and lack of livelihoods on the accessibility of resources. Gendered adaptation policies based on community resources promote equality and can be universalised if there is a participatory system in place. However, as the stakeholders have identified, there are many barriers to such a system. The absence of good market linkages results in middlemen taking away much of the income or in untimely payment by buyers. Items like

mushrooms which fetch good market prices are only seasonal. With SHGs only offering help in self-monitoring activities, many women either make meagre sums or fall prey to leaders using the SHGs to promote their own ends. Migration is becoming a viable adaptation strategy for both men and women. Unless policy implementers link the conditions that promote migration in climate-change-driven situations and its impact on women, women as heads of households in general and widows in particular remain exposed to high-risk situations. The governance mechanism is not inclusive and fails to meet the challenges faced by women in migration situations, especially the loss of livelihood, physical and sexual violence and lack of access to resources and social protection measures. It is important that climate-change policies and programs include safe migration within the broad spectrum of adaptation options.

Women's political negotiation of the space opened up by the migration of men is visible in the shift from a binary understanding of male/female roles to a multilevel inclusion of wives, widows and mothers-in-law in the decision-making process.

ii. Migration and Adaptation: Inclusive Governance

State action in India is, unfortunately, crisis-oriented and ignores women's capacities to meet the situation. However, research shows that women, given the chance, adapt to change and overcome socioeconomic barriers. Thus, their decision-making needs recognition and integration within the national approach to climate change. The State has to take advantage of women's knowledge of climate variability, its impact on them and how the consequent adversities can be met. Effective governance requires women's inclusion in all stages, whether mitigation, migration or adaptation. There is a growing need for inter-sectionality in providing women equal access to resources and climate financing.

The presence of women in governance structures is key to promoting equity and collective decision-making. For such an attempt to be successful, the vision of vulnerability as a uni-linear concept must first be discarded in favour of a multi-linear view where vulnerability, capacity-building and agency intersect. Raising awareness is another way to remove the social controls on women's participation. The impact of anthropogenic climate change has become dialogic and states are recognising the need to bring all women, including those at the lowest strata, into public policy-making. To ensure this, a bi-directional approach is needed which involves: i) recognizing women's expertise and incorporating women as experts; and ii) building their capacity wherever it is required so that the disadvantages they face can be removed. Indian policy-makers must incorporate gender-equality objectives in policies related to climate change, adaptation, mitigation and migration. Further, it can succeed only if there are monitoring mechanisms, a clear gender-mainstreaming agenda and provisions of sex-disaggregation of information, so that men's and women's needs and interests are explicitly identified.

There is a need to understand that, in the case of climate change and displacement, the “aspiration is not to promote a case for developing binding conventions but to initiate a bottom-up approach” (Zetter 2008, 62). A Gender Focal Point in every state with Gender Cells at district level must be set up to design, implement and monitor climate policies that will ensure that gender goals are identified and applied across programmes and policies. Only then can the goal of equality, referring to visibility and fulfilment of differential needs, concerns and abilities of men and women, become part of the governance process. Policy needs to accommodate provisions of health and financial coverage in the rehabilitation and resettlement of migrants, and the new Ministry of Skill Development has to include migrants in their programmes.

Conclusion

This paper seeks to provide an understanding of the power dynamics in gender relations in order to create a context for women’s coping with and adaptation to climate-change shocks. It has placed women and their actions within a feminist framework so as to demonstrate that their lives are intimately linked to changes at the local community level. Such an exercise informs our argument for the gendering of policy to accommodate women’s choices.

In conclusion, India needs to streamline gender integration from the national to the local level and remove the roadblocks to inclusive growth. This includes an increase in budgetary allocation for capacity-building and better research and planning to focus on gender equity in the processes of migration, adaptation and rehabilitation. The political system needs to be comprehensive in its approach and must take into account the disparate socioeconomic conditions, adaptive capacities and vulnerabilities of all its citizens, especially women. When due attention is paid to who has benefited and who has been excluded from the purview of policies, only then can policy-making address inequalities in gender dynamics and development in India.

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Notes

1. As Nicholls et al. (2018) state, “Globally deltas and their environs house 500 million (or 7 percent of global population) people on one percent of the land area, with a concentration of populated deltas at mid and low latitudes. Deltas are highly dynamic biophysically. This includes a high vulnerability to sea-level rise and climate change, and also subsidence (deltas sink), exacerbating global changes in sea level. Deltas are also socially dynamic, with changing land use, economies and strong trends of migration that have potential to be modified under future environmental and climate change.”
2. Considering the federal structure of the country, most of the key sectors such as agriculture, water, health and women’s issues are included in the State List of the Indian Constitution, which means the States can legislate on these matters. Forest and Environment is in the Concurrent list, meaning that the Union (Federal) and State Governments have power over it.
3. The action plan aims to build women’s capacity and health, and provide funding for integrating gender in adaptation, and document the positive impact. It also focuses on in situ livelihoods and climate resilient cropping techniques. Part of the policy also aims to improve infrastructure and livelihood options (*Government of Odisha* 2018, 161-162).
4. Between 2008 and 2017, an average of 12.4% of women were delegates. However, in the same period, in the 34 meetings analyzed only three were led by women. (Women’s Environment and Development Organization 2016b).
5. In this project, migration refers to the concept of risk “represented as probability of occurrence of hazardous events, degree of vulnerability of the area as well as migration analyses using the indirect methods” (Das et al. 2016).
6. Hot spots are defined as areas where a strong climate change signal is combined with a large concentration of vulnerable, poor and marginalized people (<https://cariaa.net/findings-and-lessons/#finding-Hot-Spot-Approach>).
7. According to research carried out by Jadavpur University for DECCMA, “From the block level (sub-district) risk and migration analysis, it has been observed that several coastal blocks which are adversely affected by climate change and low level of economic growth exhibit higher risk and high rate of outmigration. Dhamnagar, Ersama, Balikuda, Tihidi blocks are bio-physically and socioeconomically at very high risk where out migration dominates. On the other hand, several blocks of comparatively lower risk like Khordha, Puri districts or other urban growth centres show positive net migration or in-migration” (Das et al. 2016).

8. Households are important in analysing intra-household gender relations as women and men are both consumers and producers.
9. The Panchayat previously comprised seven villages. Today, only Satbhaya remains, with an acreage of only 200. Hundreds of houses, more than 2,000 acres of paddy/rice fields, temples, a 125-year-old high school and a summer palace of the local royalty have gone under. The last village, Kanhupur, disappeared in 2011 (Hindustan Times, 2019).
10. Field work with Jasmin Giri and Amrita Patel, DECCMA Team, April, 2017.
11. In discussion, women during field work in April, 2017 in Kendrapada.
12. SRI (System of Rice Intensification) helps to reduce methane emissions by using an alternative wetting and drying method, reduces water use and leads to higher outputs. SRI is part of Odisha Climate Action plan up to 2023 (*Government of Odisha 2018, 57*).

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