

A Review on Climate Change and Gender Dynamics in Pakistan

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Abstract

This study conducts an extensive review to examine how gender relates to climate change in Pakistan by exploring the climate-led difficulties that affect women differently. The research happens at a time when experts position Pakistan as a leading risk nation for climate change, and its social problems intensify because women face substantial exclusion gaps. Pakistani women face substantially adverse outcomes from climate change, which include increased caregiving responsibilities and insecure income, and dangerous health conditions. The 2022 flood disaster revealed that millions of citizens became more exposed to danger while facing the catastrophe. Women face two major challenges that prevent them from joining climate resilience programs: ongoing gender inequality and discriminatory policies. The assessment shows why gender sensitivity should be coupled with stakeholder cooperation for addressing these problems. Gender-inclusive climate action approaches will enable Pakistan to develop better strategies that combine climate resilience with sustainable development achievements. The document recommends strengthening both policies and institutional processes, which should empower women to act as climate solution providers for Pakistan.

Keywords: Climate Change in Pakistan, Gender Inclusive Climate Action, Gender Inequality, Gender Sensitivity

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INTRODUCTION

Climate change is one of the world's most current and pressing concerns for nations; Pakistan is the eighth most susceptible country to climate-related disasters (Global Climate Risk Index, 2017). Regional variability is the major reason for climatic threats in Pakistan, as it is located in a region with different climatic conditions. Socioeconomic differences intensify climate change results, including floods, droughts, and resource shortages. This transformation places socio-economic disruption risks whereby food production in the primary area would be impacted together with security (Raza, 2023). It is regularly affected by floods and drought, which severely affect agriculture; an important economic sector in the country. The flood of 2022 claimed 33 million people of its total population and engulfed a third of the country; it demonstrated how climate change impacts the vulnerable easily, especially women (UNDP, 2023). They have been attributed to climate change, and the effects witnessed have included destruction, floods, and economic loss (Ishaque et al., 2022).

Currently it faces severe water shortage problems due to glacier melting, poor water storage infrastructure, and its growing population. This crisis is a cocktail of threats associated with its social and health impacts as influenced by horrible aspects such as contaminated water sources (Climate Change and its Effects on Pakistan, 2023, Ishaque et al., 2022). especially women and girls because they are saddled with the responsibility of water collection in most rural homes making them more prone. Hence, there is a great need to understand the outcome of climate change in Pakistan to counter the effects that affect vulnerable groups and provide correct preventive measures. Gender relations are also essential in determining how climate risks are felt in different societies. Gender relations determine socio-political and economic characteristics within the society (Channa & Tahir, 2020). This paper also reveals that the socio-economic vulnerability of women in Pakistan has not improved and they are still more susceptible to climate shocks. The 'feminization of vulnerability' describes the fact that women are exposed to even greater risks than men and it becomes worse for women in the rural areas; They lack access to resources, decision-making power, and education as compared to men in their communities (Mckune et al., 2015). Another approach is a gender perspective that is essential to identify essential conditions that women accept while adjusting to climate change.

Mainly, the paper aimed to discuss the need to incorporate gender factors in adaptation as a measure of strengthening the ability of needy groups to cope with the ramifications of climate change. When female social capital is incorporated, and women's contextual knowledge of the ecological systems involved in resource management is valued, gender and social equity can promote climate adaptation practices (Assan et al., 2018). However, factors including restricted funding, training, and decision-making capacity negatively affect women's efforts to improve these strategies (Abid et al., 2015). It, therefore, becomes important to understand these barriers to promoting women's rights and improving community coping in adaptation. The purpose of this literature review will therefore be to review the existing literature to establish how climate change holds implications for gender relations in the context of Pakistan. It aims to examine climatic change risks from a gender analysis, establish measures to support women's ability to adapt to the changes and review existing policies addressing the risks. Key research questions guiding this exploration include: There are a range of ways, but before answering this question we have to explore what actually climate change means and how it impacts women.

Which approach has been pointed out as best suited for women's adaptation? This review paper draws on qualitative research methods to integrate the constituent aspects of gender within climate change. As such, it also stresses the need to substantially increase public awareness programs on climate change risks and how these affect women. Education of women in local resource management of their communities contributes to increased community resilience as mentioned by Nousheen et al (2023). For example, the use of climate-smart technologies in agriculture, if taught to women, not only enhances food production but also increases their commercial value through extra returns (Memon et al., 2023). Women's involvement in policymaking makes sure that all the policies intended to aid vulnerable persons are well implemented. Therefore, focusing on education and good governance is key to fashioning a society in Pakistan that can effectively respond to climate change dynamics in support of women's agendas on the overall bearings of sustainable development.

LITERATURE REVIEW

Climate change is the biggest threat that poor and sensitive countries like Pakistan are facing. The country is very vulnerable to disaster and always experiences floods and drought which avert the socio-economic productivity of the country and availability of food (Ali et al., 2020; Red Cross, 2021). In its assessment, the study shows that climate change does not only deepen vulnerability but also presents major threats to human health, assets, and means of living in these areas. On the extreme scale, 119 million people can be flooded in a major flood only and they result in approximate GDP losses of \$289 billion (World Bank, 2022). While the current effects of climate change are apparent through its influence on public health and the stability of Pakistan's Economy, climatic change also has an effect on the agricultural growth that is very central to food security in Pakistan. It means any disruption in the agriculture sector costs severe socio-economic impacts since it contributes to a considerable portion of the GDP and engages nearly half the population (Khan 2015). More so, the enhanced occurrence of disastrous climatic conditions, not only does it lead to low crop production but also soil and water the overall enhanced occurrence of disastrous climatic conditions, although comprehensively leads to low crop production as well as soil and water thus enhancing poverty and malnutrition level in vulnerable communities (Fahad and Wang, 2020).

However, farmers change cropping patterns or become absenders for some time, coping strategies may in turn decrease local resiliency eventually marking cyclic dependency as opposed to establishing enduring development (Farooq and Fatima, 2022). Thus, the pressure shifts onto policymakers to ensure that they develop very effective measures for the adaptation process, which will encompass the short-run requirements as well as the long-run environmental management. Pakistan's vulnerability is alarming: there is a scarcity of inputs available in shires like Badin and Rajanpur and high temperatures affect wheat negatively with low national productivity during rainfall stresses (Imran & Amanullah, 2018). Gender mainstreaming in climate adaptation not only improves the firm's capability to adapt but also improves development as empowered women are often involved in agriculture innovation and resource management (Shahbaz et al., 2022). Research reveals that when women are decision-makers within households and activities supporting their decision-making, they are less exposed to climate impacts (Iqbal et al., 2015). This implies that there needs to be enlightenment and participation in education for women so that they can be able to withstand such climatic shocks and at the same time have positive impacts on the community stability of the affected areas as postulated by Blamkespoor et al. 2010. Moreover,

the elimination of social factors that limit women in engaging in practices of farming may result to appropriate practices of farming, thus an increase in yields and possible economic self-sufficiency of rural women (Tanwir & Safdar, 2013). Therefore, mainstreaming gender in climate adaptation interventions is the fundamental tool of a strong framework that can address the impact of climate change on vulnerable groups.

Since the control of resources and decisions weakens, women are worse affected—this situation is termed the feminization of vulnerability (Djouidi et al., 2016; Brown et al., 2020). Vulnerability is a function of socio-demographic status; especially when women depend on natural resources for their livelihood, but education is out of their reach (Sultana, 2018; Mnimbo et al., 2016). Secondly, conflicts over environmental resources and women's vulnerability are partly linked and these two areas of concern need to be addressed through differing intercessions that correspond to gaining access to resources and education. The various challenges that women face make them adapt to working in the informal sector different and multiple income-earning strategies. Despite these strategies may offer a time-bound solution, they do not guarantee long-haul stability (Brown et al., 2020).

Stressing one's weakness is considered as one more important step towards recognizing and combating the problems ladies have in their daily softened existence. In contrast, emphasizing vulnerability can help establish comprehensive care systems and portray complex and valuable women, as opposed to constructively erasing women's agency (Savas et al., 2023). If vulnerability is acknowledged, then the woman is enabled to ask for assistance, fight for her rights as well as support other women. It can help increase women's agency through empowering them to pursue responses thereby not erasing their strength or independence (te Riele & Shelly, 2021). This move brings about recovery and strength and grapples with a culture that always disapproves of weakness. Widening of these vulnerabilities is well observed in the areas with severe ecological deficits and environmental deterioration where utilization of scarce resources fuels gender and other types of violence and deepens women's subjugation. Hence, the solution to these interrelated problems involves a partnership that presents women with education fair use of resources, and provision of solutions to the effects of environmental conflicts that affect their lives. This indicates that adaptation requires population sub-discourse categorization focusing on the problems faced by women during climatic transformation. It is however relevant to accept criticisms of victimization narratives, as it is relevant to admit that such conversations may help people. This is because informal narratives of individuals and how they experienced adversities in their lifetime could offer a form of endorsement of the same adversities (Green et al., 2020).

To understand this intersection, textual knowledge is gender socialization theory which posits that behavior in regard to an environment may be influenced by gender roles (Lunneberg & Charles, 2018; Ampaire et al., 2020; Nagasha et al., 2019). The roles limit women's ability the control of resources like water or agriculture. Gender socialization theory explains the regulation of gender roles based on mainstream societal culture on climate change issues. (Tigishvili, 2020) In the Pakistani perspective, women are socialized to be the managers of resources in the family. It situates them at the sharp end of climate change effects but provides them with almost no say in the management of their futures (Habib et al., 2022). The theory explains what is referred to as the 'feminization of risk' in as much as women's vulnerability increases because of conventional paradigmatic roles during climatic catastrophes. These policy implications are sometimes overlooked hence giving rise to demands by women and prompt policy strategies (Hlahla, 2022).

Furthermore, the nature of gender has a broad cross-over in the policies and makes it essential to analyze the local government structures that disempower women in decision-making regarding their own lives. This deficiency weakens the management of resources and increases women's risks because they are often left out of decisions on disaster planning and mitigation. Even though most traditional frameworks are perceived to negatively impact women's empowerment, some give it a perfect foundation. Several cultures have set out roles that have the potential to be helpful to women if given the right meaning (Goodman et al., 2022). For instance, evaluated the role of sample tradition in achieving career-related goals, traditional family structure can enhance women's collaboration enabling them to use relationships for self-enhancement (Pitilin et al., 2013). Additionally, traditional practices and values can foster community cohesion, which can be a powerful platform for women to advocate for their rights and interests. Moreover, traditional structures can serve as a catalyst for change when women actively engage within them. By participating in and reshaping these systems, women can influence decision-making processes, challenge stereotypes, and create pathways for future generations. This engagement can lead to a more inclusive interpretation of traditions, allowing for the empowerment of women while respecting cultural heritage. (Vukovic, 2022) Thus, rather than viewing traditional structures solely as obstacles, they can be seen as potential allies in the quest for women's empowerment.

Despite advancements in integrating gender perspectives into policies addressing these issues remains evident: current adaptation policies are predominantly lacking when it comes to indicating how different genders might need consideration (Mersha et al., 2019). Power relations that underpin differential responses to inclusive adaptation cannot be fully understood without a critical intersectional analysis (Garcia & Tschakert, 2022). It is a fact that most frameworks do not address the characteristics of women; the strategies developed at the technical level do not take into account socio-cultural realities influencing resource utilization (Alhelou et al., 2022). This not only fails but sustains inequalities because climate adaptation requires the participation of all actors – or, especially those that are most susceptible to climatic shifts. (Kushwah et al., 2022) (Rattani et al., 2021).

Furthermore, it is more likely that neglecting methods from the gender perspective will only sustain gender disparities that negatively affect efficiency in the end (Gaona et al., 2022). Studies indicate that women have local ecological knowledge that, if incorporated into policy, might improve adaptive capacity (Walker et al., 2021). It is stated that targeting intra-gender differences possibly depending on caste and/or economic status can either develop custom solutions considering what the different groups within communities need (Migliorini et al., 2020). The literature offers a pattern interaction of methodologies used in studies discussing this subject of concern with a focus on ways in which climate change impacts differently between men and women and women and their roles in relation to adaptation. Therefore, to address this multifaceted reality, which encompasses qualitative research as well as various quantitative methods, further methodological pluralism is needed, as has been described by Kelly et al. (2023), and Nahar, and Tajuddin (2022). Quantitative methods have been important, particularly for capturing concrete experiences caused by climate changes —disclosing how cultural realities entail effective comprehension of such issues (Reyes-García et al., 2019). This approach not only improves the credibility of obtained results but also brings reflection upon scientific discourses and indigenous knowledge systems to a higher level.

In order to avoid leaving out certain types of data, Amara has found that researchers will have to deploy quantitative techniques that will complement the qualitative data collected in order to

develop rational, systems frameworks that are sensitive to cultural nuances and that simultaneously seek to address critical problems arising from climate change. These frameworks enable synergy between various stakeholders, thereby ensuring that, in addition to meeting all scientific requirements, solutions are also culturally appropriate and socially just.

On the other hand—quantitative methodologies comprise constant statistics helping in the development of overall patterns of change within the larger population which has been greatly affected by traditional resource management systems in rural livelihoods especially the agriculture sector greatly influenced changes in weather patterns seen through statistical projection matrices derived from precipitation data from main regions recently affected northern areas having increased risks associated with natural disasters attributed changes observed in underlying system (Kumari et al., 2022; (Sime & Aune, 2019). Mixed methodologies therefore ensure connecting apparently unrelated qualitative/in addition quantitative approaches that enable researchers to relate complexities or discuss climate change impacts on different groups/regions defined by different levels of socio-economic development that vary in different demographic segments of the country as well as in terms of certain common issue that are evident in the rest of the world according to the authors (Hesse-Biber, 2019).

This composite approach enhances knowledge of climatic effects and explicates socio-cultural processes especially the gender system-defined vulnerability/adaptation of numerous communities. Thus, by incorporating Qualitative data with a Quantitative framework, the researchers are able to capture the experiences of the subjects better and thus facilitate equitable policy interventional. In addition, it is also equally important that the intersectionality of identity, age, education level/economic status shall address a broad perception of the different demographic segments and how they address the complexities of climate change adaptation across different socio-economic realities. Inclining such approaches makes it important to understand that any policy-making must involve the local people, to ensure that the policies being set are not only analytical within a data-oriented context but also contextually relevant and inclusive. An inclusive framework can help the ‘voiceless’ in society to be able to participate actively in the decision-making processes that affect them and/or their environments.

METHODOLOGY

This paper uses a method of conducting a qualitative analysis of literature to analyze the relationship between climate change and gender in Pakistan. The kind of research that is at the center of the methodology is a synthesis of other works of research and, in particular, articles that focus on women and their susceptibility to climate change. The following components outline the approach taken. Scoping of family planning research data, specifically, the use of peer-reviewed articles, reports, and case studies that provide information about how climate change impacts women in Pakistan was compiled. To that end, this review seeks to establish themes bordering on gender-sensitive specific risks, adaptation measures, and policy frameworks. The current review analysis is therefore presented in a coherent and credible chronological sequence that captures the true nature of women’s interaction with climate change. This particular paradigm enables the identification of the relation between the socio-economic factors, cultural practices, and environmental issues affecting women. The review also critically evaluates the existing climate change policies in Pakistan to identify the extent as well as how well they meet the gender needs and risks. The research focuses on these aspects demonstrates the drawbacks of existing approaches and provides suggestions for policy improvement.

As this study is based on a literature review ethical approval is not needed. However, all sources used in this work are acknowledged in compliance with copyright to the original authors. Thus, the goal of this scoping review of qualitative literature is to advance the understanding regarding the integration between climate change consequences and gender relations in Pakistan. This way, focusing on women's experience, the study aims to present useful information for the policy-makers and interested parties to develop relevant climate change adaptation mechanisms.

RESULTS AND DISCUSSION

This study has identified the issues of climate change, gender, and socio-economic vulnerabilities that are interacting in various ways in Pakistan. Referring to the literature, it must be noted that Pakistan remains one of the most susceptible countries to climate change associated with severe consequences for the population. Present-day physical flood risks, including significant floods, could impact about 119 million people and cause GDP losses of nearly \$289bn (World Bank, 2022). It is against this backdrop that societies must seek basic climate solutions that will work especially for women due to the various vulnerabilities that they experience as a result of climate change.

The investigation of gender relations finds that women in Pakistan often find themselves in a position of high risk because of cultural practices that diminish their ability to control resources and make important decisions. The idea of the 'feminization of vulnerability' is pertinent here; as highlighted by (Djouidi et al., 2016), and (Brown et al., 2020), constrained educational, and earning potential resulting from dependence on natural resources is an essential precondition to the disaster-related impacts of climatic change among the female population. This is similar to the literature explaining that women-headed households that involve women, who have pluralistic decision-making powers, have relatively lower levels of overall vulnerability (Iqbal et al., 2015). Therefore, not only is there a gender equality issue here, it is critically important for furthering the health and well-being of the communities involved.

However, the study also reveals the challenges that reduce women's participation in agricultural activities/ climate change mitigation. Cultural practices and practices of conventional machismo impact on access to resources and influence women to either individually or collectively play a limited role in the formulation and implementation of policies on resource and adaptation management (Shahbaz et al., 2022). Overcoming these barriers is important in promoting the use of sustainable methods in farming as well promoting economic autonomy among rural women (Tanwir & Safdar, 2013).

The outcomes of the given consideration also stress the necessity of incorporating gender factors into climate change mitigation activities. As highlighted in the literature, it goes a long way to make women empowered not only to improve resilience but also to support sustainable development (Shahbaz et al., 2022). This integration is important to formulate a strong framework that would help to minimize the impacts of climate change on vulnerable groups. However, there are policy crevices that do not consider gender-specific concerns due to both reinforcing inequalities and weakening the approach of the interventions (Mersha et al., 2019; Gaona et al., 2022).

Moreover, the study focuses on the importance of methodological diversification concerning the effects of climate change on various population categories. The literature shows that men's and women's climatic conditions involve differing coping mechanisms for climate change (Kelly et

al., 2023; Nahar & Tajuddin, 2022). Integrating both objective and subjective data consistently complicates the study, but it allows for capturing experiences essential for balanced policy and equitable treatment.

The study also further established the importance of local governance institutions in the advancement of women in climatic change adaptation policies. The absence of representation makes it even more difficult to call in resources to negotiate or enhance existing threats and vulnerabilities (Garcia & Tschakert, 2022). Patriarchal systems of power prejudice women's involvement undermining their decision-maker roles and perpetuating poverty and subordination in rural zones. So, incorporating gender-disaggregated information into policy strategies is crucial to enable gender-sensitive consideration of women's experience and value for creating a climate-resilient environment.

Although we read traditional structures as constraining women's opportunities for power, they can be friends when viewed as having a positive spin (Goodman et al., 2022). For instance, nuclear hospitality can enhance togetherness of females to bring relations into work for advancement (Pitilin et al., 2013). According to this view, instead of just wanting the annulment of conventional systems, endeavors should also be made to enroll the women within these frameworks to fight for their rights. From these understandings, there is a significant lack of contextual investigations focusing on how traditional archetypes confront current issues arising from the climatic transitions Pakistani women face. Such dynamics have not been captured in existing studies, and therefore there is a need to have more research done to understand how the governance of the local institutions contributes to enhancing or otherwise women's participation as well as how such cultures can be best embedded into the creating of appropriate policy interventions that would enhance the resilience of vulnerable groups.

Thus, based on this work, the social and political connections between climatic change vulnerability and gender disparities in Pakistan are closely discussed. It requires that concerted efforts be fashioned and implemented to promote women's political participation through education and the management of required resources as well as socio-cultural factors that influence their exclusion. In this way, it is possible to encourage greater concern for women's opinions in the climate change debates and in turn hover for useful measures for society.

Limitations

There are some limitations of this research that can be discussed while analyzing gender and climate change in Pakistan. First, the research mainly only uses qualitative data; this is important as qualitative data sources are rich in details, but often fail to provide a broad picture of how women across all socio-economic groups may experience pelvic pain. It is noteworthy that there is a clear lack of qualitative research that would be valuable for future studies combined with quantitative data which would allow for a richer understanding of women's risks and their strategies.

Second, the study was constrained to a few regions in Pakistan which may give a restricted generalization of the study. These characterization patterns of gender roles and climate change adaptation can therefore differ from one province to another and from one community to another. Future research should investigate these processes and actors in different geographical settings in order to establish regional characteristics of women's role in climate change adaptation.

Furthermore, although this paper draws on local governance structures as a determinant of climate vulnerability and women's engagement in adaptation, it does not explore how these structures work. Subsequent research should explore how local governance can be better supported so that women can better participate and be involved in decisions about climate change. Last but not least, there is a lack of longitudinal research on the impact of gender-sensitive climate policies and programs on women's vulnerability that enables a much better understanding of the efficacy of these interventions in the long run. This would assist the policymakers on which of the strategies is most responsive to the promotion of gender equity as well as sustainable development in the backdrop of ongoing climate fluctuations.

CONCLUSION

This literature review has also brought out the issue of interaction between Gender Dynamics and Climate change In Pakistan and how socioeconomic status has worsening consequences for women and other less privileged areas. This paper focuses on Pakistan as one of the countries most vulnerable to climate change disasters and how structural factors such as gender barriers affect women's ability to access funding and have control over resources or education. This paper also explores the dynamics by using the framework of 'feminization of vulnerability', in which it is seen that women are more affected by climate change due to the reasons of unequal structures. Present policies lack the capacity to directly address women's issues and in fact continue to work to uphold injustice. This above failure realizes the clash and negligence towards gender-sensitive approaches in the climate adaptive policies. Inclusion of women's Participation within the policy formulation processes and its implementation, it is possible to ensure that solutions geared towards combating climate change effectively, are inclusive.

Competing Interests

The author declared no known competing interests.

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