

Women, Climate, and Justice: Unpacking Gendered Vulnerabilities in India

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Abstract

Gender equality is an important indicator of a society's development and a necessary element for achieving sustainable growth. As the effects of climate change become more widespread, it is vital to include gender perspectives in climate-related actions. Although the United Nations Framework Convention on Climate Change has begun to address gender issues, these discussions started later than other key areas and progress remain slow. In India, despite increased awareness, gender equality in climate policy is still not fully integrated into the central policy agenda. In many contexts, women are more vulnerable in rural areas, because they depend highly on local natural resources for their livelihood. In the future, India needs to take more initiatives to establish gender equality. Moreover, gender equality in climate governance is one of the essential concerns. Therefore, this study is being conducted through mixed-method research, and the research design are descriptive and analytical based on secondary data, this paper aims to explore the intricate relationship between gender equality and climate change in the Indian context, focusing on how climate policies can be shaped to promote gender-responsive approaches that empower women.

Keywords: Climate Change, Gender Equality, Rural Women, Water Fetching, Food Security, Energy Security

1. Introduction

Climate change is a major concern globally, where the effects of climate change are not equal. Women are more vulnerable than men, because of climate change. Most of the developing and underdeveloped countries' livelihoods are mostly dependent on natural resources, which are threatened by climate change. In particular social, economic, and political barriers abate women's coping capacity. People in rural areas, particularly those who rely heavily on natural resources for their livelihoods, are especially vulnerable (Osman-Elasha, 2009). Thereby, well-known women's responsibilities to secure water, food, and fuel for cooking poses challenges. An account of that, Unequal access of natural resources and decision-making process, creating gaps particularly in rural areas, where they are disproportionately affected by climate change. Therefore, it is essential to identify gender-sensitive strategies to respond to the environmental and humanitarian crises caused by climate change (Nations). "The (SBI, n.d.) and (SBSTA, n.d.) also stress on women's participation in climate and environmental decision-making is vital for civilized society and also it is a human right. Nonetheless, Gender equality stands as a core pillar of the United Nations Sustainable Development Goals, representing a global commitment to fairness, inclusivity, and equitable

development (Zhang et al., 2021). Their participation is not only crucial (and has been proven) to create more robust, stronger environmental outcomes; but also, must be inherent in decision-making processes to fulfill these rights. Monitoring women's participation in the UNFCCC's Conference of Parties, which is its highest decision-making body, and its subsidiary body meetings, like the Bonn Climate Change Conference, helps us to spot and resolve ongoing disparities. However, due to the inadequacy of gender equality in land, capital, technical resources, and related things, it is difficult for women to tackle climate change. In its early years, the UNFCCC did not explicitly include gender considerations in its climate governance agenda, reflecting a delayed institutional focus on gender equality (Zhang et al., 2021). Here I systematically summarized and analyzed women's participation in decision-making bodies at the international level and in India as well. Moreover, Institutions should ensure women's participation in climate governance to diminish gender inequality. Since 2012, it becomes a permanent agenda under the convention. The Lima Work Program on Gender, addressing gender-related issues, was officially adopted at COP20 in 2014. Since then, gender issues have been systematically and steadily moving forward. The Paris Agreement marked a turning point in global climate policy by acknowledging the importance of gender equality, women's empowerment, and other human rights in climate-related actions (Zhang et al., 2021). This study will analyze national and international initiatives aimed at addressing these issues, review existing literature on the implications of climate change for gender relations through a thorough review of secondary sources, and highlight case studies that demonstrate effective interventions. hence, this study aims to add to the current conversation about gender and climate change by highlighting the necessity of integrated approaches that acknowledge and capitalize on the distinctive roles that women play in fostering climate resilience.

THEORITICAL FRAMEWORK

In order to investigate the connection between 'Women, Climate, and Justice in India', this study makes use of eco-feminism and climate justice theory. The relationship between the problems women confronts and environmental degradation is made clear by eco-feminism, which also demonstrates how important women's participation, knowledge, and experiences are to long-term climate action. An ethical viewpoint is added by climate justice theory, which emphasizes that policies must be equitable, inclusive, and rights-based because women are frequently the groups most impacted by climate change, particularly in rural and resource-dependent areas. In order to ensure that policies are more robust, inclusive, and sustainable for everyone, these ideas collectively imply that advancing gender equality is not only a moral requirement but also a practical imperative for effective climate governance.

Gender Disparities in Climate Vulnerability: A Global Overview with a Focus on India

FOOD SECURITY

Table. 1. Gender-wise distribution of cultivators and agricultural labourers in rural and urban India (2011).

Caption: This figure shows the percentage of women employed in agriculture and those who own land in India and, revealing a stark gender gap.

Source: Registrar General of India/Ministry of Agriculture and Farmer Welfare

States\UTs	Total / Urban / Rural	Cultivators (Main and Marginal)	Agricultural Labour (Main and Marginal)	Male Cultivators (Main and Marginal)	Male Agricultural Labour (Main and Marginal)	Female Cultivators (Main and Marginal)	Female Agricultural Labour (Main and Marginal)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
India	Total	118808780	144333690	82762934	82742337	36045846	61591353
	Rural	115084638	136998308	79895308	77932222	35189330	59066086
	Urban	3724142	7335382	2867626	4810115	856516	2525267
Jammu & Kashmir	Total	1245316	547705	765527	414344	479789	133361
	Rural	1180384	498531	729874	376051	450510	122480
	Urban	64932	49174	35653	38293	29279	10881
Himachal Pradesh	Total	2062062	175038	906154	103060	1155908	71978
	Rural	2048582	170279	899954	99801	1148628	70478
	Urban	13480	4759	6200	3259	7280	1500
Punjab	Total	1934511	1588455	1753359	1239445	181152	349010
	Rural	1840001	1474732	1669638	1146165	170363	328567
	Urban	94510	113723	83721	93280	10789	20443
Chandigarh	Total	2578	1687	2114	1375	464	312
	Rural	457	168	406	122	51	46
	Urban	2121	1519	1708	1253	413	266

While climate change is a threat to everyone, however, it doesn't affect everyone equally. The impacts of climate change perpetuate and magnify structural inequalities, such as between men and women. This is especially true in many parts of the world, where women rely on climate-sensitive work like agriculture and manual labour to make a living (UNDP, 2023). In continental Asia and the Pacific, women have a fundamental role in all dimensions of food security (UN, 2022), (UNESCAP, 2022). According to (Lorena et al., 2015) here are four grave dimensions of food security; food availability, food accessibility, food utilization, and food system stability. Furthermore, women are responsible for food production in agriculture and also serve as household food providers. Currently, women farmers are about 45-80 percent of all food production, about two-thirds of the female labour force in developing countries, and more than 90 percent of many African countries (Nations).

In India according to 2011 census as shown in *Table 1*, women form a large share of the agricultural workforce but are underrepresented in land ownership. Approximately 30 percent are female cultivators (who possess land or lease taken land), if we see in rural areas then, the data indicates that out of 30 percent female cultivators approximately 98 percent belong to rural areas, and 3 percent are from urban areas. Likewise, about 42 percent are female agricultural labourers (those do not own land or lease taken land), of this 42 percent, 96 percent belong to rural areas. So, the thing is that only 30 percent of women possess their land (own land and lease land) and 70 percent are male (Welfare, 2023).

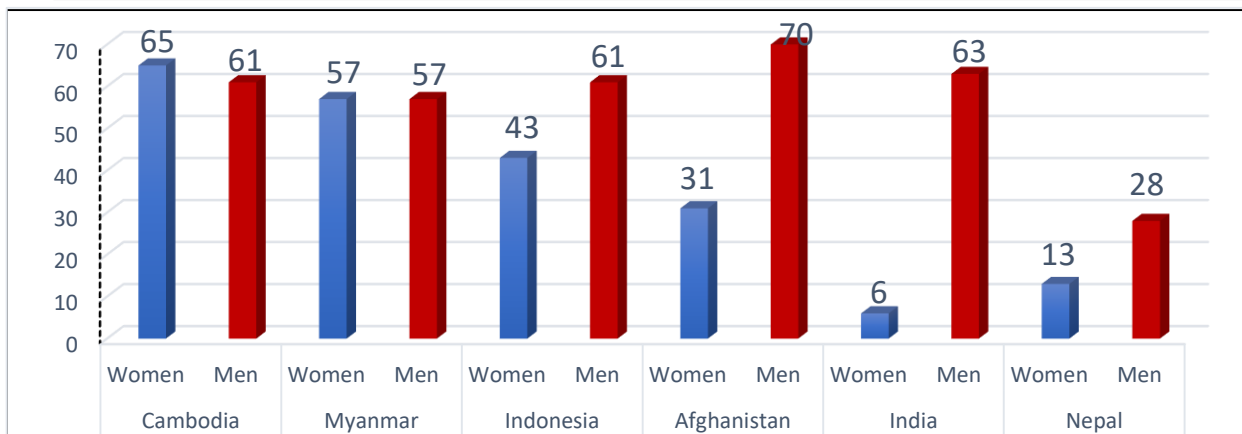
Figure 1, illustrates the disparity in land rights between women and men in several countries. However, the difference between India and Afghanistan is substantial. While 60 percent of women are employed in agriculture, out of them 30 percent have ownership rights over agricultural land. The difference becomes even higher in India, where 55 percent of women are employed in agriculture, yet only

6 percent of them have ownership rights over agricultural land compared to 63 percent of men (UNESCAP, 2022)

Fig. 1 Proportion of agricultural population with ownership or secure rights over agricultural land, by sex, in all countries from Asia and the Pacific with available data.

Caption: This figure compares the gendered division of water-fetching responsibilities and the average distance to water sources in India and selected Asia-Pacific countries.

Source: UN Women 2022b based on latest available data at Global SDG Indicators database / ESCAP



Inadequacy of assets and women's higher likelihood of informal employment abating women's capacity to cope with the impacts of climate change. Furthermore, where laws fail to safeguard women's inheritance rights, the loss of land and productive assets owned by deceased family members due to disasters put women at further risk of poverty and lost livelihoods (UN Women, 2022b), (UNESCAP, 2022). These challenges coupled with the extreme effects of climate change in Asia and India particularly. Because, Increases caused by climate change in storm, flood, and heatwave frequency result in crop failures, job losses, and food insecurity for agricultural workers who depend on consistent weather patterns to generate food. The fact that women farmers have less access to capital, labor, and land presents extra difficulties for them. Rural women's access to natural resources and their capacity to participate in the labour market are both impacted by the general rise in social and economic instability brought on by climate change. Thus, promoting gender equality and women's empowerment in agriculture not only improves food security and nutrition at the household level but also results in resilient, climate-smart, and sustainable food systems overall (UN, 2021), (UNESCAP, 2022).

Gender integration is a crucial issue for improving agricultural productivity (NFSM, 2017). To address the gender gap in agricultural aspects there are several centrally sponsored schemes, under "Support to State Extension Programmes for Extension Reforms" popularly known as Agriculture Technology Management Agency (ATMA) has adequate provisions for women in farming. Further, as per ATMA guidelines, 30% of the beneficiaries should be women farmers/farm-women (PIB, 2023). "As per the operational guidelines of NFSM, at least 30% of funds is to be allocated for women farmers, 33% allocation of the fund is to be made for small and marginal farmers" (KrishiVistar, 2021). Moreover, POSHAN Abhiyaan focuses on improving nutrition for vulnerable groups, including women, contributing to enhanced food security and gender equity (Advisor, 2018). These schemes demonstrate a concerted effort to reduce the gender gap and ensure inclusive participation in addressing food security challenges.

However, these limited schemes are not sufficient to address gender equality in contemporary climate change vulnerability for women.

BIODIVERSITY AND GENDER EQUALITY

Climate change is the major concern for the loss of biodiversity; thus, it plays a critical role in climate change adoption and mitigation. Owing to that deforestation is responsible for an average of 20% of carbon dioxide emissions. Likewise, in rural areas of Africa and Asia women and men are highly affected, because they are dependent on biomass such as wood, agricultural crops-wastes, and forest resources for their energy and livelihoods. However, it is important to note that the declining biodiversity does not solely impact the material welfare and livelihoods of people; it also cripples access to security, resiliency, social relations, health, and freedom of choices and actions (Nations). Thus, deforestation means that the most widely used solid fuel is further located from where they live. In poor communities' women and girls are responsible for collecting fuel. Consequently, they aren't able to fulfill their domestic responsibility, earn money, engage in politics and other public activities (Nations), due to that, sometimes girls are kept from school to help gather fuel. Additionally, "Climate change, through droughts, floods, and changing weather patterns, increases the burden on women, as they have to work harder and travel further to fulfill these roles. This not only affects their physical health but also limits their opportunities for education, employment, and participation in community decision-making" (Kaur & Ganie, 2024). Furthermore, environmental degradation forces them to collect further resources and become more vulnerable to injuries for long distances heavy-loads and increased risk of sexual harassment and assault (Nations). Furthermore, in terms of supplying food or rent food sellers, farmers, or land owners occasionally demand sexual demands from women and girls (Arshad, 2024).



Photo Credit: FAO / Pius Ekpei/WEDO

Indigenous people and communities possess good knowledge about biodiversity. Their knowledge comprises with understanding of ancestors of food, medicinal plants, domestic animals, ecosystems, and geography. Thus, in order to further preserve biodiversity and limit degradation, indigenous people can play a vital role in climate change. In particular, indigenous women play a vital role as stewards of natural resources. A greater inclusion of Indigenous communities and Indigenous women further validates the significance of their knowledge (Nations).

In this concern, the government of India adopted several policies such as Pradhan Mantri Ujjwala Yojana (PMUY) initiated to promote the use of clean fuel to women belonging to BPL households. It aims at improving the health and productivity of women (Kumari & Sinha, 2022). The National Biogas and Manure Management Programme (NBMMP) encourage the construction of biogas plants, which provide rural women in particular with a clean and sustainable cooking alternative (CAG). Similar to this, the Unnat Chulha Abhiyan emphasizes energy-efficient cookstoves that enhance women's health and lessen labour by consuming less fuel and reducing indoor air pollution (Vikaspedia, 2020). To achieve this goal, the Solar Chulha Scheme promotes the use of solar-powered cookstoves, offering a clean and sustainable energy source for cooking. Despite these, there are multiple hindrances to abate women's vulnerability.

WATER RESOURCES

Climate change, gender equality, and water scarcity are the most crucial things which are interrelated. Apart from that, women are more responsible for fetching water for their households from different distant resources. Such that women and girls pay the heaviest for sanitation. For instance, “in cases where the arsenic contamination of groundwater is prominent, increased flood levels intensify the rate of exposure among rural people and other socio-economically disadvantaged groups. The resulting health problems include: Lesions, skin hardening, dark blotches on hands and feet, swollen limbs, and loss of feeling are some of the health issues that follow. Arsenic exposure also manifests itself in the form of skin lesions that usually have negative social repercussions for arsenic-poisoning victims—the situation is particularly worse for women who can be denied, marginalized, and stigmatised due to their physical appearance—this affects single women's capacity to marry, and single women are frequently more susceptible to poverty and social exclusion” (Nations).



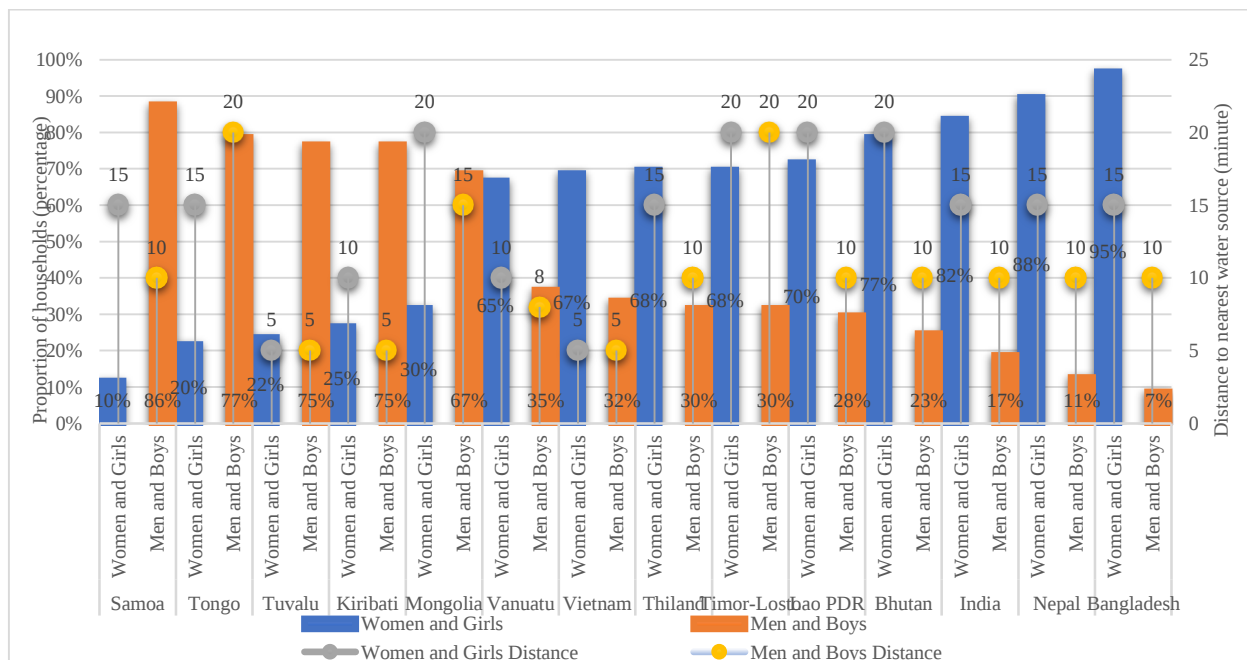
Source: ESCAP

Fig. 2 Proportion of households, person in charge of fetching water and the distance in minutes to a water source for households without water on premises.

Caption: This figure shows the yearly percentage of women participating in UNFCCC COP meetings, illustrating slow progress in women's involvement in global climate decision-making.

Source: UN Women 2022b based on UN Women analyses carried out using data from Multiple Indicator Cluster Surveys (MICS) and DHS data/ESCAP

Note: All countries with available data for years 2000 and onwards on the MICS and DHS repositories have been included in the analysis.



In Asia and the Pacific women's time spent on domestic work four times more than men. Water fetching is one of them, this adversely affects the use of their time due to their responsibility in collecting

water. Therefore, they spent 5 to 20 minutes per trip to the closest water source. “This may impinge on the time they can allocate to paid work or leisure, and water collection can pose health risks – not only from transporting heavy weights for long distances; but also, by increasing exposure to violence during their travel. However, in some countries, men may be stepping up to collect water in households where the water source is far, as indicated by higher median times” (Women, 2022).

Figure 2, shows that in India approximately 85% of women households are responsible for fetching water, and about 15% are men. Moreover, the distance to the nearest water fetching for women is relatively higher than men. “For many villagers, particularly women, obtaining fresh water for domestic use meant traveling distances of over 1.6 kilometers” (BANK, 2023). In contrast to India, if we see Samoa here men are rather responsible then to women, and girls are less responsible, unlike India. However, the distance to the nearest water source is higher for women than men, which is alike India. Therefore, it’s obvious that women’s vulnerability is higher in securing water security for themselves and their family’s livelihood.

This particular responsibility affects school attendance for young girls, and also other things. An account of this “The proportion of women water fetchers were also found to be higher among rural residences, scheduled tribes, scheduled castes, Muslims, and eastern and southern India as compared to the others” (Ghosh & Sarkar, 2023).

India has made significant strides in addressing water security and promoting gender equality through various schemes like the Jal Jeevan Mission, Swachh Bharat Mission, and Atal Bhujal Yojana. These initiatives aim to reduce the burden on women, who traditionally bear the responsibility for water collection, by providing access to piped water and improving sanitation infrastructure (Bureau, 2024), (Atal Bhujal Yojana, n.d.). Programs such as MGNREGS and Namami Gange have empowered women economically by involving them in water conservation efforts and decision-making roles in water management (Ministry of Rural Development, 2023). However, the success has been mixed, as many rural areas still struggle with consistent access to water, and the cultural norms that place the burden of water fetching on women persist. While these schemes have improved the participation of women in water governance, the long-term goal of achieving gender equity in water-related responsibilities remains a work in progress. Overall, India's initiatives show positive movement but highlight the need for continued efforts to fully realize gender equality in water security.

DISASTER AND GENDER EQUALITY

At the elementary level, women's and men's mortality rates are often different in natural disasters. Asia and the Pacific is the most disaster-prone region in the world (ESCAP, 2017), (UNESCAP, 2022). And India is one of them, Disasters affects the livelihoods, health, and well-being of women, especially those of lower socioeconomic status (UN Women, 2022), (UNESCAP, 2022). If, women’s economic prosperity is lower than that of men, then, women’s vulnerability is higher. In 2006 a study was conducted by the London School of Economics on 141 natural disasters, and found that the same number of women and men die in disaster when economic and social rights are fulfilled for both sexes. At the same time, when women do not enjoy those rights equally, they are more affected by disasters than men (Neumayer), (Nations). Furthermore, women's sole economic reliability in agriculture is affected because of different

disasters and hazards, owing to that women's labour also shrinks their economic stability. Furthermore, Climate change also affects the availability of natural resources such as firewood and water fetching, due to drought, flood, aridity, deforestation, and desertification, which directly increase women's efforts and time to access these resources. Namely, disasters such as droughts, and floods increase illness in children and elders adding to women's care work and representing a rise in women's time in collecting water and food (Tanyag & True, 2019).

There are several reasons for increasing women's vulnerability, post-disaster period becomes higher risks because of overcrowded shelters, placed in unsafe places, and lack of assets (Nations). Furthermore, at the moment of cyclones, floods, and other related disasters requiring mobility, cultural and religious norms create obstacles for women to take quick decisions in emergency situations, and movements to timely escape; and access to shelter and healthcare. Moreover, women's clothing and childcare responsibilities may prevent them (Arshad, 2024). Another thing is due to domestic and sexual violence women often avoid to use of shelters. Furthermore, Indigenous and Afro-descendent women and girls, older women, physically challenged women and girls, migrant women, and those who reside in disaster-prone regions, rural and remote areas particularly face severe climate change risks and violence (Arshad, 2024). In the notion of migration climate change becomes a major force that differentiates genders. Women often bear security challenges, when several natural disasters occur and migration has become a way of survival. The Foreign, Commonwealth, and Development Office (FCDO) of the United Kingdom (UK) conducted a study in 2022 that revealed that Kendrapara one of Odisha's economically stable districts, has witnessed a high rate of population migration. Specifically, 85 percent of the district's population migrates once or twice a year as a result of heightened vulnerabilities brought on by frequent cyclones, floods, and storm surges (Shaikh, 2022). Namely, in the 2004 Asian tsunami, 70% of those who died were women. Meanwhile, men were locked outside, while many women and children were in their homes. Thereby, gender discrepancy is a major concern, including the Asian Tsunami; hurricanes; America's storms; European heat waves; cyclones in South Asia, etc.

As climate change impacts India as a nation seriously threatened by climate change. indeed, Indian women already struggle with multiple discriminations and inequalities. Their social, economic, and political inequalities make them unstable and highly dependent on men and natural resources. In addition, cultural and religious norms, beliefs, and customs (Jolly & Menon, 2019) creating hindrances to deal with those disasters and hazardous. A report by Oxfam observed that a higher number of women lost their lives than men in the ocean tsunami, which hit in Indian Andaman and Nicobar Islands, the states of Tamil Nadu, Kerala, and Andhra Pradesh, and the Union Territory of Pondicherry. Local survivors cite different reasons why this may be so. For instance, When the tsunami hit, many men were fishing at sea while the women were waiting near the shoreline for the boats to come in with the catch, which they would collect, clean, and then take to the market to sell (Arshad, 2024). The tsunami travelled relatively calmly out at sea, passing under the boats, but swelled up as it reached the shore. Many women also lost their lives in their attempts to save their children and elderly relatives who were with them at the time (Oxfam, 2005).

A survey was conducted to analyze the disproportionate impact of gender on disaster in the aftermath of the Tsunami, south India documented different consequences of orphaned girls becoming victims of sexual harassment, widows plunged into depression, and also domestic violence increased (Luke, 2012), (Jolly & Menon, 2019). These kinds of issues increase women's vulnerability. Owing to

that, different Initiatives have already been taken in some areas. For example, the Tamil Nadu and Kerala governments in the initial period after the tsunami, stations for women, fire officers, police, and women doctor in the camps and affected villages. This positive move helps to deter violence against women and girls and provides a safer environment (Oxfam, 2005). In other areas, numerous progresses are still needed to ensure gender equality in respect to climate change.

Thus, Sendai Framework for Disaster Risk Reduction 2015-2030 recognizes the importance of integrating a gender perspective into all Disaster Risk Reduction (DRR) policies and practices and the need to empower women and promote equal access to recovery and resilience (ASEAN & UN Women, 2021), (UNESCAP, 2022). Also, SDG (goal 13) focuses on strengthening resilience and adaptive capacity during hazards and natural disasters, for vulnerable groups at risk of climate change. “In doing so, gender equality and women’s empowerment is key to mitigate, adapt and build resilience against climate change” (UNESCAP, 2022).

Therefore, the United Nations has identified environmental degradation as a major threat to human security, “it is thus important to identify gender-sensitive strategies and policies for responding to human security needs and environmental and humanitarian crises caused by climate change. These efforts should focus on: reducing women’s vulnerability, in tandem with men’s susceptibilities; promoting gender-sensitive emergency responses; and enlisting women as key environmental actors in natural disaster management decision-making processes, alongside men, tapping on women’s skills, resourcefulness, and leadership in mitigation and adaptation efforts” (ISDR, 2001), (Nations), (Lorena et al., 2015).

GENDER EQUALITY IN CLIMATE GOVERNANCE

According to (SBI, n.d.) Women’s participation in climate and environmental decision-making is a human right. Their participation is not only crucial (and has been proven) to create more robust, stronger environmental outcomes but also must be inherent in decision-making processes to fulfill this right (WEDO, 2023). The climate crisis is just like other humanitarian and development challenges, which have greater impacts on women. This is because of the unequal share of power between men and women (UNDP, 2023). Additionally, involving women in decision-making and leadership can help to derive climate change policies and strengthen mitigation and adaptation efforts by ensuring they benefit the needs of women (UNDP, 2023). Thus, to ensure climate solutions gender equality and women’s empowerment must be considered throughout. Therefore, to track women’s participation in conferences of parties, UNFCCC (United Nations Framework Convention on Climate Change which is a supreme decision-making body), and Boon Climate Change Conference (subsidiary body) enable to address and identify persisting inequalities.

The UNFCCC has recognised the significance of women’s participation in several key decisions. In 2001 UNFCCC’s gender decisions were not about gender mainstreaming across areas, but about “improving the participation of women in the representation of Parties in bodies” (WEDO, 2023). “The first Gender Action Plan (2017) and the current Enhanced Lima Work Programme on Gender and its Gender Action Plan (GAP, 2019), the UNFCCC’s key initiative for a gender-responsive approach to climate change, have priority areas on ‘gender balance, participation, and women’s leadership’” (WEDO,

2023). Hence, WEDO has been tracking women's participation data in the UNFCCC negotiations since 2008, and in 2016 the GCT first made this data publicly available.

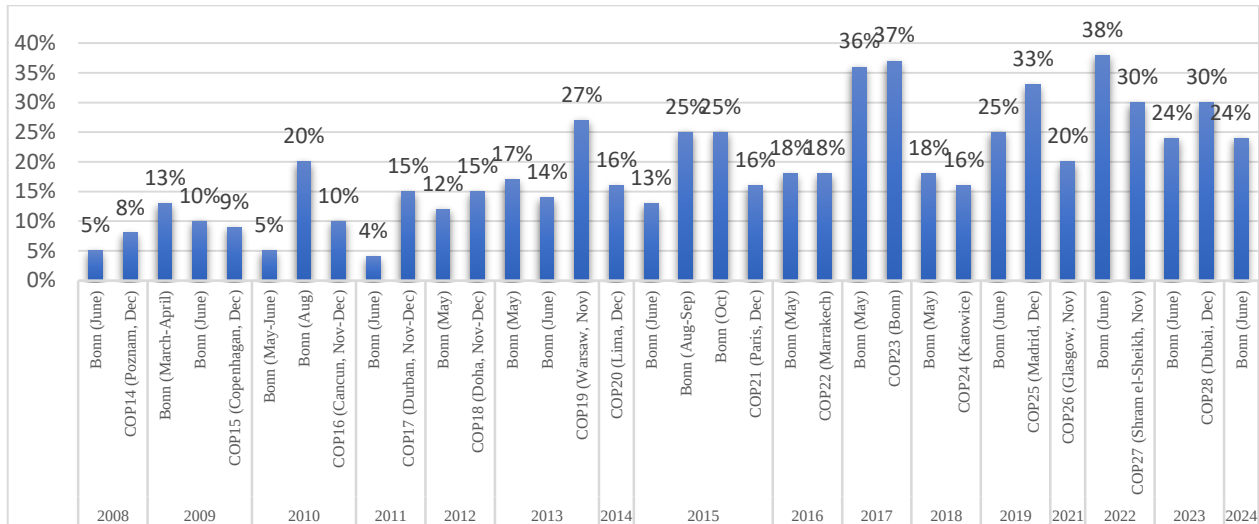


Fig. 3 Percentage of women among party delegates.

Caption: This figure shows the percentage of women delegates attending COP and Bonn climate conferences, illustrating trends in gender representation over time.

Source: **Data collected from (GCT)**

In the illustration, *figure 3*, shows that in the 2008 Conference of Parties (COP) 14, women's participation was 31% and since 2017-2022 participation was stable than 2009-2016, afterward, in 2023 women's participation was 34%, thus, the average growth rate is 0.62% over the 15 years, indeed which is indicating that how the matter of gender equality is being neglected. Moreover, "The average growth rate of women's participation in Bonn conventions climate governance from 2008 (36%) to 2024 (48%) was calculated using the Compound Annual Growth Rate (CAGR) formula, resulting in an average growth rate of approximately 7.42%. Parties are bringing more delegates for negotiations, but they are not bringing more women, thereby, parties in holistic are not prioritizing gender equality in their delegations. However, the variations in participation levels signal potential challenges and setbacks that needed to be addressed.

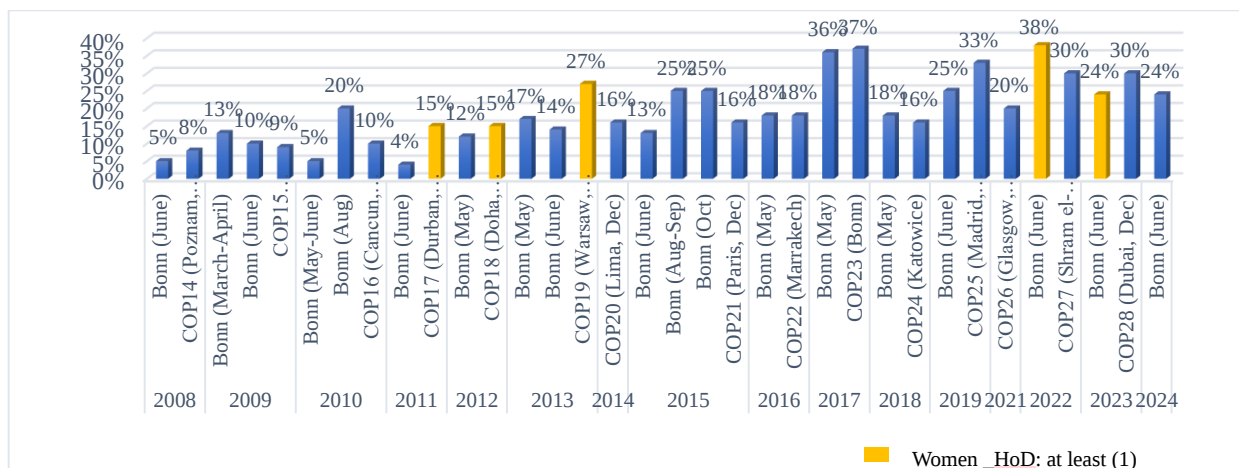


Fig. 4 Percentage of Women Delegates from India.

Caption: This figure shows the percentage of Indian women delegates and the presence of female Heads of Delegation (HoDs) at COP and Bonn meetings over time.

Source: Data collected from (GCT)

Although the proportion of women in political, social, economic, and decision-making in India steadily increasing, there are still major gaps in related fields. In terms of national climate decision-making consultation, the proportion of women's participation is increasing Persistently, but the overall participation is underwhelming. Thereby, in India women's representation in the decision-making body is pivotal.

As presented in *Figure 4* which shows women's participation in COP's and Bonn convention, however, in 2008 among the total delegates, there were 5% of delegates were women. But in 2017 and 2022 the percentage of women delegates was admirable and higher than 2008-2016. In a recent Bonn convention in 2024, women's participation was very low. Therefore, the average percentage of women participation in Boon is about 9.16%. On the other side COP participation in 2008(COP14) was 8% and in 2023(COP28) is 30%, hence, the average percentage of the participant is approximately 7.94%. In addition, COP 17, 18, and 19 and in 2022 and 2023's Bonn (June) conventions there were at least one woman had been HoD.

India's women's participation in climate change and environmental decision-making bodies is higher than overall participation in the globe. Thus, these findings highlight the necessity for targeted policies and initiatives that not only promote women's involvement in climate governance but also ensure that their voices are consistently integrating into decision-making frameworks. However, in India's villages, and remote areas women are more vulnerable, thereby, those women's participation in climate change and environmental bodies is required. Therefore, Sustainable gender equality in climate governance is crucial for effectively addressing the multifaceted impacts of climate change, as diverse perspectives can lead to more comprehensive and equitable solutions.

Recommendations

Women's active involvement in climate governance is widely recognized as essential for effective and equitable solutions (Zhang et al., 2021). Although India has implemented various programs to strengthen women's engagement in climate change mitigation and governance, significant challenges remain in fully achieving gender equality within these efforts. To further promote gender balance in India's response to climate change, the role and status of women in responding to climate change should be enhanced at different levels to help women better respond to climate change and make better contributions in the future. Thus, "Addressing climate change effectively requires ongoing refinement of policies and interventions. This includes enhancing social safety nets, fostering environments that promote gender equality, and expanding opportunities for women's participation across all climate-related sectors.

The statistic shows the current inadequacy of women's participation in UNFCCC from India and all other countries as well. Therefore, parties cannot assume these disparities can slowly fix itself. At the current growth rate of gender balance in party delegations to COP will not be attained until 2042, while, given the fluctuations, there is no forecastable future where COP Heads of Delegations will achieve gender balance (WEDO, 2023). Thus, to accelerate progress, parties must focus on-

1. Women should be actively integrated into Party delegations among Parties. To solidify the link between reducing climate change and attaining gender equality, parties with delegations that are balanced in terms of gender should advocate and share their experiences with other parties (WEDO, 2023).
2. The gender distribution of decision-makers and/or leadership teams in the major ministries, departments, and/or units involved in the UNFCCC talks and implementation should be closely examined by the parties. The gender balancing of these units may improve and ultimately be reflected in delegations by taking these gendered factors into account and aiming for gender balance in professional development initiatives, mentorship, and training programs (WEDO, 2023).
3. This is crucial to assess how climate change affects men and women differently, based on gender equality. It will help to understand and identify inequalities and existing gender gaps. Once we understand the distribution of resources, opportunities, limitations, and power in a given context, then we can be able to develop more effective, evidence-based climate policies and initiatives that take into account the needs of both men and boys and women and girls (UNDP, 2023).
4. While introducing and implementing new climate policies, we must ensure equal benefit of allocated budget to men and women as well. This will enable everyone's skills and leadership to respond during a crisis. For instance, women play a crucial role in the agricultural sector, however, women do not have equal access to agricultural resources, services, and also in decision-making processes. Therefore, women's access to resources can reduce women's vulnerability (UNDP, 2023).
5. Attention should be paid to education, reproductive care, and protection from harm to adolescent girls. When poverty and water scarcity arise due to climate change, their family and social norms

keep them from school. Therefore, there should be a vigorous tracking system, especially in extreme droughts, crop failures, and other climate-impact regions (Shaikh, 2022).

6. India also requires a system of guiding policies for menstrual hygiene in times of disaster. To do this, it ought to mobilize state-level crisis management agencies as well as health departments. The UN Population Fund (UNFPA) and WaterAid have created a framework (UNFPA, 2021), but state governments are still struggling to adopt it (Shaikh, 2022).

Additionally, Indigenous people possess a wealth of knowledge about biodiversity. Which comprises: an understanding of medical plants and animals, wild ancestors' food symbiotic relations with ecosystems. an understanding of the way ecosystems are put together, how certain species function, and where those species are found geographically. To preserve biodiversity and restrain its degradation, indigenous people can play a leading role in response to climate change. In particular, women play a vital role as conservators of natural resources. Thus, A greater inclusion of Indigenous communities and Indigenous women further validates the significance of their knowledge (Nations).

Eventually, UNDP's Climate Promises devised a multifaceted strategy aimed at bolstering gender-responsive climate action in three primary domains: 1) effective governance, 2) inclusive planning, and 3) integrated policy frameworks, to tackle these concerns and forge a more robust basis for advancement. In-depth gender analyses were also encouraged by the Climate Promise as a means of comprehending the roles that men and women play in priority NDC sectors, the structural disparities that women encounter when it comes to climate action, and the chances that exist to empower women's involvement in climate solutions (UNDP, 2023).

Limitations

Each and every study has limitations, Despite the valuable insights gained from this study, several limitations should be acknowledged. First, this study is based on secondary data, which may limit the generalizability of the findings. Secondly, using a mixed-method approach offers a well-rounded analysis, the lack of primary data collection limits the ability to capture current, on-the-ground experiences. Additionally, since the research is focused on the Indian context, the findings may not be applicable to other regions with different social, economic, or environmental conditions. Lastly, given the complex nature of the relationship between gender and climate change, it may be difficult to pinpoint clear cause-and-effect dynamics. Thus, the study leaves the potential for further research through primary data. These limitations emphasize the need for more study to understand the complex interaction between gender inequality and climate change.

Conclusion

Climate change is a crucial challenge of our time. And its impacts are wide-ranging and complex. it is imperative to understand the different ways that various societal groups are affected by climate change. there is a growing notion that women and girls are unequally impacted by the effects of climate change. Therefore, understanding these impacts is essential to ensure an effective, equitable, and sustainable society. The social response is the largest difference in the gendered climate change impacts. In many parts

of the world women and girls are highly likely to be discriminated against at an early age, which leads to abate opportunities for education and employment. In the economic aspect, women are more likely related to agriculture, and women's responsibilities are higher in terms of household work, nonetheless, different statistics show that women do not possess the land and are not owners of agricultural resources alike men.

Thus, the design of gender perspective policies is required, to account unique challenges, which faced by men and women in different contexts of climate change. Though, lack of gender-disproportionate data makes it difficult to understand the different ways in which men and women are affected differently by climate change policymakers and researchers may build more nuanced understandings of the gendered implications of climate change and, in turn, more effective and equitable policies and interventions by increasing the systematic collecting and analysis of gender-disaggregated data.

We have seen earlier, that there are several initiatives taken by the international and national level in India as well, in addition, as a successful initiative Women and Gender Constituency (WGC) was established in 2009 by UNFCCC. Which now consists of 54 women's and environmental organizations, that are working to ensure women's rights and upcoming COP 29 talks about formalizing women's voice and gender Civil society organizations that are actively involved and consistently participate in the UNFCCC processes. Nevertheless, gender equality is yet to be ensured completely. There are various hindrances are existing. However, several initiatives indicated positive.

Women and girls are not just affected by climate change—they are also key players in driving economic growth and strengthening climate resilience. Actively involving them in policy decisions, especially at local and regional levels, is crucial for developing effective climate action plans that address the unique challenges different communities face. Regional planning is key, as the effects of climate change—and women's roles in responding to them—differ from region to region, calling for tailored, localized solutions.

The climate change implications not least on an environmental level, environmental disasters, also Integrate a gender-sensitive aspect. India's legal framework already incorporates gender concerns, providing entry points for holistic gender mainstreaming. For an effective right-based gender mainstreaming mechanism the core basic principles should be followed carefully: participation and inclusion, non-discrimination, and accountability. As there are no one-size-fits-all approaches, any adoption of gender perspective cannot take a uni-dimensional approach with global and national focus and strategies. A successful disaster response mechanism has to be locally driven, and the special knowledge and perspectives of women at the grassroots level have to find its integration in all phases of disaster governance. The first step in this direction has to be the active involvement of the Panchayat Raj institutions in disaster management.

In summary, attaining gender equality in climate governance is crucial for the effectiveness of climate initiatives in addition to being morally required. Through empowering women and girls and incorporating their perspectives into policy frameworks, we may progress toward a future that is more progressive, sustainable, and resilient. whereas there are still difficulties, continued attempts show optimistic moves in the right direction. Women's responsibilities in climate governance can be strengthened, culminating in a more effective response to the climate crisis, with richer gender-disaggregated data, better policy frameworks, and more inclusive decision-making.

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