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INVISIBLE WATER LABOUR AND WOMEN'S LIVES: AN ECOFEMINIST ANALYSIS OF RURAL INDIA'S WATER CRISIS UNDER CLIMATE CHANGE

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ABSTRACT----------
Water is central to rural livelihoods in India, yet the labour involved in collecting, managing, and conserving water remains largely invisible and disproportionately borne by women. Under conditions of climate change – marked by erratic rainfall, prolonged droughts, and declining groundwater levels – this invisible water labour has intensified, placing additional physical, emotional, and social burdens on rural women. Drawing on an ecofeminist perspective, this study examines how environmental degradation and patriarchal social structures intersect to shape women's everyday experiences of water scarcity in rural India. Ecofeminism provides a useful framework to understand the parallel exploitation of natural resources and women's labour, highlighting how women's close relationship with water sources is rooted not in choice but in socio-cultural expectations and survival needs.

This study explores how increased distances to water sources, time poverty, health risks, and reduced opportunities for education and income generation affect women's lives across different rural contexts. It also analyses women's traditional ecological knowledge and coping strategies, which are often overlooked in formal water governance and climate adaptation policies. By foregrounding women's voices and lived experiences, the research seeks to challenge the invisibility of water labour and question development models that ignore gendered realities.

The researchers in their research critically analyse the impact of climate change–induced water scarcity on rural women in India through an ecofeminist perspective, highlighting the invisibility of women's water labour.

KEYWORDS: *Climate Change; Water Scarcity; Invisible Water Labour; Rural Women; Ecofeminism; Gender Inequality; Sustainable Water Management; Climate Adaptation; Rural India----------*

INTRODUCTION

Water scarcity has emerged as one of the most critical challenges facing rural India, particularly in the context of accelerating climate change. Irregular monsoon patterns, rising temperatures, frequent droughts, and the over-extraction of groundwater have significantly reduced the availability of safe and reliable water sources. While water shortages affect entire rural communities, their impacts are not experienced equally. Women, who are traditionally responsible for water collection and household water management, bear a disproportionate share of the burden. This gendered responsibility has intensified in recent years, transforming water collection from a routine domestic task into a physically demanding and time-consuming form of labour that often remains unrecognised and undervalued.

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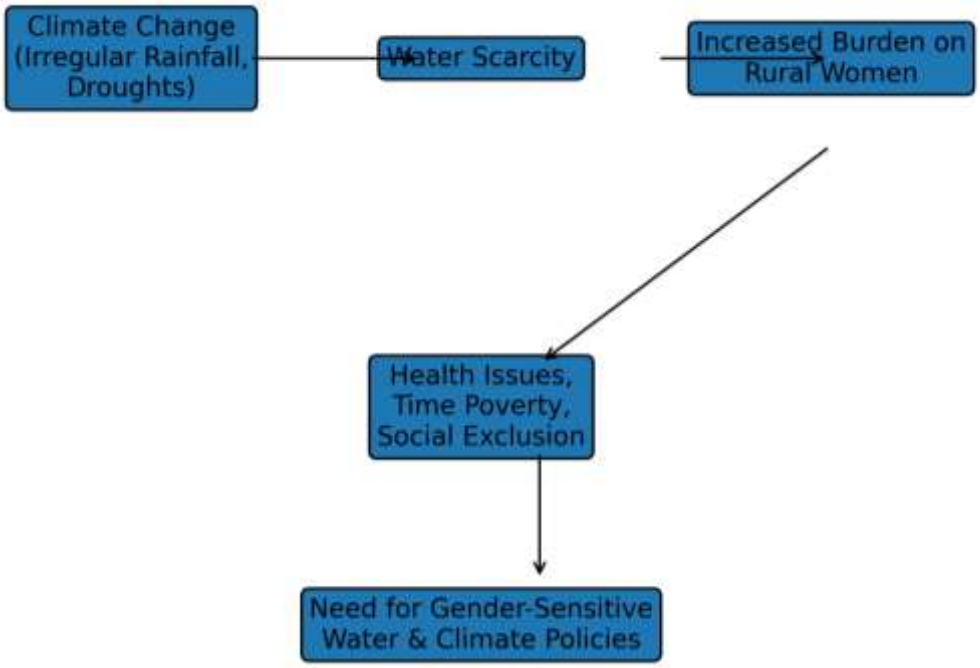

Figure 1: Conceptual Framework of Climate Change, Water Scarcity & Women's Invisible Labour

A comparison between past and present rural water systems reveals a stark shift in women's experiences. Earlier, many villages depended on nearby wells, ponds, tanks, and seasonal streams that were managed collectively by the community. Although access was not always equitable, water sources were generally closer to households. In contrast, contemporary rural settings increasingly rely on distant borewells, tanker water, or erratic public supply systems. Climate change has accelerated the drying up of traditional water bodies, forcing women to walk longer distances, queue for hours, or depend on uncertain external sources. This transition has deepened women's time poverty, reducing opportunities for education, income-generating activities, rest, and participation in local decision-making.

From a social perspective, water scarcity reinforces existing gender inequalities. Men's engagement with water is often linked to irrigation, technology, and market-oriented agriculture, while women's water work remains confined to domestic and care-related roles. This division renders women's labour "invisible" in economic and policy discussions, despite its essential contribution to household survival and community well-being. Compared to men, women face greater health risks due to carrying heavy water loads, exposure to contaminated sources, and increased stress, yet these impacts are rarely documented in climate or water governance frameworks.

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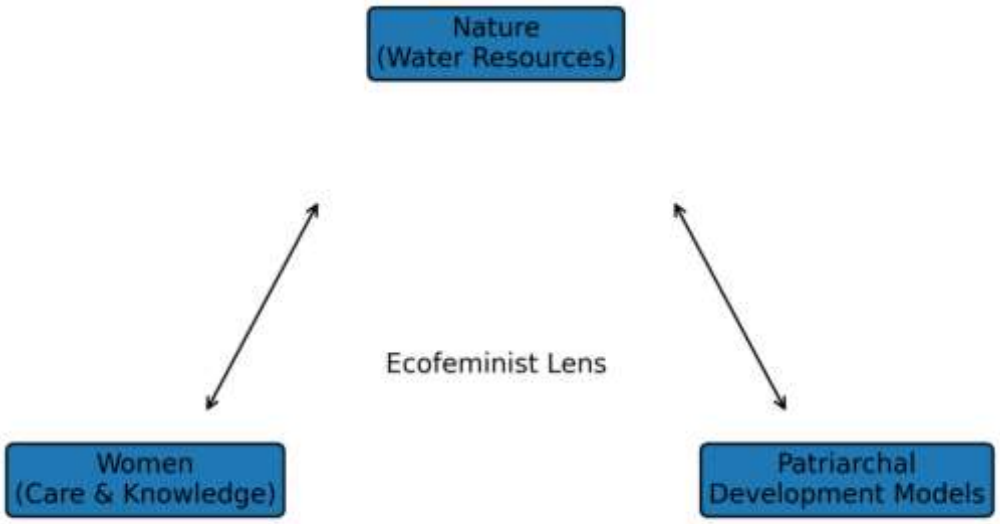

Figure 2: Ecofeminist Perspective on Water and Gender

An ecofeminist approach provides a critical lens to examine these inequalities by drawing parallels between the exploitation of natural resources and the marginalisation of women. Ecofeminism challenges dominant development models that prioritise economic growth over ecological balance and social justice. It emphasises that women's close relationship with water and the environment is not a romantic or natural association but a consequence of social structures that assign care work and environmental management to women without power or recognition. In comparison to technocratic solutions such as large dams or intensive groundwater extraction, ecofeminist perspectives value local knowledge, community-based water management, and sustainable practices rooted in ecological sensitivity.

Furthermore, a comparison between policy intentions and ground realities highlights significant gaps. While national and international climate policies increasingly acknowledge gender, their implementation often remains superficial. Women are frequently portrayed as beneficiaries rather than as active agents of change. Their indigenous knowledge of water conservation, crop diversity, and adaptation strategies is seldom integrated into formal planning. This disconnect limits the effectiveness of climate adaptation efforts and perpetuates social and environmental vulnerabilities.

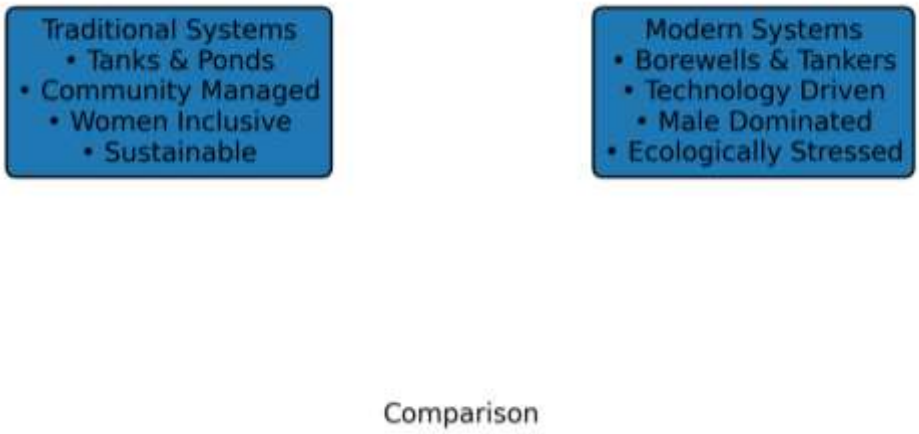

Figure 3: Comparison of Traditional and Modern Rural Water Systems

The present study seeks to situate rural women's water labour within broader debates on climate change, sustainability, and gender justice. By critically examining women's lived experiences of water scarcity through an ecofeminist framework, the research aims to make visible the hidden costs of climate change borne by women

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and to argue for inclusive, gender-sensitive, and ecologically sustainable approaches to water management in rural India.

REVIEW OF LITERATURE

Research on water scarcity and rural livelihoods in India has evolved over time, gradually incorporating gender and climate dimensions. Early work by **Agarwal (1992)** and **Chambers (1983)** focused on rural development and natural resource management, but largely viewed households as uniform units, paying limited attention to intra-household gender roles. These studies highlighted structural issues such as access, infrastructure, and poverty, yet women's everyday engagement with water remained under-analysed.

A gender-sensitive shift became visible in the late 1990s and early 2000s. **Agarwal (2001)** critically examined gender inequalities in environmental governance, arguing that women's exclusion from decision-making weakens sustainability outcomes. Similarly, **UNDP (2006)** and **FAO (2011)** reports documented that rural women in developing countries, including India, spend significantly more time than men on water collection and management. Comparative findings showed that women's water-related labour increases sharply in drought-prone and climate-vulnerable regions.

Climate change literature further deepened this discussion. **IPCC (2014)** highlighted that climate change intensifies existing social inequalities, with women facing disproportionate risks due to their dependence on natural resources. In the Indian context, **Rao et al. (2017)** demonstrated that erratic monsoons and groundwater depletion have increased women's workload and health stress in semi-arid regions. Studies by **Jodha (2012)** compared pre- and post-climate variability phases and found that traditional coping mechanisms are increasingly strained under prolonged climatic stress.

Ecofeminist scholars have provided a critical theoretical lens to interpret these realities. **Shiva (1988)**, in her seminal work, argued that the domination of nature and the marginalisation of women stem from the same patriarchal and capitalist development paradigms. Later, **Mies and Shiva (1993)** expanded this argument by emphasising how women's ecological knowledge is systematically undervalued. Comparative analyses by **Salleh (2009)** showed that community-based, women-inclusive environmental practices are more sustainable than top-down, technology-driven interventions.

Water governance studies in India have also highlighted gender gaps. **Meinzen-Dick and Zwarteveen (2001)** revealed that water institutions are often male-dominated, despite women being primary water users. More recent studies by **Kulkarni (2015)** compared formal irrigation governance with informal domestic water systems and found that women's labour is recognised only in the latter. **Joshi and Fawcett (2018)** further noted that women's participation in water committees is often symbolic, with limited influence over policy decisions.

Literature on traditional knowledge versus modern water management presents important contrasts. **Agarwal and Narain (1997)** documented indigenous rainwater harvesting and tank systems in India, many of which relied heavily on women's knowledge and participation. In contrast, **Shah (2010)** argued that excessive dependence on borewells and market-led water extraction has reduced ecological resilience and increased gendered burdens. These comparative studies underline the sustainability advantages of decentralised and community-managed water systems.

Despite extensive scholarship, notable gaps remain. **Resurrección (2013)** pointed out that women are frequently portrayed as vulnerable victims rather than active agents in climate adaptation discourse. Moreover, **Rao and Hans (2018)** emphasised the lack of intersectional analysis considering caste, class, and regional differences among rural women. The concept of "invisible water labour" is acknowledged but insufficiently integrated into climate policy and ecofeminist empirical research.

STATEMENT OF THE PROBLEM

Climate change–induced water scarcity has become a persistent challenge in rural India, affecting agricultural productivity, household well-being, and social stability. While water shortages are widely discussed in policy and development literature, the gendered dimensions of water scarcity remain inadequately addressed. Rural women are primarily responsible for collecting, storing, and managing household water.

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RESEARCH METHODOLOGY

The study adopts a **qualitative and analytical research approach**, supported by secondary data. Data are drawn from peer-reviewed journals, government reports, international agency publications, policy documents, and credible case studies related to climate change, Comparative analysis is employed to examine traditional and contemporary water management systems and their impact on rural women. water scarcity, gender, and ecofeminism. The ecofeminist framework is used as a theoretical lens to critically analyse the intersection of environmental degradation and gender inequality.

OBJECTIVES OF THE STUDY

1. To examine the impact of climate change–induced water scarcity on rural women in India.
2. To analyse women's invisible water labour through an ecofeminist perspective.
3. To compare traditional and modern water management practices in rural contexts.
4. To assess the gender sensitivity of existing water and climate adaptation policies.
5. To suggest inclusive and sustainable strategies for water management.

RESEARCH GAAP (GENERALLY ACCEPTED ACADEMIC PRACTICES)

The study strictly follows Generally Accepted Academic Practices by ensuring originality, ethical use of secondary data, proper citation of sources, and avoidance of plagiarism. Arguments are presented with academic integrity, clarity, and logical coherence.

SIGNIFICANCE OF THE STUDY

The study is significant as it brings visibility to women's unpaid and unrecognised water labour, which is often excluded from mainstream development discourse. By applying an ecofeminist framework, the research contributes to interdisciplinary knowledge in gender studies, environmental studies, and climate policy.

RESEARCH DESIGN

Research Flow Diagram

The research follows a **descriptive and interpretative design**. It systematically reviews existing literature and policy frameworks to interpret patterns and gaps related to gender and water scarcity.

RESULTS AND DISCUSSION

The analysis indicates that climate change has intensified water scarcity in rural areas, directly increasing women's physical and emotional burden. Women spend longer hours collecting water from distant and unreliable sources, leading to health issues, time poverty, and reduced social participation. The study also reveals a disconnect between policy commitments to gender inclusion and actual practice, such as valuable indigenous knowledge related to water conservation and climate adaptation, their participation in formal water governance remains limited.

FINDINGS

- Women bear a disproportionate share of water-related labour in rural households.
- Climate change has increased the distance, time, and effort required for water collection.
- Women's water labour remains largely invisible in economic and policy frameworks.
- Traditional, community-managed water systems are more inclusive and sustainable than centralised models.
- Gender-neutral climate policies fail to address women's specific vulnerabilities and contributions.

HYPOTHESIS

- **H_0 (Null Hypothesis):** Climate change–induced water scarcity has no significant gendered impact on rural women in India.
- **H_1 (Alternative Hypothesis):** Climate change–induced water scarcity has a significant and disproportionate impact on rural women in India, increasing their invisible water labour.

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LIMITATIONS OF THE STUDY

The study is based primarily on secondary data and does not include primary field-level data. Regional variations across different states of India may not be fully captured and by analysis focuses mainly on gender and does not extensively explore intersections with caste, class, and age, which could provide deeper insights.

RECOMMENDATIONS AND SUGGESTIONS

1. Integrate gender perspectives into water and climate adaptation policies at all levels.
2. Recognise and value women's water labour in development planning and resource allocation.
3. Promote women's leadership and decision-making in local water governance institutions.
4. Support revival of traditional and community-based water management systems.
5. Incorporate women's indigenous knowledge into climate resilience and sustainability programmes.

CONCLUSION

As water sources become increasingly scarce and distant, women experience greater physical strain, health risks, and time poverty, which limits their opportunities for education, income generation, and social engagement. Despite their central role in managing water and sustaining households, existing water management and climate adaptation policies largely remain gender-neutral, failing to recognise or address their contributions and challenges

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