

CLIMATE CHANGE, CARE WORK, AND CULTIVATION: THE INVISIBLE BURDEN ON FARMER WOMEN IN INDIA – A STUDY

Chayadevi .E

Research Scholar

Centre for Women's Studies, Bangalore University, Bengaluru

C. Somashekher

Dean and Director

Centre for Women's Studies, Bangalore University, Bengaluru

ABSTRACT

Climate change poses one of the most significant threats to agrarian livelihoods in India, disproportionately affecting farmer women who constitute a substantial yet structurally marginalized segment of the agricultural workforce. This paper examines the gendered impacts of climate variability across diverse agro-ecological regions of India, including drought-prone, flood-affected, coastal, and tribal regions. Drawing upon secondary climate data, agrarian reports, state-level case studies, and feminist theoretical frameworks, the study argues that climate vulnerability among farmer women is socially constructed through intersecting axes of gender, caste, class, and land ownership patterns. Using Feminist Political Ecology, the Capability Approach, and Standpoint Theory, the research highlights how structural inequalities limit women's adaptive capacity while simultaneously positioning them as key agents of ecological resilience. The paper identifies increased labor burdens, income insecurity, health risks, feminization of agriculture, and exclusion from institutional support systems as primary consequences of climate stress. It concludes by advocating for gender-responsive climate governance, land reforms, inclusive financial mechanisms, agroecological transitions, and decentralized participatory adaptation frameworks. Addressing climate change in India requires not only environmental interventions but structural transformation rooted in climate justice and gender equity.

Keywords: Climate change, farmer women, India, gender inequality, agrarian crisis, Feminist Political Ecology, climate justice, adaptation

INTRODUCTION:

India's agricultural economy remains highly climate-sensitive. Nearly half of cultivated land is rain-fed, and a majority of small and marginal farmers depend directly on monsoon rainfall. In recent decades, India has experienced rising average temperatures, erratic monsoon patterns, prolonged droughts, intensified floods, cyclonic disturbances, and increased frequency of extreme weather events. These environmental shifts have profound implications for agricultural productivity, rural employment, and food security. However, climate change is not experienced uniformly. Its impacts are mediated through existing social hierarchies and structural inequalities. Among the most affected are farmer women cultivators, agricultural laborers, livestock managers, seed preservers, and household food managers whose contributions are indispensable yet undervalued.

Women represent approximately one-third of agricultural workers in India, with even higher participation in rain-fed and subsistence farming regions. Yet only a small percentage of women possess formal land titles. This structural exclusion from property ownership directly affects access to credit, irrigation, insurance, subsidies, and extension services. The

feminization of agriculture driven by male migration to urban areas has increased women's agricultural responsibilities without corresponding increases in decision-making authority or institutional recognition. Climate change intensifies this imbalance by amplifying agrarian risks while leaving women with fewer safety nets.

This study aims to:

1. Examine the gendered dimensions of climate change impacts on farmer women across India.
2. Analyze structural determinants of vulnerability.
3. Explore adaptive strategies emerging from grassroots experiences.
4. Develop policy recommendations rooted in gender justice and climate equity.

Climate Change and Indian Agriculture: Structural Context:

India's agrarian system operates within fragile ecological parameters:

- Dependence on the southwest monsoon.
- Over-extraction of groundwater.
- Declining soil fertility.
- Fragmented landholdings.
- Limited irrigation coverage in several states.

Climate trends show:

- Increasing mean temperatures across central and northern India.
- Delayed onset and uneven distribution of monsoon rainfall.
- More intense short-duration rainfall leading to flooding.
- Rising frequency of heat waves.
- Increased incidence of pest attacks linked to climatic shifts.

These environmental changes affect crop cycles, sowing patterns, yield stability, and livestock health. Smallholder's especially women-managed farms face heightened exposure due to limited technological buffers.

The agrarian crisis in India is thus both climatic and structural. Climate change interacts with market volatility, input cost inflation, indebtedness, and land fragmentation, compounding vulnerability.

LITERATURE REVIEW:

- **Gender and Agrarian Structures in India:** Scholars have long documented that women's agricultural labor is systematically undervalued. Gendered division of labor assigns women labor-intensive, low-recognition tasks such as transplanting, weeding, harvesting, fodder collection, and post-harvest processing.

Despite significant contributions:

- Women rarely control farm income.
- Access to mechanization is limited.
- Agricultural training programs predominantly target male farmers.

- Extension services often exclude women due to mobility and social norms.

This structural marginalization reduces adaptive capacity during climate stress.

- **Gendered Impacts of Climate Change:** Research across South Asia demonstrates that climate change intensifies:

- Time poverty
- Nutritional deprivation
- Health risks
- Economic insecurity
- Gender-based violence during displacement

Women often act as “shock absorbers” during crises, sacrificing nutrition and rest to maintain household stability.

Climate impacts thus intersect with reproductive labor, unpaid work, and care responsibilities.

- **Feminization of Agriculture:** Male migration due to agrarian distress has increased women’s managerial roles in agriculture. However, this feminization remains incomplete because:

- Land titles remain male-dominated.
- Credit systems prioritize male ownership.
- Policy frameworks treat farmers as male by default.

Thus, women bear responsibility without authority a structural contradiction intensified by climate change.

Theoretical Framework: This study integrates three complementary frameworks:

- **Feminist Political Ecology:** Feminist Political Ecology examines how environmental change interacts with power structures, gender norms, and resource access. It argues that ecological degradation cannot be understood outside social hierarchies.

In the Indian context:

- Access to water, land, and forests is gendered.
- Environmental degradation redistributes labor burdens.
- Climate policy often neglects gendered knowledge systems.

Thus, vulnerability emerges not from climate alone but from unequal access to ecological resources.

- **Capability Approach:** The Capability Approach conceptualizes development as expansion of freedoms and opportunities. Climate change constrains women’s capabilities by:

- Reducing food security.
- Increasing health risks.
- Limiting income opportunities.
- Restricting mobility and participation.

Adaptive capacity depends on enhancing capabilities, not merely technological fixes.

- **Standpoint Theory:** Standpoint Theory argues that marginalized groups possess epistemic privilege derived from lived experience. Farmer women's experiential knowledge of seeds, soil, water cycles, and biodiversity provides critical insights for climate adaptation. However, policy structures rarely incorporate this standpoint knowledge. Climate governance must therefore democratize knowledge production.

Methodology:

This research employs a qualitative-dominant integrative design combining:

- Secondary analysis of climate projections and agricultural data.
- Review of government reports and national surveys.
- Comparative synthesis of documented field-based studies.
- Thematic analysis of case-based narratives from drought, flood, coastal, and tribal regions.

The approach enables macro-level analysis while retaining gendered experiential dimensions.

FINDINGS: GENDERED IMPACTS OF CLIMATE CHANGE ON FARMER WOMEN IN INDIA:

This section integrates macro-level secondary evidence with synthesized qualitative narratives representing field-based patterns across diverse agro-climatic zones.

1. Intensification of Agricultural Labor and Time Poverty: One of the most consistent findings across regions is the intensification of women's labor burden. Climate variability alters agricultural cycles in multiple ways

- Delayed monsoons require repeated sowing.
- Irregular rainfall increases weed growth, requiring additional manual weeding.
- Drought conditions necessitate longer irrigation hours where possible.
- Livestock require additional fodder collection due to pasture degradation.

Women reported spending significantly more time on:

- Water collection (in drought-prone areas).
- Crop monitoring and replanting.
- Fodder and fuel wood collection.
- Household food management during scarcity.

In semi-arid regions of Maharashtra and Rajasthan, respondents described walking 3–5 kilometers daily for water during peak summer. This unpaid labor expansion reduces time available for income-generating activities, participation in extension programs, and rest. Time poverty becomes a critical dimension of climate vulnerability.

2. Economic Insecurity and Debt Cycles: Erratic rainfall and crop failure reduce household income stability. Smallholder women farmers are particularly vulnerable because

- They lack land titles required for institutional credit.
- Compensation schemes for crop loss often exclude non-registered cultivators.

- Crop insurance enrollment remains low among women.

In drought-prone districts of Maharashtra, studies show increased reliance on informal moneylenders during consecutive drought years. Women frequently join self-help groups (SHGs) to access microcredit, but loan burdens can intensify during repeated climate shocks. The feminization of debt parallels the feminization of agriculture.

3. Food and Nutritional Impacts: Climate change reduces food availability and diversity. Women, as primary household food managers, often adjust consumption patterns

- Reduction in protein intake.
- Increased dependence on cereals.
- Skipping meals during scarcity periods.

National nutrition surveys indicate high prevalence of anemia among rural women. Climate-induced food insecurity exacerbates micronutrient deficiencies.

Women's bodies thus become sites where climate crisis materializes biologically.

4. Health Implications: Heat waves and extreme temperatures disproportionately affect women engaged in manual agricultural labor. Observed impacts include

- Heat exhaustion.
- Dehydration.
- Reproductive health complications.
- Increased musculoskeletal strain.

Water scarcity also compromises sanitation and menstrual hygiene management in rural areas, adding hidden burdens.

5. Migration and Changing Gender Roles: Male out-migration due to agrarian distress is increasing across states like Bihar, Odisha, and Uttar Pradesh. Women assume expanded responsibilities as de facto farm managers.

However:

- Decision-making power remains limited.
- Access to machinery and markets remains male-dominated.
- Institutional actors often continue engaging absent male heads.

This creates a paradox: women perform managerial roles without formal recognition.

State-wise Comparative Case Studies:

To understand regional diversity, this section compares climate impacts across different ecological zones.

MAHARASHTRA (DROUGHT AND AGRARIAN DISTRESS):

Vidarbha and Marathwada regions experience recurrent droughts. Rain-fed cotton farming is highly climate-sensitive.

Impacts on women:

- Increased re-sowing costs.
- Higher fodder scarcity.

- Intensified debt cycles.
- Psychological stress linked to agrarian crisis.

Widowed women farmers face additional marginalization in land inheritance disputes.

- **Bihar and Assam (Flood-Prone Regions):**

Floods cause crop submergence, soil erosion, and displacement.

Women experience:

- Temporary shelter insecurity.
- Increased care responsibilities during displacement.
- Heightened vulnerability to violence in relief camps.
- Loss of kitchen gardens critical for nutrition.

Climate shocks disrupt both production and social safety.

- **Odisha (Cyclones and Coastal Vulnerability)**

Cyclonic events damage paddy fields and fisheries.

Women report:

- Loss of livestock.
- Salinity intrusion reducing soil fertility.
- Increased unpaid reconstruction labor post-disaster.
- Dependence on relief assistance.

Coastal women's vulnerability reflects both environmental and infrastructural fragility.

- **Rajasthan (Desertification and Water Scarcity)**

Rising temperatures and groundwater depletion intensify desertification.

Women spend extended hours fetching water. Girls' education suffers due to domestic responsibilities. Livestock mortality increases, affecting dairy-based income.

Water becomes a gendered axis of climate inequality.

TRIBAL REGIONS (FOREST DEPENDENCY)

In tribal belts of central India, women depend on forest produce.

Climate impacts:

- Reduced availability of minor forest produce.
- Biodiversity loss.
- Increased walking distance for collection.

Forest degradation intersects with indigenous women's livelihood systems.

INTERSECTIONAL DIMENSIONS:

Climate vulnerability is not uniform among women.

Dalit women:

- Often landless laborers.

- Dependent on daily wage agriculture.
- First to lose employment during crop failure.

Adivasi women:

- Depend on forest ecosystems.
- Face displacement due to climate and development projects.

Widowed or single women farmers:

- Face inheritance discrimination.
- Excluded from credit access.

Intersectionality deepens climate injustice.

DISCUSSION:

Climate change in India operates as a multiplier of pre-existing structural inequalities. Feminist Political Ecology reveals that access to ecological resources is mediated by power hierarchies.

The Capability Approach demonstrates how climate shocks restrict women's freedoms:

- Economic security.
- Nutritional adequacy.
- Bodily health.
- Political participation.

Standpoint Theory emphasizes that farmer women's experiential ecological knowledge remains underutilized in climate policy design.

Technocratic adaptation strategies that ignore social hierarchies fail to address root causes.

CONCLUSION:

Climate change in India is not merely an environmental phenomenon; it is a deeply gendered socio-political crisis. Farmer women stand at the intersection of ecological instability and structural inequality. Their vulnerability arises from exposure to climate risks combined with systemic exclusion from land ownership, institutional credit, and policy recognition.

Yet women are not passive victims. They are custodians of seeds, biodiversity, livestock systems, and household food security. Their adaptive practices though constrained represent localized resilience models.

Climate justice demands:

- Redistribution of resources.
- Recognition of women as farmers.
- Integration of grassroots knowledge into climate planning.
- Structural reform in agrarian governance.

Without gender-transformative climate policy, adaptation will remain partial and inequitable. Sustainable agricultural futures in India depend upon centering farmer women's rights, knowledge, and agency.

Empowering farmer women is therefore not only a matter of gender equality but a precondition for national food security and climate resilience.

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