

Commentary

Gender–Climate Nexus

PREMANGINI BASUMATARY¹, URBASHI SARKAR², ADITI NATH³ AND ARUN JYOTI NATH^{1*}

¹*Department of Ecology and Environmental Science,* ²*Department of Earth Science,* ³*Department of Social Work, Assam University, Silchar, India*

E-mail: premabasumatary123@gmail.com, sarkarurbashi@gmail.com, aditinath1@gmail.com, arunjyotinath@gmail.com

***Corresponding author**

ABSTRACT

Climate change represents a global crisis with uneven impacts, disproportionately affecting women, girls, and gender-diverse individuals due to deeply rooted socioeconomic and cultural inequalities. These disparities are exacerbated during climate-induced disasters, which limit access to essential resources, decision-making processes, and recovery mechanisms. Women, particularly those in rural and marginalized communities, bear greater burdens yet demonstrate remarkable resilience through localized adaptation strategies. In contrast, men often experience psychological stress due to economic instability. A gender-responsive Climate Action Plan that recognizes and values various experiences and knowledge is essential for achieving equitable climate solutions. Empowering individuals of all genders is a matter of justice and a crucial strategy for fostering effective, inclusive, and sustainable climate resilience and development.

Key words: Climate change, Environmental governance, Resilience

INTRODUCTION

Climate change represents one of the most pressing global challenges, significantly impacting ecosystems, economies, and human societies (Malhi et al. 2020). However, its effects are not felt uniformly; gender dynamics play a crucial role in shaping vulnerability and resilience. Women, girls, and gender-diverse individuals do not inherently possess greater vulnerability; instead, they often face a disproportionately heavy burden due to entrenched socio-cultural and economic inequalities that limit their access to resources, opportunities, and decision-making power (Arvind 2024). The impacts of climate change can heighten socioeconomic and political tensions, sometimes pushing communities to a tipping point that may lead to violence or the resurgence of enduring conflicts. Climate-induced events can be categorized into two types: 1) slow-onset events, such as sea level rise and soil degradation, and 2) rapid-onset events, including droughts, floods, cyclones, wildfires, and extreme heat. Both categories exacerbate socioeconomic and political challenges, disproportionately affecting marginalized communities (Putsoane et al. 2024).

THE NEXUS

Women, particularly those living in poverty, rural areas, or indigenous communities, rely heavily on natural resources for their daily survival, engaging in activities such as collecting water, gathering firewood, and practising small-scale farming (Upadhyay 2005, Bey et al. 2025). As these resources become increasingly scarce or unpredictable due to climate change, the burden on women intensifies, negatively impacting their health, security, and available time (Nosheen et al. 2023). Furthermore, women frequently lack access to essential assets, such as land, education, finance, and technology (Jain et al. 2023), and they remain underrepresented in household, community, and national decision-making processes. These systemic barriers hinder their ability to participate in climate adaptation and mitigation initiatives, as well as to benefit from recovery following disasters. Consequently, women and gender-diverse groups are often excluded from climate policy discussions that directly influence their well-being and resilience. Social norms and traditional gender roles influence how individuals interact with their environment and respond to crises

(Islam et al. 2025). In some societies, cultural restrictions may inhibit women from migrating for work or accessing public shelters during disasters, thereby increasing their vulnerability. Additionally, caregiving responsibilities - most often assigned to women - limit their mobility and restrict opportunities for economic recovery and empowerment (Kreutzer et al., 2023). Conversely, men encounter significant, albeit different, challenges (Stern et al. 2022). As primary earners in many cultures, men face economic and psychological strain when climate change disrupts male-dominated livelihoods such as agriculture, fishing, or herding. The loss of income, unemployment, and resource scarcity can adversely affect their mental health and sense of self, particularly in societies where masculinity is closely tied to land ownership and economic provision (Nath et al. 2025). Recent research by Prati et al. (2022) in the Mahanadi Delta of India indicates that migration driven by climate change is altering family dynamics, with women facing the brunt of the impact. When the male member of the family migrates for work, women are expected to perform dual responsibilities, including caregiving and livelihood roles. This gives women decision-making power temporarily. However, this independence erodes with the return of the men, resulting in increased psychological distress for women. Furthermore, the loss of mangroves, erosion of coastlines, and increased flooding due to environmental decline diminish resources, which in turn restrict women's capacity to adapt to evolving circumstances.

In South Africa, average temperatures have increased by 1.5°C over the last 50 years, impacting groundwater, biodiversity, and agriculture. Since 61% of South African women rely on rain-fed agriculture, they are particularly vulnerable to its effects (Hlahla et al. 2022). Bangladesh ranked 9th in the 2024 World Risk Index, frequently experiences cyclones, such as Sidr (in 2007), Aila (in 2009), and Amphan (in 2020), which have led to salinity intrusion, waterlogging, food insecurity, and displacement. Such events have prompted significant male migration, leaving women - often widowed, divorced, or abandoned - as heads of households. Many of these women survive on modest incomes (USD 12.25-41.17) through work in shrimp farm

fisheries or by migrating seasonally for labour (Rahman et al. 2025). A similar trend was observed in KwaZulu-Natal, where climate change impacted all impoverished groups reliant on natural resources, but the gendered roles presented different experiences in terms of shared burden and coping mechanisms (Dankelman et al. 2008, Shefer et al. 2008). This research highlights the crucial need to integrate gender-sensitive approaches into climate and migration policies, recognizing that women are not merely victims but also key agents in building resilience and driving transformation. Therefore, climate adaptation plans should address the unique vulnerabilities associated with gender by providing women in climate-affected regions with access to resources, opportunities for decision-making, and essential services.

THE WAY FORWARD

Climate change intensifies gender disparities but also offers an opportunity to challenge entrenched norms. Gendered vulnerabilities in the face of climate change underscore the urgency of centering women in climate action (Fig. 1). Socio-cultural and structural inequalities are exacerbated during environmental crises, necessitating gender-responsive strategies. A Climate Action Plan (CAP), while designed to serve entire populations, is most effective when it acknowledges gender-specific impacts and adaptive capacities (Constantino et al. 2022, Zhang et al. 2024). Women, especially in rural and indigenous settings, manage critical natural resources and possess valuable ecological knowledge. Their inclusion in CAPs is vital to designing effective local responses. Ignoring their contributions not only deepens inequality but weakens climate resilience efforts (Upadhyay 2005). A gender-responsive approach ensures equitable access to resources, empowers women, and engages men in transforming unjust systems.

CONCLUSIONS

Climate change impacts are not gender-neutral. Women and marginalized groups often bear a disproportionate burden due to existing social, economic, and cultural inequalities. Ignoring the

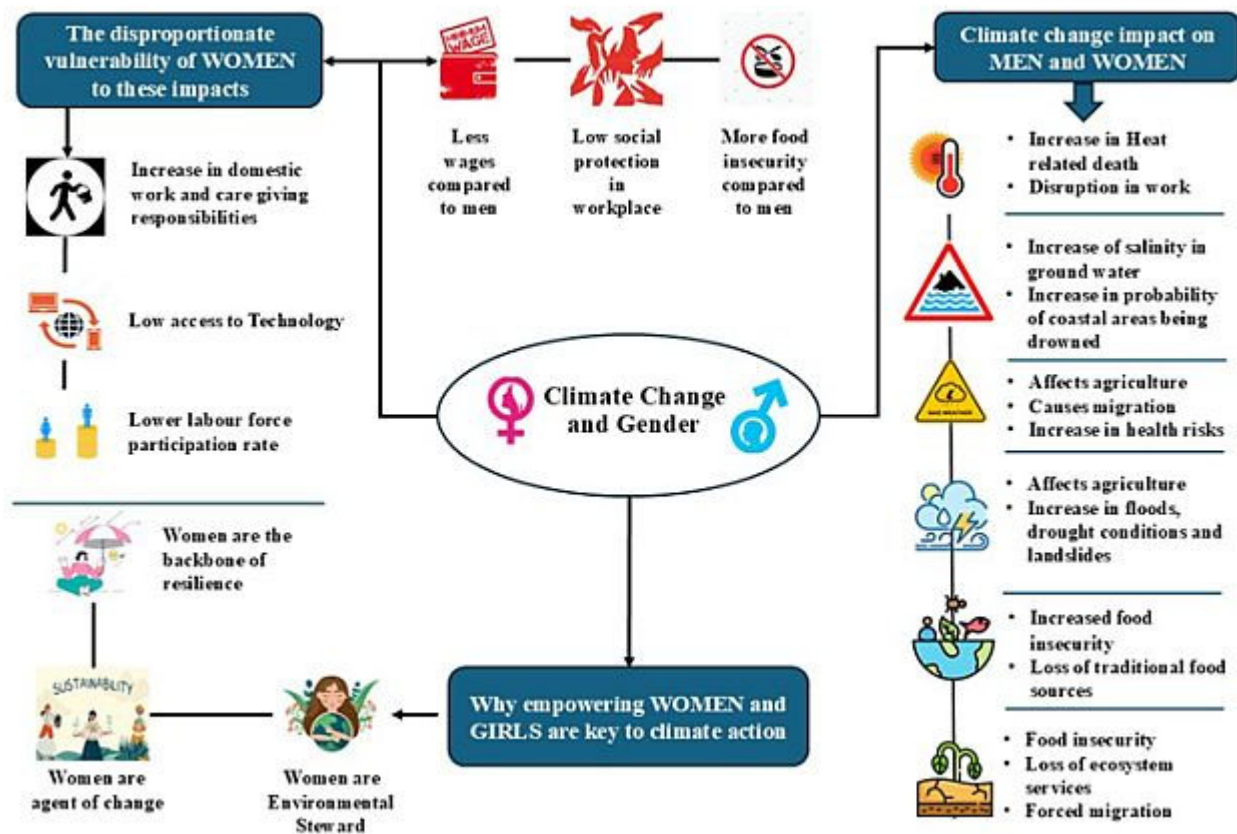


Figure 1. Impact of climate change on women and their role in climate mitigation

gendered dimensions of climate change risks reinforcing these disparities and undermines the overall effectiveness of climate policies and programs. To promote equity, resilience, and sustainable outcomes, it is essential to implement inclusive and gender-responsive climate strategies. These approaches acknowledge the distinct vulnerabilities, needs, and capacities of all genders, ensuring that no group is left behind in the design and implementation of climate solutions.

Authors' contributions: All authors contributed equally.

Conflict of interest: Authors declare no conflict of interest.

REFERENCES

- Arvind, L. 2024. Theoretical Crosscurrents, Intersectional Inquiries: Examining Gender and Tribal Vulnerability in Disaster Studies. *Oxford Research Encyclopedia of Natural Hazard Science*. <https://oxfordre.com/naturalhazardscience/view/10.1093/acrefore/9780199389407.001.0001/acrefore-9780199389407-e-536> (Retrieved 30 April 2025)
- Babugura, A., Mtshali, N., and Mtshali, M. 2010. Gender and climate change: South Africa case study. Heinrich Böll Stiftung, Cape Town, South Africa. 74 pages. https://www.boell.de/sites/default/files/assets/boell.de/images/download_de/ecology/south_africa.pdf
- Bey, S., Thabab, A., Basumatary, P., Hazarika, A., Nath, A., Das, A. K., & Nath, A. J. (2025). Dying Traditional Water Harvesting Systems in the Indian Himalayan Region: Historical Significance, Current Challenges, and Potential Solutions. *International Journal of Ecology and Environmental Sciences*. <https://doi.org/10.55863/ijees.2025.0682>
- Constantino, S.M., Sparkman, G., Kraft-Todd, G.T., Bicchieri, C., Centola, D., Shell-Duncan, B., Vogt, S. and Weber, E.U. 2022. Scaling up change: A critical review and practical guide to harnessing social norms for climate action. *Psychological Science in the Public Interest*, 23(2), 50-97. <https://doi.org/10.1177/15291006221105279>
- Dankelman, I., Alam, K., Ahmed, W.B., Gueye, Y.D., Fatema, N. and Mensah-Kutin, R. 2008. Gender, climate change and human security: Lessons from Bangladesh, Ghana and Senegal Report prepared for ELIAMEP, Women's Empowerment and Development Organisation (WEDO), Brooklyn, NY, USA 73 pages. <https://wedo.org/wp-content/uploads/hsn-study-final-may-20-2008.pdf>

- Hlahla, S., Simatele, M.D., Hill, T., and Mabhaudhi, T. 2022. Climate–urban nexus: a study of vulnerable women in Urban Areas of KwaZulu-Natal Province, South Africa. *Weather, Climate, and Society*, 14(3), 933-948. <https://doi.org/10.1175/WCAS-D-20-0180.1>
- Islam, M.S., Sarker, M.F.H., Ehsan, S.M.A and Sohel, M.S. 2025. Rethinking women empowerment in rural Bangladesh: Male out-migration, left-behind wives, and changing gender roles. *Social Sciences & Humanities Open*, 11, 101425. <https://doi.org/10.1016/j.ssaho.2025.101425>
- Jain, C., Saxena, D., Sen, S. and Sanan, D. 2023. Women's land ownership in India: Evidence from digital land records. *Land Use Policy*, 133, 106835. <https://doi.org/10.1016/j.landusepol.2023.106835>
- Kreutzer, W., Millerd, C. and Timbs, N. 2023. Disasters and the diminishing of women's economic empowerment. *Disasters*, 47(4), 891-912. <https://doi.org/10.1111/disa.12582>
- Malhi, Y., Franklin, J., Seddon, N., Solan, M., Turner, M.G., Field, C.B., and Knowlton, N. 2020. Climate change and ecosystems: threats, opportunities and solutions. *Philosophical Transactions of the Royal Society B*, 375(1794), 20190104. <https://doi.org/10.1098/rstb.2019.0104>
- Nath, A., Nath, A.J. and Sileshi, G.W. 2025. Can agroforestry alleviate climate change-induced mental health issues? *International Journal of Ecology and Environmental Sciences* 51. (3), 283-285. <https://doi.org/10.55863/ijees.2025.0725>
- Nosheen, M., Iqbal, Jand Ahmad, S. 2023. Economic empowerment of women through climate change mitigation. *Journal of Cleaner Production*, 421, 138480. <https://doi.org/10.1016/j.jclepro.2023.138480>
- Prati, G., Cazcarro, I and Hazra, S. 2022. Gender dimensions of the migration, sustainability and care nexus: The case study of the Mahanadi Delta, India. *Current Research in Environmental Sustainability*, 4, 100104. <https://doi.org/10.1016/j.crsust.2021.100104>
- Putsoane, T., Bhanye, J. and Matamanda, A. 2024. Extreme weather events and health inequalities: Exploring vulnerability and resilience in marginalized communities. *Developments in Environmental Science*, 15, 225-248. <https://doi.org/10.1016/B978-0-443-21948-1.00011-X>
- Rahman, S., Yusoff, S.Y. and Dali, M.M. 2025. Women's agility in coping with cyclone and cyclone-induced hazards: a case study on female-headed households in coastal Bangladesh. *Planning Malaysia*, 23(2), 36. <https://doi.org/10.21837/pm.v23i36.1738>
- Shefer, T., Crawford, M., Strelbel, A., Simbayi, L.C., Dwadwa-Henda, N., Cloete, A., Kaufman, M.R. and Kalichman, S.C. 2008. Gender, power and resistance to change among two communities in the Western Cape, South Africa. *Feminism & Psychology*, 18(2), 157-182. <https://doi.org/10.1177/0959353507088265>
- Stern, N., Stiglitz, J. and Taylor, C. 2022. The economics of immense risk, urgent action and radical change: towards new approaches to the economics of climate change. *Journal of Economic Methodology*, 29(3), 181-216. <https://doi.org/10.1080/1350178X.2022.2040740>
- Upadhyay, B. 2005. Women and natural resource management: Illustrations from India and Nepal. *Natural Resources Forum*, 224-232 <https://doi.org/10.1111/j.1477-8947.2005.00132.x>
- Zhang, M., You, S., Yi, S., Zhang, S. and Xiao, Y. 2024. Vulnerability of poverty between male and female-headed households in China. *Journal of Family and Economic Issues*, (in press). <https://doi.org/10.1007/s10834-024-09969-5>

Received: 11th May 2025

Accepted: 9th July 2025