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Climate Change, Women's Health and Community Coping Strategies: A Case Study on Socially Constructed Vulnerability

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Abstract

Women in Pakistan face climatic pressures in an inadequate manner where environmental stressors unite with entrenched socio-cultural and institutional inequalities. This qualitative research was conducted to explore such inequalities with women. Study was based on 25 semi-structured interviews with 20-55 years aged women living in vulnerable areas of Pakistan. NVivo software was used for thematic analysis, and interpreted socially constructed vulnerability, the Pressure and Release (PAR) model and feminist political ecology. This combined framework is good for understanding of vulnerability shaped by basic inequalities, cultural expectations, and institutional exclusion. Results suggest that women's climate-associated health challenges are expressed in different ways such as caregiving, food and water insecurity, or exposure to extreme heat. Women have shown to be very adaptable with their relational support networks, traditional ecological knowledge and mobilizing collective community action. These coping strategies are informal practices that can be recognized and implemented in formal adaptation systems.

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Introduction

Climate change is increasingly recognized as a risk multiplier that intensifies existing social, economic, and health inequalities rather than affecting populations uniformly (IPCC, 2022). The Intergovernmental Panel on Climate Change emphasizes that vulnerability is shaped not only by exposure to climate hazards but also by structural inequalities that determine sensitivity and adaptive capacity, making climate risk a socially and politically produced condition (IPCC, 2022, WHO, 2023). Pakistan indicates one of the most climate-vulnerable countries around the globe, facing recurring floods, continued heatwaves, glacial melt, and unpredictable monsoon patterns that have disrupted food schemes, health setup, and livelihoods (Eckstein et al., 2021, World Bank, 2021). The terrible 2022 floods alone created issues such as displacement and loss of millions, stressing how climate hazards interact with pre-existing socio-economic vulnerabilities to create compounded risks (UNDRR, 2021).
Within this situation, emerging evidence from Pakistan reveals that climate change disproportionately disturbs women due to gender inequalities, such as limited mobility and access to resources. Another main point is exclusion from decision-making at home (Habib et al, 2022; Mansab et al, 2025). Research from rural Punjab further prove that women's vulnerability is shaped by interconnecting livelihood constraints, household duties, and

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inadequate control over productive resources, which together limit adaptive capacity (Habib, et al, 2022). Similarly, analyses of the 2022 floods highlight those gendered norms and weak institutional protection mechanisms significantly increased women's exposure to violence, health risks, and displacement-related insecurity (Kamran and Mir, 2023).

Although global and national frameworks such as the Sendai Framework and Pakistan's climate policy commitments increasingly emphasize gender-responsive adaptation, implementation remains limited and often fails to address the lived realities of vulnerable groups (UNDRR,2021; UN Women, 2020, World Bank, 2021). Most of the already published literature continues to treat women as a vulnerable group, overlooking how vulnerability is aggressively produced through daily social relations, care-giving responsibilities, cultural hopes, and institutional negligence. Recent reports from Pakistan also recommends that such structural conditions shape not only experience to climate hazards but also how women observe and respond to climate risks within their home and communities (Habib et al., 2022; Kamran and Mir, 2023). At the same time, increasing evidence highlights the importance of social links, local eco-environmental knowledge, and collective accomplishment in shaping community resilience in climate-affected areas of Pakistan (Kamran and Mir, 2023). Though, there remains limited research that focusses on women's own descriptions and meaning-making processes in understanding climate-related health and livelihood risks.

Vulnerability is not just an outcome of environment but also socially constructed through interconnecting systems including gender, culture, and institution. Environmental degradation, rising temperatures and water scarcity contribute to expose infectious diseases, maternal health, malnutrition and dehydration complications (Watts et al., 2023). In several climate-affected areas of Pakistan, access to safe water and sanitation is big issue and it has intensified women's exposure to waterborne and reproductive illnesses challenges. Moreover, severe heat has amplified physical exhaustion and care-giving burdens (WHO, 2023; UNICEF, 2023). Emerging study further highlights the psychological impacts of climate uncertainty such as emotional distress, anxiety, and trauma linked with livelihood, displacement, and frequent exposure to environmental shocks (Berry et al., 2018; Hayes et al., 2019).

From a gender perception, women's vulnerability to climate change is not only an impact of environmental exposure but is deeply entrenched in socially built roles and inadequate power relations. Feminist political ecology offers a vital framework for understanding how gendered divisions of labor, inadequate access to resources, and limited participation in decision-making shape women's experiences of climate risk (Ravera et al., 2022; Nightingale, 2017). Women are often responsible for water security, preparing food, caring for children and aged family members and supporting agricultural activities in rural Pakistan, all of which become increasingly difficult under circumstances of environmental stress (Habib et, al 2022). However, women play a central role in household and community resilience, but women's knowledge, experiences, and adaptation capabilities remain underrepresented in climate governance and policy reports (UN Women, 2020). This exclusion bounds the effectiveness of adaptation approaches and reinforces current inequalities (Mansab et al. 2025).

At the community level, casual managing systems and collective resilience plans play a critical role in mitigating the effects of climate stress. Women often rely on social funding networks, equal care-giving preparations, collective resource management, and outdated ecological knowledge to respond to environmental challenges (UNDP, 2023; Kamran and Mir, 2023). These locally entrenched approaches often provide instant and culturally applicable forms of adaptation that institutional plans may fail to deliver. Though, such community-based

handling approaches are progressively stressed by frequent climate shocks, economic adversity, and declining natural resources (IPCC, 2022). Understanding how women assemble these plans for recognizing their designated adaptation policies that build upon current community strengths rather than imposing outwardly driven solutions (Ravera et al., 2022).

The rural Punjab case is important for assessing these dynamics due to its climate-sensitivity towards agricultural production. Rural Punjab experiences growing environmental pressures such as continued heatwaves, unpredictable rainfall patterns, decreasing groundwater availability, and increasing flooding (Government of Pakistan, 2023; World Bank, 2021). These variations directly threaten livelihoods, household, agriculture and food security. It further increases women's unpaid labor and care-giving everyday jobs (Habib et al. 2022). In several districts where poverty and social inequality interconnect with environmental degradation, women often play important role to household crises, handling food shortages, water access, and family health under ever more constrained circumstances (Kamran and Mir, 2023). Their survived experiences offer critical insight that how climate vulnerability is negotiated and managed at the community or household level.

Even with growing recognition of gender and climate matters in academic and policy reports, important gaps remain in understanding how women themselves interpret and direct climate-related risks in their normal lives. Addressing such gap, this study explores how women observe, experience, and respond to climate-related health and livelihood risks in climate-vulnerable communities in Pakistan. A qualitative investigation of women's experiences can disclose how climate risks are understood, personified, and socially negotiated, contributing to a more perspective on vulnerability and resilience (Creswell and Poth, 2021). By positioning women's voices, this case study pursues to bridge this gap and contribute to a more inclusive considerate of climate adaptation that recognizes both structural inequality and women in responding to environmental change. This case study also explores women's experiences of climate-related health risks and the community-based managing plans which are used to respond to environmental stress. Finally, the case study research aims to update gender-responsive and socially inclusive climate adaptation policies in Pakistan.

3.Methodology

3.1 Study Design and Research Approach

This study implements a qualitative research design to discover women's experiences of climate-related health risks and community managing plans in climate-affected rural areas of Pakistan. A constructivist approach is mainly appropriate for this study because it stresses the subjective meanings individuals assign to their lived experiences and identifies that knowledge is shaped through social, cultural, and environmental interactions. This framework is for revealing that, climate vulnerability is not only a physical exposure due to environmental threats but also a serious situation which is socially built which leads to gender discriminations, institutional restrictions, insufficient access to existing resources and decision-making power. The qualitative design is chosen for in-depth research related to women’s observations and response to the challenges generated by climate change such as public health, livelihoods, and other household issues. Table 1 shows interview guidelines.

Table 1 Interview guideline

Research Question / Theme	Reason for Selection
Why study the connection between women and the environment?	Women's social roles often expose them to environmental problems in specific ways. Women are more likely to experience poverty, which increases their vulnerability to environmental challenges.
How are culture and natural values connected with women's environmental roles?	To understand how cultural practices and values influence women's relationship with natural resources and environmental protection.
How does the feminization of poverty relate to environmental issues?	Poverty affects women disproportionately and increases their dependence on natural resources for survival.
How are women affected by deforestation?	Women often depend on forests for food, fuelwood, water, livestock resources, medicinal plants, and materials for house construction. Deforestation creates social and ecological impacts on their lives.
What are gender roles, and how are they different from gender responsibilities?	To conceptualize how socially constructed gender differences influence environmental awareness, decision-making, and coping strategies.
How does gender influence environmental sustainability in design and planning?	To examine how including gender perspectives can improve sustainable development practices.
What is the relationship between women, environment, and sustainability?	To explore women's contributions to environmental management and sustainable development.
What is mainstream gender in environmental studies?	To understand how gender perspectives are integrated into environmental policies, programs, and decision-making processes.
How does division of labour affect women's environmental responsibilities?	Women often perform equal or greater environmental-related work, such as collecting water, fuel, and managing household resources.
How are women affected by natural disasters?	Gender inequalities influence disaster experiences. Women often face greater risks due to caregiving responsibilities, poverty, limited mobility, and health challenges.
Why are women more vulnerable during natural disasters?	Women may experience malnutrition, chronic illness, psychological stress, lack of transportation, and longer distances to access resources.
How have government environmental policies addressed gender issues?	To examine whether environmental policies consider gender perspectives or remain general without addressing women's specific needs.

Research Question / Theme	Reason for Selection
How are gender perspectives included in environmental programs?	To analyze whether environmental initiatives recognize women's roles, knowledge, and participation.
How do women contribute to community environmental capacities?	Women often help communities reduce environmental risks, assess local vulnerabilities, and develop coping strategies.
How does women's economic dependence influence environmental struggles?	Many women depend economically on men, limiting their decision-making power and access to environmental resources.
How is gender equality and empowerment connected to environmental sustainability?	To explore how empowering women can improve environmental management, participation, and sustainable development outcomes.

3.2 Participants, setting, and interviews

A purposive sampling method was used to distinguish women with direct lived experience of climate-related environmental stressors and their related health impacts. To confirm diversity in viewpoints, maximum difference in sampling was done. Contributors are from different marital statuses, age groups, educational backgrounds, and livelihood circumstances, see table 2. Snowball sampling was also used during fieldwork, because it allowed participants to recommend other women facing same issues within their communities.

Table 2 Socio-demographic profile of participants (n=25)

Characteristic	Category	Frequency	Percentage
Age Group	20-35 years	12	48%
	36-55 years	13	52%
Marital Status	Married	18	72%
	Unmarried/Widowed	7	28%
Occupation	Agriculture/Household	20	80%
	Other	5	20%

The study was conducted in rural areas of selected districts, Bahawalpur, Multan, Muzaffargarh, Dera Ghazi Khan, Rahim Yar Khan and Layyah because they are climate-vulnerable districts of Punjab province. They face climate-related disasters including floods, continued heat-waves, drought, and water scarcity. These areas characterize as they are having environmental stress with interaction of structural inequalities, this make them highly relevant

for understanding how women faces and manage climate-related health challenges. The selection of study area was based on three criteria: (i) dependence on highly sensitive climatic agriculture, (ii) high exposure to climate-related environmental hazards, (iii) current socio-economic and gender-based vulnerabilities.

3.3 Data Collection

Data collection was from 25 women aged 20-55 years via semi-structured interviews in local language, audio-recorded with agreed consent to discover their experiences of climate-related health risks and managing plans. Translation and transcription verbatim were done for further analysis. Field notes were also kept to detect contextual observations and expand data depth.

3.4 Data Analysis

Reflexive thematic analysis was done with software Nvivo to recognize and understand significant patterns across participants' narratives. The analysis involved systematic coding, theme development, and modification was done.

3.5 Ethical Considerations

For ethical considerations in the research process, consent was obtained from all respondents prior to the interviews. All participations were entirely voluntary. Personal data were deleted during transcription and data analysis for their privacy.

4 Results and Discussion

The results reveal that climate change is not only an environmental problem but also a socially built element of daily life which mainly affect women in Pakistan. Women face more pressure because climate-related risks suffer their health, mostly during periods of extreme heat and droughts. It leads to water scarcity, and environmental instability. Their word burden increases. Reported impacts are fatigue, dizziness, and dehydration particularly in pregnant and lactating women making them vulnerable group. Climatic hazards further bring other several issues such as clean water problem. Contaminated water further appeared as a chronic health problem, causing to gastrointestinal illness among women and children. These health effects are normal as part of daily survival under these environmental circumstances. As one participant stated, “The heat makes us too weak to bring water during our pregnancy, but we have to go for survival." This proves that climate change is not an external shock but it is a embodied, nonstop state of survival shaped by gender-based labor.

Women's personal experiences are strongly systematized in vulnerable areas by gendered divisions of labor and duty to perform in every situation. Such duties are important for survival such as water providing, food preparation, and care-giving during sickness and climate disasters. These tasks exaggerated during life-threatening events including floods and heat-waves, growing both physical exposure and emotional strain. A participant explained, “When the river water changes its position, we are the first to feel it as dangerous and the first to find a way to avoid any incident.” This shows that vulnerable group get disturbance from every climatic shock. They have their own ways to adapt the climate change situation. Women have more knowledge for tackling the situation with informal ways because

governance and institutions arrive aftershocks. Community=besed coping mechanism is shown in fig 1.

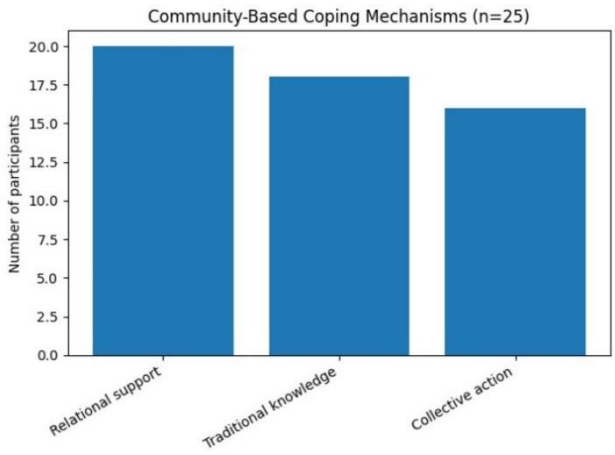

Figure 1. Community-based mechanisms among managing women (n=25).

Even with structural boundaries, women showed their adaptive capacity through interlinked forms of community-based managing methods. Table 3 shows several coping strategies and other related problems. Relational care networks appeared as a serious survival infrastructure during climate shocks. Neighborhood relations play important role such as food sharing, joint childcare, emotional support, and shared sheltering during floods. One participant explained the feelings, “During flooding, we all eat from one pot.” This kind of sharing plays vital role for disaster response mechanisms. Women have traditional ecological knowledge for healing, such as herbal medicine, home-based adaptation methods, and informal water cleaning practices. One participant said, "We use tree leaves particularly Neem-Tree to clean dirty water." This reflects intergenerational knowledge transmission entrenched in women's care-giving roles. It leads to local adaptation for climate shocks. This result aligns with climate adaptation literature which stresses the importance of indigenous and observed knowledge in handling climate uncertainty. Women also involved in collective action at the community level, mainly in fixing and keeping shared infrastructure such as hand-pumps, drainage infrastructures, and water access arrangements. One respondent specified, “We fixed the hand-pumps together because no one was there to help." These practices prove that adaptation is not only an individual response but a shared, willing, and socially entrenched process.

Table 3 Summary of Themes, Codes, and Illustrative Evidence

Main Theme	Sub-theme	Code	Illustrative Quote
Climate Health Risks	Embodied experience	Heat-related weakness	“The heat makes me too weak to carry water during pregnancy."”
Gendered Roles	Care responsibility	Water & food management	"If there is no water, I must walk farther to find it.”
C o	Re lati	Food sharing	“During floods, we all eat from one pot.”

p i n g Mecha nisms	on al su pp ort		
Coping Mechanisms	Tra ditio nal kno wle dge	Herbal water treatment	"We use neem leaves to clean dirty water.”
C o p i n g Mec hanis ms	Collective action	Infrastructur e repair	"We fixed the handpump together.”
Inst ituti ona l Res pon se	Disconnect	Lack of trust	“Officials come and go, but nothing changes.”

Though, these robust informal managing systems exist due to no cooperation with related institutions. Participants constantly stated dissatisfaction with formal climate and health interventions, because they are always temporary, and poorly aligned with local realities. One participant briefed this sentiment: "Officials come and go, but nothing changes for us.” This supposed to be weak integration between policy frameworks and lived experiences. This is the reason, they do not trust on institution and leading to informal arrangements of adaptation. From a theoretical perspective, these conclusions strongly support the concept of socially built vulnerability, where climate risk is shaped through intersecting gendered roles, institutional exclusion, and organizational inequality rather than environmental exposure alone. According to the Pressure and Release (PAR) model, vulnerability is rooted in deeper structural circumstances including inadequate access to resources, restricted decision-making power, and gendered divisions of labor that form both exposure and adaptive capacity.

However, the study also discloses a serious tension between high levels of informal resilience and low levels of institutional recognition and support. This can be described as "invisible resilience." Though communities endlessly absorb and manage climate shocks through local approaches, these practices remain mostly unsupported within formal

governance structures. Overall, the findings highlight that operative climate adaptation in Pakistan needs a shift from technocratic, top-down methods toward gender-responsive, locally beached, and socially inclusive governance frameworks. Integrating women's lived experiences, personified knowledge, and community-based methods into formal adaptation arrangement is important for addressing both climate vulnerability and fundamental structural inequalities. Fig 2 demonstrate related information.

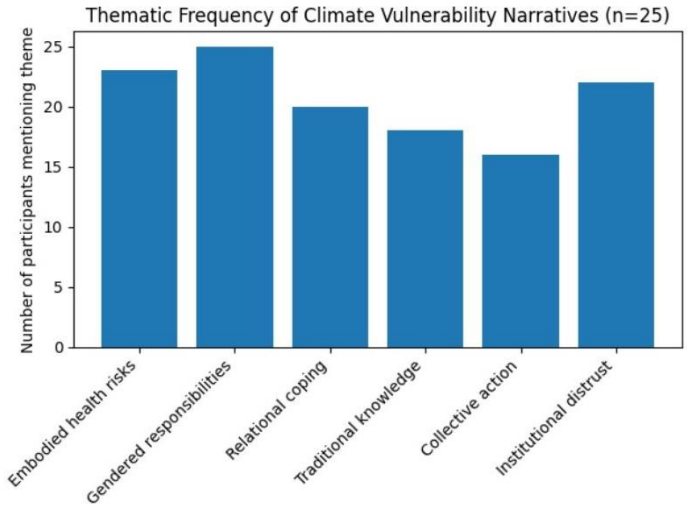

Figure 2. Thematic frequency of climate vulnerability narratives among women (n=25).

5.Conclusion and Policy Implications

This study proves that impacts of climate change in Pakistan are not only environmental in nature but are deeply socially built through gendered relations, institutional activities, and daily survival approaches. At the same time, the research shows that women are not passive recipients of climate risk. They actively understand environmental change and respond through their own knowledge, personal networks, and collective action. Their managing mechanisms ranging from food sharing and care structures from traditional ecological knowledge are playing a good role for community infrastructure repair but mainly unrecognized as it is local adaptation. These plans remain informal, under-resourced, and inadequately supported by institutional structures, resulting in labelled as invisible resilience, where communities sustain adaptation without policy makers support or other assistance. From a theoretical perspective, these conclusions strongly support the concept of socially built vulnerability, where climate risk is shaped through intersecting gendered roles, institutional exclusion, and organizational inequality rather than environmental exposure alone. According to the Pressure and Release (PAR) model, vulnerability is rooted in deeper structural circumstances including inadequate access to resources, restricted decision-making power, and gendered divisions of labor that form both exposure and adaptive capacity. The study concluded that climate change in the research context is experienced not as an environmental phenomenon but as a deeply personified and socially built condition of daily life, mainly for women in climate-affected societies of Pakistan. This study also concluded that that operative climate adaptation in Pakistan needs a shift from technocratic, top-down methods toward gender-responsive, locally beached, and socially inclusive governance

frameworks. Integrating women's lived experiences, personified knowledge, and community-based methods into formal adaptation arrangement is important for addressing both climate vulnerability and fundamental structural inequalities.

In policy terms, a fundamental shift is required climate adaptation in Pakistan. Existing approaches remain largely technocratic and hazard-focused, with partial attention to lived experience and social inequality. Effective adaptation should move toward gender-responsive and socially inclusive climate governance frameworks that identify women not only as vulnerable groups but also as active knowledge holders and main agents of resilience. Climate adaptation policies should integrate at local and district levels. Adaptation programming should address structural constraints, especially those related to mobility, resource access, and decision-making power that limit women's adaptive capacity. Finally, institutional mechanisms must be redesigned to improve trust, continuity, and local relevance, ensuring that interventions are sustained rather than episodic and disconnected from community realities.

Conflicts of Interest Declaration

All authors declare that they have no conflicts of interest.

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