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Gender, Climate Change, and Social Inclusion in Pakistan: A Case Study of Khyber Pakhtunkhwa

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ABSTRACT

Khyber Pakhtunkhwa (KP), the province of Pakistan, having a patriarchal society, gender inequality, and environmental vulnerability, needs an inclusive climate governance and women are disproportionately affected due to climate change . The objective of the study is to examines the relationship between climate change, gender inequality, and social justice in KP only from 2014 to 2025. The study adopted qualitative research methodology by collecting data from books, articles, reports of international and national organization data sources and analysied through thematic analysis. The results show there is gender discrimination in literacy rate, access to economic resources, access to information and the inclusive decision-making process further intensified by institutional and cultural barriers. The results highlight the urgent need for Gender Equality and Social Inclusion (GESI) in climate governance with the integration of indigenous knowledge and cultural and community engagement in policy making and implementation to improve resilience. It recommends the need for an integrated approach that incorporates gender-responsive policies, community engagement, and innovative solutions.

| **Keywords:** | Climate Change, Social Inclusion, Khyber Pakhtunkhwa, Climate Adaptation, Cultural Engagement, Gender Inequality |

Introduction

In Pakistan, the intersection of social injustice and climate change is not just an emerging challenge; it is an immediate crisis. The devastating floods of August 2022 highlighted this reality, as countless vulnerable populations were displaced, their livelihoods shattered, and socio-economic disparities widened. These challenges disproportionately affect marginalised groups, particularly women, who often bear the brunt of environmental degradation due to socioeconomic inequalities (Ahmed, et. al., 2015). Pakistan is not only the signatory of several important multilateral climate change agreements, but it has also ratified them, including Kyoto Protocol (1997), the Paris Agreement (2015), and the United Nations Framework Convention on Climate Change (UNFCCC 2016) to establish a robust climate change governance policy that integrates gender-responsive legislation to assure inclusive and responsive climate action policies (ADB, 2017). The relationship between social justice and climate change offers a challenge and a crisis in Pakistan. The devastating floods of August 2022 and the latest floods in Swat and GLOFs in Hunza Gilgit (2025) are the latest examples, as millions of people were displaced and many among them were vulnerable, devastating their livelihoods and intensifying socio-economic inequalities. These climate-induced impacts excessively affect marginalised communities, specifically women who mostly suffer due to socio-economic inequalities. Pakistan emits less than 1% of global greenhouse gas, but one of the four most severely affected countries by climate change (Nadeem, et. al., 2023; Umer et al., 2024; UNDP, 2023)

The environment has been the subject of the national government since 1975, and the Ministry of Environment (MoE) was established to develop environmental Policies, programs and agreements with international organisations regarding the environment. Then, in 1983 Pakistan Environmental Protection Ordinance (PEPO) was announced, which was a legislative environmental milestone according to the World Bank (2006) and in 1997 enacted as Pakistan Environmental Protection Act (Pak EPA, 1997) making the foundation for the Pakistan Environmental Protection Council (PEPC) and Pakistan Environmental Protection Agency (PEPA) (UNEP, 2013). After the 18th amendment environment became the subject of provincial government, terminating the Ministry of Environment's activities in the centre. Subsequently Ministry of Climate Change was established by the federal government of Pakistan in 2012, followed by the National Climate Change Policy (NCCP) (Akbar, 2023). The government of Pakistan passed the Climate Change Act in 2017 with the International Union for the Conservation of Nature (IUCN)'s assistance, and to mitigate the impacts of climate change, it also formulated the national climate change Gender Action Plan (ccGAP) (2022). The 18th Amendment was not only an opportunity but also a challenge for all the provinces of Pakistan to formulate climate change mitigation policies (Shah et al., 2021). Punjab and Balochistan passed environmental protection laws in 2012, and Sindh and Khyber Pakhtunkhwa (KP) in 2014.

Annual glacial melting in Pakistan is recorded at 2.3%, projected to rise by 2050 (Adnan et al., 2024). Pakistan is home to approximately 7,000 glaciers, extending across the Karakoram, Himalaya, and Hindukush Mountain ranges, regarded as one of the most glaciated regions outside the polar areas (Khan et al., 2022). These glaciers are a crucial source of freshwater, with millions of people's livelihoods dependent on them for drinking water, irrigation, and hydroelectric power; however, these glaciers are retreating at an increasing rate due to rising temperatures. Reports indicate that about 3000 glaciers are unstable and deemed critical for glacial lake outburst floods (GLOFs), which can result in flooding downstream (Shrestha et al., 2023; Afzal, et. al., 2020). Even if global warming is limited to 1.5°C, it is predicted that 30% of the Himalaya and Hindukush glaciers would vanish by 2050, heightening the risks of water scarcity and threats to socio-economic stability (Khan, et. al., 2022; Magee & Dixit, 2023, December 3).

Climate change and gender discrimination are interconnected global issues. Developing nations like Pakistan have a pre-existing issue of gender discrimination that has a great impact on women due to climate change. The international literature on climate change highlights the importance of women-inclusive climate action policies to create awareness among those particularly affected by climate change. Pakistan is one of the most vulnerable countries to the impacts of climate change and suffers an economic loss of $38 billion annually. Millions of people in Pakistan are directly exposed to natural disasters. Women, children, and old people are among the most vulnerable populations exposed to climate change. According to the Gender Gap Index, Pakistan is the 145th country among the most significant Gender Gap countries (UNDP,2023). Therefore, working on the gender-climate nexus will be a great opportunity to address both issues, and it will also be an opportunity to achieve Sustainable Development Goals 5 and 13, which are gender equality and climate Action.

Women in KP (Pakistan) are severely affected by climate change due to their economic status, social roles, limited access to resources, and absence of gender-responsive policies, which intensify their vulnerabilities. The study aims to examine how gender equality and climate change are interconnected in Khyber Pakhtunkhwa (KP), a province of Pakistan. Due to the social responsibilities and limited financial resources, women face risks due to climate change in rural Khyber Pakhtunkhwa (KP), Pakistan. Climate impacts, ranging from heatwaves to melting glaciers, harsh weather to floods, floods to heatwaves, further increase gender disparities, making it unavoidable to develop gender-inclusive

climate action policies that address these inequalities and contribute to achieving SDGs for Gender Equality and Climate Action.

The literature on gender and climate change has grown significantly, but the focus was on broad regional impacts, in the global South, without adequate attention to the intersection of gender, climate change, and local policy frameworks. In Pakistan, few studies have explored gender vulnerabilities in the face of climate change, with little focus on how national and provincial climate policies integrate gender considerations, and the extent to which they actively promote climate justice for women, especially in marginalised rural areas. Moreover, while Pakistan's national climate policies have started addressing gender issues, the implementation of gender-responsive strategies at the provincial level remains underexplored. The role of gender justice, particularly addressing the unique vulnerabilities of women in regions of Khyber Pakhtunkhwa, has not been thoroughly analysed in climate adaptation and mitigation frameworks. This study explores the intersection between gender-inclusive climate governance and local engagement for sustainable and equitable climate adaptation and mitigation in KP.

The first document was the Khyber Pakhtunkhwa Environmental Protection Act (2014), provided a road map towards environmental protection in KP. Khyber Pakhtunkhwa Climate Change Policy (2022) is the second document, incorporating policy measures, identifying research areas, including newly merged districts and rules for inclusive climate action, an updated version of the 2017 climate change policy. Khyber Pakhtunkhwa Climate Change Action Plan (2022) is the third document, including adaptation and mitigation policies. The second and third documents align with the National Climate Change Policy (2021).

The Khyber Pakhtunkhwa (KP) has a population of 40.85 million, with 51.02% male and 48.97% female, with 15.01% rural and 84.99% urban population according to the executive report on KP gender parity (Chief Minister Khyber Pakhtunkhwa, 2025). The province is situated in the northwest of Pakistan, bordered by Afghanistan, with Gilgit Baltistan to the northeast, Azad Kashmir to the east, Punjab to the southeast, and Balochistan to the southwest. Peshawar serves as the provincial capital and covers a total area of 101,741 square kilometres, with a population of approximately 35,519,927 as of 2017. The province exhibits climate variations across its different regions. The valleys of KP experience moderate summers and harsh winters. Annual rainfall from January to April averages 400mm, while snowfall occurs in the high-altitude mountainous areas characterised by oak, conifer, and pine trees, which are currently declining due to deforestation that affects many mountain regions. Some areas of KP consist of grasslands populated by acacia, shrubs, and grasses. Annual glacial melting in Pakistan is recorded at 2.3%, projected to rise by 2050 (Adnan et al., 2024).

In KP, the connection between climate impacts and gender disparities is deeply rooted, posing governance challenges. Women's literacy rate is 35% in KP, lower than the average (Khan, Abdullah & Shah, 2024), with the least representation in the employment sector and public decision-making. KP's more than 80% population is rural, traditional norms restrict women to domestic roles, limiting their voice, and confining mobility in institutional matters. Women are disproportionately affected by climate change, although they can contribute to adaptation and mitigation strategies. Despite having community networks, traditional knowledge and sustainable practices, this gender dynamics limit inclusive climate action.

Vulnerability is derived from various biological, geophysical and social systems, is becoming the core issue of climate change. It is the limited capacity of an individual to predict, handle, manage, confront and recover and restore from human-made or natural climate hazards. The climate-induced vulnerabilities are high in KP due to limited livelihood opportunities, and the climate impact is a gendered reality. This research is designed to

assess women's financial situation in rural regions in KR confronting climate change with a qualitative methodology. Temperature rise, flash floods, landslides, and erratic rainfall are the major threats for women. During these hazards, women and children are the most vulnerable population in KP. Women's domestic responsibilities doubled during these natural disasters compared to men in their families, while women's contribution to resilience and adaptation to climate impacts is significant in this region. It is inevitable to formulate and implement gender-sensitive region-wise policies in Pakistan, considering the various climatic conditions of the regions.

Literature Review

KP faces vulnerability to climate disasters, with one-third of the region at risk of seasonal and flash flooding, especially in Shangla, Malakand, Swat, Lower Dir, Upper Dir, and Mansehra. The 2022 floods in Swat displaced thousands and damaged infrastructure (Allan et al., 2025). Contributing factors include poor planning, deforestation, heavy rainfall, and steep terrain (Hussain et al., 2021). Glacial Lake Outburst Floods (GLOFs) are becoming increasingly critical risk due to glacial melting in KP, particularly in the Karakoram, Himalaya, and Hindukush ranges. Rising global temperatures have increased both the size and number of glacial lakes, making Chitral and Swat especially vulnerable to GLOFs (Allan et al., 2025). Climate change impacts such as global warming, rapid glacier melting, and increased lake pressure pose significant challenges and threats (Kääb et al., 2015; Farinotti et al., 2019). KP's early warning systems and mitigation policies remain insufficient, placing large populations at risk of displacement and income loss. Extreme snowstorms are expected to become more frequent in the northern parts of the province. The Galiyat region in Northern KP, known for its snowfall, experienced a heavy snowstorm in January 2022, causing 20 deaths due to road accidents, avalanches, and extreme cold, as reported by the Pakistan Meteorological Department and local news agencies (Dawn News, Jan 2022). Similarly, Pakistan has recently experienced an increase in the intensity and frequency of heatwaves during summer, which could lead to heat-related illnesses and fatalities. Studies by the Pakistan Meteorological Department and the World Bank show that rising temperatures, especially in summer months, have resulted in more frequent heatwave events, causing health issues and deaths (World Bank, 2019). Climate reports forecast worsening trends if mitigation and adaptation strategies are not implemented (IPCC AR6, 2021).

Women are vulnerable to climate change due to disproportionate access to resources and over-reliance on climate-impacted livelihoods. The gender analysis shows that climate-induced disasters have impacted women and men differently, highlighting women as a high-risk vulnerable group (Abedin, Habiba, & Shaw, 2013). Moin (2024) discovers the impacts of climate change on the gender dimension in Pakistan, focusing on how women are affected due to socio-cultural and economic vulnerabilities, highlighting the vitality of integrating gender responsive climate policy to ensure inclusive adaptation strategies. Ahmed and Kiester (2021) observe that gender inequalities in coastal Bangladesh influence farmers' access to credit, information, and land, highlighting that women's pre-existing socio-economic limitations restrict their adaptive capacity. The study highlights the importance of gender-sensitive agricultural climate adaptation policies to promote equal distribution of resources and to strengthen community resilience.

The cross-sectional study on flood-affected households in Nowshehra, Pakistan, revealed that women represent only 5% of household heads with antenatal (45%) and postnatal (39%) health care, with 26% of child births from skilled attendants. The study highlights that increasing women's education, specifically health education, can reduce gender-specific public health issues during floods (Sadia et al., 2016). Shah et al. (2020) examine the data from 600 flood-affected households in KP to identify socio-economic factors such as gender, education, income, and health services that significantly impact flood and health-related vulnerabilities. The study examines capacity-building programs,

infrastructure, and national and international collaboration to reduce household risks and improve health due to climate change in Pakistan. The climate-induced risk and household losses in a rural KP reveal that socioeconomic factors such as education, income, health and housing quality and infrastructure influence post-flood financial consequences.

Material and Methods

This qualitative study adopts an interpretive approach to assess the connection between gender, climate change, and governance in KP, Pakistan. KP is a climate-vulnerable province facing forest degradation, frequent floods, and glacial lake outbursts (GLOFs). These challenges disproportionately affect agriculture, which rural and mountainous communities depend on. The climate change policy of KP (2017) and reports from the government, NDMA, and UNDP have been utilised to contextualise these challenges and their discriminatory impacts. Long-standing patriarchal systems in KP hinder women's participation, mobility, and access to climate information in decision-making. Male-dominated decision forums (e.g., Jirgas), cultural restrictions, and purdah limit women's activities. KP women lack land ownership, livestock, or financial resources (Amaral et al., 2024). Their informal labour is confined to household tasks or agriculture, which is seldom documented. However, women possess the capacity for adaptive responses, such as indigenous survival strategies like rainwater harvesting or organic composting, which are crucial for resilience. The 18th Amendment provided opportunities for the provincial government to develop inclusive policies, albeit with weak gender mainstreaming. This framework aims to recommend a pathway towards gender-responsive climate action, fostering sustainable, locally owned adaptation and mitigation strategies, building community trust, and ensuring just and equitable transitions. This entire construction is derived from document analysis and personal observation. The researcher's direct engagement with policy processes, grassroots forums, and academic discourse in KP is vital to interpreting data and bridging gaps in existing literature. To ensure impartiality and neutrality, the research relies on document analysis with indicators such as inequality, poverty, unemployment, and marginalisation, rather than solely on personal observations.

Results and Discussion

Khyber Pakhtunkhwa (KP) has an uneven climate governance landscape with weak coordination between departments such as the Disaster Management Authority, Environmental Protection Agency (EPA), and Forest Department. These institutions operate in silos, lacking gender-sensitive frameworks and inclusive participation mechanisms. Khyber Pakhtunkhwa has a Climate Change Policy (2022) that suffers from limited capacity and inadequate institutional coordination to strategise effectively (Nafees & Zubair, 2021). The study also indicates that following the 18th constitutional amendment in Pakistan, climate adaptation and mitigation strategies have become the responsibilities of provincial governments. This devolution presents opportunities for effective environmental policies and management; however, it has been obstructed by funding, coordination, and capacity issues. The preservation of the environment is the responsibility of every citizen and government institution in Pakistan, requiring coordination among federal, provincial, and national levels, as well as across different sectors, for effective and well-articulated environmental preservation. However, KP's provincial institutions have limited budget allocations for climate issues, a lack of technical capacity, and insufficient representation of women in decision-making processes (Khayam & Ahmad, 2020). The lack of institutional coordination disproportionately affects rural and indigenous communities, where women's roles in natural resource management are significant yet frequently unrecognised (Mustafa, Akhter & Nasrallah, 2013).

Although Pakistan has made efforts in developing climate-related policies, including the National Climate Change Policy (2021) and the KP Climate Change Policy (2022), gender remains unintegrated into the implementation process. Gender is often seen only as a

vulnerable group, not as a transformative agent in climate action (Rai et al., 2021). These result in missed opportunities for leveraging women's indigenous ecological knowledge and adaptive practices.

Policy implementation is hindered by a lack of gender-specific data and participatory mechanisms to guarantee that women and marginalised groups are active contributors to policy development and monitoring (Fatima & Tariq, 2023). Governance frameworks do not account enough for local climate impacts and socio-cultural differences across KP's districts, particularly in tribal and rural areas, having patriarchal norms confine women's public engagement. The limited integration of local governance bodies, such as village, jirgas or councils, into climate policy developments further complicates gender-responsive governance. These traditional institutions often ignore women completely, but they play an important role in local-level decision-making about water allocation, land use, and forest conservation (Ali & Ahmad, 2020).

Cultural values in KP both restrict and offer opportunities for climate engagement. Patriarchal norms bound women's prominence in formal governance, but several women actively manage domestic-level natural resources and have critical knowledge of water conservation, traditional farming, and herbal medicine (Khan et al., 2021). But such knowledge is hardly recognised, documented or included into climate mitigation strategies.

Literacy rate in KP has notable disparity, the overall literacy rate was 52%, with 72.8% male and 37.2 % female in 20-21 and rural areas, male literacy rate is 64.73% and female 32.48%, showing substantial gender disparity in KP in the education sector. Similarly, the survival rate in school from class 1 to 5 in boys is 78%, and in girls is 63%. Teaching staff is 79.9% male and 21.1% female. In 2022, 76.8% of male students were enrolled, while 23.3% of female students were enrolled, showing a pronounced gender gap. Similarly, the enrollment of females in technical institutes is also very low. The low enrollment in schools is due to many reasons, such as females having additional household roles at home, along with mothers. Girls are not allowed to go to boys' schools after class 5, as only 36% of the schools are designated for females, and the distance of the school also matters. Another reason is socio-cultural norms and poverty and economic resources (Chief Minister's Office, Khyber Pakhtunkhwa,2025).

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formulate and implement gender-sensitive region-wise policies in Pakistan, considering the various climatic conditions of the regions.

Labour force participation analysis shows the underrepresentation of female labour force participation is 15.8 %, with 17% in urban areas and 9.1% in rural areas. About 14.2% of men are in the formal sector, and 42% are in the informal economy. The situation of women is worse in the formal labour force, with only 2.5% and 4.28% in the informal sector attributed to socio-cultural and economic barriers restricting women from participating in the formal sector. 48.02 % of men are employed, and 28.04% of women are employed. Women's contribution to the labour workforce is agriculture mainly which is mostly unpaid (Bibi, Amin & Haq, 2021).

Females as the head of the household and work are more likely to participate in all working states except unpaid family work (Andlib, Sarfraz & Kamran, 2022). This shows that, being a supervising figure in the house, women do not like to work without any financial reward or voluntarily as unpaid household workers/helpers. Data also shows public sector bank account holders are men, and only 8.36 % of accounts are owned by women, showing systematic barriers for women to access credit and finance. 64.8% of men and 22.85% of women have access and ownership to cell phones, and 61.2 % of men and 27.7 women have access to mass media. Male Registered voters are 55.6%, and 44.4 % of voters are female. The representation of females in the general election 2024 is 6.09%, who contested elections on general seats in the National Assembly of Pakistan and 4.28% KP provincial assembly. Only 14.29% of women hold local body positions in the province (Ullah,2024). 43% of women face physical violence since the age of 15 (Chief Minister's Office, Khyber Pakhtunkhwa,2025).

Women are an integral part of the agricultural workforce in KP, like harvesting and livestock farming. Climate-induced impacts like livestock diseases, crop diseases, and reduced crop yields directly impact food security and women's economic stability, intensifying poverty levels and increasing their labour. Women face an extra burden in collecting water for agricultural and domestic use due to water scarcity, which is the impact of the rise in temperature, heat waves, changing rainfall patterns, and glacial melt. This affects their health, limits their educational opportunities, and participation in the decision-making process. Climate change impacts women's health due to contaminated water, viral diseases, malnutrition, and heat stress and pregnant and nursing mothers are most vulnerable among them.

Conclusion

The legal and institutional frameworks governing gender inclusion and cultural engagement in climate mitigation in Pakistan, especially in Khyber Pakhtunkhwa, show significant challenges. While there are frameworks, their effectiveness is destabilised by weak implementation, a lack of resources, and the absence of integration between gender and climate action. Women of KP are responsible for domestic resources, such as livestock and agriculture, fetching water and fuel from distant areas for household activities, compromising their education and health. Women's vulnerability towards climate impacts intensifies due to limited access to healthcare, mobility, and education. Women's exclusion from climate adaptation and mitigation policies and their implementation hinders community resilience. Therefore, gender-responsive climate action is a matter of equality and a strategic obligation for effective and inclusive climate resilience in KP. The 18th Amendment in the Constitution of Pakistan has delegated climate and environmental governance to the provinces. KP has a chance to prioritise climate action through inclusive policies. Women's Integration into climate-related decision-making, community-led adaptation, and resource management can convert vulnerability into resilience and action. Policies must recognise women's roles and provide support through funding to empower them, along with equal access to education, financial resources, and disaster risk reduction

tools. Promoting gender-inclusive data, capacity-building initiatives, and local awareness campaigns will foster long-term sustainability and inclusivity in climate governance.

Recommendations

- KP must include gender in climate-related policies to build effective and inclusive climate strategies, including gender inclusive assessments, while starting any climate adaptation and mitigation projects. Policies should include gender-responsive budgeting to increase women's access to climate-related training and green jobs.
- Local women have indigenous knowledge of sustainable practices and resource management, but they are excluded from decision-making processes. The province should initiate and promote community-based adaptation (CBA) models actively involving women decision-makers and leaders. Women-led disaster preparedness teams, water user associations, and forest monitoring groups can be instrumental in strengthening resilience and accountability. Rural women of KP lack formal education or technical training access hindering them from adapting to climate change. Women's inclusive capacity-building programs should be provided to enhance knowledge on water conservation, early warning systems, climate-resilient agriculture and alternative income resources. These programs must be designed in local languages with cultural sensitivity to secure impact and accessibility.
- To engage women in education, reduce the burden on women, and income-generated activities, KP should invest in rural infrastructure such as sanitation facilities, renewable energy, easily accessible healthcare and clean water supply systems.
- To ensure women's representation, they should be included in climate-related frameworks and decision-making at the council, tehsil, district levels and disaster risk management committees.
- To make an effective policy needs gender-specific data on resource access, climate vulnerability and adaptation policies. KP should invest in the research and monitoring systems to track specific impacts of climate and should collaborate with academic institutions and civil society, which will help to identify gaps and highlight gender responsive policies. Implementing these recommendations requires political will and institutional support, and it will be a step towards resilient, inclusive and sustainable climate governance, which will ensure women are not victims of climate change but are the agents of transformation and change.

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