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Title: India's Urban Climate Crisis is Affecting Invisible Victims of Gender Inequality

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Abstract
As India undergoes rapid urbanization and a growing climate emergency, a gendered lens can be used to view the deepening of structural inequalities. Women in informal settlements and the unorganized workforce are particularly affected by urban climate events like heatwaves, floods, and water scarcity. This study examines how climate crises interact with gender to increase vulnerabilities related to health, safety, livelihood, and mobility in urban India through secondary sources. In light of the shortcomings in urban planning missions, disaster response, and climate governance, this paper advocates for an intersectional and inclusive approach to climate resilience. The study aligns with Sustainable Development Goals (SDGs), 5, 11, and 13, which require a significant change in policy to protect the unseen victims of India's urban climate crisis.

Keywords: gender inequality, urban climate crisis, heatwaves, floods, informal sector, India, SDG 5, and urban governance.

1. Introduction

India's cities are both a symbol of economic growth and modernization, but they also are facing some of the country's most critical climate-related challenges. Urban India is facing a complex and interconnected set of environmental threats, which include deadly heat waves and flash floods, seasonal water crises, and chronic air pollution. The gendered impact of these crises is still not well-understood by policy discourse. The effects of pre-existing social, economic, and spatial disadvantages are more severe for urban women, especially those from low-income, Dalit, and minority communities. Climate shocks are not only caused by direct exposure to environmental stressors, but also by structural barriers like lack of access to health care, water, sanitation, and social protection.

This paper aims to assess how India's ongoing urban climate crises affect gender disparities and how governance structures can help address them.

2. India is facing challenges related to urban climate

2.1 Heatwaves and Urban Heat Islands

The past two years have seen a significant increase in the frequency and intensity of heatwaves in Indian cities, which indicates a clear change in climate patterns. According to the India Meteorological Department (IMD), Delhi, Nagpur, and Ahmedabad suffered the most from the 200 days of heatwave

conditions in 2023. These cities experienced prolonged periods of high temperatures that had an impact on health infrastructure and daily life in informal settlements, particularly during May and June (IMD Annual Climate Summary, 2023).

In 2024, the crisis worsened. Rajasthan had the most extreme temperature recorded in India that year, registering 50.5°C between mid-May and late May, as confirmed by IMD in northwest and central India. Between May 27 and May 29, 2024, Delhi was subjected to extreme heat, with multiple weather stations reporting temperatures above 45°C. The IMD later stated that the temperature reported at Mungeshpur station in Delhi was likely due to a sensor error, which caused significant media attention.

The UHI effect amplifies these extreme temperatures, particularly in high-density, low-income neighborhoods with limited vegetation and poor ventilation. UHI results in urban areas being significantly warmer than their surrounding rural zones, which increases the physiological stress on residents during heatwaves.

Women in informal sectors, such as domestic workers, construction laborers, and street vendors, are disproportionately burdened. Outdoor and mobile work environments lack adequate protection for extreme temperatures. The absence of hydration, rest areas, and cooling mechanisms heightens their vulnerability to heatstroke, dehydration, and chronic fatigue. **Pregnant and lactating women are at higher risk of complications such as pre-term labor and cardiovascular stress due to high temperatures.**

Further compounding the crisis, **India reported over 40,000 suspected heatstroke cases and at least 219 confirmed deaths due to heat-related illnesses by late May 2024**, as per official figures from the Ministry of Health and Family Welfare (May 2024 bulletin).

These figures highlight the urgent need to integrate gender-responsive strategies into heat action plans and urban climate resilience frameworks.

2.2 Urban Floods and Water Scarcity

Poor drainage, unplanned urbanization, and erratic climate patterns are the reasons why India's urban centers experience recurring flooding and seasonal water scarcity. These environmental stressors are particularly affecting women in low-income settlements, particularly in their roles as caregivers and water managers.

Over 41,000 people were displaced due to heavy rainfall in Chennai caused by Cyclone Michaung in December 2023, along with widespread power outages and transportation shutdowns (NDMA, 2023; IMD, 2023). According to the Times of India, Mumbai experienced its highest pre-monsoon rainfall in 107 years in May 2024, resulting in flooding in new areas beyond traditional waterlogging zones. Severe urban flooding occurred in Bengaluru and Guwahati during the pre-monsoon and monsoon months, causing the undermining of critical infrastructure and the launch of rescue operations (IMD, 2024; TOI, 2024).

Women who were impacted reported being unable to move around due to flooded access routes to schools, workplaces, and healthcare centers. Public relief shelters without safe and private sanitation are more likely to experience gender-based violence and reproductive health complications (UN Women India, 2022).

At the same time, there has been a rise in the problem of water shortage. Informal settlements in Delhi, including Vivekanand Camp, faced acute shortages during the June 2024 heatwave, and residents relied on overburdened water tankers (Le Monde, 2024). According to a 2024 report by the Praja Foundation in

Mumbai, slum dwellers get only 45 liters per person per day, well below the national standard of 135 liters per person, which is why they depend on private vendors.

Women may experience more poverty and physical stress due to the responsibility of sourcing water from unsafe or distant sources. This has an effect not only on household health, but also on women's economic participation and girls' attendance in school.

3. Gendered Dimensions of Urban Climate Impact

3.1 Health and Sanitation

Urban poor women in India who lack reproductive healthcare and sanitation are more vulnerable to health risks during climate-induced disasters. Despite the National Family Health Survey-5 (2019-2021) reporting a 77% increase in the usage of hygienic menstrual methods nationwide, there are still significant disparities between states and socioeconomic groups (IIPS & ICF, 2021).

Flooding and contaminated water sources increase the likelihood of urinary tract infections, diarrhea, and menstrual health issues occurring in slums and overcrowded relief shelters. In these environments, women have to use unsafe public sanitation facilities, which can lead to reproductive tract infections and maternal complications (UN Women, 2022; MedRxiv, 2024).

In cities like Mumbai, over 50% of women in informal settlements report using shared community toilets that are frequently in disrepair, overcrowded, or closed at night—conditions that pose not only health hazards but also safety risks (Praja Foundation, 2024).

The lack of female representation in local sanitation planning leads to gender-insensitive infrastructure that fails to meet women's basic hygiene needs, especially during climate emergencies.

3.2 Safety and Mobility

The cause of climate-related disasters is often gender-based violence (GBV), particularly in urban, low-income settings. Women who travel through waterlogged areas or reside in temporary shelters are more susceptible to sexual assault, theft, and domestic violence. The NCRB reported that India had 445,256 cases of women's crimes, a 4% increase from 2021. According to the NCRB, Delhi had the highest reported rate of 144.4 cases per 100,000 women (NCRB, 2022).

Due to floods or cyclones, women frequently find themselves relocated to overcrowded camps or shelters that lack adequate lighting, security, and private sanitation. Unsafe environments are created by these conditions, resulting in an increase in vulnerability to violence and exploitation (UN Women, 2022). Past disaster contexts, such as post-Cyclone Fani (2019) and the Chennai floods (2015), have reported similar patterns of increased domestic abuse and reduced police accessibility for women (Iyer et al., 2021).

Women's mobility is hindered by environmental hazards like heatwaves and floods, which prevents them from participating in education, employment, and public life. Due to caregiving duties and social safety concerns, women are more likely to stay indoors during climate emergencies, which can result in gendered social isolation and economic dependency (UNDRR, 2022).

3.3 Livelihoods and Economic Insecurity

Many urban women in India work in the informal sector, which is highly vulnerable to climate extremes. Contracts, benefits, or insurance are often lacking for women who work as domestic workers, street vendors, or in home-based enterprises. Their daily income is disrupted by climate events such as floods and heatwaves, and there are no formal safety nets in place.

85% of women in Ahmedabad's informal settlements experienced income loss due to extreme heat events, as found in a study by Mahila Housing SEWA Trust in 2020. In response, MHT and SEWA piloted heat-

linked insurance schemes, which in 2024 provided payouts to over 46,000 women across Rajasthan and Gujarat during recorded heatwaves, helping offset income disruption and build resilience (MHT, 2020; Reinsurance News, 2024).

These examples highlight gender-responsive climate adaptation policies that prioritize social protection for informal women workers.

4. Governance Frameworks: Analysis and Gaps

4.1 Smart Cities and AMRUT Missions

Both missions' gender-neutral approach neglects the specific needs of women, particularly when it comes to mobility, safety, and caregiving.

Assessing differential impacts on women is difficult due to the lack of gender-distributed data in reports.

Tokenism in safety and sanitation often limits women's safety and sanitation to symbolic measures such as installing a few toilets or lights, without addressing the root issues.

Decision-making bodies like SPVs and city forums are dominated by women, especially those from informal settlements. Smart City designs fail to provide secure workplaces, childcare, and sanitation for urban women in the informal sector because of neglect. Climate planning that is gender-blind neglects the increased vulnerability of women during floods, heatwaves, and displacement.

Smart solutions that often exclude digitally illiterate or poor women can exacerbate the digital divide in service access. The ability to address or measure gender inequality is limited because neither mission mandates gender-based audits.

4.2 National Disaster Management Framework

The NDMA advises on heatwaves and floods do not provide specific protocols for women's specific vulnerabilities, such as caregiving roles, mobility constraints, and health needs. Inadequate relief infrastructure can result in the lack of separate toilets, bathing spaces, and secure shelters for women, increasing the risks of sexual harassment and compromising dignity. Digital illiteracy and the lack of access to mobile phones or radios often prevent women, especially those in marginalized communities, from receiving emergency alerts and advisories. Limited female representation in disaster planning and response teams can lead to blind spots in needs assessment and priority of response. Disaster response plans often fail to include menstrual hygiene kits or reproductive health services, which can have an impact on women's health during crises. NDMA's risk mapping does not disaggregate data by gender, which fails to identify which groups are most at risk and why.

4.3 Budgeting and Institutional Inclusion

The Ministry of Finance's Gender Budget Statements show that women-specific components in urban development and climate adaptation are not being given enough funding, frequently being under 5% of total allocations. Tokenistic inclusion results in women-focused schemes in urban planning being added-Ons instead of integrated components, which leads to limited impact and fragmented implementation. Top-down policies that ignore ground realities occur when women from marginalized communities are excluded from decision-making in urban local bodies, planning commissions, and climate task forces. An institutional mechanism is not used to evaluate the effectiveness of allocated gender budgets in achieving tangible outcomes for urban women. The lack of gender desks or trained personnel in most urban bodies to design, implement, or monitor gender-responsive policies hinders institutional accountability. Budgeting frameworks do not take into account intersecting identities like caste, disability, and livelihood status, which further marginalizes vulnerable women.

5. Case Studies

5.1 Ahmedabad's Heat Action Plan

The Mahila Housing SEWA Trust and Natural Resources Defence Council helped Ahmedabad implement a Heat Action Plan (HAP) in 2013. However, there are still inconsistencies in the implementation. The effectiveness of the plan is limited by the fact that women in informal settlements often lack mobile phones and access to early warning messages.

5.2 Mumbai Floods

Flood-prone areas, like the Mithi River slums, experience annual devastation. Stress and displacement lead to the consequences of losing access to maternal health care, wading through water to obtain food or water, and experiencing an increase in domestic violence.

5.3 Chennai's Water Crisis

The dryness of Chennai's reservoirs in 2019 led to a severe water crisis According to their accounts, women from low-income households walk more than 2 km every day to obtain water. Their health, the education of girls, and informal economic activities such as tailoring or home-based food businesses were affected by this.

6. Recommendation

1. **Mainstream Gender into Urban Climate Policy**

- Ensure that all urban climate strategies include gender-based vulnerability assessments, with the assistance of disaggregated data.
- The Smart Cities and AMRUT schemes require gender impact evaluations for infrastructure projects.
- Make sure that infrastructure plans that cover transport, housing, sanitation, waste, and energy reflect the specific needs of women, especially in underserved areas.

2. **Design Gender-Responsive Resilience Infrastructure**

- Urban infrastructure should ensure safety, dignity, and inclusiveness through:

Streets and public spaces that are both well-lit and secure
Facilities for public sanitation that are accessible and gender-sensitive
Assisting with emergency shelters that provide menstrual and reproductive care
Safe and monitored water points in informal communities

- Encourage the development and maintenance of eco-friendly infrastructure, such as green roofs and parks, with the active participation of women.

3. **Empower Community-Based Women's Leadership**

- Integrate women's self-help groups (SHGs), grassroots women's networks, and community-based organizations in a formal manner.

Boards that are accountable for urban planning and disaster risk management
Development and oversight of early warning systems.
Participants conducted risk identification and local mapping exercises

- Ensure that reserved representation is given to women from marginalized communities in city-level governance and citizen forums.

4. **Expand Safety Nets for Informal Women Workers**

- Acknowledge and integrate women into informal sectors.

Insurance for urban health and climate change and disasters.
Programs that provide emergency aid and food.

The ability to participate in public employment initiatives after a disaster

- Ensure that domestic workers, home-based entrepreneurs, and vendors have protection and workspace security.

5. Build Institutional Gender Capacity

- Create gender-specific units for municipal bodies, Smart City institutions, and disaster management agencies.
- Schedule gender-sensitive workshops for civic officials, planners, and first responders.
- Implement gender-based budgeting frameworks in urban climate interventions, with built-in monitoring and audit mechanisms.

6. Enhance Digital Access and Civic Communication

- Use SMS, women-friendly apps, and community radio broadcasts to ensure that early warning messages reach all women.
- Develop digital education programs to enhance women's access to technology and participation in smart urban initiatives.

7. Monitor with Gender-Specific Tools

- Create and implement indicators that are gender-specific to assess the results of resilience programs.
- Using social audits and gender report cards, evaluate service delivery and disaster preparedness.
- Provide support for data systems that are accessible and display gender-distributed statistics for transparency and policy correction.

8. Legal and Policy Enhancements

- Suggest a comprehensive national policy that addresses gender equality and urban climate resilience, in accordance with SDG 5 (Gender Equality) and SDG 11 (Sustainable Cities).
- Change the Disaster Management Act (2005) to include gender equality in planning, implementation, and relief.
- Make sure that urban governance frameworks uphold constitutional safeguards for women, particularly those who are vulnerable to climate displacement or exclusion.

7. Conclusion

The urban climate crisis in India doesn't affect everyone equally. The most severe consequences of it are being felt by women, especially those from poor, marginalized, or informal communities. The gender inequalities that women face on a daily basis, like limited access to healthcare and education and unsafe public spaces, are magnified during climate-related events such as heatwaves, floods, and water shortages. Disasters make it even more challenging for women to access safety, clean water, healthcare, or income security due to these existing struggles. Moreover, these effects are not exclusive to women alone. Their offspring, specifically girls, are also affected in a disproportionate way. When resources become scarce, girls are often the first to quit school. Domestic responsibilities are borne by them during crises, and they are at a higher risk of exploitation and abuse in unsafe and overcrowded shelters. Indian cities are making progress in urban planning, but many are still failing to address the gendered realities of urban life. Women's health, safety, mobility, and caregiving duties are still not taken into account when designing infrastructure and services. Essential gender-sensitive support—such as clean and accessible public toilets, menstrual hygiene facilities, safe public transportation, and secure shelters—is often entirely missing, and during disasters, these gaps become even more severe, deepening the vulnerability of women and girls.

The failure is a result of the lack of women's representation in urban planning, governance, and decision-making processes.

To guarantee the sustainability and resilience of Indian cities, urban climate governance must prioritize gender equity. It is important for women to become actively involved in shaping the systems that affect their lives, not just as recipients of aid or support. The voices of marginalized women must be taken into account when creating policies, data frameworks, and implementation strategies.

Addressing the climate crisis and building just and inclusive cities are not two separate goals. They are deeply interconnected. By prioritizing gender in climate adaptation and urban development policies, India can develop cities that are both climate-resilient and socially just, inclusive, and truly habitable for all.

Table 1: Summary of Gendered Climate Impacts in Urban India

Climate Event	Gendered Impact	Affected Groups
Heatwaves	Outdoor work conditions can increase the risk of pregnancy and job loss due to dehydration.	Women in the informal sector (e.g., street vendors, laborers).
Flooding	Gender-based violence (GBV) and exposure to infections are both exacerbated by the deficiency of sanitation.	The population of women and girls who reside in slums, shelters, and refugee camps.
Water Scarcity	Missed work/school and health issues can result from long walks to collect water.	Women and girls with low incomes who attend school.
Storms and cyclones	The loss of identity documents and access to welfare schemes is a consequence of displacement.	Households that are headed by females include widows, single women, and households.
Heat islands in urban areas	Poor housing exacerbates indoor heat stress and increases domestic burdens.	Women who live in crowded housing and informal settlements.
Drought	Food insecurity leads to undernutrition and adverse maternal health outcomes.	Rural and urban areas have women who are pregnant and lactating.
Landslides	The vulnerability to trafficking and exploitation increases when shelter is lost.	Girls and women were relocated to hilly urban areas.
Air Pollution	Aggravated respiratory diseases affect the health of unborn children and mothers.	Urban areas with low-income, pregnant women, and children.
Contaminated Water	Increases the risk of urinary and reproductive infections; obstructs menstrual hygiene.	Clean toilets are not accessible to adolescent girls and women.

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