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Gender disparities and Climate Change: A grounded study from Okara

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Abstract

Climate change doesn't need passport as it does not respect borders. Similarly, climate change doesn't respect any gender, it disregards gender equality. The impacts of climate change differ from person to person. The Women impacted rate by climate change is out of proportion, making it an important universal feminist problem that calls the worldwide attention. In Pakistan, climate induced vulnerabilities are affecting both genders. It was mainly due to socially constructed roles and responsibilities of male and female. Further, these vulnerabilities and capacities differ on the basis of gender, location, time, resources, social positions and geophysical locations. Culturally there is a clear gender division of labor in responding to disasters too. The roles and responsibilities have differences between men and women in preparation, responding, and recovering from disasters. In This study underscores the disproportionate impact of climate change on women (Primarily Okara city) due to their socioeconomic status and societal responsibilities and biological differences, emphasizing the need for gender-sensitive climate policies.

Keywords: Climate Change, Gender Inequalities, Okara, Feminism, Women Rights.



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Introduction

The world temperature has jump up by 1°C since the 19th century. It is the result of human caused CO₂ emissions and other many factors. (NASA Science, 2024). In reaction of this, the efforts were made to counter climate change impacts at global level first time in the history. It is setting the platform for recent going global cooperation for climate protection. The results of a study clear that the climate disasters is planned to disproportionately effects the vulnerable inhabitants of world by 2050, potentially driving 158 million more women and girls into poverty and exacerbating food insecurity for 236 million. Furthermore, climate change may escalate conflict, migration, and isolate political rhetoric and include compromising the rights and well-being of women, refugees and marginalized groups. (UN Women, 2022)

Climate change has extensive outcomes which are effecting the environment via various disasters such as rising temperatures, flooding, rise in sea level, drought and many other destructive impacts. These changes in climate threaten the necessary aspects of everyone's life. The aspects including water, energy, agriculture and the whole environment which is for the well-being of humans. In addition to this climate change impacts the women disproportionately which intensify existing social, economic and political inequalities for women. As the climate disaster exacerbates, women face extreme susceptibility and vulnerability which include loss of livelihood, increased health risk and reduce access to natural resources. The report of UN environment explains that among all of the people who are displaced due to climate change, 80% of them are women or girls facing extreme risk of poverty, violence and unintended pregnancies as they move to safer location as a migrant. (WEF, 2024).

While studying the recent climatic impacts on women, we also consider the difference in climate effects on biological (sex) and sociological (gender) characteristics of women. For Example, the effects which are biological in nature for women such as pregnancy complications that harm the mother and fetus, sexual violence and prolonged exposure to pollution and extreme heat. Similarly, in many societies specifically the women of rural areas are responsible for household's cores including the need of energy for cooking food, bring water, taking care of the young and elderly of their families & other societal norms forced women to bear the climatic impacts which are genderic in nature.

In previous years, in scenario of Pakistan, destructive floods made 650,000 pregnant Pakistani women alone with lack of access to health care and other facilities. Most of them were enforced to deliver the child under open sky (UNICEF, 2023). In Pakistan, women are primarily responsible for household water collection, fuel-wood gathering and agricultural tasks, making them more vulnerable to climate-related resource scarcity. A recent reports shows that in rural areas of Pakistan women spent 2 or 3 hours more per day in stockpiling water due to water scarcity as a consequence of climate change. (International Water Management Institute,2025). Research in Pakistan's Himalayan region showed that women's agricultural productivity decreased by 30% due to climate change (International Centre for Integrated Mountain Development). Women declined socioeconomic status and lack of access to education and economic facilities increase their vulnerability to climate crisis. Climate related disasters for instance heat waves and water scarcity, impacts women reproductive system and increase maternal mortality rate, disproportionately. Pakistan specific data and statistics shows that women consist of 70% of Pakistan's rural population which are most impacted by the climate change then urban areas (Pakistan Bureau of Statistics). According to the report of world health organization the life expectancy in female is lower than male in Pakistan (World Health Organization). The study by UN Women, reports that the women participation in climate decision making is limited with only 5% representation in

Pakistan's climate change policy making bodies (UN Women). Through our research, we have discovered that both men and women are impacted by change in climate, but women are more vulnerable due to their societal norms or responsibilities they bear. Furthermore, our research has uncovered that previous literature often conflated the distinction between gender and sex when discussing the impacts of climate change, whether it be biological impacts or those influenced by societal norms, often labeling it as a generic effects of climate change.

Significance of Research

The substance of this research is, we identify both impacts differently, whether they are generic or biological in nature. This research highlights the nuanced climatic effects on women by distinguishing between biological (sex) and sociological (gender) factors and addressing the gender-specific vulnerabilities. The importance of this research reclines in its input to the addition of more details concerning the climate justice frameworks, acknowledging different perspectives of women and the forward experiences. Furthermore, the importance of gender mainstreaming in climate action is also uncovered in this research, promoting distribution of equitable resource and decision-making, consequently enhancing the gender equality.

Research Methodology

To methodically examine the relation between climate change and gender inequalities in the perspective of Okara specifically, a qualitative method of research is used in a case study. This method and approach was picked out to hold the complexity and depth of social dynamics and local realities with excellence and proficiency. Specifically, where both climate effects and gender responsibility are enormously rooted in economic and societal structure of a society. The study was grounded in two primary means of data: Interviews with rural women explicitly impacted by climate change and Specialist interviews with subject matter about gender and climatic issues in the Pakistan. Fifteen extensive interviews were carried out with women from different villages within rural Okara. These women were carefully selected based on their association with agriculture, water-related labor, household management and sectors that are particularly sensitive to climate volatility. Using semi-structured interviews, respondent shared their subjective encounter regarding water scarcity, reduced agricultural yield, changing weather patterns, impacts on food security, health, care-taking duties, and financial autonomy. The open-ended layout allowed participants to voice one's opinion openly while upholding continuity of key thematic parts across interviews. All respondent was informed of the objectives of study and code of ethics, such as informed approval and privacy were strictly observed.

Simultaneously, expert interviews were undertaken with individual working on women rights, climate science and non-governmental organizations concentrating on gender development in the Pakistan. These experts offered a more comprehensive understanding of in what ways climate change is effected rural societies and offered analysis of policy shortcomings, institutional issues and possible approaches for forming gender-sensitive climate resilience. Their viewpoints also helped interpret the narratives expressed by the rural women and provided a comparative lens on in which manners institutional knowledge correlates with and varies from lived realities. The review enabled a comparison between personal experiences and expert opinion, uncovering key intersections where climate change deepens ongoing the gender inequalities. While the focus of study is confined to a single district and a qualitative sample size, it provides a useful contribution for grasping the nuanced manners in which climate change sways women in rural Pakistan and emphasize the need for diverse and localize adaptation blueprints.

Literature review

The scholars have explored the different ways over the years in which climate change intensifies existing gender inequalities, risking women's health, restricting their mobility and increasing their vulnerability to food insecurity with violence and economic dis-empower.

The research by Duncan (2006) signifies the biological vulnerabilities that raises women susceptibility to climate related strain. Basically women have a higher working metabolic rate and evaporate less heat through sweating and having a thick subcutaneous fat layer which limits the radiative cooling process. These psychological and biological differences can increase health risk during extreme hot weather, specifically when there is no proper access to health care and poor resources. Neumayer and Plumper (2007), both conducted a large scale empirical research on gender specific mortality due to the natural disasters. Their research data from 141 countries between the time period of 1981 to 2002 found out that the women suffered higher mortality rate as compared to men in context of natural disasters. This imbalance was explained by pre-exist socioeconomic inequalities and not only by biological differences between men and women. The contribution of this extreme vulnerability of women is due to limited access to resources, resisted mobility due to cultural norms and dress code and elimination from the decision making process. Also in numerous cases men are more likely to receive rescue assistance than women in disasters. In 2011, Arora-Jonsson analyzed that women show more environmentally responsible behaviour along with the more vulnerable to climate change. She asserted that it will be unfair and ineffective if we continuously ignore gender related perspectives in climate change discourse. Her work signifies the perspective from viewing women not only as a victim but also considering their potential as important agents in climate resilience and adaptations. The study of McKune (2015) widely describes the effects of climate change through a gendered lens on household and food security. Their research explains how the labor burden on women in climate affected areas specifically in agriculture, water collection and care-taking impacted directly their children and household nutrition such as it may lead to termination of breastfeeding before time and improper feeding to children causes nutritional deficiencies in long term. One more local case study by Nizami and Ali (2017) explains how the responsibility shifts from male to female while migration in Pakistani highland areas due to climate change. When the man migrating for work to the other areas, the women are left solely to manage the land, water and other agriculture resources. This whole scenario shows a feminization of labour which left women exposed to the more climate changing risk excluding the necessary institutional support to make critical decisions in male dominating society. Eastin (2018) analyses that the traditional division of labour in various low income countries increases the women's exposure to the effects of climate change. Her study found out that women are usually responsible for securing the food production and water availability which disproportionately burdens them. Her research work shows that the climate change impacts declined the woman's financial independence and also increased the existing social inequalities. In 2020, Memon conducted a research in the areas of Sindh, Pakistan which is affected by floods. This research shows that the rise in domestic and sexual violence against women during climate related disasters such as flood. The after effects of these disasters such as displacement, living in temporary shelters and the breakdown of social systems create conditions for women that increased violence. This study linked the experience of restrict culture norms and the absence of protective legal and institutional mechanisms during disasters emergencies.

Dessy et al. (2021) explain a different perspective by studying the surviving structure in affected areas by disasters. In some African areas, like Mali, polygyny, where man has more than one wife, is used as a strategy to counter the shortage of agriculture labour caused by climate change. These

types of practices not only weaken women's bargaining power but also increase their vulnerability to domestic and economic violence. Aslam (2024) explain in his study, the health related implications for women living in rural and backward areas of Pakistan due to climate change. His research signifies that water scarcity is the central issue, in which women frequently have tasks of water collection in harsh and extreme weather. The woman with limited access to healthy and nutritious food, early marriages and unhygienic delivery practices with this burden of water collection, consequence the higher maternal morality and miscarriages. His study also explains the shortage of food for women who are usually the last one to eat food in the household, especially who required more nutrition during pregnancy and lactation. The worst nutrition among women results as long term physical and cognitive effects for both mother and their children. His study presents a comprehensive picture of genderic aspects and vulnerabilities of climate change. According to him the nature of vulnerabilities may have different contexts but still women faced high risk including both biological and social factors. Effective climate adaptation and policy responses must be adapted which not only highlight these vulnerabilities but are also able to empower women as an emerging actor in climate resilience and sustainable development.

A comprehensive overview of different regions of Pakistan

Pakistan contributes less than 1% of the Global emission of carbon into the earth atmosphere yet we are most affected by the climate change. It poses growing threats to the communities across Pakistan, but its impacts are not experienced equally. From the water-scarce deserts of Baluchistan to the flood-prone valleys of Khyber Pakhtunkhwa, the effects of climate change amplify existing gender inequalities. Each region presents distinct environmental challenges, and women, being primary caregivers and resource managers, are often on the front-lines.

Sindh:

Reports in Sindh province highlight women's increased vulnerability to heat waves. The 75% percent of the females died due to heat related issues in that province (Pakistan Journal of Meteorology). Pakistan consists of vast arid and semi-arid regions particularly the area of southeast and the Southwest of Pakistan which are highly vulnerable to climate crisis including rise in temperature, drought and desertification. Reports in Sindh province highlight women's increased vulnerability to heat waves. The considerable number of the females died due to heat related issues in that province. The paper reports that 77 per cent of women and 34pc of men in Sindh are affected due to climate change (Dawn, 2024). Tharparkar which is situated in the South Eastern corner of Sindh is impacted by drought and environmental degradation because of minimal rainfall and hot climate. These women of Sindh regularly experience the extreme heat. Similar case in the Jacobabad which is the considering among the hottest cities in the world. In the summer the temperature reached up to 50 degrees Celsius (122 degrees Fahrenheit) where women are facing the both extreme biological and social impacts of climate change (Dawn, 2022).

Punjab:

The highest populated province of Pakistan is Punjab, facing the similar climate issues. South Punjab drop in the extreme risk category while North Punjab and Central Punjab are at a high risk. The minimum temperature of Punjab has increased by 0.97 degree Celsius and the maximum temperature by 1.14 degree Celsius over the past 30 years (1975-2005) putting it on the list of most vulnerable regions to climate crisis. WHO reports that the two large cities of Punjab, Lahore and Faisalabad have resulted in the loss of 5.3 and 4.8 years of life expectancy from 1998-2016 among populations due to increasing levels of air pollution, respectively. Statistics revealed that 70% of women and 30% of men in Punjab are adversely impacted by climate change (Dawn, 2024). Again

the ratio of women effecting rate due to climate change is more than double as compared to men. They are facing more psychological issues such as Climate Anxiety.

Baluchistan:

Next, Balochistan, the biggest province of Pakistan which is rich in traditional culture and norms with a strong presence of tribalism in every part of province. In Baloch cultural societies, the women are expected to isolate themselves to their houses. The case study shows that the women are facing numerous social impacts of climate change in Balochistan due to the specific social norms and traditions of Baloch society. Women have lack of empowerment in Balochistan because they have to seek permission from male family members before taking any action. Other than these, the women of 18 districts in Balochistan are also facing biological effects of climate change such as food insecurity has increased in the province which is impacting nearly 49% of women (South Asia, 2024). As a consequence of food shortage, almost half of pregnant women are dealing with anemia, gestational diabetes and preterm birth.

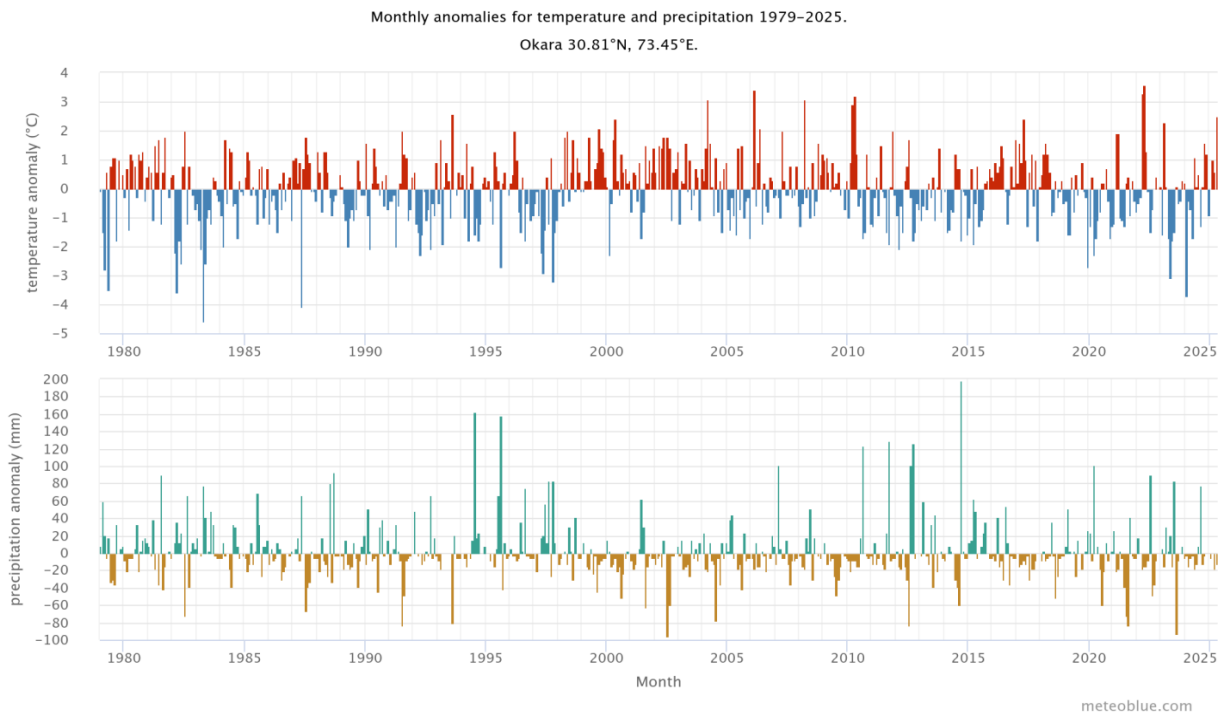
KPK:

KPK has same cultural societies in which women's have lack of empowerment. Women represent 50% of the province's population, who are disproportionately affected by climate change due to their social responsibilities such as take care of elders and children, managing household water, food, and other needs (UNDP, 2022). This highlights the need to re-calculate the national and provincial policy frameworks to build-in gender-responsive planning and ensure gender equity policies and outcomes to prevent exacerbated vulnerabilities to climate change crisis (UNDP Pakistan). Due to accelerated glacial melt in 2022, the 25 districts of KPK categorized as endangered to flash flooding. Reports explained that these floods unsettle the food security and livelihoods in the region, particularly in the agriculture sector, where 44% of the population is employed and it contributes 22% to the national GDP. The health-care facilities were also destroyed by the floods. Specifically, the access to reproductive health services such as contraception and maternity care was difficult for women and girls. The other important thing to highlight that internal displacement camps are often unsafe for displaced women, especially younger ones, to give birth due to the lack of necessary equipment and personnel for proper maternal care. The mental health of women and girls who have been displaced by the floods is also a concern. The losing homes and livelihoods put them in trauma, compounded by the conditions in IDP camps, has profoundly negative effects on women's mental health. The lack of menstrual kit which is necessary for hygiene, and unavailability bathrooms which are gender-segregated and no proper sanitation in camps, leaving women and girls extremely vulnerable. Girls who experience their first period in these camps also face trauma and anxiety due to the lack of knowledge and facilities to meet their needs.

A case study of Okara

A small city called Okara which is situated on the Southeastern side of the Punjab, Pakistan is at the mercy of climate change gradually (see in below chart). Where the main concerns are the water scarcity and agriculture outputs. The climate of district Okara is noticeable by various changing weather patterns such as hot summers with the rising temperature up to 45°C, low severity winter and a roughly 615 mm of typical annual rainfall (Meteoblue, 2025). The findings of some latest research disclose that a significant fall in groundwater levels up to 10 meters between the time period of 2010 to 2022 (Asif, U. et. al, 2023). This water downfall escalates the water scarcity for both household use and irrigation purposes. This situation has led to increased dependency on tube wells and gradually their quantity is increasing from almost 15,000 to 47,000 in between 2010 to

2022, this lead to financial tensions on the small farmers due to the rising cost of irrigation. The economy of district Okara mainly depends on agriculture, where wheat, rice and sugarcane are considered as primary crops. All the weather changes factors of climate change such as irregular rainfall, unpredictable growing seasons and rising temperatures effects the crops productivity and farmer's revenues, directly.



Source : meteoblue https://www.meteoblue.com/en/climate-change/okara_pakistan_1168718

As mentioned above, agriculture is the main source of income which is affected by water scarcity and other changing weather patterns cause women to be employed usually at very low pay. The informal sector workers also have to deal with raised uncertainty of income. This income strain not only affects their sole satisfaction, happiness and well-being but also forces them to take hard decisions. Such as withdrawing their children out of the school so they can help in household income, mainly girls. Here to discuss a case study of a woman named Suraiya, a mother of 5 children belongs to the rural area of Okara. She describes how climate change has deeply affected her family in the way of income sources and future of her children. Suraiya, works as a house helper in the homes of different local farmers. The change in weather patterns and water scarcity drop the agriculture productivity of local farmers and make them financially stressed which are her employers. This financial stress led to an important reduction in her wages and made it extremely difficult to manage household expenses. The extreme economic conditions forced Suriah to make a hard and difficult decision to withdraw her elder daughter from the school so she can assist her in work and they both could work in multiple homes to make the ends meet. "it wasn't a choice" Suraiya sadly explained. "It was a Survival" (Personal communication, 2025). The story of Suraiya reflects how climate change extremely impacts women and girls which take them away from their education and the opportunity for a better or secure future.

As the climate change causes shifting in weather patterns which lead to extreme working conditions such as harsh heat and more working hours due to the unpredictable harvest cycles. In this, the women are physically demanding roles, facing increased health risk. For instance, the

respondent's miscarriage which is not directly impacted by the climate change but it reflects how environmental stress can lead to extreme vulnerability. Particularly the woman with limited access to health-care and the least option to reduce her workload, is more vulnerable to the climate changes. A case study of one female respondent which is engaged in agriculture labour in the wheat fields of Okara, shared her deeply confidential version that how her health has been impacted due to increasing extreme working conditions. Although she was being in the later stages of pregnancy still she continued working long hours in the fields due to the economic necessity and financial crisis. While this she experienced a miscarriage, according to her she believes this miscarriage was influenced by the physical stress and exposure to extreme weather conditions such as prolonged heat and the dehydration (Personal Communication, 2025). Although such health outcomes cannot be only linked to the climate change but still the respondent's situation reveals that how vulnerable environmental conditions and extreme weather changing patterns can complex the risks for women in labour intensive roles in the rural areas. Her experience shows the comprehensive and somehow indirect but still the gendered impacts of climate change on health of women in agriculture dependent communities and areas.

Another significant factor is the socioeconomic status of women, with those who are underprivileged being more impacted by climate change than those who are privileged. For instance, a wealthy woman is less affected than her domestic workers. Additionally, factors such as location, time, and physical positioning play a crucial role. For instance, individuals residing in areas where natural disasters are more frequent are more vulnerable to climate change compared to those living in less affected areas. Similarly, women of rural and backward areas are more impacted, because they are very less empowered & don't have a say in decisions making. In numerous rural areas, women usually work relentlessly in agriculture fields and manual labor to support their families economically and to pursue their own small personal dreams. Although, the increasing impacts of climate change such as heat waves, droughts, irregular rainfall and falling crop yields are endangering their livelihoods. Consequently, these women face a decline in income, food insecurity and the inability to afford their basic items. Another case study of a woman named Sakina, a hard working woman from a rural area of Okara who has spent her whole life laboring in the fields to support her family financially. Meanwhile also fulfill her modest personal dreams such as buying a pair of shoes, a small radio and other little personal belongings for herself. She has been working in the fields since she was a less than 18 years old. Before time, she used to earn enough money during harvest season that a part of it she kept aside just for herself, to buy some little personal dreamy items for herself. But now the extreme fall and decline in the crops, makes her work twice and hard for half of the pay as compared to the earlier. Sometimes she gets no labour at all (Personal Communication, 2025). People talk about the climate change and its impacts like its far-away but for the women like Sakina its right here, in the dry soil, in the empty grain sack in the eyes of their children when they bring less or nothing to home. This situation highlights and signifies how climate change disproportionately affects vulnerable populations economically and socially, especially the women of rural areas as we can see in below table.

The Gendered Effects of Climate Change on Rural Communities in Okara,

Category	Observation	Gendered Impact
Climate Conditions	Avg. annual rainfall 615 mm, temperatures reach 45°C	Increased exposure to heat and dehydration in women's labor-intensive roles
Water Scarcity	Groundwater dropped >10m (2010–2022), tube wells increased from 15,000 to 47,000	Higher irrigation costs reduce job availability; women walk long distances to fetch water
Agricultural Disruption	Irregular rainfall, decreasing yields of wheat, rice, and sugarcane	Women's informal farm work affected lower wages and seasonal job loss
Economic Impact	Rising input costs, lower returns for farmers	Women's wages drop, inability to afford personal needs or invest in family welfare
Education and Child Labor	Families forced to prioritize income over schooling	Girls are pulled out of school more often to contribute to income
Health Risks	Increased workload, exposure to heat and unsafe conditions	Risks of miscarriage, dehydration, anemia, lack of medical care
Social Inequality	Gender roles restrict decision-making and access to resources	Poor rural women are most affected, elite women less exposed
Dreams & Aspirations	Personal goals sacrificed due to worsening economic conditions	Women can no longer fulfill modest dreams (e.g. buying shoes, radios)
Perception of Climate Change	Often seen as a distant or abstract issue	Rural women experience its effects directly in daily survival

Source: By conducting interviews of women from rural okara

Recommendations:

- The women in our society are often unaware that they belong to a marginalized group that is disproportionately affected by climate change. To protect women from the impacts of climate change, it is crucial to raise awareness. This awareness should be spread at a national level through both public and private campaigns.
- Furthermore, effective policies need to be implemented to address the factors of climate change that disproportionately affect women. It is not enough to have policies on paper; they must be properly implemented. For instance, in 2012, the Government of Pakistan introduced the Climate Change Policy by the Ministry of Climate Change, Pakistan. This policy recognizes the vulnerability of women to the impacts of climate change and includes specific provisions for their protection. These provisions include acknowledging the disproportionate impact of climate change on women, especially in rural areas (Gender and Climate Change, Section 4.7); aiming to empower women (Women's Empowerment, Section 5.4); and addressing the gender dimensions of climate-related health impacts, particularly on maternal and child health (Climate Change and Human Health, Section 5.5). However, the main challenge lies in the implementation mechanisms of this well-defined policy.

- Encourage women leadership in policy making related to climate change. Increase women participation in scientific debate. Pakistan has been still considered as one of the only countries in the globe to bring all-male members to national delegations to the international climate negotiations of UNFCCC.
- It is crucial to challenge harmful views that blame women for climate-related disasters, particularly within certain religious contexts. Awareness campaigns in mosques can help dispel myths and promote accurate understanding of climate change. Religious leaders should advocate for eco-friendly practices aligned with Islamic teachings on environmental stewardship. A collaborative "green movement" involving religious communities and environmental groups can drive sustainable change and empower women (Abbasi, H. 2024 Personal communication).
- When developing and introducing technologies related to climate change adaptation, the funding organizations and donors should also take into account the women-specific circumstances. (Farooq, A. 2024. Personal communication).

Conclusion

In summary, it can be concluded that climate change disproportionately affects women, worsening existing socioeconomic and cultural inequalities. Women's vulnerability is rooted in gendered roles, limited access to resources, and societal marginalization. Rising temperatures, extreme weather events, and resource scarcity further exacerbate the burdens faced by women, compromising their health, livelihoods, and well-being. This harsh reality is acknowledged in policy statements and government documents worldwide. Moreover, women are not just considered as sufferer, they are called as essential agents to this change. Empowering women through the education, economic opportunities and inclusive decision-making processes can enhance climate resilience. To address the gendered impacts of climate change, it is crucial to integrate gender-sensitive policies into climate action plans. To support women-led climate initiatives and grassroots organizations. Must promote climate education and awareness among women, and ensure women's representation in climate decision-making. Recognizing the intersectionality of climate justice and gender equality, it is imperative to prioritize inclusive, gender-responsive climate action to reduce the unfavorable climatic impacts on women and promote a more equitable and sustainable future for all.

Limitations in Research:

While this study has made valuable contributions, it does have some limitations. Geographically, the study is focused solely on the Okara city, neglecting other regions in Pakistan that experience diverse impacts of climate change. The limited sample size of the survey may not be representative of the entire female population of Pakistan. The absence of a comparative analysis with other city or provinces may also indicate some methodological and literature weaknesses. Future research should aim to address these gaps by conducting multi-provincial or national studies, as well as longitudinal or mixed-methods research. Comparative studies with other countries should also be considered.

Conflict of Interest

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References

- Arora-Jonsson, S. (2011). Virtue and vulnerability: Discourses on women, gender, and climate change. *Global Environmental Change*, 21(4), 744-751. <https://doi.org/10.1016/j.gloenvcha.2011.01.002>
- Asif, U., Ahmad, A. M., Javed, M. A., & Minallah, M. N. u. (2023). Groundwater quality and quantity analysis for irrigation purposes in Okara, Sahiwal and Khanewal districts of Punjab, Pakistan. *Geography, Environment, Sustainability*, 16(4), 105–119. <https://doi.org/10.24057/2071-9388-2023-2901>
- Aslam, M. (2024). Health implications of climate change for women in rural Pakistan: The case of water scarcity and maternal mortality. *Environmental Health Perspectives*, 132(3), 045004. <https://doi.org/10.1289/EHP7243>
- Berninger, M. (2024, January 16). Climate change impacts women more. We must legislate to protect their health. World Economic Forum. <https://www.weforum.org/stories/2024/01/women-health-climate-change/>
- Dessy, S., Tiberti, L., Tiberti, M., & Zoundi, D. A. (2021). Polygyny and farm households' resilience to climate shocks. Policy Research Working Paper No. 9663. *The World Bank*. <https://doi.org/10.1596/1813-9450-9663>
- Eastin, Joshua, 2018. "Climate change and gender equality in developing states," *World Development, Elsevier*, Vol. 107(C), pages 289-305.
- Greenstone, M., & Fan, Q. (2019, February). Pakistan's air pollution challenge & potential for longer lives. *Air Quality Life Index*. <https://aqli.epic.uchicago.edu/wp-content/uploads/2019/02/Pakistan-Report.pdf>
- International Water Management Institute. (n.d.). *Pakistan*. IWMI. Retrieved May 7, 2025, from <https://www.iwmi.org/where-we-work/pakistan/>
- Jamali, M. (2025, May 29). Climate change: Challenges and opportunities for women in Balochistan. *South Asia Journal*. <https://southasiajournal.net/climate-change-challenges-and-opportunities-for-women-in-balochistan/>
- Memon, S. (2020). Gender-based violence during climate-related disasters: A case study in flood-affected Sindh, Pakistan. *International Journal of Climate Change Strategies and Management*, 12(1), 85-100. <https://doi.org/10.1108/IJCCSM-10-2019-0204>
- Meteoblue. (2025). Climate change Okara. Retrieved May 29, 2025, from https://www.meteoblue.com/en/climate-change/okara_pakistan_1168718
- Ministry of Climate Change. (2012). *National climate change policy*. Government of Pakistan. <https://mocc.gov.pk/PolicyDetail/NGMxZDlmOGYtNWE5NC00ZWUxLWFfFLOGYtZW RmNTYwZjUzYjQ0>
- Nasa. (n.d.). *Evidence*. NASA Science. Retrieved May 7, 2025, from <https://science.nasa.gov/climate-change/evidence/>
- Neumayer, E., & Plümper, T. (2007). The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981–2002. *Annals of the Association of American Geographers*, 97(3), 551–566. <https://doi.org/10.1111/j.1467-8306.2007.00563.x>

- Nizami, S., & Ali, S. (2017). Gendered impacts of male migration due to climate change in the Pakistani highlands. *Asian Journal of Environmental Studies*, 14(3), 201-218. <https://doi.org/10.1080/21583717.2017.12310>
- Punjab Board of Investment & Trade. (n.d.). Environment. Urban Unit. Retrieved May 29, 2025, from https://pbit.gop.pk/system/files?file=10.%20Environment%20_compressed_1.pdf
- Reuters. (2022, June 14). In Jacobabad, the hottest city on Earth, mothers bear brunt of climate change. Dawn. <https://www.dawn.com/news/1694778>
- Sarah L. McKune, Erica C. Borresen, Alyson G. Young, Thérèse D Auria Ryley, Sandra L. Russo, Astou Diao Camara, Meghan Coleman, Elizabeth P.
- Ryan, Climate change through a gendered lens: Examining livestock holder food security, Global Food Security, Volume 6, 2015, Pages 1-8, ISSN 2211-9124, <https://doi.org/10.1016/j.gfs.2015.05.001>. (<https://www.sciencedirect.com/science/article/pii>
- The Newspaper's Staff Reporter. (2024, February 22). Women are more affected by climate change than men, moot told. Dawn. <https://www.dawn.com/news/1816062>
- Un Women. (2022, February). Explainer: How gender inequality and climate change are interconnected. UN Women. <https://www.unwomen.org/en/news-stories/explainer/2022/02/explainer-how-gender-inequality-and-climate-change-are-interconnected>
- Undp Pakistan. (2022, February 2). *UNDP Pakistan and NCSW hold provincial consultations in Khyber Pakhtunkhwa to gauge the gendered impact of climate change*. United Nations Development Programme. <https://www.undp.org/pakistan/press-releases/undp-pakistan-and-ncsw-hold-provincial-consultations-khyber-pakhtunkhwa-gauge-gendered-impact-climate-change>
- Waheed, Z. (2023, December 8). Climate change's greatest victims are women and girls. *Unicef South Asia*. <https://www.unicef.org/rosa/blog/climate-changes-greatest-victims-are-women-and-girls>
- Zhu, Y., He, C., Bell, M., Zhang, Y., Fatmi, Z., Zhang, Y., Zaid, M., Bachwenkizi, J., Liu, C., Zhou, L., Chen, R., & Kan, H. (2023). Association of ambient temperature with the prevalence of intimate partner violence among partnered women in low- and middle-income South Asian countries. *Jama Psychiatry*. Advance online publication. <https://doi.org/10.1001/jamapsychiatry.2023.1958>.