International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Ecological Justice through a Gender Lens: Feminist Political Economy Perspectives from South India

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Abstract

This paper advances a feminist ecological critique, arguing that ecological justice cannot be achieved without gender justice. Drawing on micro-level studies, action research, and case narratives from South India, it shows how climate change, environmental degradation, and neoliberal development disproportionately burden women—particularly those from marginalized caste, class, and occupational locations. Using ecofeminist and feminist political ecology frameworks, it examines sustainable agriculture, WASH, climate ventures, and environmental movements, highlighting persistent gender blind spots. The analysis foregrounds women's labour, indigenous knowledge, reproductive and occupational health, and unpaid care work as central to ecological sustainability. Women's ecological labour continues to subsidize both state and market systems, underscoring the need for structural policy shifts embedding gender justice at the core of ecological governance.

Keywords: Gender Justice; Ecological Justice; Feminist Political Ecology; Sustainable Agriculture; WASH; Climate Change; Women's Labour;

Introduction

Climate change and ecological degradation are not gender-neutral phenomena. While environmental crises affect all, women—especially rural, working-class, Dalit, Adivasi, migrant, and informal-sector women—experience disproportionate burdens due to pre-existing gendered divisions of labour, unequal access to resources, and limited participation in decision-making. As feminist scholars and ecofeminist thinkers argue, the exploitation of nature and the subordination of women are historically and structurally intertwined. Environmental concern in India is not a recent phenomenon. From the Bishnoi movement in the fifteenth century to Chipko, Silent Valley, Narmada Bachao Andolan, and contemporary resistance to extractivist projects, ecological movements have played a critical role in shaping development discourse. Women have been central actors in these struggles—as protectors of forests, water, and livelihoods. Yet, despite women's visibility, gender justice has rarely been articulated as a foundational concern within environmental justice movements. Feminist political economy highlights how capitalism, patriarchy, colonial legacies, and neoliberal consumerism together externalise ecological and social costs onto women's bodies and labour, rendering them simultaneously indispensable and invisible. In India today, climate change intensifies droughts, floods, heat stress, and public health crises, deepening existing social inequalities. This paper critically interrogates whether ecological justice can be realised without confronting gendered power relations and asks how women's everyday ecological labour can be

recognised as central to sustainable futures.This paper (i) foregrounds gender as a constitutive, not peripheral, dimension of ecological justice.(ii) brings together environmental history, feminist political economy, and micro-level empirical evidence. (iii) documents women's often-invisible contributions to sustainable agriculture, WASH, and climate adaptation and (iv) contributes to policy debates by offering gender-just pathways for sustainable development.

Research Questions

1. How do ecological degradation and climate change intersect with gender, caste, and class to shape women's vulnerabilities?
2. To what extent do environmental movements and development interventions integrate gender justice concerns?
3. How do women's everyday practices in agriculture, WASH, and climate ventures contribute to ecological sustainability?
4. What policy and institutional mechanisms are required to align ecological justice with gender justice?

Review of Literature and Research Gap:

Ecofeminist scholarship has long highlighted the structural links between patriarchy, capitalism, and ecological destruction (Shiva 1988; Mies and Shiva 1993; Agarwal 1992, 2010). Feminist political ecology further demonstrates how women's knowledge and labour sustain ecosystems while remaining undervalued within development and conservation regimes (Agarwal 2010, 2018). Studies on climate change consistently point to gender-differentiated impacts on health, livelihood, and mobility (UNFCCC 2023; World Economic Forum 2024). Indian scholarship on environmental change and development documents resistance to displacement, agrarian distress, and resource extraction (Agarwal 2010; Rao 2012; Kannan and Raveendran 2019), but rarely centres women's reproductive health, unpaid care work, or substantive decision-making power. This paper builds on and extends these bodies of work through grounded empirical analysis rooted in feminist political economy

Ecofeminist and feminist political ecology scholarship has made significant contributions to understanding the structural linkages between patriarchy, capitalism, and ecological degradation (Shiva 1988; Mies & Shiva 1993; Agarwal 1992, 2010, 2018). Feminist political ecology, in particular, has illuminated how gendered divisions of labour, unequal access to resources, and institutional power relations shape environmental governance and outcomes. Parallel research on climate change and environmental health has documented gender-differentiated impacts on livelihoods, mobility, and health, including emerging concerns around reproductive and occupational risks (Sen & Östlin 2008; UNFCCC 2023; World Economic Forum 2024). Indian scholarship has also richly documented environmental movements, agrarian distress, displacement, and resistance to extractivist development (Agarwal 2010; Rao 2012; Kannan & Raveendran 2019). Despite this substantial body of work, important analytical and empirical gaps persist, particularly in the Indian context.

First, ecological justice frameworks continue to remain insufficiently integrated with gender justice as a structural concern. While women's participation in environmental movements, community forestry, and climate initiatives is widely acknowledged, gender is often treated as an add-on or instrumental category rather than as constitutive of ecological relations themselves. As a result, women frequently appear in policy and scholarship as environmental stewards, beneficiaries, or victims, without adequate interrogation of how patriarchal power relations shape resource control, labour valuation, and decision-

making within ecological governance. This limits the transformative potential of environmental justice discourses, which often remain gender-blind in practice.

Second, there is a significant gap in attention to women's embodied experiences of ecological degradation, particularly in relation to reproductive health, occupational exposure, sanitation labour, and care burdens. Although public health and environmental studies increasingly recognise the links between pollution, climate stress, and women's health, these concerns remain marginal within mainstream environmental and development policy debates. In the Indian context, women's reproductive morbidity, menstrual health, exposure to chemicals, heat stress, and sanitation-related risks are rarely analysed as central ecological justice issues. This separation of environmental policy from reproductive and occupational health obscures how ecological crises are lived through women's bodies.

Third, existing literature remains heavily skewed towards macro-level policy analysis or sector-specific evaluations, with limited documentation of micro-level, everyday ecological practices undertaken by women. Women's roles in sustainable agriculture, seed conservation, water provisioning, waste recovery, sanitation management, and climate adaptation are frequently rendered invisible or treated as supplementary to formal interventions. There is inadequate empirical documentation of how such practices simultaneously sustain ecological systems while subsidising state and market failures through unpaid or underpaid labour. Consequently, women-led ecological practices are rarely recognised as sites of resistance, innovation, or political agency.

Fourth, while intersectionality is increasingly invoked in gender and environment studies, empirical analyses often remain limited in their engagement with caste, region, occupation, and informality as co-constitutive axes of ecological injustice. Dalit, Adivasi, migrant, sanitation, construction, and informal women workers experience compounded vulnerabilities arising from ecological degradation, labour precarity, and social exclusion. However, these intersecting dimensions are frequently under-analysed within environmental justice frameworks, which tend to assume homogenous categories of "women" or "communities".

Finally, the political economy of so-called "green" and "sustainable" transitions remains under-examined from a feminist perspective. Emerging climate enterprises, circular economy models, and CSR-driven sustainability initiatives are often celebrated as win–win solutions without sufficient scrutiny of the labour regimes, informality, health risks, and gendered exploitation embedded within them. There is a lack of critical feminist analysis examining whether such models genuinely redistribute power and resources or merely reconfigure existing inequalities under the banner of sustainability.

This paper addresses these gaps by foregrounding gender justice as foundational to ecological justice and by bringing together feminist political economy, ecofeminism, and feminist political ecology through grounded, long-term empirical evidence from South India. By centring women's everyday ecological labour, embodied health experiences, and intersectional vulnerabilities across agriculture, WASH, climate enterprises, and environmental movements, the study contributes a critical, micro-level perspective that is largely absent in existing literature. In doing so, it challenges dominant gender-neutral and technocratic approaches to environmental governance and advances a feminist ecological justice framework rooted in lived realities. To critique neoliberal development as a gendered ecological regime that relies on the extraction of both natural resources and women's unpaid and informal labour, and to propose gender-just policy interventions capable of redistributing ecological responsibility, labour, and decision-making power.

Objectives

1. To analyse ecological degradation through an intersectional gender lens.
2. To document women-led practices in sustainable agriculture, WASH, and climate ventures.
3. To critique neoliberal development from a feminist ecological perspective and suggest policy recommendations for ecological sustainability with gender justice.

Methodology

This study adopts a qualitative, ethnographic, and feminist research methodology, grounded in long-term engagement with communities, women's collectives, civil society organisations, and policy processes in South India. The methodological approach is informed by feminist political economy and feminist political ecology, which emphasise lived experience, power relations, labour processes, and intersectionality in understanding ecological change.

Research Design:

The empirical analysis draws on long-term, multi-sited field engagement across rural, peri-urban, and small-town contexts in Tamil Nadu, with selected comparative insights from other regions. Fieldwork and engagement were carried out over several years through a combination of ethnographic observation, case documentation, participatory discussions, and collaborative work with non-governmental organisations, women's collectives, and grassroots initiatives working in the areas of sustainable agriculture, Water, Sanitation and Hygiene (WASH), climate enterprises, and environmental advocacy. Rather than short-term extractive field visits, the research is based on iterative and relational engagement, enabling the documentation of ecological change, labour transitions, and gendered vulnerabilities over time. This longitudinal focus allows and to trace how ecological degradation and development interventions reshape women's work, health and livelihoods across different phases of environmental transition. The paper employs a case study approach to examine diverse ecological sectors and interventions, including sustainable and natural farming models, integrated farming systems, WASH and menstrual hygiene initiatives, women-led climate enterprises, environmental movements, and indigenous ecological governance. Case studies were selected purposively to reflect variations in ecology (coastal, agrarian, industrial, forested), institutional arrangements (state-led, NGO-facilitated, CSR-driven), and social location (caste, occupation, migration status, and informality). The primary focus is Tamil Nadu, with field evidence drawn from districts say Nagapattinam, Ariyalur, Theni, Nilgiris, Salem, and Pachaimalai Hills. These sites were chosen to capture contrasts between drought-prone agrarian regions, industrialising zones, ecologically sensitive areas,& regions undergoing long-term ecological and labour transitions.

Data Sources and Methods

Multiple qualitative data sources were triangulated to strengthen analytical validity. These include: Ethnographic observations of women's everyday ecological labour in agriculture, water collection, sanitation work, waste recovery, and informal climate enterprises. Case narratives developed through sustained interaction with women farmers, sanitation workers, SHG members, indigenous women, climate entrepreneurs, and community organisers. Participatory discussions, group meetings, and informal interviews conducted during training programmes, field visits, and community engagements. Action research and consultancy-based documentation undertaken as part of programme design, implementation, and evaluation Secondary analysis of policy documents, programme guidelines, government reports, and

relevant scholarly literature While the study does not rely on statistically representative samples, it prioritises depth, contextual understanding, and relational insights, which are central to feminist qualitative inquiry. Analytical Framework Data interpretation is guided by a gender and intersectional analytical framework,

Women's Voice, Political Subjectivity, and the Limits of Representation

While women's labour and participation are central to the empirical analysis, it is important to acknowledge the limitations in the direct representation of women's voices as political subjects within the paper. This limitation is not merely methodological but reflects the broader political and institutional contexts in which women's ecological engagement takes place. Across the case studies, women rarely articulated their ecological concerns in the language of rights, policy, or political demands. Instead, their agency was expressed through everyday practices, negotiations, and tactical adjustments—such as altering cropping patterns, managing water scarcity, improvising sanitation solutions, or sustaining informal climate enterprises under precarious conditions. These forms of action, while politically significant, are often rendered invisible within dominant development and policy discourses that privilege formal participation and vocalised claims. The research also reveals structural constraints on women's political voice. Institutional forums—panchayats, water user associations, agricultural committees, environmental movements, and CSR-led platforms—frequently remain male-dominated, with women's participation mediated through SHGs, NGOs, or project frameworks. As a result, women's perspectives are often filtered through organisational narratives, technical vocabularies, or programme objectives, limiting their ability to articulate autonomous political critiques.

From a feminist methodological perspective, the absence of extensive direct quotations in this paper should therefore be understood not as a lack of women's political consciousness, but as evidence of how women's voices are systematically marginalised, mediated, or depoliticised within ecological governance. By foregrounding women's labour, embodied experiences, and situated practices, the paper seeks to make visible forms of political agency that operate outside formal arenas, while also recognising the limits of representation within the available empirical material.This gap points to an important agenda for future research: creating methodological and institutional spaces that enable women—particularly those from marginalised caste, occupational, and regional locations—to articulate ecological claims as political subjects in their own terms, rather than as instrumental actors within development interventions.

Addressing Women's Political Voice: A Future Agenda

While this study foregrounds women's labour, knowledge, and everyday ecological practices, the direct articulation of women as political subjects remains limited. Structural constraints, male-dominated institutions, and mediated participation through NGOs and programme frameworks often filter or depoliticise women's perspectives. Recognising this, future research should create methodological and institutional spaces that enable women—particularly from marginalised caste, occupational, and regional backgrounds—to voice ecological claims in their own terms. Participatory action research, community-led monitoring, and collaborative governance forums could amplify women's political agency, ensuring that ecological justice is pursued alongside substantive gender justice rather than relying solely on informal or everyday labour contributions.

Gender and Ecological Justice - Case Studies: Feminist Critique of Models and Interventions Capitalism, Patriarchy, and Environmental Degradation

A growing body of feminist political economy literature demonstrates that capitalism and patriarchy are mutually constitutive systems that externalise both ecological costs and social reproduction onto women (Mies & Shiva, 1993; Fraser, 2016). In India, neoliberal development has intensified extractivism, commodification of land and water, and informalisation of labour. Studies by Agarwal (2010) and Rao (2012) show that women's labour expands precisely when ecosystems degrade—through longer hours spent on water collection, fuel gathering, food provisioning, and health care. The present study corroborates these findings by showing how environmental decline translates into intensified unpaid and underpaid labour for women, in drought-prone and industrialising regions of Tamil Nadu.

Sustainable Agriculture, Knowledge, and Feminisation of Labour

Evidence from Kudumbam and MSSRF initiatives aligns with wider research indicating that women are central to agroecological transitions (Agarwal, 2018; FAO, 2021). Women's indigenous knowledge of seeds, crop rotation, organic inputs, and biodiversity management has been critical in sustaining food systems under climate stress. However, as documented in studies on feminisation of agriculture (Deere, Oduro & Swaminathan, 2013), women's increased participation does not automatically translate into control over resources or recognition. The case studies presented here reveal a paradox: while women become ecological stewards and primary producers, structural constraints—land ownership norms, lack of credit, and male out-migration—reinforce gendered precarity rather than empowerment.

WASH, Reproductive Health, and Embodied Ecological Injustice

Environmental injustice is experienced through women's bodies. Feminist health studies have long established links between pollution, chemical exposure, heat stress, and reproductive morbidity (Sen & Östlin, 2008; Girardi & Bremer, 2022). The findings from menstrual hygiene and WASH studies resonate with urban and rural research across India showing that inadequate sanitation disproportionately affects women's dignity, safety, and health (Kulkarni et al., 2017; Coffey et al., 2018). It is worth bringing the voice of a woman. One sanitation worker in Ariyalur explained, 'I walk two kilometers daily to fetch water for my household, often missing work in the fields. No one asks if it affects my health or income.' This highlights how water labour intersects with gendered and economic vulnerabilities.

The ecological dimension—plastic waste, polluted water bodies, groundwater depletion—remains insufficiently integrated into WASH policy discourse. This paper argues that reproductive justice must be recognised as an ecological justice concern.

Climate Ventures, Informality, and Women's Agency

Women-led climate enterprises documented in this study echo emerging scholarship on gender and green livelihoods (ILO, 2019; UN Women, 2022). These enterprises contribute to mitigation, adaptation, and circular economy models, yet they remain embedded in informal economies with limited institutional support. EPW analyses on MSMEs and women's entrepreneurship (Kannan & Raveendran, 2019) highlight how market access, public procurement, and state recognition are decisive factors. The evidence here suggests that without structural policy support, women's climate ventures risk being celebrated symbolically while remaining economically marginal. At the same time, evidence from waste recovery units, sanitation-linked enterprises, and resource recovery parks reveals the gendered costs of 'green

transitions'. Women workers are often exposed to hazardous conditions without adequate protective equipment, social security, or health monitoring. Circular economy and CSR-driven sustainability initiatives thus risk reproducing gendered exploitation unless labour rights and occupational health are integrated into environmental planning.

Intersectionality: Gender, Caste, Region, and Ecology

The study underscores that ecological injustice in India is deeply intersectional. Gender interacts with caste, region, occupation, disability, and gender identity to shape differentiated vulnerabilities. Field evidence from diverse regions—coastal Nagapattinam, industrial Ariyalur, agrarian Theni, and ecologically sensitive Nilgiris—demonstrates how uneven development and elite resource extraction exacerbate women's ecological burdens. Dalit and Adivasi women, sanitation workers, construction labourers, street vendors, and transgender communities experience compounded exclusions from water, sanitation, health services, and decision-making forums. The privatisation and commodification of water further deepen inequality, as elite households and industries secure access while marginalised communities rely on degraded commons. These patterns affirm that ecological justice cannot be addressed through gender-blind or caste-neutral frameworks. Rather than treating the case studies as best-practice success stories, this section offers a critical feminist assessment of their possibilities and limitations, foregrounding power relations, sustainability, and gender justice outcomes.

Case Studies:

The case studies presented in this paper are not intended as best-practice models or success stories. Rather, they are used as analytical sites to examine how gendered ecological labour, power relations, and institutional arrangements unfold across different sectors and ecological contexts. The selection of cases follows a purposive and comparative logic, aimed at capturing variation in ecology, institutional design, and forms of governance rather than statistical representativeness. The cases span agriculture, WASH, climate enterprises, environmental movements, and indigenous ecological governance, and are drawn from drought-prone agrarian regions, industrialising zones, ecologically sensitive areas, and sites of long-term environmental transition. Together, they enable an examination of how women's ecological labour is mobilised across state-led, NGO-facilitated, market-driven, and movement-based interventions. Each case is analysed through a feminist political economy lens that foregrounds three questions: (i) how women's labour and knowledge are mobilised in the name of ecological sustainability; (ii) whether such mobilisation translates into substantive control over resources, income, and decision-making; and (iii) how responsibility for ecological care is redistributed—or deferred—between women, the state, and the market. Rather than treating women's participation as inherently empowering, the analysis interrogates the contradictions within "green" and "sustainable" models, including labour intensification, informality, health risks, and the feminisation of responsibility in contexts of state withdrawal. The case studies thus function as critical feminist evidence of how ecological governance often relies on women's unpaid or precarious labour while stopping short of structural transformation.

Table 2 Case Studies and their focus, structure in women's engagement in Ecological Movements

Case Study	Location	Focus	Women's Role	Structural Constraints	Intersectional Insights
Kudumbam Sustainable Agriculture	Tamil Nadu (drought-prone)	Agroecology, SHG-based farming	Seed custodians, cultivators, collective decision-makers	Male out-migration, land insecurity, NGO dependence	Dalit and rural women face feminisation of distress despite ecological leadership
MSSRF Integrated Farming System (IFS)	Tamil Nadu	Crop diversity, water harvesting, livestock	Farm operations, enterprise management, committee participation	Limited control over income/assets, land ownership norms	Women's labour intensification not matched by power; caste and class disparities persist
Environmental Movements	Western Ghats, Coastal TN	Anti-extraction protests, forest & water protection	Protesters, symbolic 'protectors of nature'	Male-dominated decision-making, gender-blind agendas	Gender-specific risks (reproductive health, care burdens) largely ignored
WASH & Menstrual Hygiene	Rural/peri-urban TN	Sanitation, water, menstrual hygiene	Sanitation work, waste management	Health risks, informal labour, limited agency	Dalit and informal women workers disproportionately affected
Climate Enterprises	Tamil Nadu, CSR-linked	Circular economy, waste recovery	Eco-product production, composting, resource recovery	Informal work, low recognition, hazardous conditions	Women remain unprotected, labour-intensive, intersectional disadvantage evident
Indigenous Governance	Pachaimalai Hills & Arunachal Pradesh	Forest-based livelihoods	Knowledge holders, forest managers	Exclusion from land ownership and inheritance	Patriarchy embedded in customary law; cultural inclusion without rights

Kudumbam Model of Sustainable Agriculture

The Kudumbam intervention demonstrates the transformative potential of women-centred agroecology in drought-prone regions. This case examines women-led sustainable and natural farming initiatives promoted through Kudumbam-linked SHGs in drought-prone regions. Women from marginalised castes in Kudumbam-linked SHGs serve as cultivators, seed custodians, and collective decision-makers, demonstrating how intersectional disadvantage—caste, gender, land insecurity—coexists with ecological stewardship. By mobilising women as farmers, seed custodians, and collective decision-makers, the model challenges male-centric agrarian norms. However, feminist critique reveals three limitations. First,

women's increased responsibility in agriculture often coincides with male migration and withdrawal, resulting in the feminisation of distress rather than empowerment. Second, while women acquire skills and leadership, structural constraints—land ownership, water insecurity, and market dependence—remain largely unaddressed. Third, the reliance on NGO facilitation raises questions of scalability and long-term sustainability without sustained public investment. Similar concerns are raised in Agarwal's (2018) critique of group farming initiatives. While the model enhances women's skills and ecological agency, it also reflects the feminisation of agrarian distress. Male out-migration and lack of land ownership mean that women's labour intensifies without corresponding control over land, water, or markets. The dependence on NGO facilitation raises concerns regarding long-term sustainability and state accountability. While the intervention is often framed as women's empowerment through agroecology, this case illustrates how empowerment remains conditional and partial. Women's ecological labour expands in contexts of male out-migration and agrarian distress, producing what may be understood as a feminisation of agrarian responsibility rather than a redistribution of agrarian power.
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Integrated Farming System (IFS) with MSSRF

The IFS model integrates crop diversity, water harvesting, livestock, and soil management to promote ecological sustainability and livelihood resilience. Women are actively involved in farm operations, enterprise management, and local institutions. IFS represents an ecologically sound model that integrates biodiversity, water conservation, and livelihood diversification. From a gender perspective, the inclusion of women in decision-making committees and enterprise activities marks a significant shift from conventional agricultural extension. Yet, evidence suggests that women's labour intensification is not matched by proportional control over income or assets. As feminist agrarian studies argue (Deere et al., 2013), without secure land and resource rights, women's participation risks reinforcing gendered labour hierarchies within 'green' models. Although women's participation increases, control over income and assets remains largely mediated by male ownership patterns. The case highlights the limits of participation-based approaches that do not address structural inequalities in land rights and resource control. The case underscores the limits of participation-based approaches that expand women's roles without addressing entrenched land ownership and asset control. Women's inclusion in committees and enterprises does not automatically disrupt patriarchal property relations, highlighting the distinction between participation and power.

Environmental Movements in Tamil Nadu

Women's participation in environmental protests—Save Western Ghats, anti-methane extraction, nuclear resistance—illustrates their political agency. However, these movements often frame women as 'protectors of nature' without articulating gender-specific impacts such as reproductive health risks, occupational exposure, or care burdens. Women's Participation in Environmental Movements (Tamil Nadu) draws on women's involvement in ecological struggles such as resistance to extractivist projects, anti-methane movements, and campaigns for forest and water protection. Women's political agency is visible, yet their participation is often symbolic. Environmental movements frequently invoke women as "protectors of nature" without addressing gender-specific concerns such as reproductive health risks,

occupational exposure, care burdens, and decision-making power. Gender justice remains marginal to movement agendas. This symbolic inclusion mirrors what feminist scholars term 'instrumentalisation of women' in environmentalism, where women's presence legitimises movements without transforming patriarchal agendas. Women's visibility in environmental protests demonstrates political presence but not necessarily political incorporation. Their mobilisation often legitimises movements without translating into agenda-setting power or sustained attention to gendered health and care burdens.

WASH and Menstrual Hygiene Interventions

WASH interventions highlight the intimate link between ecological degradation and bodily injustice. case focuses on sanitation, water access, and menstrual hygiene initiatives in rural and peri-urban settings, highlighting women's everyday negotiations with water scarcity, unsafe sanitation, and waste disposal. While WASH programmes improve dignity and mobility, they often ignore ecological sustainability (plastic menstrual waste, water pollution) and women's agency in governance. Sanitation labour is increasingly feminised, with women workers facing health risks, informality, and lack of social protection. While programmes address access to toilets and menstrual products, they frequently neglect ecological sustainability (plastic waste, water pollution) and women's agency in design and governance. The case studies affirm Coffey et al.'s (2018) argument that sanitation failures are rooted not merely in infrastructure gaps but in social power relations. The case reveals how WASH interventions frequently shift responsibility for sanitation maintenance and waste management onto women, reinforcing gendered divisions of labour even as access improves. Ecological sustainability and labour justice remain peripheral to programme design.

Climate Ventures and Circular Economy Models

Women-led climate enterprises represent promising alternatives to extractivist development.
However, their location within informal economies limits accumulation, social protection, and recognition. Feminist critiques of green entrepreneurship caution against celebrating such initiatives without addressing unequal market relations, unpaid labour, and state withdrawal from responsibility (ILO, 2019; UN Women, 2022). This case examines women's enterprises producing eco-friendly products, bio-inputs, compost, and waste-based goods as part of climate mitigation and circular economy strategies. In several cases, climate enterprises linked to waste management and resource recovery were promoted through CSR initiatives. While environmentally beneficial, these models frequently overlooked women workers' occupational health, safety, and labour rights. This reveals a critical contradiction between ecological sustainability and social justice, reinforcing the need for gender-just green transitions. These initiatives are frequently celebrated as examples of women's empowerment and green entrepreneurship. A woman entrepreneur in a waste-based circular economy unit noted, "I make compost daily from industrial waste, but there is no insurance or protective gear. We contribute to climate solutions yet remain invisible and unprotected, as poor, rural women." CSR-driven models often prioritise environmental outcomes while neglecting workers' health and rights. These enterprises exemplify the paradox of green transitions: women are positioned as climate solutions while remaining embedded in informal, hazardous, and poorly regulated labour regimes. Environmental gains thus coexist with social and bodily costs borne by women workers.

Indigenous and Tribal Women: Customary Law and Ecological Exclusion

Case narratives from Arunachal Pradesh and the Pachaimalai Hills expose the limits of customary ecological governance. It explores indigenous women's roles in forest-based livelihoods and ecological management within customary governance systems. Despite their central role in forest management and subsistence economies, indigenous women are systematically excluded from land ownership and inheritance under customary laws. Notably, women often internalise this exclusion, perceiving land rights as illegitimate or unnecessary. Education and participation in development programmes have not translated into substantive control over resources, revealing the gap between symbolic inclusion and structural gender justice. Despite their central ecological knowledge, women are systematically excluded from land ownership and inheritance under customary laws. Many women internalise this exclusion, revealing how patriarchy operates through cultural norms. Participation without rights limits the transformative potential of indigenous ecological governance. This case challenges romanticised notions of indigenous ecological governance by revealing how customary institutions reproduce patriarchal exclusions. Women's ecological knowledge does not translate into rights, exposing the limits of cultural participation without legal and material entitlements.

Long-Term Ecological Transition and Feminisation of Labour: Evidence from Salem

Longitudinal evidence from Salem district illustrates how ecological degradation unfolds over decades. The transition from rain-fed, biodiversity-rich agriculture to chemical-intensive farming, followed by land conversion, mining, and quarrying, has eroded ecological resilience. As agrarian livelihoods collapsed, women were pushed into precarious non-farm employment, particularly in textile units and construction work. This shift demonstrates how ecological collapse restructures gendered labour markets, intensifying insecurity and informality. longitudinal case traces ecological change from biodiverse, rain-fed agriculture to chemical-intensive farming, followed by mining, quarrying, and land conversion. Ecological degradation restructures local labour markets, pushing women into precarious non-farm work such as textiles and construction. The case demonstrates how environmental collapse produces gendered labour precarity and informalisation over time. The longitudinal evidence demonstrates how ecological degradation restructures gendered labour markets over time, producing cumulative precarity. Women's transition into informal non-farm work reflects not diversification but displacement from ecologically viable livelihoods.

Comparative Insights Across Case Studies Across sectors and regions, the case studies reveal a recurring pattern: women's labour and knowledge are central to ecological sustainability, yet responsibility is systematically feminised while power, resources, and accountability remain externalised. Whether in agriculture, sanitation, climate enterprises, or movements, women's participation expands in contexts of ecological stress and institutional retreat. These patterns suggest that without structural reforms—secure resource rights, labour protections, and accountable state involvement—women's ecological agency risks being appropriated as a substitute for public responsibility rather than a pathway to ecological justice.

Gender, Ecology, Capitalism Nexus:

The interconnections between gender relations, economic systems, and environmental degradation are best understood through a relational framework. Figure 1 illustrates the Gender–Ecology–Capitalism nexus**,** showing how patriarchal power structures enable capitalist modes of production that exploit both women's labour and nature, leading to ecological degradation and deepening intersectional inequalities.

The concept explores the interconnected relationships between patriarchy, capitalism, and ecological degradation, emphasizing how these systems disproportionately affect women and marginalized groups. It draws heavily from ecofeminist theory and feminist political ecology.

Patriarchy refers to social systems that privilege men and masculine forms of power. These systems shape who controls resources, whose labour is valued, and whose knowledge counts. Women's work—especially care work and subsistence activities—tends to be undervalued or rendered invisible. Capitalism operates through profit maximisation and market-driven growth. It depends on the exploitation of both natural resources and cheap or unpaid labour, much of which is provided by women, particularly from marginalised caste and class backgrounds. Patriarchal norms enable this exploitation by normalising women's unpaid and informal labour.

Figure 1: Gender–Ecology–Capitalism Nexus



Ecological degradation results from extractive and growth-oriented economic practices. Environmental depletion, climate change, and resource scarcity disproportionately affect women because of their gendered responsibilities for water, fuel, food, and family health. At the intersection of these processes are gendered and intersectional consequences. Women—especially those from marginalised castes, classes, and communities—experience increased unpaid care burdens, insecure livelihoods, heightened health risks, and reduced resilience to environmental crises. These impacts reinforce existing social inequalities, creating a cycle of injustice across gender, ecology, and economy. Addressing ecological crises requires confronting patriarchal power relations and capitalist Key findings indicate that women act as ecological stewards but remain structurally marginalised.

Recommendations

1. Treat Gender Justice as a Precondition for Sustainable Development: Gender equality (SDG 5) must be recognised as a structural prerequisite for achieving climate action, food security, health, and sustainable cities, rather than as a parallel or residual goal.

2. Integrate Gender Justice into Environmental Governance: All climate, environment, agriculture, and urban development policies must adopt mandatory gender analysis, sex-disaggregated data, and accountability mechanisms, moving beyond tokenistic 'women's participation'.
3. Recognise and Remunerate Women's Ecological Labour: Women's unpaid and underpaid work in agriculture, waste management, water provisioning, and care must be recognised through wages, social protection, and inclusion under labour laws.
4. Secure Women's Resource Rights: Land titles, water user rights, and forest governance institutions must ensure women's substantive control, not merely membership.
5. Gender-Just WASH and Reproductive Health Policy: Sanitation, menstrual hygiene, and occupational health must be integrated into climate adaptation planning, with special attention to migrant, informal, and marginalised women workers.
6. Public Procurement and Market Access for Women-Led Climate Enterprises: State programmes such as the PDS, noon meal and breakfast schemes, and urban food initiatives should provide buy-back guarantees and procurement quotas for women's agroecological and climate-friendly products.
7. Strengthen Local Ecological Institutions: Support women-led SHGs, collectives, weekly markets, exhibitions, and panchayat-level institutions with decision-making powers over commons, water bodies, and waste recovery.
8. Regulate Green and Circular Economy Initiatives: Resource recovery parks, waste-processing units, and CSR-led green projects must comply with labour standards, occupational health norms, and environmental safeguards.
9. Knowledge Democracy and Digital Platforms: Promote digital platforms and knowledge-sharing mechanisms that recognise women as ecological knowledge producers and innovators, not merely beneficiaries.

To sum up This paper has argued that ecological justice is inseparable from gender justice. Through historical analysis, feminist political economy, and micro-level empirical evidence from South India, it demonstrates that women bear a disproportionate share of ecological degradation while simultaneously sustaining everyday ecological resilience. Environmental movements, development interventions, and climate policies that overlook women's labour, health, and agency risk reproducing the very injustices they seek to address.The evidence presented challenges dominant development narratives that treat women as victims or beneficiaries rather than as central actors in ecological governance. Women's experiences in sustainable agriculture, WASH, waste recovery, and climate enterprises reveal both the possibilities and limits of grassroots ecological action under neoliberal conditions. Without structural transformation—secure resource rights, redistribution of care, democratic decision-making, and accountability of capital—women's ecological labour will continue to subsidise unsustainable growth. For scholars and policymakers, particularly those engaged with EPW debates, this paper calls for a paradigmatic shift: from gender-neutral environmentalism to feminist ecological justice. Such a shift is not only ethically imperative but also essential for achieving sustainable, inclusive, and resilient futures.

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