How does climate change adaptation policy in India consider gender? An analysis of 28 state action plans

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Abstract

Gender mediates climate vulnerability and adaptation action. Consequently, climate change adaptation policy has seen a push towards 'mainstreaming' gender and prioritising 'gender-responsive' climate action. However, it is unclear to what extent this mainstreaming advances or obscures gender considerations and whether current climate policies reflect developments in the gender and climate change literature. This paper explores how gender is operationalised in adaptation policy in India through a policy review of 28 State Action Plans on Climate Change. We juxtapose normative goals around reducing differential vulnerability with policy approaches to mainstreaming gender to propose entry points that link advances in gender and feminist studies with climate change adaptation policy. Our analysis indicates that most subnational climate policies in India explicitly mention gender as a mediator of vulnerability and adaptive capacity but operationalise it inadequately and unevenly. We also reflect on how the heuristics of mainstreaming get operationalised in policies (gender-blind, gender-sensitive, to gender-transformative approaches) and what that means for addressing gendered vulnerability.

Keywords: Climate change; Adaptation; Gender; Intersectionality; Mainstreaming; India; SAPCCs

Key policy insights

- While explicitly mentioned, gender concerns are unevenly operationalised in subnational climate policy.
- In most State Action Plans on Climate Change in India, gaps exist between normative goals such as reducing differential vulnerability and empowering women, and policy approaches (namely gender-blind, -neutral, -specific, -sensitive, and -transformative approaches).
- To be effective, the conceptualisation of gender must expand beyond focussing on differences between women and men to engaging more with intersections of sex, caste, class, and resources.

1 Introduction

1.1 Gender in climate policy

Women and men experience climate change differently and have differential capacities to adapt to the risks it poses, all of which are mediated by cultural norms, varied resource access, and peoples' positions in social hierarchies. Recognition of these differential experiences has led to an increasing focus of international and national climate policies on mainstreaming gender in adaptation and mitigation planning (Thompson-Hall et al., 2016). This implies taking on board gender roles, responsibilities, and interests through the entire project-cycle, from data collection for planning formulation purposes to policy adoption, implementation, monitoring, and learning lessons for further improvements (Alston, 2014). It also suggests a more inclusive, multi-sectoral process that places people and their specific livelihood needs at the centre of adaptation analysis and action.

In 2017, the UNFCCC adopted the Gender Action Plan, which prioritised five areas to 'advance knowledge and understanding of gender-responsive climate action and its coherent mainstreaming in the implementation of the UNFCCC and the work of Parties, the secretariat, United Nations entities and all stakeholders at all levels, as well as women's full, equal and meaningful participation in the UNFCCC process'[1] (UNFCCC, 2017). Countries have responded to this mandate by mainstreaming gender in their National Adaptation Plans (Alston, 2014), but currently, only 40 percent of countries that have signed the Paris Agreement mention gender in their Nationally Determined Contributions and only half of them identify gender as a priority for climate policies (Holvoet and Inberg, 2014; Roy, 2018).

Parallel to these global and national policy developments, research on climate change vulnerability and adaptation now provides robust empirical evidence on the intersectional nature of gendered vulnerabilities[2] (Arora-Jonsson, 2011; Djoudi et al., 2016; Rao et al., 2019a; Ravera et al., 2016a) and capacities to adapt (Jerneck, 2018; Rao et al., 2020b; Ravera et al., 2016b). This literature calls for national and subnational climate policies to address structural inequities based on gender and other intersecting social identities (Alston, 2014) and provides various pathways to achieve this: from gender-specific approaches that typically target women and children to gender-redistributive approaches that attempt to right past wrongs (Kabeer and Subrahmanian, 1996, also see Figure 1). Research on environmental policy, and more recently climate change policy, has called for 'mainstreaming' gender, by incorporating gender concerns throughout the policy process (policy formulation, adoption, implementation, and evaluation) (Alston, 2014; Moser, 1989; Rao and Kelleher, 2005). In this paper, we examine how gender concerns are addressed in climate adaptation policy in India, a country that explicitly identifies gender as a priority in its climate policies (Kapoor, 2011), but performs poorly on several gender development metrics (Sorensen et al., 2018).

1.2 Climate change, gender, and the development context in India

India is highly vulnerable to climate change, having already seen an average increase of 0.7°C from 1901 to 2018 (Krishnan et al., 2020). Projections of more erratic rainfall, longer drought spells (Aadhar and Mishra, 2019), and more severe heat waves (Mishra et al.,

[1] The five priority areas are (1) Capacity-building, knowledge sharing and communication, (2) Gender balance, participation and women's leadership, (3) Coherence (within United Nation entities and stakeholders towards the consistent implementation of gender-related mandates and activities), (4) Gender-responsive implementation and means of implementation, (5) Monitoring and reporting gender-related mandates under the UNFCCC.

[2] Gendered vulnerability refers to the fact that vulnerabilities to the impacts of climate change differ by gender and these differences are overlaid on pre-existing inequities along gender (e.g. disproportionate labour, disparate participation in decision-making, low workforce participation, etc.). Also see Alston, 2013; Moosa and Tuana, 2014; and Rao et al., 2019a.

2017), are expected to have differential impacts, reinforcing and amplifying existing gender inequalities (Mehar et al., 2016; Ravera et al., 2016b; Yadav and Lal, 2018). Vulnerabilities to climatic risks such as extreme events are mediated by a complex interplay of class, caste, gender (Ray-Bennett, 2009; Singh et al., 2018; Solomon and Rao, 2018), and location. For example, upper-caste women's material conditions (concrete housing, better housing locations) and social capital reduce their vulnerability to flooding compared to women from lower castes (Ray-Bennett, 2009). Further, climate-driven crop yield reductions impact food insecurity, adversely impacting poor households who already suffer higher nutrient deficiencies (Bhuyan et al., 2020). Within small and marginal landholding households, while men face social stigma due to unpaid loans leading to emotional distress and sometimes even suicide (Kennedy and King, 2014), women experience higher domestic work burdens, worse health, and intimate partner violence (Mitra and Rao, 2019; Nelson and Lambrou, 2010).

Women-headed households are especially at risk from climate change owing to their limited access to natural, social and economic capital to cope with climate risk (Hazra et al., 2021). Out of India's 23 million rural households headed by women, 10.11% lie below the poverty line earning less than ₹5,000/month, and only 0.89% earn more than ₹10,000/month compared to 8.25% of all rural households that earn more than ₹10,000/month (Govt. of India, 2015). Increasing temperature and rainfall variability intersect with existing social inequities (e.g. landholding size, caste-based marginalisation), disproportionately impacting women with fewer assets or belonging to certain castes (Sugden et al., 2014). Recognising these gendered impacts, India's National Action Plan on Climate Change (NAPCC) emphasises addressing gendered vulnerabilities, stating,

> *'the impacts of climate change could prove particularly severe for women. With climate change, there would be increasing scarcity of water, reduction in yields of forest biomass, and increased risks to human health with children, women and the elderly in a household becoming the most vulnerable. With the possibility of decline in availability of food grains, the threat of malnutrition may also increase. All these would add to deprivations that women already encounter and so in each of the adaptation programmes, special attention should be paid to the aspects of gender'* (NAPCC, 2008, p. 14).

While this call for mainstreaming gender in climate policies and programmes is important, it is also clear that not only is gender equality seen as a women's issue, but women themselves are seen as a homogenous category (Lau et al., 2021). However, we need to contextualise this focus on women against the wider political economy of gender and development in India. Despite significant technological and economic progress, India continues to perform poorly on several gender metrics (Sorensen et al., 2018), ranking 129 in the Gender Inequality Index Rank and 112th in the Global Gender Gap Index 2019-2020, having addressed only 66.8% of the gap[3] (World Economic Forum, 2020). Despite progressive policies on education, health and public participation, restrictive social norms, resource inequities and absence of remunerative employment opportunities continue to hinder women's empowerment and agency.

These structural deficits mediate men and women's vulnerability to climate change and their adaptation responses (Chanana-Nag and Aggarwal, 2020; Kuppannan et al., 2015; Rao et al., 2019a, 2019b; Singh, 2019; Sugden et al., 2014), yet existing adaptation programmes in India address this gendered vulnerability unevenly. For example, access to climate information is often provided through mobile services despite the lack of access to mobile

[3] The **Gender Inequality Index** is a composite measure reflecting inequality between women and men in three different dimensions: reproductive health (maternal mortality ratio and adolescent birth rate), empowerment (share of parliamentary seats held by women and share of population with at least some secondary education), and labour market participation (labour force participation rate). The **Global Gender Gap Index** benchmarks national gender gaps on economic, political, education and health criteria.

phones and connectivity issues facing rural women, poorer and older men, and Scheduled Tribes living in remote locations (Ahmed and Fajber, 2009).

In this paper, we explore how gender is considered in sub-national adaptation policy in India through a review of 28 State Action Plans on Climate Change (SAPCCs) to understand how they recognise gendered vulnerability and develop strategies to build adaptive capacities. By doing so, we examine to what extent gender mainstreaming efforts advance or obscure gender considerations and whether current climate policies reflect concurrent advances in the gender and climate change literature. We juxtapose normative goals (e.g. gender mainstreaming, reducing differential vulnerability) and policy approaches (e.g. targeting certain social groups/livelihoods) and propose entry points to link advances in gender and feminist studies with climate change adaptation policy in India.

2 Gender and climate policy

Within climate policy, there is growing recognition that vulnerability and adaptive capacity are strongly differentiated by gender and these differences are overlaid on pre-existing inequities of caste, class, race, ethnicity, marital status, amongst others (Alston, 2013; Moosa and Tuana, 2014; Rao et al., 2019a; Sultana, 2014). Here, we refer to vulnerability as the susceptibility of people and places to risks such as extreme events, environmental change, and non-climatic shocks and stressors (Ford et al., 2018) and adaptive capacity as 'the ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences' (IPCC, 2014, p. 1758). This literature questions the continued practices of homogenising men and women in adaptation policy and implementation as distinct categories and not giving adequate attention to the unequal power relations between them, and within each category (Djoudi et al., 2016; Kaijser and Kronsell, 2014; Nightingale, 2017; Sultana, 2014; Tavenner and Crane, 2019).

People's ability to act is shaped by their intersecting identities (Crenshaw, 1991; Elmhirst, 2011; Hill Collins, 2010; Nightingale, 2011; Rao, 2005; Taylor, 2013), and their geographical and ecological contexts. The social roots of the concept of intersectionality lie in Black feminist thought, highlighting the nature and workings of privilege and oppression, of power and inequality in society, across institutional and temporal scales (Crenshaw, 1991; Yuval-Davis, 2006), including the cultural norms shaping decision-making and the exercise of agency at individual, household and collective levels within institutions of governance, politics, and markets (Rao et al., 2020b, 2019a). Intersectionality relates to how 'different forms of disadvantage intersect and thereby explain the specific experience of certain groups of women on the basis of gender, race and class *simultaneously'* (Bastia, 2014, pp. 238–239, emphasis added). It also explains how these factors co-constitute inequalities (Choo and Ferree, 2010; Collins, 1998; Rao, 2015).

The reality on the ground is complex, shaped by women and men's specific positions and claims within the social relations of production and reproduction, and involving both conflicts and cooperation (Nightingale, 2017; Rao, 2017; Sen, 1990). A deeper understanding of the distribution and negotiation of labour and other resources -- be it access to land, fair wages, the need for migration, or the exclusive allocation of certain tasks, seen as 'dirty' to particular social groups or genders -- in the domestic domain and beyond, is key to finding ways to build adaptive capacities (Hodgson and McCurdy, 2001; Simiyu and Foeken, 2013). An important element of such intersectional analysis is *recognition* of the multiple, intersecting injustices confronted by differently positioned women and indeed men, for example, landlords and landless workers (Sugden et al., 2014); young male migrants (Singh, 2019);

and *Dalit* women (Rao, 2015) in India. This move beyond class interests has led to the demand for recognitional justice, wherein cultural domination becomes a site for political struggle, redressing in many ways the 'cultural blindness of a materialist paradigm' (Fraser, 1997, p. 12).

Alongside these conceptual developments in feminist thought, there have been attempts to examine policy approaches from a gender lens. From the early Women in Development (WID) approaches that targeted women as a pathway to closing gender gaps across development sectors, today we have a much more nuanced understanding of gender. This is visible in a range of approaches collectively termed 'gender mainstreaming' (the process of incorporating a gender perspective at all stages of the policy process) (Moser, 1989).

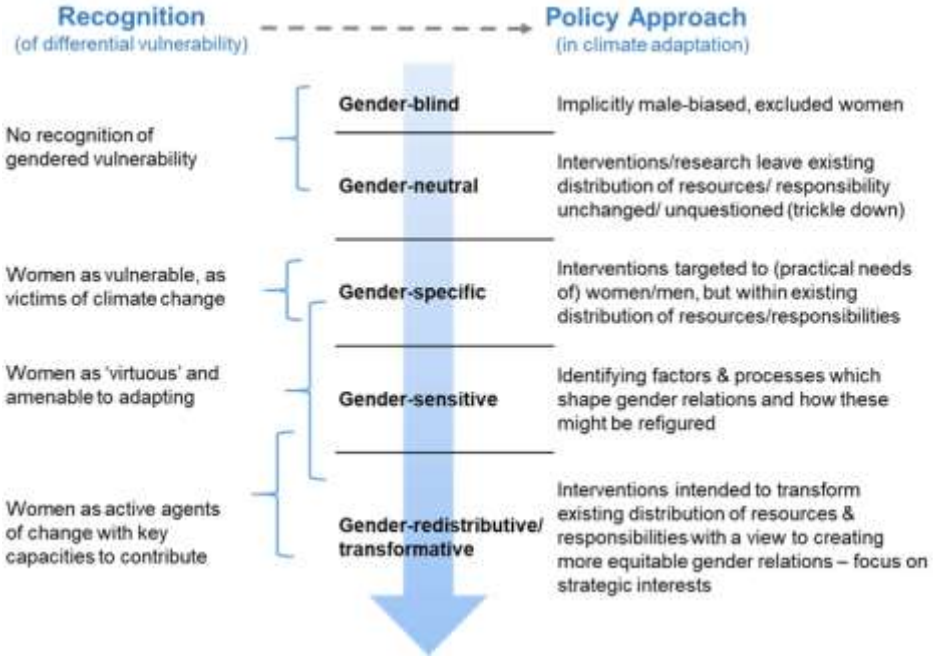
Gender mainstreaming emphasises that policy takes cognisance of inequitable power relations in productive and reproductive labour to ensure existing inequalities are not perpetuated, but rather find synergies between business-as-usual interventions and gendered priorities (Alston, 2014; Rao and Kelleher, 2005). However, in practice, mainstreaming incorporates different levels of recognition, ranging from gender-blind policies that are explicitly biased, gender-neutral policies that hardly question existing inequalities to those that are gender-sensitive and potentially even transformative, actively seeking to empower men and women to reconfigure unequal social relations (Kabeer and Subrahmanian, 1996). Gender-transformative policies, not only hold value for meeting personal aspirations but also supporting collective wellbeing, social equity, and sustainability goals (Resurrección et al., 2019). Yet, addressing the challenge of unequal power relations in such recognition remains difficult. For example, while climate action plans and policy frameworks demonstrate considerable progress by adopting some of this language, they still aim only for gender-*responsive* adaptation (UNFCCC, 2017), stopping short of transformative approaches.

Overall, how gender is understood and operationalised in policies primarily depends on if and how gender identities are recognised in policy documents and processes. In climate policies especially, the recognition of gender is largely unitary (Lau et al., 2021), e.g. women, children, and the disabled, are typically viewed as more vulnerable than men (Arora-Jonsson, 2011), not taking account of the multiple, intersecting strands of marginality in any systematic way. This reduction of women as a homogenous category is visible in policy approaches and interventions such as women's Self Help Groups, women and girl-targeted health or microfinance schemes, etc. (Kelkar, 2005) and are based on an assumption that all women can benefit equally, contrary to evidence on intersectional vulnerability (de Waal, 2006; Kelkar, 2005; Rao, 2005). In fact, Alston (2014, p. 287) argues that the 'implementation of gender mainstreaming across the globe has not necessarily resulted in advances for women, as it is usually associated with a winding back of women-focused policies and programs'.

In climate adaptation, the gamut of policy approaches through which gender mainstreaming is operationalised seeks to address deficits and differences in adaptive capacities (Thompson-Hall et al., 2016). We bring together these aspects of gender and climate policy (Figure 1) to hypothesise that different ways of recognising gendered vulnerability (moving from women as vulnerable to women as change agents) shape adaptation policy approaches (from gender-blind to gender-transformative). The continuum depicts how gender-blind policy approaches can stem from a lack of recognition of gendered and intersectional vulnerabilities to climate change. Further, viewing women as 'victims' of climate change tends to lend itself to policy approaches that target women as recipients of adaptation action. Moving down the continuum, when women are recognised as contributing

to adaptation, policy approaches tend to be framed as gender-sensitive and/or gender-transformative.

Figure 1 Different framings to recognise gendered vulnerability lead to different policy approaches. Source: Authors, based on Moser 1989; Kabeer & Subramanian 1996; Arora-Jonsson 2011; Alston 2013



In subsequent sections, we evaluate sub-national climate action plans in India to examine how the different framings of gendered vulnerability map onto different policy approaches to gender mainstreaming. As all the Indian climate policy documents reviewed equate gender with women, our analysis too focuses on women. We nevertheless seek to break down this artificially homogeneous category of women to draw out the extent to which intersecting identities and multiple marginalities are recognized. We bring out the implications of this restricted view of gender in the discussion (Section 5.1) as symptomatic of broader gender considerations in Indian policy.

3 Methodology

3.1 Data collection

India's federal structure means that there is a hierarchy of national (e.g. National Action Plan on Climate Change or the NAPCC) and sub-national climate action plans (e.g. State Action Plans on Climate Change or SAPCCs), implemented through sectoral policies and projects. In 2009, the Government of India directed all state governments and union territories to prepare SAPCCs consistent with the NAPCC. We examine how these sub-national plans consider gender by interrogating (1) how gendered vulnerability is framed and reported, and (2) what policy approaches are used to build local adaptive capacities.

In November 2019 we obtained SAPCCs of 28 states from the Ministry of Environment, Forests and Climate Change portal (MoEFCC, 2019) and used the most recent version of the SAPCCs available at that time. We conducted a qualitative content analysis of SAPCC policy documents. Content analysis, understood as 'the systematic classification, organization, and examination of a body of text to interpret meaning and make inferences about patterns' (Bowen and Bowen, 2008, p. 689) is commonly used to study and compare

policy documents (Vogel and Henstra, 2015) and focuses on interpreting underlying meaning in texts rather than quantification (Howlett et al., 2009).

3.2 Data coding and analysis

The analysis followed three steps. First, we developed a data extraction sheet (Supplementary Material 1), which contained general information on each SAPCC (e.g. date of publication, organisation preparing the report). Drawing on the literature (Figure 1, shown previously), the extraction sheet focussed on two broad themes:

- **Recognition (of differential, intersecting vulnerabilities)** – How is gender conceptualised in the report and are intersections with other identities and socio-economic differences recognised?
- **Adaptation policy approach** – What are the approaches taken towards building adaptive capacities and mainstreaming gender concerns in adaptation planning?

The themes were chosen deductively (Elo and Kyngäs, 2008), drawing from foundational literature on gender, development, and global environmental change as well as similar gender assessments of climate policy in India (Parikh et al., 2012; Tyagi and Das, 2018) and elsewhere (Mersha and van Laerhoven, 2019, in Ethiopia; Vogel and Henstra, 2015, global).

Next, the SAPCCs were read in detail to code the text. Coding refers to 'attaching labels to segments of data that depict what each segment is about' (Charmaz, 2006, p. 3) and initially, two authors randomly selected 5 SAPCCs to test the data extraction sheet and coding process. The authors then reconvened to cross-check responses and add additional codes that emerged during the initial document analysis. For example, we added a new category 'Process of SAPCC' to capture any documentation of how SAPCCs were conceptualised, formulated, and written. The finalised extraction table was then used to code each document.

Each SAPCC was read to identify key statements and phrases on gendered vulnerability and adaptation. Focussing on the two conceptual themes we used manifest and latent coding. Manifest coding captured explicit, visible references to gender through words such as 'women', 'men', 'gender', 'girls'; while latent coding examined the underlying meaning and tone of the text (Downe-Wamboldt, 1992), captured by reading the sections on gender in context of the full policy document. For example, if women's vulnerability was highlighted through increased drudgery when collecting water (manifest coding), the policy's broader focus on improving water access for men and women were kept in mind when coding for 'adaptation policy approach' (latent coding). The focus of the analysis was on ascertaining how gender is recognised within SAPCC documents, rather than capturing the *processes* of policymaking (which would benefit from interviews with those involved in policy formulation).

Coding of the documents was done separately by two authors, with cross-checking to remove bias and ensure intercoder reliability (Downe-Wamboldt, 1992). In some cases, one policy document used multiple frames to discuss gendered vulnerability (examples in Table 1). In such cases, multiple codes were attached to an SAPCC to capture the different framings used and inconsistencies within specific policy documents. Coding for policy approach (gender-blind to transformative) required subjective decisions by the authors and we ensured consistency in interpreting codes by two authors cross-checking codes. Where there were doubts, the policy approach was discussed between three authors.

4 Findings – How is gender operationalised in India's climate policy?

Overall, gender is finding increasing mention in Indian climate change policies but the level of engagement with gendered vulnerability and adaptive capacity is uneven. In this section, we discuss the differential treatment of gender in 28 SAPCCs by focussing on recognition (of gender and intersectionality) (Section 4.1) and policy approaches towards adaptation action (Section 4.2).

4.1 Recognition of gendered vulnerability to climate change

4.1.1 Gender in the SAPCCs

Gender is discussed unevenly across the SAPCCs: 43% (n=12) have no substantial mention of gender, either in discussions on vulnerability or adaptation actions. In the 16 SAPCCs that do mention gender, three broad framings are used (Table 1). The first and most common, is women as highly and disproportionately vulnerable to climate change risks and impacts (Arora-Jonsson, 2011). This framing either mentions women along with other marginal and vulnerable groups such as disabled or old people (e.g. Tamil Nadu) or identifies women as vulnerable based on pre-existing development deficits (e.g. Rajasthan's discussion on women and children are more vulnerable because of poor health and literacy).

A second framing examines gender through heuristics of women as caregivers (Arora-Jonsson, 2011), and with a proclivity to protect nature (Lau et al., 2021) and engage in communal activities. Here, SAPCCs (e.g. Uttarakhand, Tripura) use examples of previously successful interventions such as forest protection as proof of women-led programmes being effective in targeting women. Here too differences amongst women are hardly acknowledged.

A third framing views women as active agents of change (Alston, 2013) with specific capacities to contribute to adaptation outcomes. This framing, seen in four SAPCCs, gives more agency to women and their social positioning by showcasing how they are considered as key actors in realising inclusive, effective adaptation.

In five states (Bihar, Chhattisgarh, Gujarat, Tripura, and Uttarakhand), the SAPCCs used more than one framing. For example, the Gujarat SAPCC recognises women as one of many vulnerable groups, stating that 'women are particularly vulnerable as a consequence of their social roles, inequalities in the access to and control of resources, and their low participation in decision-making' (p. 169); in other places, it calls them 'agents of change to reduce energy consumption…building a cadre of women who are energy savers…' (p. 189, Gujarat). Where multiple framings are used, the SAPCCs potentially allude to multiple identities of women (as simultaneously vulnerable *and* change agents) but do not discuss the implications of these multiple framings consistently. In Maharashtra's SAPCC, for example, women are discussed as vulnerable due to their reliance on natural resources: 'Among the most vulnerable are communities like tribals and indigenous people, smallholder farmers, the landless, and women as their livelihoods are intrinsically dependent on natural resources, and any stress on these would have a direct or indirect impact on them' (p. 231). This is juxtaposed with later discussions of women's groups enabling climate solutions: 'There is potential for key roles to be played by the women, the youth, NGOs and community leaders...(Women SHGs) can be trained to spread awareness, handle technology demonstrations, and produce dissemination material to communicate climate change in locally relevant ways' (p. 294). The quotes implicitly acknowledge intersectionality in recognising women in specific contexts as agents of change, yet women's gender identity is presented alongside other identities, rather than intersecting with them.

Uttarakhand, Bihar, Chhattisgarh, and Gujarat stand out for a relatively sophisticated portrayal of gendered vulnerability. These states provide a nuanced understanding of gender possibly driven by targeted stakeholder engagement activities undertaken during SAPCC formulation (see Section 4.2.1 on SAPCC policymaking processes). For example, the

Uttarakhand SAPCC process involved multiple community workshops where citizens and local elected representatives participated. It hosted the country's first ever inter-departmental roundtable on mainstreaming gender with government officials, academic institutions, and civil society, to gather lessons from research and practice.

Table 1 Different framings of gender used in the 28 SAPCCs

How gender is recognised	**Illustrative quotes from policy documents**	**States using this framing**
No mention of gendered vulnerability	NA	Andhra Pradesh, Arunachal Pradesh, Assam, Haryana, Madhya Pradesh, Manipur, Meghalaya, Mizoram, Odisha, Sikkim, Telangana, Uttar Pradesh
Women as vulnerable, as victims of climate change	'The impacts of climate change will be experienced unevenly, both spatially and temporally and the consequences of climate change will also vary as a result of the differing vulnerability of individuals, communities, different age groups and gender' (p. 7, Punjab). 'While a large number of poor, rural women depend on climate-sensitive resources for survival and their livelihoods, they are also less likely to have the education, opportunities, authority, decision-making power and access to resources they need to adapt to climate change. Women's vulnerability to climate change differs from men and climate change interventions that are not gender-responsive often result in deepening the existing gender divide' (p. 26, Bihar).	Bihar, Chhattisgarh, Gujarat, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Maharashtra, Nagaland, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttarakhand, West Bengal
Women as 'virtuous' and more amenable to adapting, undertaking behavioural change	'Women help in increasing the social capital and make the community resilient. It has been seen through the work of SHG groups and especially during the post disaster recovery period. Therefore, it is important to nurture such social capital through strengthening women's institutions like SHG groups to enhance their resilience' (p. 27, Tripura). 'The specialized knowledge of women about forestry, botany, biodiversity and water management makes them critical resources in combating deforestation. To realize their potential, the Forest Department will examine options for adopting policies that support women's leadership and recognize their expertise and support women in combating gender discrimination' (p. 87, Uttarakhand).	Kerala, Tripura, Uttarakhand
Women as active agents of change with key capacities to contribute	'women who are already experiencing the effects of weather-related hazards –such as erratic monsoon patterns, flooding and extended periods of drought – are developing effective coping strategies, which include adapting their farming practices. Therefore, efforts will be made to further recognize and support women's role in adaptation, including promoting women's involvement in decision-making processes and implementation. Also, given women's key role in agriculture, efforts will be especially made so that gender disaggregated data becomes available to enable gender specific planning and interventions' (p. 47, Bihar).	Bihar, Chhattisgarh, Gujarat, Uttarakhand

	‘A program for empowering women, through micro-credit, can be introduced. Poor women can be organized into groups, at the grassroots, and volunteers can be selected and given designations such as infrastructure volunteer, health volunteer, financial volunteer and environmental volunteer’ (p. 191, Gujarat).	

4.1.2 Intersectionality: Is gender and its intersections with other identities and socio-economic differences recognised?

Overall, the treatment of gender across most SAPCCs does not acknowledge the relational and dynamic aspects of gender-differentiated vulnerabilities. Fourteen SAPCCs allude to intersectionality by discussing how gender intersects with livelihood opportunities (especially in agriculture and forest-based livelihoods); labour divisions; natural resource access and use (especially water, land); and existing development deficits (e.g. marginalisation along caste, literacy levels disadvantage certain women and men through disproportionate impacts on health, income, etc.) (Supplementary Material 1). These intersectional aspects are discussed with illustrative examples below.

Livelihoods: Nine SAPCCs highlighted how gender, livelihood opportunities, and asset ownership make men and women in certain nature-based livelihoods more vulnerable. For example, Jharkhand’s SAPCC highlights how tribal women in Khunti district who traditionally produce and sell lac (a natural polymer from the insect *Kerria lacca*) have suffered losses of up to 25% because of untimely rains and extreme cold, which kills lac insects and reduces production. Here, caste/ethnicity, gender, and livelihoods intersect to result in disproportionate vulnerability. Women here are shifting to commercial logging and agriculture, with longer-term impacts on natural resources and sustainability. Similarly, Nagaland’s SAPCC notes that climate change impacts are unequal, with ‘the poor, women, the aged, and the very young – especially in underdeveloped or developing area contexts (being) relatively more vulnerable due to their greater dependence on climate-sensitive sectors like agriculture, fisheries, and forestry for their livelihoods’ (p. 2).

Differential resource access and use: Women’s vulnerability in agriculture, livestock rearing, and forestry was linked to their limited access and control over natural resources in six SAPCCs. Tamil Nadu, Bihar, and Chhattisgarh SAPCCs argue that unequal rights mediate resource access and use, often excluding women and thereby constraining their adaptive capacity. In Uttarakhand, resulting perhaps from the extensive engagement with diverse stakeholders including grassroots organisations and communities, the SAPCC prioritises gender concerns and recognizes how women’s lack of formal access to land, for instance, limits their ability to access programmes such as the Kisan (Farmer) Credit Cards and proposes alternate solutions such as distributing cards through SHGs. Thus, within climate-sensitive sectors such as agriculture and fisheries, women face higher barriers such as lower access to inputs, extension services, and subsidies (e.g. Chhattisgarh), resulting in lower capacities to manage risks.

Gender divisions of labour: Eight SAPCCs report women are vulnerable due to reproductive tasks including additional burdens of care that potentially have negative effects on women's own health (Rao and Raju, 2020). For example, collecting water for domestic use tends to fall on women but erratic rainfall and falling groundwater can exacerbate time and effort spent (Karnataka). The West Bengal SAPCC notes that climate change is expected to exacerbate incidence of diarrhoea, vector-borne diseases, and infections associated with undernutrition. They indicate that *‘the groups who are likely to bear most of the resulting disease burden are children and the poor, especially women’* (p. 127). Similarly, the Meghalaya SAPCC notes that ‘*household energy requirements for heating and fuel is met through collection of fuel wood which is primarily done by women’.* Reductions in biomass yields then add to women’s labour of collecting firewood for cooking (Tripura

SAPCC). Uttarakhand's SAPCC details how climate change-driven higher temperatures are leading to an increase in weeds. Since weeding is essentially a woman's task, this has increased women and girls' drudgery. Across the SAPCCs, increased work burdens for women are mentioned, especially those who are poor. However, a similar discussion of men's changing labour is conspicuous by its absence, though the literature increasingly points to the vulnerabilities of young migrant men (Rao et al., 2020a; Singh, 2019).

Structural development deficits: Notably, five SAPCCs allude to structural gender inequalities as shaping differential vulnerability to climate change, touching upon issues of poor female health (Rajasthan), relatively lower literacy especially among women and certain castes (Chhattisgarh), social norms around men and women's work (Jammu & Kashmir), and uneven participation in decision-making processes (Bihar, Tamil Nadu). The Bihar SAPCC (p 26) as noted in Table 1 (women as victims of climate change) highlights how deprivations in education, access to resources and decision-making power mean that climate change can end up deepening existing gender divides disproportionately, especially amongst poorer households, and those belonging to Scheduled Tribes and Castes.

Thus, several SAPCCs do focus on the intersectional nature of vulnerability, drawing out connections between gendered roles and work, livelihoods, labour divisions, and health and literacy levels. However, they do so by through an exclusive focus on women and girls with silence on the disadvantages men and other genders experience. They also examine the intersections of gender with one other variable at a time, rather than taking on board the multiple, intersecting injustices and inequalities that simultaneously confront many women.

4.2 Policy approaches in adaptation: how is gender operationalised?

4.2.1 Policymaking processes

Most of the SAPCCs were coordinated by a single state department or agency, usually the department of environment or forests (see Supplementary Material 1). To bridge capacity constraints, think tanks, and bilateral and multilateral agencies were brought in for technical support. Most states formed steering committees to oversee SAPCC preparation. States typically held inception workshops with government department representatives, sectoral research experts, and civil society actors to inform the themes the SAPCC focussed on. Although most states do not specify the degree or nature of stakeholder engagement, from the policy documents, we find that states that prioritised stakeholder engagement throughout the process had gender reflected more significantly in their SAPCCs (e.g. Bihar, Chhattisgarh, Nagaland). However, despite an explicit commitment to inclusive and multi-stakeholder engagement in some state SAPCCs (e.g. Madhya Pradesh, Andhra Pradesh), gender is entirely missing, indicating that stakeholder engagement in itself is not sufficient to highlight gender concerns.

None of the plans explicitly mention gender experts participating in policymaking, although some mention inputs from the Department of Women and Child Development (e.g. Gujarat). States usually circulated SAPCC drafts for stakeholder comments. In some cases, gender was identified as a gap during the review process, and the plan was reworked (e.g. in Uttarakhand gender was incorporated after review). The central government has also proactively tried to ensure that states sufficiently address gender. In 2012, the Climate and Development Knowledge Network (CDKN) conducted a project on behalf of the MoEFCC titled 'Gender and State Climate Change Action Plans in India: Research and policies to enable poor women and rural communities adapt to climate change' (Kapoor, 2011). This project reviewed SAPCCs, existing state budgets, and programmes on gender, which lead to the MoEFCC asking all states to incorporate gender into their SAPCC based on CDKN's

framework. Only Kerala prepared a separate document titled 'Gender-inclusive State Action plan for Climate Change' in response to these recommendations.

In parallel, some states such as Odisha have updated their SAPCCs, primarily to showcase ongoing state initiatives and plan for the next five years. Odisha's revised, SAPCC (2018-23) includes a separate section on climate change and gender but while gender is more visible in this document, it remains an extension of the previous SAPCC and fails to identify and address gender gaps systematically across the plan.

4.2.2 SAPCC policy approaches: from gender-blind to gender-transformative

How gender is recognised (Section 4.1) has implications for how the SAPCCs operationalise gender in climate policy (see Supplementary Material 2). Of the 28 SAPCCs, five that did not mention gender or recognise gendered vulnerability (Assam, Manipur, Meghalaya, Mizoram, Odisha), followed a gender-blind approach to adaptation planning. This meant that gender was completely missing or mentioned cursorily in these SAPCCs.

Five states (Arunachal Pradesh, Andhra Pradesh, Madhya Pradesh, Telangana, Uttar Pradesh) follow a gender-neutral approach where they mention initiatives for women (e.g. hostels for working and unemployed women in Arunachal Pradesh) but these leave existing inequities in place. For example, the Arunachal Pradesh SAPCC highlights how '(m)ost of the proposed actions/activities directly or indirectly benefit the vulnerable gender group', citing initiatives including 'access to safe drinking water, enhanced water availability through rain water harvesting, providing ecosan toilets, adaptation in horticulture and livestock sectors, energy efficient actions' (p. xxii, Arunachal Pradesh). How these interventions are reducing gendered vulnerability or inequitable access is not discussed in the SAPCC.

Thirteen SAPCCs (Gujarat, Haryana, Himachal Pradesh, Jharkhand, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Punjab, Rajasthan, Sikkim, Tripura, West Bengal) follow a gender-specific approach, targeting women and certain livelihoods, castes, and income groups through sectoral or livelihoods-based interventions. For example, Haryana and Maharashtra's SAPCCs focus on women SHGs and Tamil Nadu reported capacity building programmes for women to manage dairy profitably. While these interventions targeted differential needs of women and men, they operated within existing structures of norms and responsibilities. This is visible in Himachal Pradesh's SAPCC as well which mentions,

> *'Gender-specific policies are required to help cope with the loss of control over natural resources, technologies and credit to deal with seasonal and episodic weather and natural disasters…special emphasis on the involvement of women in programs and self-help groups and forest management committees to involve women'* (Himachal Pradesh, p. 248).

While such targeting is an important step forward and reflects calls for mandatory involvement of women in forest and watershed committees (Agarwal, 2010), without supporting institutions to improve participation and leadership in these committees, they miss an opportunity to be gender-transformative (as Tyagi and Das 2018 and Singh 2018 show for forest and watershed committees, respectively).

Five SAPCCs (Bihar, Chhattisgarh, Nagaland, Tamil Nadu, Uttarakhand) pushed the agenda on gender further by following a gender-sensitive to gender-transformative approach. This was evidenced through their proactive interventions to address gender inequalities; enable more inclusive participation (though the focus still remained on women); and integrate gender concerns in poverty alleviation and livelihood strengthening programmes. For example, the Chhattisgarh SAPCC recommends using gender analysis and toolkits

developed by gender networks and consultation with gender experts during the planning and design of all programmes to ensure the project is gender equitable.

We now discuss a few notable outliers (also see states marked in bold in Supplementary Material 2). In Tamil Nadu and Nagaland, women were discussed as very vulnerable to climate change but both states followed a gender-sensitive approach to their adaptation planning. While this might be due to stakeholder feedback or the presence of strong gender-targeted policies in these states, further empirical evidence is needed to understand this better. Haryana and Sikkim on the other hand, did not recognise gender in their SAPCCs and discuss vulnerability in biophysical terms but did take a gender-specific policy approach (e.g. SHGs of poor women for empowerment). This is possibly explained by the presence of German technical support (GIZ) partner, which has a strong focus on inclusive and gender-sensitive adaptation planning. While we provide early insights into why we see dissonances in how gender is recognised and then mainstreamed in policy, further research, especially through interviews with policymakers and stakeholders is needed. This is especially the case given the complexity of policymaking that involves negotiation and contestation of ideas and language amongst different stakeholders (Dubash and Jogesh, 2014) – some status quoists and others desiring change – ultimately mediated by bureaucrats seeking to reach some form of consensus (Fraser, 1989).

Despite good intentions, gender mainstreaming in climate policy remains uneven. The SAPCCs mention different modes of mainstreaming but these tend to report existing development projects aimed at women rather than a reconsideration of existing policies to make them transformative. For example, Rajasthan discusses health, water and sanitation, and literacy schemes targeting women and children but does not link these to adaptive capacity building or vulnerability reduction in particular. In Tripura, gender is treated separately in a section titled 'Gender dimensions of climate change' which gives a somewhat superficial overview of vulnerability of women, without any discussion on other genders or intersections with other social factors.

5 Discussion

India’s NAPCC articulates the need to mainstream gender in climate policy, recognising that vulnerability to climate change is mediated by gender and socio-economic factors. In the previous section, we assessed the extent to which gender and its intersections with different forms of disadvantage (e.g. along lines of caste, income, landholding, or livelihood) are recognised as mediating vulnerability in India’s 28 SAPCCs. We then examined how this recognition of differential vulnerability shapes adaptation policy approaches. In this section, we summarise our findings and reflect on opportunities for gender mainstreaming that move away from gender-blind or -neutral approaches to those that are more transformative and focus on a redistribution of resources and strengthening agency.

5.1 Uneven treatment of gendered vulnerability in Indian climate change policy

Overall, positive steps have been taken to improve recognition of gender and equity concerns in Indian climate policy, yet challenges remain. First, 12 states do not recognise gender in their policies at all (Section 4.1.1). In the remaining 16 that do recognise gender, most policies tend to frame women as victims (of climate change) or ‘most vulnerable’ without a balanced recognition of their contributions to household adaptive capacities and their role in adaptation decision-making. This is erroneous given the substantial evidence on women’s contributions to household incomes and risk management, which acknowledges their role in strengthening food and nutritional security and family wellbeing through direct

and indirect labour and care duties (Chanana-Nag and Aggarwal, 2020; Kristjanson et al., 2017; Rao et al., 2020b).

Second, all the SAPCCs view gender through binaries of male/female-headed households which masks intra-household heterogeneity, relational gender dynamics and changing masculinities. While there is some coverage of how gender intersects with other factors, e.g. resource access and use or divisions of labour (Section 4.1.2), in all the SAPCCs, gender is equated with women[4], with women mostly discussed as a homogenous category. This potentially overlooks the differential experiences of women and men. For example, Govindan et al. (2021) discuss how physical elevation shapes gendered vulnerabilities in Himalayan settlements; Hazra et al. (2021) discuss the specific vulnerabilities of women-headed households in migrant and non-migrant households; Ravera et al. (2016b) show how household structure, knowledge, social ties, and intra-household labour allocation in Bihar and Uttarakhand intersect with gender to shape vulnerability and adaptation. Crucially, the vulnerability of men is also relevant. For example, Singh (2019) shows how in drought-prone Karanataka, young men are often more vulnerable because social norms and changing livelihoods such as urban migration expose them to novel. Only Nagaland, Chhattisgarh, and Uttarakhand SAPCCs acknowledge that certain men are also vulnerable to climatic risks.

Third, empirical support in the form of gender-disaggregated data is lacking in all reports and they depend largely on sector-specific anecdotal accounts of women's increased vulnerability. Yet growing evidence from the reports of the National Family Health Surveys in India (Kishor and Gupta, 2009) indicates that changing social norms and household structures, as well as social identity and position, are key to understanding differential vulnerability (Rao et al., 2020b). Gender is thus narrowly recognised in most of the SAPCCs (notable exceptions are Uttarakhand, Bihar, Chhattisgarh, and to some extent, Tripura and Gujarat).

5.2 Operationalising gender-responsive adaptation action

We examined how different ways to recognise gender are operationalised through actions reported in the SAPCCs. Most states that did not mention women followed a gender-blind approach in adaptation planning (Section 4.2.2). States that framed women as most vulnerable tended to use a gender-neutral or gender-specific approach that included schemes targeted at women and improving their material condition, but operated within existing norms and resource distributions. States that recognised women's agency (i.e. women as adapting or agents of change) tended to follow gender-sensitive or gender-transformative approaches, attempting to explicitly identify factors and processes driving gender inequalities and exploring ways to reconfigure them. Thus, the ways in which gendered vulnerability is recognised shapes how gender is mainstreamed in the SAPCCs. However, from this document-based review it is unclear to what extent the recognition and action plans reflect the states' priorities and development realities or only the perspectives and negotiated decisions of the actors involved in developing the SAPCCs. Given the nature and complexity of the policymaking process, involvement of multiple actors, and existing development agendas (Dubash and Jogesh, 2014), what results as gender mainstreaming is a negotiated agenda, and may not necessarily reflect the intentions of those who raised the issue. This is an area of possible future research.

[4] This translation of gender as equalling women is symptomatic of the broader policy environment on gender and trans rights in India. While transgender people are recognised in India as a third gender, under Section 377 of the Indian Penal Code 377, homosexuality was illegal until September 2018 when the Supreme Court finally ruled in favour of recognition. Given this context, non-binary categories have been largely invisible in public discourse and policies, with the exception of health (e.g. HIV).

Almost none of the plans (with the exception of Uttarakhand) consider gender throughout the policy process from policy formulation to implementation and evaluation stages. SAPCCs of Bihar and Chhattisgarh opt for a retroactive approach — post hoc gender audits are suggested to ensure that projects cater to men and women. However, in the absence of flexible institutional processes, the additional value of this is unclear.

We do find that irrespective of policy approach, and despite using heuristics of mainstreaming and women's empowerment, the SAPCCs approach gender through sectoral policies without a clear articulation of how they will address gendered vulnerabilities or enable gender-responsive climate action. Current SAPCCs thus use language to signal recognition of gendered vulnerability but do not necessarily follow this intention into policy approaches.

5.3 Policy directions and entry points

In 2019, Indian states were asked to revise their five-year SAPCCs. This provides an opportunity to reflect on and leverage the growing evidence on climate risks and how they are distributed amongst populations. With the UNFCCC Global Stocktake scheduled for 2023, where all countries will report on their Nationally Determined Contribution (NDC), these SAPCCs are expected to provide inputs into India's updated NDC. The revision of SAPCCs provides a moment for reflection and reorientation, an opportunity to engage with gender more deeply so that it is not piecemeal and tokenistic but provides a roadmap to address the uneven impacts different households and individuals face. To make the SAPCCs meet their mandate of mainstreaming inclusive climate change in government processes, current portrayals of gendered vulnerability as pertaining to women alone and uneven inclusion of intersectional aspects need revision. This important, clear framing and articulation of what needs to be done is the first step in making gender equality in climate planning and action a reality.

There is also space to commission new or draw on existing state- and district-level vulnerability and risk assessments that have a gender component. This would entail moving beyond collecting sex-disaggregated data to more systematic gender analysis to identify differences in men and women's access and agency, and intra-household decision-making processes. This can improve representation of the compounding and multiple disadvantages confronting women and men, how these intersect with other axes of differentiation (e.g. landholding, resource access, participation in local decision-making), and identify opportunities to exercise agency. Further, collaborations with local partners and organisations engaged in gender consciousness-building and awareness of normative structures surrounding gender can play an essential role in designing socially relevant climate adaptation policy. Tools such as the Women's Empowerment in Agriculture Index (Alkire et al., 2013) or qualitative diagnostic tools (Davies and Dart, 2005) to identify constraints and enablers associated with particular approaches and technologies can also be valuable to ensure gender responsive policy.

The SAPCCs at present do not engage with men and boys or with the intersections of gender with other social factors such as age, caste, ethnicity or sexuality in any systematic way to showcase how vulnerability is socially differentiated. We argue that SAPCCs can move towards becoming gender-transformative by actively acknowledging what the empirical literature shows: i.e. (1) vulnerability to climate change is intersectional with differences even within the category of women in how they experience vulnerability; and (2) climate change puts men at risk too. Acknowledging this in vulnerability assessments is important to reduce vulnerability and design inclusive adaptation strategies. A related gap in the SAPCCs is allocating financial and human resources for developing long-term datasets on the changing nature of gendered vulnerability in a context of changing climate.

The SAPCC development process relies on government departments as nodal agencies and donor agencies/research organisations as technical partners (Section 4.2.1). Most SAPCCs organised multi-stakeholder consultations to get feedback and prioritise actions. While NGOs and local communities were reported as involved in these processes, other independent assessments have argued that these engagement processes were often sporadic and did not shape the final reports (e.g. Dubash and Jogesh, 2014 for five states). More meaningful ways to bring in the voices of grassroots organisations and men and women and create spaces for them needs to be experimented with and lessons drawn from other environmental policies such as forestry (Tyagi and Das, 2018) and watershed management (Singh, 2018). Pluralising whose voices are included in SAPCC reports might be a way to open up spaces for different social groups and actors to highlight differential vulnerability and context-specific solutions.

Current adaptation actions in the SAPCCs focus on sectoral schemes that are women-targeted (e.g. solar cook stoves, women Self-Help Groups in fisheries or livestock). While these are undoubtedly important, adaptation interventions need to also challenge existing unequal distributions of resources, responsibilities, rights, and opportunities and envision women and men as key to building climate-resilient livelihoods. Some entry points for action from the SAPCCs reviewed are (1) leveraging existing social safety net programmes such as daytime crèches (Punjab), or maternal health programmes (Rajasthan) that have implications for improving adaptive capacity of men and women and improve overall household risk management; and (2) setting gender-specific indicators in adaptation programmes and schemes (Tamil Nadu).

6. Conclusion

Progress in gender and adaptation research has not yet filtered into sub-national adaptation policy in India. This includes acknowledging how the intersectionality across different forms of disadvantage, how changing household structures, and how agency shape differential vulnerability and adaptive capacities. In our review of 28 SAPCCs we find that Indian sub-national climate change action plans recognise gender as a driver of differentiated vulnerability, but the frames used tend to equate gender as women and women as most vulnerable to climate change. Intersectionality is discussed unevenly and mostly in relation to how gender intersects with labour divisions, resource access and use, or structural development deficits (e.g. nutrition, health, and literacy deficits).

This uneven and women-centric framing of gender in the SAPCCs shapes their gender mainstreaming approaches. States that do not mention gender tend to follow a gender-blind approach while those that focus on women as vulnerable tend to follow a gender-specific approach (i.e. women-targeted schemes with little engagement with underlying structures of inequality). SAPCCs that recognise women as agents of change tend to be gender-transformative, developing spaces for women's voice and decision-making, but they too suffer from focussing on women exclusively.

In India, changing social norms, supportive policies (e.g. women's participation in local elected bodies), and community-led women's empowerment programmes are providing livelihood opportunities, increasing women's political participation, and in many cases, increasing their agency and adaptive capacity (Rao et al., 2020b). The SAPCCs, currently under revision, present an opportunity to mainstream gender concerns and leverage existing sectoral interventions in agriculture, health, and natural resource management to become vehicles of gender-transformative climate action.

Supplementary Material

See attached worksheet with full dataset

Additional information

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