



# تَهْزِيبٌ

Tezhib: Undergraduate Research Journal

**Volume III | Issue 3**  
**NAVIGATING CLIMATE, GENDER  
& PEACE**







Tezhib: Undergraduate Research Journal

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NAVIGATING CLIMATE, GENDER & PEACE



Habib University  
shaping futures

Tezhib — Journal

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## ABOUT THE JOURNAL

**T**ezhib (not *tehzib*), or illumination, literally means to ornament a surface with gold. It is an art form that manifests as palmettes, rosettes, and arabesques around the margins of the Quran and in important manuscripts, illuminating the mind of the reader through knowledge and beauty.

Allegorically, the art of Tezhib is represented by the tree; an attempt to understand the roots of knowledge, which branch from the mind towards the Infinite. The floral forms and motifs rest upon geometric patterns, which travel within a spectrum from finitude to infinitude.

Tezhib Undergraduate Research Journal was founded in 2018 with the vision of making a diverse set of knowledge and intellectual thought more accessible. It is a student-led journal by Habib University students, with the support of Habib University's faculty. It serves as a platform for the research produced by students from undergraduate universities across Pakistan in the fields of literature, language, philosophy, development, religious studies, and technology. It aspires to motivate students towards research and to cultivate a culture of inquiry and academic discourse.

## EDITOR'S NOTE

This Special Edition of Tezhib Undergraduate Research Journal came around as a result of a grant from the United States Institute for Peace. Through this grant, we were able to host the “Aamozsh-e-Tehqeeq: Navigating Gender, Climate and Peace Building Conference” in March 2024. The views expressed in this special issue are those of the authors and do not reflect any official policies or position from the United States Institute for Peace.

The papers compiled in this Special Edition are selected abstracts submitted for the Aamozsh-e-Tehqeeq Conference, as well as an open call for papers on the theme of gender, climate and peace-building.

I would like to extend special thanks to Dr. Shama Dossa who made this collaboration possible. As well as the SDP program and Office of Research for their resources and technical support.

The end product that you see would not have been possible without the hard work of Zayaan Delawalla, who served as the Guest Editor, and Mashal Shamsi who served as the Guest Graphic Designer for this edition.

I would deeply want to express that working on an academic project on the theme of ‘peace-building’ while a genocide is being live-streamed, was a mentally exhausting endeavor, to say the least. Nonetheless, it is important. May our knowledge and knowledge-seeking lead us to a better world.

Congratulations to all the authors being published!

**Saniyah Salman**  
Editor in Chief  
Tezhib 2023–2024

## FOREWORD

**I**t is a pleasure to be asked to write the forward for the Special Issue of Tezhib on Gender, Climate and Peace. Centering undergraduate students in the pedagogy and practice of social science research Pakistan requires a paradigmatic shift. Being intentional about facilitating innovation in research pedagogy also requires skill and resources. Habib University is the first undergraduate liberal arts university in Pakistan, now in its 10th year and we have been exploring and experimenting with how to facilitate and resource student-centered research, particularly on the theme of sustainability.

This issue has been the result of an innovative collaboration between students, young researchers, faculty and the Office of Research at Habib University; and the United States Institute for Peace (USIP). Special thanks to the editorial committee of Tezhib who have outdone themselves in publishing not only two issues of the annual edition but also this Special Issue despite convocation and looming thesis and capstone deadlines.

Pakistan ranks within the top ten most vulnerable countries to climate change globally and is ranked as the fifth most unequal for women. The deeply embedded patriarchal structure within our current cultural and security landscape determines how different genders perceive and experience climate change and its impacts. Women and trans persons, who are already marginalized and vulnerable to gender-based violence due to structural oppression tend to find their circumstances further exacerbated by the outcomes of climate change. An intersectional and intersectoral understanding of the nexus is essential for young researchers in Pakistan where we have limited resources dedicated to research and a dearth of locally produced relevant scholarly work on the topic. Social Policy and development research that takes into consideration these lenses have significant utility for practitioners, policymakers, scholars and the general public.

In this special issue, you will see how students have taken a holistic approach to the theme exploring the urban and rural contexts of Pakistan and the interconnection between climate disasters and migration as well. In rural Pakistan, climate change is diminishing access to water and agricultural productivity resulting in the economic marginalization of agrarian communities. Consequently, men are resigned to migrating for better livelihoods leaving women behind as caretakers of their lands and families. Restricted mobility and limited agency endanger women's lives in natural disasters such as river floods, droughts,

tropical storms, heat waves, encroachment of land by the sea and GLOFs (glacial lake outburst floods). For sustainable development, it is imperative to look into the nexus between gender and climate change to design research-informed policy interventions that promote peacebuilding. This is also reiterated by the Climate Change Gender Action Plan of the Government and the People of Pakistan (IUCN, 2022). We hope you will find the articles included in this special issue valuable in highlighting the magnitude and urgency to act in advocating to design and scale up sustainable policy and program interventions. In addition, we hope that it demonstrates how we can support the capacity strengthening of young researchers and will encourage others to also invest in this area.

*In Solidarity,*

**Dr Shama Dossa**

Associate Professor, Social Development & Policy  
Habib University

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**DR AAMIR HASAN**

*Vice President Academic Affairs*

**DR SHAMA DOSSA**

*Chair of Conference Committee, Associate Professor SDP*

**SANIYAH SALMAN**

*Editor-in-Chief, Tezhib Undergraduate Research Journal*

**DR COLINE FERRANT**

*Faculty Supervisor, Tezhib Undergraduate Research Journal*

**AROOMA NAQVI**

*Conference Coordinator*

**ZAYAAN DELAWALLA**

*Guest Copyeditor*

**MASHAL FARAZ SHAMSI**

*Guest Graphic Designer*

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# BALANCING ON THIN ICE: GENDERED IMPLICATIONS OF CLIMATE CHANGE ON LIVELIHOOD AND SUSTAINABILITY IN MOUNTAIN COMMUNITIES OF HINDU KUSH HIMALAYAS

KOSAR BANO

([kosar.bano@icimod.org](mailto:kosar.bano@icimod.org))

Gender and Adaptation Specialist  
ICIMOD Headquarters, Nepal

## ABSTRACT:

Climate change is causing extreme weather conditions that significantly impact the economies and society. Rapidly melting glaciers lead to floods, soil erosion, droughts, and sedimentation, all of which adversely affect the lives of mountain people. While such events are not new, their frequency has increased due to the changing climate, as recent studies indicate. Mountainous regions are particularly vulnerable to climate change-related risks, and the effects are not gender-neutral. They differently affect women, men, and various societal segments due to pre-existing disparities based on caste, class, ethnicity, (dis)ability, and geographical location.

When these factors intersect with gender roles, responsibilities, conditions, and positions within families, communities, and broader society, they can either privilege or further marginalize people during and after disasters and emergencies. These conditions often intensify inequalities and reinforce disparities among women and marginalized groups regarding exposure and capacities for preparedness and response. The lack of access to and ownership of productive resources, information, and technology exacerbates their suffering. Therefore, it is crucial to carefully analyze the gendered implications on different segments for livelihood and sustainability in the context of climate change to achieve inclusive development outcomes.

**Keywords:** *Climate change, intersectionality, disaster risk reduction, adaptation, livelihoods*

## INTRODUCTION & BACKGROUND

Extreme weather conditions caused by global warming and climate change significantly impact lives and livelihoods globally. The mountainous regions of South Asia and the Hindukush Himalaya (HKH) area are especially vulnerable to these changes. Rapidly melting glaciers lead to floods, soil erosion, droughts, and sedimentation, exacerbating socio-economic and political challenges. These events contribute to food insecurity, damaged infrastructure, and biodiversity loss. (Hussain et al., 2021; Rasul et al., 2014; Schild, 2008; Islam and OHCHR, 2019; Winkel, 2017; Kosar et al., 2023).

In the HKH region alone, there are over 25,000 glacial lakes, many of which pose a significant flood threat to downstream communities. Countries such as Nepal, Pakistan, China, and India have been severely impacted by glacial lake outburst floods (GLOFs)<sup>1</sup>, jeopardizing the lives and livelihoods of millions. Additionally, rising temperatures contribute to droughts, fires, and pest outbreaks, adversely affecting crop yields and leading to plant species extinction or migration. Over the long term, the disappearance of glaciers could exacerbate water shortages, impacting over a billion people who rely on meltwater from the Himalayas (ICIMOD, 2019; IPCC, 2022).

Recent events, such as heatwaves and wildfires in India, Pakistan, Bangladesh, and Nepal, have further underscored the devastating impacts of climate change on biodiversity and livelihoods. Vulnerable populations, particularly women, face disproportionate consequences due to pre-existing inequalities based on gender, caste, class, ethnicity, disability, and geographical location. Women, who constitute most of the world's poor, are especially at risk,

lacking the resources and capacity to respond effectively to disasters (BBC 2021; Government of Pakistan 2022; ICIMOD 22; Sama 2022).

## CONCEPTUAL FRAMEWORK

In this paper, I employ Naila Kabeer's (1994) social relations approach and Rocheleau's (1996) feminist political ecology framework, incorporating the gender and intersectionality lens proposed by Crenshaw (1989, 1991, 1992) to assess how climate change affects different groups based on gender and social disparities. The social relations approach reveals inequalities in responsibilities, resource distribution, and power dynamics within society, highlighting how these dynamics influence institutional mechanisms from households to the state (Kabeer, 1996). In South Asia and the HKH region, social, religious, political, and cultural factors shape people's experiences, resulting in inclusion, exclusion, privilege, and discrimination. When gender intersects with other social fault lines like class, caste, ethnicity, and geographical location, individuals' vulnerability to climate change varies, affecting their coping abilities (ICIMOD, 2017, 2022). Feminist political ecology emphasizes a bottom-up approach, analyzing people's embodied experiences and their relationships with environmental degradation, mobility, displacement, and power dynamics in decision-making processes. These approaches complement each other, comprehensively understanding the complex interplay between social dynamics and climate change impacts (Goodrich et al., 2019, 2021, 2022; Hillenbrand et al., 2014; ICIMOD, 2019).

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<sup>1</sup> A glacial lake outburst flood (GLOF) is a type of outburst flood caused by the failure of a dam containing a glacial lake.

## ANALYSIS AND DISCUSSION

### *Navigating the Policy Landscape and Strengthening Institutional Mechanisms: A Path to Inclusive Development*

At the international level, various institutions have put efforts into including Gender Equality considerations in policies and programs. The UN's Sustainable Development Goals have considered gender equality as one of the commitments. Various international forums and institutions such as the United Nations (UNDRR, 2015; UNICEF & UN Women, 2017), World Bank (World Bank, 2019), and Asian Development Banks (ADB, 2020) have commitments and goals to involve women and marginalized groups in processes. Such institutions have made governments accountable for considering Gender Equality as the primary outcome. Sendai framework also has a clear vision and mission of Gender equality and supports institutions to achieve its goals (UNDRR, 2015). Most HKH countries have included Gender Equality concerns in their climate change policies and strategies. National development commitments also address gender equality concerns. However, implementation remains a significant challenge. Institutional mechanisms in almost all these countries exhibit a clear bias against women and marginalized groups in both structures and leadership roles. Although governments have set quotas for women, various socio-cultural and religious reasons prevent women from joining the formal sectors even if they wish to. Gender bias and the glass ceiling further hinder their employment opportunities. According to the World Bank (2018), women's participation in the workforce in South Asia is generally low, with the lowest in India, where only 20% of women are employed, and the highest in Nepal, where women across various sectors hold 70% of jobs. In disaster risk reduction, women's participation at different levels remains notably sparse.

Moreover, inclusive financial allocation is also a concern for achieving goals and commitments. At the regional level, the South Asia Regional Corporation and the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BEMSTIC) also operate; however, their role in engaging with governments is limited due to political and financial issues (Goodrich et al., 2021; Goodrich et al. 2022). At the regional level, ICIMOD has succeeded so far in giving South Asia and HKH countries a platform to come together and take measures to tackle climate issues with the support of various local and international donors. Under multiple initiatives such as the Koshi River Basin, Indus River Basin initiative, and SWARMA, ICIMOD is undertaking research and co-creating knowledge shared with national, regional, and international stakeholders to influence policies related to climate change. ICIMOD is part of various international forums such as IPCC 2019, 2020, 2021, 2022, COP 2021, 2022, and COP (biodiversity), in which ICIMOD explicitly highlights mountain issues and advocates for climate action related to unheard mountain areas at such forums.

At the national level, countries have devised policies and national action plans. Most of the policies include gender perspectives. However, sector-specific policies strongly disconnect between ground scenarios and policy formulation. Women are primarily seen as recipients instead of active partners, stakeholders, and leaders. (Goodrich et al., 2022). The role of women in water diplomacy at the transboundary level of water cooperation at the country level, the sub-basin level, the basin level, and the regional and international level is also limited. (Joshi, 2014; Sharing et al., 2022) Nepal's National Water policy has only one clause regarding women's role in managing water services (Ahlers & Zwarteveen, 200; Subha, 2015).

Likewise, countries have devised a gender-inclusive Disaster Risk Reduction Policy that acknowledges the gendered vulnerabilities of women and children and how the active role of women during and after disasters is overlooked (Goodrich et al. 2021; Kosar and Celdon 2022). Moreover, the rehabilitation of affected communities and implementation of this policy in its true spirit is debatable due to gendered institutional arrangements, lack of transparency, low or no financial allocations and existing socio-cultural norms towards women and vulnerable groups (Goodrich et al. 2021, 2022).

### ***Gendered Impacts: Climate Change Challenges in South Asia's Mountainous Regions***

Climate change affects men and women differently, mainly due to existing gender roles and societal inequalities. Women and girls often bear a disproportionate burden of climate-related impacts, including natural disasters, health risks, and food insecurity, exacerbated by their limited access to resources and decision-making power. For instance, women are typically responsible for collecting water and fuel in many communities and growing and processing food. Climate change-induced water scarcity and food insecurity increase their workload and reduce their time for other activities (Goodrich et al., 2022; IPCC, 2014; Goodrich et al., 2017; Patel et al., 2019; UNFCCC, 2019).

Moreover, women and girls face heightened health risks from climate change, including malnutrition, disease transmission, and exposure to harmful chemicals. Disruptions to traditional livelihoods such as agriculture further exacerbate economic insecurities, with women often bearing the brunt of poverty and unemployment. Migration induced by climate change also poses risks to women and girls, who may face exploitation and barriers to accessing

resources and services in new communities. Recognizing these gendered impacts is crucial in policy and decision-making processes to ensure equitable access to resources and support for adaptation.

Investments in gender-sensitive agricultural programs, disaster risk reduction, and health and livelihood support are essential to address these challenges. Women and youth, who often demonstrate resilience and leadership in disaster preparedness and response, should be actively involved in these efforts. Their roles as first responders, caregivers, and community leaders are invaluable in mitigating the impacts of climate change and building resilience at the grassroots level. However, despite their critical contributions, women's participation in decision-making processes related to climate change and environmental management remains limited. Empowering women through training, access to resources, and leadership opportunities can enhance their ability to contribute effectively to disaster response, recovery, and adaptation efforts leadership (UNDP, 2013; IUCN, 2015; Chanda et al., 2017; ICIMOD, 19; Chanda et al., 2022).

### ***Human Losses and Physical Damages: Climate Change's Toll on South Asia's Vulnerable Populations***

South Asia has been relentlessly battered by floods, heavy rains, droughts, and avalanches, resulting in significant human casualties and infrastructural damage. Recent calamities, such as the floods in Pakistan and Nepal, have claimed thousands of lives and displaced millions, leaving a trail of destruction in their wake. These disasters have disproportionately affected women, children, older people, and persons with disabilities due to physical vulnerabilities and socio-cultural norms.

Research indicates that during such events, women and children are more susceptible to fatalities due to factors like lim-

ited mobility, lack of access to disaster preparedness information, and the traditional practice of *Purdah*, which restricts women's movement. In mountainous regions, where flash floods and landslides are common, women and children often find themselves trapped and unable to escape, leading to tragic outcomes.

Moreover, the economic losses incurred from climate-induced disasters exacerbate existing vulnerabilities, particularly among women predominantly engaged in the informal sector. Women agricultural laborers, private teachers, and health workers often bear the brunt of economic hardships, with flooded lands and damaged infrastructure disrupting livelihoods and delaying salaries (Climate Analytics, 2022; Government of Pakistan, 2022; World Bank, 2022).

#### ***Economic Losses: Climate Change's Impact on Livelihoods and Financial Stability***

The economic ramifications of climate change in South Asia are profound, affecting various sectors and exacerbating poverty and inequality. Changes in precipitation patterns and extreme weather events disrupt agricultural productivity, leading to food shortages and increased prices for necessities.

In Pakistan, preliminary estimates suggest that the recent floods have pushed millions into poverty, underscoring the urgent need for resilient infrastructure and adaptive measures to mitigate future losses. Similarly, Nepal has experienced significant economic setbacks, with glacial melt and flooding contributing to substantial GDP losses. In such a situation, women, who form a considerable portion of the agricultural workforce and informal sector, are particularly vulnerable to these economic shocks. The lack of land rights and access to capital further compounds their challenges, leaving them with few options for livelihood diversification months (Buzdar & Ali, 2011; Sher, 2021; IFCR, 2021; ILO, 2022).

#### ***Agriculture and Food Security: Climate Change's Toll on Livelihoods***

Agriculture, the backbone of many South Asian economies, faces severe threats from climate change, including water scarcity, changing weather patterns, and extreme events. These challenges jeopardize food security and undermine rural livelihoods, with women playing a central yet undervalued role in agricultural production and household sustenance.

In regions where women lack land rights and access to resources, they bear a disproportionate burden of agricultural labor, from crop production to livestock rearing and food preservation. However, climate-induced hazards like floods and landslides disrupt these activities, leading to crop failures, loss of livestock, and scarcity of fodder and water (Khan & Imran, 2021; Rasul, 2014; Abid et al., 2016; Qamar & Muhammad, 2022; Goodrich et al., 2022; Abid et al., 2002).

#### ***Water Availability and Hazards: Coping with Climate-Induced Water Challenges***

Water scarcity poses a significant challenge in South Asia, exacerbated by climate change-induced variations in precipitation patterns and melting glaciers. This affects water availability for human consumption and jeopardizes agricultural irrigation and hydropower generation, exacerbating food and energy insecurity.

As primary caretakers of household water needs, women bear the brunt of water scarcity, spending hours fetching water from distant sources. Moreover, disruptions in traditional irrigation systems and groundwater depletion further strain water resources, particularly in rural and mountainous areas (Ali & Dhungana, 2022; ICI-MOD 2019; Goodrich et al. 2019, 2022; Molden et al. 2021).

### ***Displacement and Migration: Navigating Climate-Driven Movement***

Climate change-induced disasters, including floods and droughts, have forced millions of people to migrate and be displaced, leading to social, economic, and political upheavals. Women, children, older people, and persons with disabilities are disproportionately affected by these displacements, facing heightened risks of exploitation, abuse, and health complications.

Inadequate infrastructure and resources in displacement camps exacerbate the challenges faced by women and vulnerable groups, with limited access to health-care, education, and sanitation facilities. Socio-cultural norms and power dynamics further compound these vulnerabilities, perpetuating gender disparities and unequal access to resources and opportunities (Friday Times, 2022; ICIMOD, 2019; Government of Pakistan, 2022; Kosar & Celdon, 2021; NDTV, 2022; The Guardian, 2022; 2022; UNFPA, 2022; World Bank, 2022).

### ***Reproductive Burden: Women's Responsibilities Amidst Climate Crisis***

Women's reproductive workload intensifies during and after climate-induced disasters as they shoulder the responsibility for household chores, childcare, and eldercare amidst challenging circumstances. Limited access to clean energy options and disrupted infrastructure exacerbate these burdens, forcing women to travel long distances for water and firewood collection.

Moreover, disruptions in livelihoods and economic opportunities leave men with limited means to support their families, shifting additional responsibilities onto women. Despite these challenges, women often play crucial roles in disaster response and recovery, demonstrating resilience and leadership in adversity. Addressing these multifaceted challenges requires a comprehensive and gender-sensitive approach rec-

ognizing women's and vulnerable groups' unique needs and contributions. Investments in resilient infrastructure, adaptive agricultural practices, and social protection mechanisms are essential to build climate resilience and promote gender equality in South Asia's changing landscape (Gurung and Bisht 2014; Goodrich and Kosar 2020; Kosar and Seldon, 2022).

Therefore, it is essential to consider the gendered impacts of climate change in policy and decision-making and to ensure that women and girls have equal access to resources and support to adapt to the changing climate. This can include investments in gender-sensitive agricultural programs, disaster risk reduction initiatives, and health and livelihood support. On the other hand, such programs should empower women and girls to participate in decision-making processes and leadership roles and address the underlying inequalities that make them more vulnerable to climate change. By addressing the gendered impacts of climate change, we can create more resilient and sustainable communities for all.

## **ADDRESSING GENDER DISPARITIES IN MOUNTAIN REGIONS: A CALL FOR INCLUSIVE CLIMATE ACTION**

Climate change exacerbates inequalities in South Asia, particularly in mountainous regions where warming mountains contribute to glacier melting and forest fires, leading to floods and other hazards. These events disproportionately affect vulnerable communities, including women, those living in poverty, and people with disabilities. In many mountain societies, women and marginalized groups lack control over resources and decision-making, rendering them more susceptible to the impacts of warming mountains. They face increased workloads, limited mobility, and reduced access to essential services, exacerbating their vulnerability.

Despite women's crucial roles in disaster preparedness, mitigation, and rehabilitation, their contributions often go unrecognized and are excluded from decision-making processes. Existing policies in the Hindu Kush Himalaya (HKH) region lack effective implementation, and gender representation in relevant institutions remains inadequate. Socio-cultural norms perpetuate these inequalities, underscoring the urgent need for inclusive and responsive approaches to address warming mountain-related hazards and risks with the following recommendations:

- Adopting holistic strategies that recognize and address the intersecting issues of gender, caste, class, and other factors. Women must be granted equal participation in environmental decision-making processes at all levels, leveraging their unique perspectives and experiences to inform disaster response and adaptation strategies.
- Ensuring gender integration in Integrated Water Resource Management (IWRM) approaches to promote equitable access to water resources for all social groups, including women and men, and across socio-economic strata.
- Governments in the HKH region should prioritize policy reforms and introduce social protection programs that specifically address the needs of vulnerable women and men. These programs should encompass reproductive activities associated with women and ensure their safety and security during and after disasters.
- During post-disaster rehabilitation processes, prioritizes the allocation of land and assets to women, empowering them economically and socially and fostering their resilience to future climate-related challenges.
- Enhance women's status and position by providing equal access to information, life skills, and socio-

opportunities. Additionally, it promotes gender equality through men's education and awareness initiatives, fostering a culture of gender sensitivity and inclusivity.

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# CREATING AGENTS OF SOCIAL CHANGE BY EMBEDDING SUSTAINABLE EDUCATION INTO CURRICULA

SARA AHSAN  
(sa07288@st.habib.edu.pk)  
Habib University

## ABSTRACT:

This research paper investigates Karachi, Pakistan's complex difficulties, which include environmental deterioration, economic disparity, and social instability. Based on secondary research of existing literature, important challenges include Karachi's damaged environment, as well as a lack of environmental awareness, skills, and attitude which contribute to the city's ongoing difficulties in achieving sustainable development and social cohesion. Furthermore, the complicated dance of ethnic variety adds another element of complexity, which can often lead to civil unrest. This study analyses the situation in Karachi, highlighting the lack of environmental and social awareness and pushing for a resilient curriculum. To investigate and resolve the issues raised, the study makes use of a theoretical grasp of sustainability education as well as a survey of the literature. The significance of a paradigm change in Karachi's educational system is emphasized in the conclusion. The recommended curriculum comes out as a transformational force that may improve the city's general well-being, economic prosperity, and livability. It is also in line with the UN Sustainable Development Goals. By encouraging environmental stewardship, civic engagement, and community resilience, the suggested curriculum becomes essential to attaining social justice, economic success, and communal well-being. Adopting sustainable learning practices is presented as more than just an educational reform; it is the foundation for strengthening Karachi's resilience, equipping the next generation with the moral consciousness and academic proficiency required to meet the many difficulties facing the city.

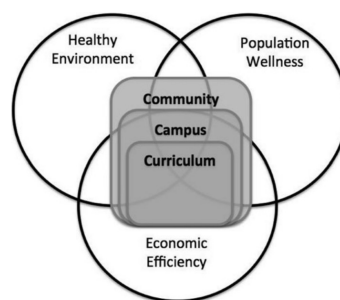
**Keywords:** *Environmental degradation, sustainability education, resilient curriculum, waste management, civic participation, paradigm shift*

## INTRODUCTION

In a world beleaguered by enormous worries such as climate change, economic inequality, and social injustices, Karachi, Pakistan's strategic pulse, finds itself at the epicenter of a multifaceted whirlwind. The city's environmental concerns mirror the city's convoluted social and economic structure, from air pollution to water poisoning to the maze of garbage management. Karachi's resilience is put to the test on a daily basis by mounting population pressure, resource constraints, and the intricate dance of ethnic diversity. While the informal sector is necessary, it also introduces issues such as job insecurity, restricted worker rights, and a lack of social benefits. Within this complex context, the urgent need for a paradigm change in education arises from the inadequacies in addressing Karachi's environmental and social challenges efficiently. This article explores sustainable learning and education as a means to address Karachi's pressing issues and proposes curriculum designed to foster transformative change. Beyond academic knowledge, the goal is to instill critical thinking skills and ethical ideals in a generation capable of facing and actively addressing the city's most pressing issues. This essay contends that a resilient curriculum is more than simply an educational reform; it is the bedrock of Karachi's route to social justice, economic development, and holistic community well-being. Embracing sustainable learning is more than just an educational step forward; it is Karachi's ticket to resilience. We can mold a generation equipped with academic genius, critical thinking abilities, and ethical ideals to navigate and conquer the city's numerous challenges by revolutionizing the curriculum.

## DEVELOPING FRAMEWORK TO UNDERSTAND SUSTAINABLE EDUCATION

According to the Oxford Dictionary sustainable is defined as "something that can maintain itself, can be upheld or defended" (Conte Grand et al., 2018). Sustainability education is described as an educational strategy that develops, integrates, and connects use-inspired knowledge to solve environmental-social challenges (Warner & Elser, 2014). It expands on environmental education by addressing complicated social concerns, such as the connections between environmental quality, natural resource allocation, human equity, and human rights. The learners of sustainable education learn to explore the three E's of sustainability—the three pillars of Equity, Economy, and Environment—and the interconnections among them. The next generation of problem solvers must grasp the linkages between natural and constructed ecosystems to propose solutions to complicated environmental concerns (Warner & Elser, 2014). This multidisciplinary approach to education is critical for equipping students with the knowledge and skills needed to handle complex environmental challenges, which frequently originate in and affect our society in unanticipated ways. To elaborate further on the idea, Figure 1 explicitly explains the connectedness of the three pillars in sustainability education. Curriculum development, campus management, and community participation are the three crucial pillars of sustainability education (Warner & Elser, 2014).



**FIGURE 1:** Sustainable Education Framework (Warner & Elser, 2014)

Curriculum focuses on classroom activities, teacher-student interactions, material structure, and programme design, with an emphasis on building critical consciousness and skills required for long-term growth. Campus-related initiatives explore school and district operational issues such as personnel practices, administrative processes, physical facility maintenance, and open space usage. Concurrently, community-oriented activities emphasize educational institutions' greater effect through parental participation, collaboration with businesses, and connection with governmental and non-governmental groups. This multimodal approach ensures that sustainability principles, including teaching techniques, institutional operations, and broader social linkages, are thoroughly interwoven into the educational fabric. Furthermore, because sustainability education is innately solution-oriented, it necessitates a curriculum that integrates across educational scales and corresponds with the basic components of sustainable solutions. At the curriculum level, a focus on the three pillars of sustainability — curriculum creation, campus administration, and community involvement — must be highlighted. This entails not only instilling a sense of the intricacies of the local environment, but also conveying a scientific understanding of the degradation and repair of human and natural settings.

An effective sustainability curriculum simultaneously addresses population wellness, deftly blending concerns and solutions anchored in educational environments ranging from poverty to nutrition and health. By highlighting the interconnected nature of many situations, such education creates a more nuanced understanding of problem causes and potential solutions within society. Additionally, an economically feasible curriculum examines resource allocation within school communities, developing an awareness of why some aims are prioritized over others. This complete

approach ensures that sustainability education extends beyond theoretical boundaries, actively engaging students in real-world problem-solving at the crossroads of environmental health, societal well-being, and economic efficiency.

### A PROPOSED CURRICULUM: EMPLOYING SUSTAINABLE EDUCATION

In terms of sustainability progress, Pakistan falls well behind the rest of Asia (Hinduja et al., 2023). Most school curricula must include notions of environmental, social, and economic understanding. The confluence of long-term learning and the needs of current societal problems necessitates curriculum modification within Karachi's educational system. Given the multidimensional nature of sustainability, a complete and purposeful curriculum reform becomes critical to provide students with the necessary information, skills, and ethical underpinnings. To tackle Karachi's environmental, social, and economic challenges, the new curriculum must transcend previous paradigms and seamlessly integrate sustainability principles into a wide range of academic courses. This includes a deliberate emphasis on classroom activities, teacher-student relationships, and topic organization to foster critical thinking and self-actualization. In addition, the education must extend beyond the classroom walls, penetrating school processes and integrating with the larger community.

**TABLE 1: Sustainability Learning Themes**  
(Hays & Reinders, 2020)

• Systems Thinking	• Convergence and
• Ecology	Divergence of
• “Wicked”	Education and
Problems	Learning
• Self-Direction and	• Managing Change
Learner Autonomy	and Innovation
• The Changing	• Vicious and
Role of Leaders	Virtuous Cycles
• Mindfulness and	• Theory and
Reflexive Action	Behavior of

• Global Citizenship	Complex Adaptive
• The Nature of Knowledge and Knowing and Their Limits	Systems (CAS)
• Agency and Efficacy	• Notions of Chaos, Discontinuity, and Emergence
• Paradigms and Paradigm Shifts	• Individual Accountability and Collective Action
• Action Learning and Action Research	• Power of Paradox
	• Problems and Promises of Teaching
	• Creativity and Creative Process

Table 1 summarizes the subject matter for a sustainability curriculum that might be implemented at Karachi’s educational institutes at the basic, secondary, and higher levels of education. Adopting sustainability principles and practices, as well as understanding of complex adaptive systems, is crucial for building a strong foundation in Karachi’s primary, secondary, and higher education institutions. A sustainable curriculum must incorporate ecological ideas, a knowledge of ecosystem interconnectedness, and the development of an environmental ethos. Recognizing “wicked” problems and the need for systems thinking equips students with the analytical tools they need to address many issues in Karachi, including as water scarcity, air pollution, and socioeconomic disparities. Furthermore, teaching students to consider chaos, emergence, and the convergence and divergence of education and learning develops adaptation and resilience, which are critical for navigating the shifting landscape of a dynamic metropolis. Self-direction, learner autonomy, and mindfulness concepts instill in students a sense of agency and efficacy, enabling them to participate effectively in long-term activities both individually and collectively. Furthermore, the emphasis on global citizenship connects local issues with global contexts, developing a sense of responsibility for the vast planet. By combin-

ing these principles, educational institutions in Karachi may create a curriculum that not only transmits material but also encourages the critical thinking and ethical foundations needed to solve the multifarious challenges of sustainability at all educational levels.

**EMBEDDING EDUCATION FOR SUSTAINABLE DEVELOPMENT INTO TEXTBOOKS**

Textbooks are an important medium of education in our country, thus it is crucial to integrate the ideas of sustainable education into textbooks. Education for sustainable development calls for an interrelated process of collaboration and dialogue to increase capacity and engagement in learning (Nations & UNESCO, 2011). The goal here is not about adding another subject of sustainable education, but rather altering the already existing subjects in a way that they talk about real-world problems, make students engage in their communities, bring their knowledge to the classroom and discover the complex linkage problems to come up with relevant solutions. In this regard, UNESCO and MGIEP published “Textbooks for Sustainable Development, A Guide to Embedding”, which is a guideline developed by more than 30 subject experts from around the world. The guide contains 5 chapters: Introduction, Mathematics, Science, Geography, and Language. Each chapter provides specific guidelines and ideas in which the subject could be molded to involve critical thinking and system-level perspectives in students. For instance, in Mathematics the author advocates for context-rich word problems where the context of questions is not ignored, rather they are discussed in classrooms. Students might be asked to calculate the teacher-to-student ratio of their school or count the number of voters in their locality; thereafter, students will make decisions about who to count as a voter (Christodoulou & Schreiber, 2017). Such an approach would encourage agency

in students driving towards a learner-centered approach.

### SOLVING THE PROBLEMS OF KARACHI

Karachi, Pakistan's industrial and financial capital, is plagued by various infrastructural issues, including poor waste management, insufficient sanitation and water supply, land and air and traffic noise, a lack of green space, and ethnic and sectarian violence. This section investigates how a sustainability curriculum may help to solve some of the city's major issues.

#### Data Analysis:

In this analysis, I analyzed the educational attainment levels across various regions in Karachi, highlighting the level of the populace that has finished primary and higher education. The district-wise percentage of people in Karachi who obtained a primary or higher level of education was obtained from the Pakistan Social and Living Standards Measurement Survey of 2019-2020 (Khan, n.d.). After obtaining the district-wise population of Karachi (*Pakistan: Subdivisions of Karachi [Districts and Subdivisions] - Population Statistics, Charts and Map*, n.d.), overall number of people who finished primary or higher education in Karachi was calculated.

Table 2 shows that 67 percent of Karachi's population have obtained primary or higher levels of education, however, the city has been ranked as one of the least livable cities (Dawn.com, 2022). Although the authorities and government are to be blamed for efficient waste collection and disposal, the citizens are equally responsible for maintaining and sustaining their localities in cleaner ways. The 67 percent of educated citizens are failing to cater to these challenges, which indicates that there is a need to reform the curriculum taught in the schools. Developing upon this analysis, we can see how curriculum reformation could play a crucial role in overcoming the problem of waste management and community building in Karachi.

### THE PROBLEM OF SOLID WASTE MANAGEMENT IN KARACHI

Karachi has a severe problem with solid waste administration, manifesting as a host of issues with far-reaching implications for public health and economic stability. Karachi generates around 12,000 tons of solid garbage daily, 40% of which is discarded on city streets (Shamshir et al., 2019). Inadequate waste disposal infrastructure has resulted in indiscriminate solid waste dump-

TABLE 2

DISTRICT	POPULATION	PERCENTAGE COMPLETED PRIMARY OR HIGHER	TOTAL COMPLETED PRIMARY OR HIGHER
Karachi Central	2,971,382	74%	2,198,822
Karachi East	2,875,315	73%	2,099,982
Karachi South	1,769,230	68%	1,203,076
Karachi West	2,077,228	58%	1,204,791
Korangi	2,577,556	64%	1,649,636
Malir	1,924,346	58%	1,116,854
<b>Total</b>	14,195,057	–	9,473,161
<b>Overall Percentage</b>	–	67%	–

ing, exacerbated air pollution by releasing dangerous particulates and poisonous gases, and exacerbated environmental degradation. The consequent air quality degradation is a major health problem, increasing the incidence of infectious diseases among the city's residents. On the other hand, the level of environmental awareness in the schooling system is at significantly lower rates.

**TABLE 3:** *Environmental education infusion index score (Akhtar et al., 2020)*

DOMAINS	INFUSION INDEX SCORE
Environmental Knowledge	0.67
Environmental Skills	0.25
Environmental Attitudes	0

Table 3 shows the infusion index score of environment-related content for the Biology, Chemistry and Physics textbooks developed by the Federal Board of Intermediate and Secondary Education for classes 9th and 10th (Akhtar et al., 2020). Here, the score 0 represents not covered, 0.5 represents partially covered, and 1 represents fully covered. Therefore, it is pivotal to incorporate knowledge and skills of recycling, environmental policy and governance, and environmental ethics in the school curriculums. There could be storytelling sessions for students below the age of 6. In contrast, later, they could be skill-based workshops on the 3Rs (Reduce, Reuse, and Recycle) or home-based composting, sorting games to teach students different types of waste, and role plays to understand the stakeholders involved in Karachi's waste management cycle.

Analyzing the impact of integrating these skills in the sustainability curriculum, if students are taught the handling of waste on the foundational level of their upbringing, they would develop a reflex and instinct

that encourage them to reduce, reuse and recycle, ultimately creating a beneficial culture for the environment. According to the estimates of SSWMB, indigenous waste lying open at the landfill sites of Karachi is 54 percent organic in nature (Ahmed & Ali, 2022). Moreover, when this organic waste is dumped into landfill sites, it decomposes because bacteria release the harmful gas methane into the environment. Thriving individuals who are habitual in separating organic waste and have hands-on experience in home-based composting means that the generated organic waste (such as fruit peels) could be returned to the soil, promoting the idea of the circular economy. On a broader lens, waste composting is relevant in reducing greenhouse gas emissions in developing countries because it can divert large quantities of organic materials from the municipal solid waste stream flow in the regions (Harir et al., 2015). Moreover, Karachi's waste management system contains a large sector of the city's informal economy. It also contains the "Kachra Mafia," which employ cheap labor as garbage collectors and gain their profits by selling waste to the government. The population of people who are waste collectors in the city mostly belong to the lower income classes; when their kids learn from a curriculum that teaches them environmental policy and governance, it would enable them to be more conscious of their rights in future and would better negotiate their rights with the local waste collection bodies, or forming labor unions in the longer run.

#### PROMOTING COMMUNITY ENGAGEMENT IN KARACHI

Karachi is one of the world's largest megacities and the country's commercial hub; it has been noticed that the violence has had a significant impact on the city's economic activity.

The city's law and order situation has also deteriorated significantly as a result of confrontations between Karachi's many ethnic populations. Because of this war, Karachi saw a lot of carnage and violence during the 1970s and 1980s. A considerable proportion of Karachi's population comprises ethnic communities that have moved from other regions, such as Pakhtuns and Punjabis, or India, which is one of the primary underlying causes of this conflict (Shamim & Hameed, 2018). However, this rising population lives in a city marked among the least livable cities. The percentage of open green spaces in the city was 4.6% in 2001, falling to 3.7% by 2013 (Gappihan et al., 2017), despite the notable increase in population density. On the other hand, Karachi's persistent violence and declining law and order have far-reaching economic implications. Widespread insecurity impairs corporate operations, discouraging local and international investment and increasing enterprise security expenses. Moreover, the consequent decline in tourism and business diminishes Karachi's reputation as a commercial hub, reducing prospective revenue sources. These linked challenges necessitate deliberate actions to restore regional stability and foster economic progress.

In order to cater to these diverse challenges, this paper proposes to include the notion of Community Engagement in school curriculum. The list of possible activities could be as follows:

- Students asked to bring items related to their community
- Community Helpers Week—guest speaker sessions, role plays, and awareness sessions to appreciate professions such as nurses, policemen, firefighters, etc.
- Maintaining community gardens in schools
- Entrepreneurial fairs
- Internships and apprenticeships in local businesses and organizations

- Students participating in local government meetings

The incorporation of community-focused projects into Karachi's school curricula demonstrates a subtle agreement with the UN Sustainable Development Goals (SDGs). Students actively contribute to Sustainable Development Goal 11, which emphasizes sustainable urban development, greater green areas, and resilient communities through group activities such as maintaining community gardens. During Community Helpers Week, guest speaker sessions not only encourage respect for Karachi's various residents but also advance SDG 16 by promoting inclusive societies, cultivating civic involvement, and contributing to a feeling of community responsibility. Participation in local government meetings enhances civic duty, which aligns with SDG 16's goal of creating peaceful and inclusive communities via effective, responsible, and transparent institutions. In the longer run, this foundational level of learning could significantly elevate the Human Development Index while also improving Karachi's position in the livability index. Green regions are reported to be 4%–12% more valued than non-green neighborhoods. (Roo, 2011) Second, psychologists have discovered that having a view of nature boosts worker productivity, particularly by lowering stress-related absenteeism and enhancing staff morale (Economic Benefits of Green Spaces, 2000). Furthermore, a group of researchers concluded in a study on forms of civic engagement by different generations of American citizens towards "hot-topic" social issues that public engagement can be productive and meaningful through civic action/participation, electoral leverage/demands, or political advocacy (Keeter et al., 2002). Moreover, civic knowledge and open classroom discussions with extra-curricular activities also promote the political participation of the youth by increasing their willingness to vote (Sherrod, 2003).

Overall, this educational approach not only coincides with global sustainability objectives but also has the potential to improve Karachi's livability, economic success, and general well-being by laying the groundwork for environmental stewardship, civic involvement, and community resilience.

## RECOMMENDATIONS

Implementing a sustainability curriculum in Karachi necessitates a multi-stakeholder strategy. Involving non-governmental organizations (NGOs) such as The Citizens Foundation and Green Crescent Trust and public and private school networks may provide different viewpoints and resources. Integrating the curriculum into public education is critical since it aligns with the government's commitment to SDG 4 and increases access for lower-income classes. Schools and instructors might be certified and rewarded for effective implementation to encourage participation and build a supportive atmosphere. Specialized teacher training programs would provide educators with the skills to deliver the curriculum properly. Furthermore, encouraging undergraduate students to volunteer with non-profit organizations and help professors with activities fosters a symbiotic connection that enriches educational experiences. In the longer run, Government agencies might give internships to graduates of this curriculum as a long-term plan, building a sustainable cycle of education, involvement, and career growth.

## PROBLEMS AND LIMITATIONS

Implementing a sustainability curriculum presents some social, environmental, and economic obstacles. Social acceptability may be hampered by opposition from parents and educators who see community service as a diversion from essential academic topics. However, 24.6 percent of children aged 6 to 10, 31.4 percent aged 11 to 13,

and 45.4 percent of children aged 14 to 16 are out of school in Sindh (Bajwa, 2011). Environmentally, implementing hands-on programs such as sustainable agriculture and waste management meets challenges owing to inadequate financial and infrastructural resources. Furthermore, including waste management skills in the sustainability curriculum may unintentionally add to environmental harm by increasing trash output. There is a potential that children will participate in inappropriate composting procedures, producing damaging greenhouse gases. Furthermore, increasing trash separation attempts may increase demand for single-use, non-biodegradable goods, worsening environmental issues. Economic problems include allocating resources for programs such as sustainable urban development and the expense of educating teachers on advanced topics. Furthermore, the education sector in Pakistan has consistently received less than a 2.5 percent budget allocation across successive governments, an inadequate share insufficient to meet the nation's increasing educational demands, particularly in the face of developing educational paradigms (Ahmad et al., 2014). According to the International Crisis Group, Pakistan is one of 12 countries that spend less than 2% of their GDP on education (Ahmad et al., 2014). Strategic planning, stakeholder engagement, and a commitment to addressing the detailed problems within each dimension are required to overcome these challenges. This will enable the effective integration of a comprehensive sustainability curriculum.

## CONCLUSION

On the whole, this study of sustainable learning and education highlights the importance of a paradigm shift in Karachi's educational environment. As the city faces complicated environmental, social, and economic challenges, the need for a curriculum that goes beyond academic understanding

becomes clearer. The examination of Karachi's difficulties, notably waste management and community participation, highlighted how a sustainability curriculum may address these issues at their source. The result reinforces that the suggested curriculum, which is linked with the UN SDGs, can improve Karachi's livability, economic success, and general well-being by fostering environmental stewardship, civic participation, and community resilience from the ground up. The suggested course of study serves as a transformative agent, encouraging critical thinking skills and ethical principles that are required for proactively dealing with Karachi's numerous challenges. It is more than just an educational reform; it is the cornerstone for achieving social justice, economic prosperity, and overall community well-being. Adopting sustainable learning is more than simply a great educational move; it is crucial to building Karachi's resilience. By preparing a generation with academic competency and ethical awareness to address many difficulties, this curriculum becomes Karachi's key to a more resilient and environmentally friendly future.

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# EXPERIENCES OF INDIAN-BURMESE WOMEN LIVING IN MYANMAR (BURMA) UNDER MILITARY RULE AND ANTI-MUSLIM SENTIMENT IN THE FACE OF CLIMATE CHANGE

**SANIYAH SALMAN**  
(saniyahsalmaan2@gmail.com)  
Habib University

## ABSTRACT:

In 2021, the United Nations Intergovernmental Panel on Climate Change (IPCC) warned that the climate crisis will be more pronounced in countries that are poor and affected by conflict. Climate change is identified as a ‘threat multiplier’ meaning that it can exacerbate socio-political factors like poverty, state incapacity and inequality, and violent conflict (Huntjens and Nachbar, 2015). Myanmar is the second most vulnerable country to climate change (The Republic of the Union of Myanmar, 2019). Over the years, as the result of the National Organization for the Protection of Race and Religion, Muslims have been seen as a threat to Buddhist values and traditions resulting in a rise of Burmese-Muslim riots (Win, 2017). This paper explores the theories on feminist peacebuilding and climate change as well as the ‘everyday’ feminist theory in order to devise a theoretical framework which would enable to understand the everyday lives of Indian-Burmese women living in Myanmar in the context of the country being the second most vulnerable country to climate change, the military rule and anti-Muslim sentiments in the country.

**Keywords:** *Indian-Burmese, women, climate change, everyday feminism, peacebuilding*

## INTRODUCTION

Over the years, as the result of movements such as the Ma-Ba-Tha Movement, also known as the National Organization for the Protection of Race and Religion, Muslims have been seen as a threat to Buddhist values and traditions resulting in a rise of Burmese-Muslim riots (Win, 2017). The International Red Cross notes that that climate change is not initiating conflicts within communities rather it is a reason to exacerbate existing ones (2020). Myanmar is the second most vulnerable country to climate change (The Republic of the Union of Myanmar, 2019). It was under military rule from 1962 till 2011. The military rule has resumed again after a successful coup in 2021. After the military coup, many international organizations have seized to work in the country as foreign presence is seen as a threat.

Patel highlights that it is crucial to understand the experiences and challenges faced by women in order to understand climate vulnerability and build capacities for directly overcoming injustices (2021). It is noted that studies that undertake a gendered focus with respect to climate change in Myanmar have mostly, if at all, been limited to rural contexts (McNamara, 2020). Furthermore, there is a tendency to present women from the Global South as weak and lacking agency. Another study suggests that the “everyday” gendered experiences of climate change policies and planning affect individuals in varied ways (Bee et al., 2015). Aroora-Johnson who studied the biases involved in studying women in the Global South and Global North highlighted the importance of incorporating the “everyday” and individual experience of climate change academia, which would give a nuanced understanding of the needs of the people (2011).

In this research, I aim to understand the intersectionality of climate change, gen-

der and conflict for Indian Burmese women living in present-day Myanmar. The aim of this paper is to devise a theoretical framework using “everyday” feminist theory, everyday “care” and feminist theory in peacebuilding climate change frameworks. I am defining the conflict in two ways. Firstly, the conflict between the people of Myanmar and the military rule, and secondly the anti-Muslim sentiment experienced by the Muslims. Therefore, this study aims to explore the everyday lives of Indian-Burmese women living in Myanmar in the context of the country being the second most vulnerable country to climate change, military rule and anti-Muslim sentiments in the country.

## STRUCTURE

This paper is divided into two parts. Firstly it will discuss the context of Myanmar in terms of climate change, gender and climate change governance. It will then introduce and critically analyze international development frameworks on climate change, gender and peacebuilding provided by the United Nations. Then, I bring the discussion to the need for “everyday” feminism and feminist theory in peacebuilding and climate change, which provides an alternate understanding to the neoliberal, positivist and colonial understanding of peacebuilding and development. Finally using the theories discussed, I provide a theoretical framework that will form the basis of the second phase of this study which aims to explore the everyday lives of Burmese-Indian women living in Burma in the face of climate change, military rule, and anti-Muslim sentiment.

## PURPOSE OF STUDY

Climate change is identified as a “threat multiplier” (Huntjens and Nachbar, 2015) meaning that it can exacerbate socio-political factors like poverty, state incapacity and inequality, and violent conflict. The Indian Burmese in Myanmar’s Yangon city are at

the intersection of ethnic identity in an anti-Muslim environment while they are located in a climate disaster-prone area. However, it is a population that is not studied in the context of climate change specifically. Furthermore, there are gaps in the literature on how to address the increase in climate change vulnerabilities in contexts of state oppression such as Myanmar under military regime.

Moreover, peacebuilding and climate mitigation development frameworks operate on neoliberal and colonial principles. Hence, they tend to have racial and ethnic biases whilst operating dichotomous discourses which limits their effectiveness (Martin, 2018).

Most studies on climate change that undertake a gendered lens in Myanmar have mostly, if at all, been limited to rural contexts (McNamara, 2020). This study provides an opportunity to understand the challenges that women face due to climate change in the Yangon city of Myanmar where the Indian-Burmese population, including my extended family, resides.

This paper serves two purposes. Firstly, it provides an overview of Myanmar, which gives the context that one needs in order to conduct research on the country. This in-depth literature review of the country gives ground to the researcher to form an understanding of the country. Secondly, through an extensive literature review of post-colonial feminist theories on peacebuilding, it provides a theoretical framework by which further research in this area of research can be carried out.

## SCOPE AND SCALE

The purpose of this paper is to provide a strong theoretical grounding to the primary research that will be conducted in the future on experiences of Indian-Burmese women living in Myanmar under military rule and anti-Muslim sentiment in the face of climate change. The literature review will only focus on Indian origin Burmese population that lives in Burma. It does not take into account other populations that live in Burma. It looks at the United Nations Security Council Resolution 1325 and the subsequent Women's Security and Peace agenda as international frameworks on peacebuilding during climate change in conflict areas. The paper provided a theoretical framework at the end, which can be utilized in future researches that focus on the postcolonial, post-positivist feminist approach to knowledge production.

## MYANMAR OVERVIEW

In 2021, the United Nations Intergovernmental Panel on Climate Change (IPCC) warned that the climate crisis will be more pronounced in countries that are poor and affected by conflict. Climate change is identified as a 'threat multiplier' (Huntjens and Nachbar, 2015) meaning that it can exacerbate socio-political factors like poverty, state incapacity and inequality, can violent conflict. The Indian Burmese in Myanmar's Yangon city are at the intersection of ethnic identity in an anti-Muslim environment while they are located in a climate disaster-prone area. However, it is a population that is not studied in the context of climate change specifically. Furthermore, there are gaps in the literature on how to address the increase in climate change vulnerabilities in contexts of state oppression such as Myanmar under the military regime and anti-Muslim sentiment. After the military coup of 2021, many international organizations have seized work in the country as

foreign presence is seen as a threat (Huntjens and Nachbar, 2015).

## MYANMAR AND RISKS TO CLIMATE CHANGE

Like many countries in South and South-east Asia, climate change is not in the future, rather it is becoming an everyday reality for people in Myanmar. According to the 2021 Global Climate Risk Index, Myanmar is ranked the second most vulnerable to extreme weather events out of 183 countries (Eckstein, D. et.al, 2021). According to the “Myanmar Climate Change Strategy 2018–2030” the country is divided into three agro-ecological zones namely, Central Dry, Coastal and Hilly (2019). It is also divided into eight physiographic regions namely, Northern Hilly, Eastern Hilly, Western Hilly, Central Dry zone, Rakhine Coastal, Ayeyarwady Delta, Yangon Deltaic and Southern Myanmar Coastal. It is projected to be a victim of more frequent floods, droughts, heat waves, cyclones and rising sea levels making the people who live on Myanmar’s nearly 2,000 kilometers long coastline has always made it to be vulnerable to the impacts of natural disasters (Kyed and Chambers, 2023). Vulnerabilities increase as the majority of the population lives in poverty in low-lying areas. According to a report jointly published by the civilian government, the United Nations and the World Wildlife Fund between 1981 and 2010, the average daily temperature in Myanmar increased by about 0.25 degrees Celsius per decade (Horton, R et al., 2016). By 2050, every region of the country will see temperatures rise between 1.3°C and 2.7°C above historical levels resulting in an increase in the number of extremely hot days where the mercury will hit between 38–39°C (Thin Lei Win, 2022). This will impact food production, food security and land scarcity, climate change poses a severe threat to livelihoods and sustainable development.

## MYANMAR CLIMATE CHANGE AND GOVERNANCE

It is safe to say that climate change vulnerabilities are not only changes in temperatures and weather patterns on a global scale, rather it is also contextual issues related to, natural resource use, governance and conflict (Kyed and Chambers, 2023). The ability of local governments to manage and control as well as the ability of communities to mitigate and respond to climate change plays an instrumental role in these risks and vulnerabilities. In the case of Myanmar, poor governance, years of conflict, regime changes, authoritarian rule and agrarian land struggle have undoubtedly made people in Myanmar more vulnerable.

Since the coup in February 2021, the situation has only worsened (Kyed and Chambers, 2023). The 2021 coup is said to be “a tragedy for both humans and nature” (Thin Lei Win, 2022). It has been reported that the military has resorted to exploiting the country’s extensive natural resources as a source of funding for its regime and violent activities. This is nothing new for the country as the longstanding pattern of military exploitation had only partially declined during the ten-year reform period. Through satellite data, it is noted that there has been a significant reduction in the size of rainforests since the coup. Moreover, civil society organizations (CSOs) have reported a rapid increase in unregulated mining activities causing pollution in waterways, the destruction of mountains, extensive damage to forests, and triggering landslides, as well as altering fragile ecosystems.

Furthermore, since the coup, the oversight mechanisms for regulations and environmental protection have disappeared, leaving local communities with no avenue to voice their concerns or complaints regarding the impacts of extractive projects

on their land rights, local environment, and livelihoods. (Kyed and Chambers, 2023).

According to Vicky Bowman, director of Yangon-based Myanmar Centre for Responsible Business and former British ambassador to Myanmar. “But development partners seem frozen since the coup, and private sector investors instinctively now view Myanmar as high risk.” (Liu and Wallace, 2021). International Organizations have also disappeared since the coup due to the increasing suspicion of foreign people. Roxa Luxemburg Stiftung, a German foundation, stated that their work had stopped since the coup (Colom, 2022). It is being stated that Myanmar is emerging as a textbook case of “the nexus between climate change, migration and political instability” (Thin Lei Win, 2022). All of these factors make the population of the country more vulnerable to climate change.

## MYANMAR AND GENDER

Myanmar ranks 148 out of 189 nations on the gender inequality index for 2018 (UNFPA Myanmar, 2018). It is a patriarchal society that operates on the belief that men are “leaders in everyday Myanmar life” while women play a supportive role (Khant and Mai, 2022). Myanmar is a signatory to the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW); however, there are numerous gender disparities in all sectors of society such as in economic, political, and educational avenues (Khant and Mai, 2022).

Although, women in Myanmar enjoy equal rights when it comes to inheritance laws and marital property rights in case of divorce, nevertheless, traditional cultural values that favor male dominance still influence family dynamics, leading to a gender-based division of labor both at home and in the public sphere (Gender Equality and Women’s Rights in Myanmar, 2016).

Women play a huge role in the well-being of families and therefore societies, they often find themselves at odds with discriminatory cultural norms, incentives, and legal institutions that prevent them from realizing their full potential (Khant and Mai, 2022). According to Gender Equality and Women’s Rights in Myanmar: A Situation Analysis significant concerns revolve around a high maternal mortality rate and inadequate access to reproductive and essential healthcare services, as well as the limited participation of women in both public decision-making processes and the workforce (2016). The gender inequality in Myanmar can be categorized education, health, water and sanitation, access to electricity, economic empowerment public decision making and gender-based violence. According to the same report, education girls account for 49%, 50% and 53% of total primary, lower and upper secondary school enrolments in school year 2010/11. However, girls’ access to education is significantly hampered by challenges arising from factors such as social class, ethnicity, linguistic background or whether they come from rural or urban locations (2016). Furthermore, it is worth noting that although there are more females than males in post-secondary education, their labor force participation remains very low. This indicates gender-based discrimination faced by women. This is apparent as 85.1% of men participate in the labor force compared to only 63.1% of women (2016).

In 2010, 48% population had access to electricity (Gender Equality and Women’s Rights in Myanmar, 2016). Women appeared to suffer the most from lack of access to electricity. The primary reason for this was the high health and economic costs associated with electricity produced through biomass. This forced women to spend significant amounts of time of their day transporting fuel (Gender Equality and Women’s Rights in Myanmar, 2016). Furthermore, household chores like cook-

ing often took longer compromising their overall quality of life. The gender equality report notes that with access to electricity, women would be “freeing up their time for economic activities which support women’s economic empowerment and improve their well-being and quality of life” (Gender Equality and Women’s Rights in Myanmar, 2016).

Furthermore, there are prevalent instances of domestic violence and sexual violence in Myanmar. The country lacks legislation targeting gender-based violence, although the Penal Code does contain provisions related to offences of sexual nature. A multitude of factors such as deeply ingrained traditional cultural beliefs, lack of awareness, the undervaluing of women in society, and the inadequate availability of legal aid services such as legal assistance, mental and physical well-being and shelter, all jointly contribute to cases being under-reported and unresolved (Gender Equality and Women’s Rights in Myanmar, 2016).

According to Georgetown University’s Institute for Women, Peace and Security (2021), gendered disparities coupled with discriminatory norms, lack of awareness and less economic opportunities put women at a disadvantage and increase their vulnerability to climate impacts. The impacts of climate change on women are further exacerbated at the intersection of gender with race, class, and ethnicity (Smith et al., 2021). The state oppression and conflict in Myanmar clearly demonstrate that is extremely essential to place conflict analysis and people-centered approaches at the center of climate change and environmental protection. (Kyed and Chambers, 2023).

## FEMINIST THEORY: PEACEBUILDING AND CLIMATE CHANGE

Decades of feminist advocacy directed towards mainstreaming gender in post-conflict countries have resulted in multiple projects related to the implementation of the UN Security Council Resolution (UNSCR) 1325 (Martin, 2018). The UNSCR 1325 was adopted in 2000. UNSCR 1325 articulated three pillars namely, the prevention of sexualized and gender-based violence, the protection of women against violence in conflict, post-conflict situations and the participation of women in peace and security governance (Martin, 2018). After its adoption, several other subsequent resolutions were passed which included the Women, Peace and Security (WPS) agenda (Martin, 2018). The UNSCR 1325, WPS along with the 2030 Agenda for Sustainable Development (UNGA, 2015) represent global frameworks that place the prevention of women in post-conflict countries as a key priority and shared responsibility (Marrisa, 2022).

After the UNSCR 1325 was adopted in 2000, it inspired a growing body of evidence showing that the participation of women contributes to not only the successful conclusion of peace talks but also to the on-ground implementation of peace agreements and the sustainability of peacebuilding and post-conflict development processes (Marrisa, 2022). Literature suggests that women’s participation in peacebuilding results in meaningful participation in these efforts since they offer perspectives and solutions that are more holistic to issues that are often overlooked by their male counterparts. As a result, the outcomes are more durable. (Marrisa, 2022).

However, with climate change, it became ever more necessary to include climate-related vulnerabilities and conflict in peacebuilding frameworks such as the

WSP. Although the UN Women's Conference adopted a section on women and the environment in its platform for action in 1995, the importance of climate change-related issues was not noted then and was slow to emerge even in the future (Kronsell 2015). In fact, the involvement of women and women's groups in climate change decision-making and negotiations only began in the mid-2000s (Kronsell 2015).

This was due to a number of factors. Firstly, climate change has become an element of attention on the women's and feminist agenda only fairly recently as well as the importance of climate change issues was slow to emerge (Kronsell 2015). Secondly, the climate change agenda was mainly associated with natural science experts like meteorologists and climatologists (Kronsell 2017). As climate change-related issues came on the global agenda, they were thought to be lacking social perspectives (Kronsell 2017). Furthermore, they were also "scientized" as well as depoliticized.

In 2018, Kronsell explored the problem of climate change as a gendered problem and connected it to the WPS agenda. The analysis showed two main findings in the approach of the WPS. Firstly, the debate on climate and gender was dominated by framing the problem as a problem of women's vulnerability to climate events and how women's livelihoods are adversely affected by climate change.

Secondly, the violence of climate change does not only come through immediate weather events, such as floods and storms but also through violence in everyday life. These are often exacerbated by other pressures and conflicts (Huntjens and Nachbar, 2015; International Red Cross Committee, 2020; Kronsell, 2018).

Moving forward, there is a general consensus in the literature on the Women,

Peace and Security agenda. It is believed that the existing policy initiatives for its implementation are only good on paper but do not change the current state of affairs on the ground (Martin, 2018).

In fact, the WPS agenda is rather considered an instrument of a liberal approach (Martin, 2018) or neoliberal (Bee et.al, 2015) as most international development projects. Postcolonial feminists claim that dichotomy evoked by international development frameworks continuities with the colonial era (Martin, 2018). According to them international peace and security and its imperial construction is apparent in its series of dichotomous discourses such as modern and traditional, developed and underdeveloped, local and global, man and woman, black and white, liberal and illiberal. (Martin, 2018). For many, WPS mirrors the discourses and practices of the neoliberal imperium that represents women not only as passive victims of conflict but also as agents of change. However, it does so by reinforcing gendered, racial, and sexual discourses and practices of international peace and security to produce "governance feminism" (Martin, 2018).

Drawing on poststructuralist and postcolonial feminist literature that underlines the role of discourse in the knowledge production of subject positions and policy practices, Martin (2018) suggests that the concept of intersectionality is a useful tool in the analysis of gender subjectification processes and how these relate to other power relations (race, class, sexuality). In the feminist literature, the vulnerability of women is explained in terms of structural violence and a combined violence to women and nature. Thus, in an attempt to achieve climate peace, the complexity of security needs should be considered (Moosa and Tauna, 2014; Kronsell, 2018). Since Neoliberal climate governance often prioritizes market-oriented behavioral change

as the solution (Macgregor 2014; Swynge-douw 2010) it focuses on shifting responsibility for mitigating climate change onto individuals through their consumption of techno-scientific solutions and ignores and obscures the experience of differently situated subjects (Bee, et al, 2015). As such, by engaging with feminist theoretical interventions scholars would be able to gain a more politically potent, holistic and nuanced understanding of neoliberal climate governance (Bee, et al, 2015).

All in all, put simply, neoliberalism is the dominant political philosophy that “argues for the desirability of a society organized around self-regulating markets, and free, to the extent possible, from social and political interventions” (Glassman 2009). Exercised through market deregulation, and state reregulation to facilitate open markets, neoliberalism has enabled a massive expansion in marketized and privatized social relations, of which nature is now prominently understood as central to the neoliberal project (Heynen et al. 2007).

Feminist scholarship increasingly challenges the disembodied and masculinist science behind climate change discourse and policy-making. Much of this work is influenced by feminist philosophies of science such as that of Gillian Rose (1993). Such philosophy challenges the masculinist underpinnings of positivist science which frame scientific knowledge around climate change as valid only the process of knowledge production is through objective and value-free research (Bee, et al, 2015). Therefore, feminists suggest an alternate method of knowledge production and understanding of climate change peacebuilding.

## “EVERYDAY” FEMINIST THEORY

“Everyday” theory is a post-structuralist (Poster, 2002), post-positivist (Redden, 2018 and Smith, 1987), intersectional and transnational feminist theory that puts importance on the mundane everyday lives of women in order to understand underlying power structures and social cultures that govern them. It defies the idea that knowledge can only be gained through scientific, objective means and that there is only one kind of absolute knowledge in the world (Redden, 2018).

This theory can be used in multiple ways for example ethnographic studies, life histories or culture studies. For the purpose of this study, I will use everyday feminist theory to devise a theoretical framework to understand the everyday lives of Indian-Burmese women in the face of climate change, anti-Muslim sentiment and military rule.

In order to understand what “everyday” feminist theory is, I first need to define what “everyday” means. Rita Felski in her chapter ‘The Invention of Everyday Life’ in *Doing Time: Feminist Theory and Postmodern Culture* (2000), offers a definition of the everyday which is grounded on what she sees as its characteristic temporality (repetition), space (home) and modality (habit).

Gillian Rose, a British philosopher and writer, says, “For feminists, the everyday routines traced by women are never unimportant, because the seemingly banal and trivial events of the everyday are bound into the power structures which limit and confine women ... The everyday is the arena through which patriarchy is (re)created—and contested” (Rose, 1993).

According to Henri Lefebvre, a central scholar in the study of the everyday, and his colleague Christine Levich (1987), “the

everyday implies on the one hand cycles, nights and days, seasons and harvests, activity and rest, hunger and satisfaction, desire and its fulfillment, life and death, and it implies on the other hand the repetitive gestures of work and consumption. In modern life, the repetitive gestures tend to mask and to crush the cycles. The everyday imposes its monotony.”

The “everyday life” theory was a prominent part of academia, especially in the post-World War II era. However, until the 1990s, numerous feminist critics observed that everyday life theory generally excluded or undermined the perspectives and experiences of women (Langbauer 1992, 1999). In fact, it only contained the voices of men which were written by men. As Lorraine Sim (2015) notes everyday life theory was dominated by a focus on post-Second World War to contemporary culture. She found academic writings such as everyday life theory and critical histories to be extremely male-dominated. In 1987, Dorothy Smith in her book *The Everyday World as a Problematic* notes that women appear as objects in academic work and not active participants or creators of knowledge.

Smith (1987) strongly challenges the male intellectual hegemony prevalent in the academy, as Sim (2015) pointed out as well. Smith also significantly talks about the need to empower the positions of women in her book. She claims that sociology used to be written “from the standpoint of men located in the relations of ruling of our societies” (Smith, 1987). Smith explains that the actual reality and local practices in everyday life are internalized by such institutional or cultural ideologies that make some things invisible. These could be behaviors and choices people, especially women have. In order to break these barriers, Smith suggests a feminist inquiry of these practices as a kind of an entry point into the knowledge

of how everyday life is constituted. Furthermore, she also explains how the economy and the state authorities are inherently masculine and are dominated by males. This, thus, directly influences the lives of women.

## EVERYDAY CARE AND PEACEBUILDING IN MYANMAR

A study conducted on “Care and Silence in Women’s Everyday Peace Building in Myanmar” (Blomqvist et.al, 2021) explored how women experienced peace in Myanmar’s Kayah state. Their findings demonstrated that practices of care and silence were the key avenues of women’s everyday peacebuilding through which women were able to sustain peace, ensure survival, and minimize violence within their families and wider communities in their everyday lives. However, it was interesting to note that, on one hand, these practices were conditioned by and contributed to gendered insecurity and marginalization of women (Blomqvist et.al, 2021). The analysis suggests that women’s gendered positioning may also simultaneously enable their agency in peacebuilding and reinforce gendered inequality and marginalization simultaneously in a post-conflict society. For example, women practiced through paid or unpaid reproduction of family and/or care through household work. Care was used to minimize conflicts on both state and not-state levels when the Kayah state was in conflict. Women had to practice everyday care in order to maintain peace by cooking food for the enemy soldiers who would demand food from the loan women in villages as the men had fled. In this context, everyday care was used as a means of subjugation of the women. While on other instances, care was seen in the form of leadership through women rising up to the position of village heads and protecting their people in order to maintain peace (Blomqvist et.al, 2021).

Thus, it can be recognized that the everyday is a gendered space and it is necessary to render visible these nuances and ambiguities of everyday peace in order to gain a better understanding of how peace is manifested, experienced and sustained in everyday lives (Blomqvist et.al, 2021).

The study also found that women's practices of care and silence as everyday peace practices were often mundane practices that people simply do to make life work in the shadow of violence and insecurity. Ensuring survival and facilitating functioning everyday interactions was in itself highly significant for the women in conflict-affected contexts, which otherwise may not necessarily be found in broader or more secure and just societies (Blomqvist et.al, 2021).

## THEORETICAL FRAMEWORK

Feminist postcolonial and poststructuralist scholarship agree that security and peace-building frameworks such as that of the United Nations Security Council Resolution 1353 and subsequent Women Security and Peace (WPS) agenda are part of a liberal peacebuilding framework that is racialized, classist, patriarchal, heteronormative and Western-centric at its core (Martin, 2018).

It is also to be noted that there are certain power distributions involved in these frameworks. For example, who is creating knowledge? How is this knowledge being produced? What are the implications of the biases involved? And most importantly, are these frameworks effectively making the lives of the women vulnerable to conflict and climate change-related issues better?

As devised from the discussion in this paper until now, an alternate framework for understanding peace-building in climate change conflict is needed. The perquisites of a new framework lie in being post-coloni-

al, post-structuralist, and post-positivist in nature as much as possible. Furthermore, it requires an intersectional and transnational feminist lens. Employing such a feminist epistemological lens in order to explore climate governance, therefore, emphasizes the importance of closely considering the mundane, everyday spaces, and practices of climate governance and their effect on people's daily lives (Bee et, al. 2015).

Hence by combining Fleski's (2000) definition of the everyday understanding of the "everyday theory" provided by Bee (2015), Lefevbre (1987), Rose (1993), and Smith (1987) this theoretical framework will use the "everyday" as the site of knowledge production of how peace is maintained in the everyday lives through the notion of "care" (Blomqvist et.al, 2021) by Indian Burmese women living in Burma under Military Rule and Anti-Muslim Sentiment in the Face of Climate Change.

## CONCLUSION

Myanmar is a country that ranks 148 out of 189 nations in the gender inequality index for 2018 (UNFPA Myanmar, 2018). Since the 2021 coup, Myanmar has been seen as a textbook case of "the nexus between climate change, migration and political instability" (Thin Lei Win, 2022). The state oppression and conflict in Myanmar coupled with gender disparity makes the impacts of climate change on women further exacerbated at the intersection of gender with race, class, and ethnicity (International Red Cross, 2020; Smith et al., 2021). International development frameworks such as the WPS agenda are considered an instrument of a liberal approach (Martin, 2018) or neoliberal approach (Bee et.al, 2015). They operate on dichotomous principles ewing people of the Global South, especially the women in the Global South as weak and thus needed to be saved. The masculinist underpinnings of positivist science that frame the scientific

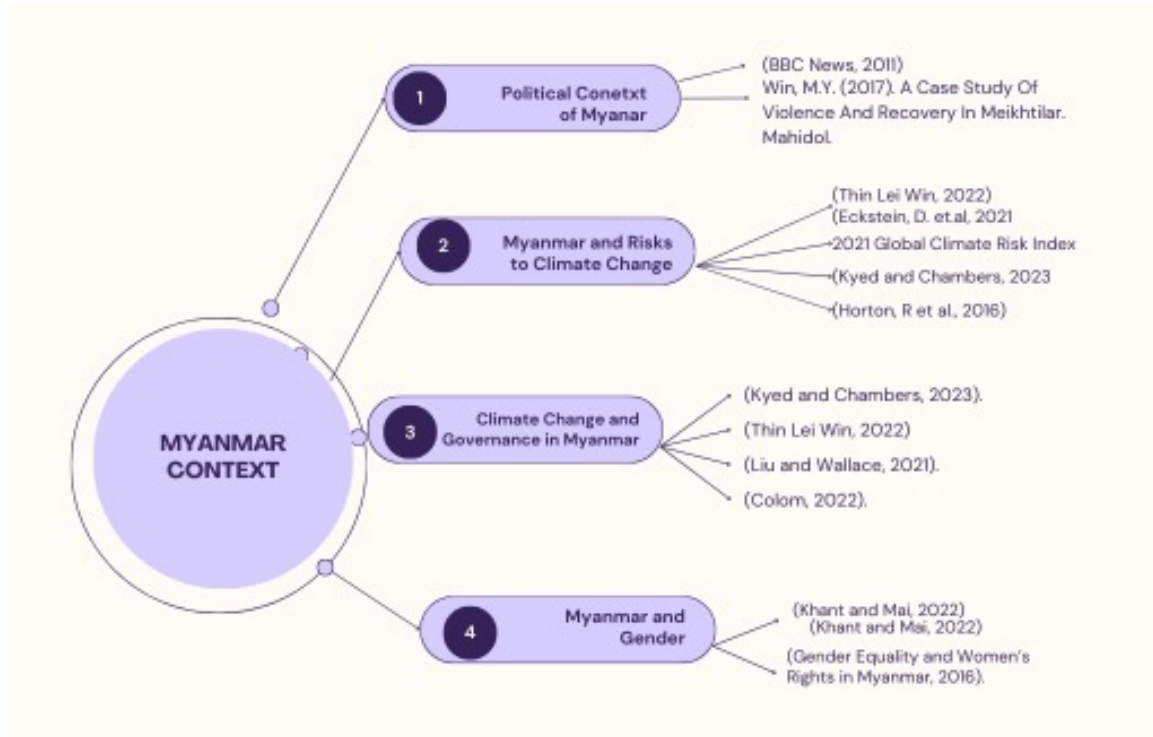


FIGURE 1: Literature Map on Myanmar Context

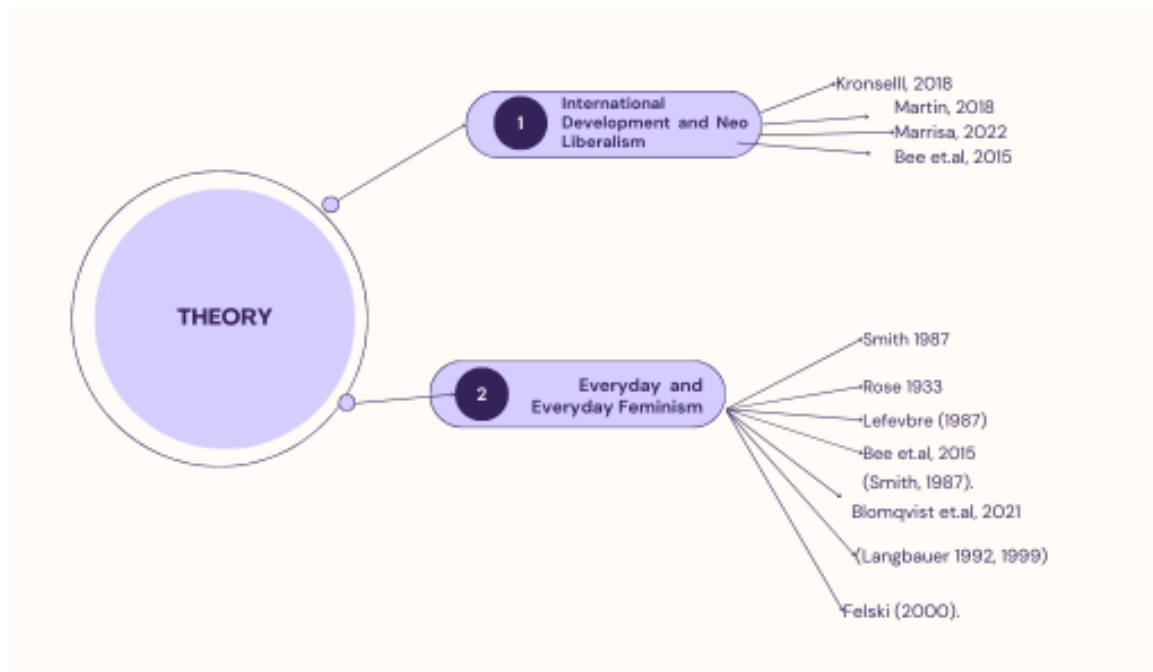


FIGURE 2: Literature Map Theory

knowledge around climate change also impact how we try to mitigate the impacts of climate change (Bee, et al, 2015).

The everyday lives of people, especially women, is a gendered space and it is necessary to understand everyday practices and peace in order to understand how peace is manifested, experienced and sustained on a larger scale (Blomqvist et.al, 2021).

Hence, this paper provides an alternate framework to understand peacebuilding in climate change in conflict is needed through a post-colonial, post-structuralist, post-positivist lens, intersectional, and transnational feminist lens that uses the “everyday” as the site of knowledge production of how peace is maintained in the everyday lives through the notion of “care” (Blomqvist et.al, 2021) by Indian Burmese women living in Burma Under Military Rule and Anti-Muslim Sentiment in the Face of Climate Change.

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# EXPLORING GENDER PERFORMATIVITY DURING POST-FLOOD REHABILITATION IN PAKISTAN: PERSPECTIVES OF RELIEF WORKERS

IMRA RAHIM HEMANI  
(hemaniimra31@gmail.com)  
Habib University

## ABSTRACT:

Floods pose various challenges to the affected communities in Pakistan, particularly during the late summer monsoon season each year, resulting in significant loss of life, extensive damage to infrastructure, and profound social, economic, and psychological distress in affected communities (Yaqub et al., 2015). However, it is essential to take into account that climate-induced disasters like floods may not impact all the genders, and their resilience, equally. This stems from their conflicting ability to react, prepare, and interact with the situations, based on the power dynamics and social roles assigned to different genders (Erman et al., 2021). Given the need to study the implications of flooding taking into account the gendered experiences and the lack of literature that engages with post-flood rehabilitation process through a gendered qualitative lens, this paper employs the theory of gender performativity by Judith Butler, which views gender as a performative act of “doing,” as a vital lens to look at the recovery period of the floods and the addition, elimination or alteration of gender roles that exist as a consequence of it (Butler, 1999). This research is based on the perspectives of total of 4 relief workers who were interviewed in a semi structured setting. The study indicates that gender is performative and dynamic, evidenced by shifts in traditional roles yet simultaneous reinforcement of gender norms due to the changes in the social settings post-flood. Enablers like displacements and survival instincts, as well as hindrances including communal norms and religion, play crucial roles in shaping, preserving, or altering these gender roles.

**Keywords:** Climate, gender roles, floods, performativity, relief workers

## INTRODUCTION

Floods are one of the most frequently occurring natural disasters in Pakistan and the consistent damage that it causes in the late summer season during the heavy monsoon rain each year is fatal with regards to the human lives that are lost, infrastructural destruction it causes and the social, economic and, mental stress that the affected communities go through (Yaqub et al., 2015). However, with different developmental and humanitarian initiatives coming into action, there are many flood risk measures that may focus on working for the preparedness, risk assessment and the recovery from the flood, which helps us become more disaster resilient as individuals as well as a community (Akbar et al., 2023). Nevertheless, it is essential to take into account that natural disasters like floods may not impact all the individuals similarly. As mentioned in Global Facility for Disaster Reduction and Recovery, gender inequality basically stems from the gender norms and expectations that are associated with men and women in the society. This impacts the power dynamics and the socioeconomic status of the genders and their capacity to prepare, react and recover from the disasters (Erman et al., 2021). Hazeleger (2013) and Drolet et al. (2015) also agree with the notion that men and women interact with disasters differently due to their particular roles in the society. For example, aspects like mobility, finances, decision making, education can play an important role in reacting to and recovering from disasters and these aspects may or may not differ for male and female in a society. Arora (2015) uses the phrase 'pre-existing social systems' as he blames the society for generating unequal exposure to risk for men and women. During my prior fieldwork experience in Karachi, I interviewed women about the potential changes in their lifestyles during displacements. In the course of these interviews, I discovered their anticipation of taking on traditionally

male roles, particularly in financially supporting their families. While much research focuses on gender roles and vulnerabilities during disasters, I believe it is equally crucial to explore the gender dynamics that emerge post-disaster when households are disrupted, communities are broken, and finances become uncertain. Using the concept of aforementioned social systems determining the gender roles, the theory of gender performativity by Judith Butler, which introduces gender as a fluid concept that is regulated by the societal norms, can be used as a vital lens to look at the recovery period of the floods and the addition, elimination or alteration of gender roles that exist as a consequence of it (Butler, 1999). Thus, this study aims to explore the post-flood rehabilitation of communities and individuals in Pakistan using the lens of gender performativity, from the perspectives of the relief workers. This includes analyzing altered, as well as unvaried, gender roles followed by their effects on the recovery process, and the factors that enable or hinder the alteration of these gender roles.

Therefore, this research seeks to answer the following questions:

1. How do gender roles change, or persist, during the recovery process post-flooding?
2. What are the effects of challenging the pre-existing gender roles during the recovery?
3. What enables, or holds back, the change of gender roles amidst post-flood rehabilitation?

## BACKGROUND

### *Existing Gender Norms in Pakistan*

In order to observe if gender norms change during the post flood recovery, it is important to have an overarching idea of the existing gender roles in Pakistan. Given the patriarchal structure of Pakistani society,

women tend to be mostly financially dependent on men and are not encouraged to pursue financial independence at the cost of their household chores and mothering duties (Sujan, 2016). This leads to financial decision-making being in the hands of their male counterparts.

Moreover, women are also more disadvantaged in terms of mobility because of their portrayal as the “honor” of the family and of men as their protectors (Adeel et al., 2016) which may give them more authority over the decision of ‘letting’ females leave their houses. Additionally, education is an important aspect when exploring the existing social norms. Women are not prioritized to be educated in relation to their brothers since boys will be able to contribute better to the family finances in future as opposed to girls who are taught cooking, washing and cleaning in order to ensure that they can be married off easily (Erman et al., 2021). These immutable ideological and material structures, along with other gender dynamics specific to different communities, shape particular gendered experiences for men and women in different contexts (Reyes & Lu, 2015), which in this case is post-flood recovery.

### *The Holistic Study of Recovery*

In often cases, disaster recovery may be seen as a quantifiable measure in terms of building back infrastructure, reconstructing houses, displacing the communities etc. However, very less emphasis is given to the personal and communal recovery of the individuals and the communities (Amramson et al., 2010). Hence, it is needed that recovery is studied with a comprehensive lens that includes a qualitative study of the narratives of the community which may include the shifts in the relationships of the survivors with themselves, their families, their belongings and the environment. As Akbar et al. (2023) term recovery as a ‘dynamic and complex process’ (p. 4), the au-

thors highlight the significance of looking at the subjective experiences of individuals and communities about adjustments, wellbeing, and future prospects rather than merely catering to recovery as a physical infrastructural process. Moreover, they add that physical, mental, and social wellbeing are some of different segments of a community and during recovery, each of it might pace at a different rate. This means that even if one aspect of the community like the physical one seems to be healed, other aspects such as social or mental might still be in the process of recovery and cannot be neglected.

### *Women’s Role Post-Disaster*

There is a vast and contrasting literature on the role of women post-disaster ranging from household duties, to labor work, to financial help etc. In a lot of cases, the husbands went out in search of new employment avenues while women were expected to assist with the agricultural work to support the financial recovery of the (Drolet et al., 2015). However, this did not excuse them of their household duties and thus, the workload for women was allegedly doubled or increased to some extent compared to men (Drolet et al., 2015 and Reyes & Lu, 2015). Some additional duties mentioned by Reyes & Lu are ‘looking and providing food for the family, keeping up hope for the family midst the disaster situation, taking care of the sick or injured members of the family, locating evacuation areas, and helping out in disaster risk response in the community’ (p. 4). The World Bank report (2020) also mentions how women after Hurricane Mitch helped in building temporary shelters, latrines, houses in addition to helping in government initiatives for recovery. Another instance where women defied the traditional gender norm was observed by Ali (2014) when women shared social gatherings with men while collecting relief funds and food, and staying with stranger men during refugee camps.

On the other hand, a lot of literature positions women at a more vulnerable position due to their traditional gender roles. Fothergill (1996) mentions how women felt anxious and conflicted during post disaster decision-making without their husbands. This may be due to the traditional norm that has not allowed women to practice decision-making independently. In the same book, he also adds that even during post disaster recovery period women were expected to complete the supportive tasks of childcare and food preparation whereas, husbands were in charge of the other things. From a religious point of view in Pakistan, women are bound to observe purdah and it was observed that even during the challenging and chaotic times of post-disaster, they were not allowed to make an exception and had to regardless wear the large chadars and cover their heads and body (Ali, 2014). Even when the sole responsibility of women was to be at home and take care of food, they were reported to be the ones skipping meals in case of food shortages in order to feed the men in the family (Erman et al., 2021). These traditional gender norms may also restrict women's mobility during or post disaster which hinders their ability to access support or medical help (Drolet et al., 2015). Moreover, due to the cultural stigmatization many women find it difficult to speak up about gender-based violence that takes place frequently during these disasters. Post Hanshin Awaji earthquake in Japan, women support groups were silenced about sexual violence cases due to the societal pressure (Erman et al., 2021).

### **Men's Role Post-Disaster**

Men's role in post-disaster recovery was largely based on two major themes. Firstly, they were continued to be seen the one in power and as the natural caregiver and breadwinner. The men also conformed to this understanding which led to the narrative that post-disaster, in this case post-Mitch, men "allowed" women to assist

them. This aided the men to sustain their authority as the dominant and responsible head (Bradshaw, 2016). However, this situation of not being able to solely help the family financially was of a lot of distress for men, even if they recognized the assistance of women (Bradshaw, 2016). They even felt that the financial aid offered to them post-disaster was a threat to their position as the breadwinner (Fothergill, 1996). These emotional and social struggles for men were a source of a lot of mental pressure for men to regain their lost self-worth, which also translated into negative coping mechanisms such as alcohol, depression, domestic violence etc. (Myrntinen, 2023).

### **Gender Performativity in Disaster's Context**

There is a lot of literature-based evidence on the discourse of whether gender performativity changed during post-disaster periods. In some cases there is a clear construction of the gender roles that the individuals who identify as women or men are supposed to conform to respectively, such as during post Mitch when women were to be confined to casa (home) and men to campo (fields) according to the defined gender rules (Bradshaw, 2016), and not "perform" differently. Another paper by Reyes and Lu mentions how there was not any differences in the expected roles of women during disaster or non-disaster situations. In each cases they were expected to take care of the house and the children (2015).

However, in some cases the difference in gender performativity could largely be seen. For example, in the similar case of Hurricane Mitch, there were instances where women were recognized for performing differently than they were traditionally expected to but only in cases which were ordinarily "men's work" (Bradshaw, 2016). This shows that even though gender performativity might alter at an individual level, it may still be looked at through tra-

ditional lenses communally. Another interesting contrast posed in the book “Men, Masculinities, and Disasters,” is of confining the post-disaster performances of men and women into traditional roles of men and women to use as a derogatory or complimentary remark. On one hand, men who couldn’t find employment were labelled as “and he is just ‘sat at home’ like a woman” and the women who worked beyond what is expected of their gender are remarked with “Roger noted they had to ‘work like men’” (Bradshaw, 2016, p.84). These intriguingly depict a complex relationship between personal gender performativity and traditional gender stereotypes. Moreover, the gender identities also potentially evolve or change meanings due to the altered socioeconomic conditions and many men and women are forced to cope up with the newer understanding of what being a men or women constitutes of (Myrntinen, 2023). This aligns with the lens of gender performativity which looks at gender as an alterable social construct.

### ***Do Altered Gender Roles Revert Back Post-Recovery?***

There is lesser yet interestingly conflicting literature available on this aspect. Bradshaw suggests that men started to gradually recognize women’s role in contributing to household financially and post-event they were able to change their gender relations in terms of being more accepting towards women working and contributing to the household (2016). However, on the other hand, Reyes and Lu (2015) add that their participants have mentioned of non-traditional responsibilities reverting back post-typhoon even though their homes were partially or completely destroyed. Some women also mentioned that men forgot their contributions to household a year after the event (Enarson & Chakrabarti, 2009).

## **RATIONALE**

### ***Analyzing the Impact of Gender Roles Post-Disaster***

Conforming to or defying the traditional gender roles post a natural disaster can have consequences that determine an individual’s or the communities’ social, economic, and mental wellbeing. Women who deal with lack of resources available for support due to their mobility or social pressure may delve into psychological impacts like social exclusion or family disruption. Similarly, for men to have no support available can lead to anxiety or depression that may lead to domestic abuse. These abusive treatments can further marginalize women (World Bank, 2020). However, on a positive side, these post-disaster recovery periods offer a chance to the community to transform their gender norms. In cases where women do start working and offering advice in decision making or men start helping in childcare or household duties may lead to a transformation in the community with a step towards lower gender inequality and avenues of women empowerment. There is evidence above that suggests that men recognized the contribution of women in household and begun accepting their position as partners in breadwinning, which can serve as a vital step towards introducing interventions for gender equality in the community.

Even though there is little research on community’s response towards changing gender role, there are not a lot of researches that dive deeper into the idea of family or community dynamics if an individual decides to perform gender differently. Questions like how their children respond to the shift of power in case the mother also starts contributing to household decisions? If it is a joint family, how supportive the in-laws are of women defying the traditional expectations of mobility, decision-making, *pardah* etc.? Are there stories of families breaking

apart because of altered gender roles? These questions intrigue me to gain more insights into this complex social arrangement post-disaster. Moreover, I also found little to no literature on how the gender performativity works in resilient communities, what gender roles do they define? Do they stick to their traditional roles and divide labor accordingly to avoid any conflict or do they empower each other by letting everyone perform gender the way one wants? Or do they reach a middle ground, what makes them more resilient? These are some of the important questions that I derived as a consequence of analyzing data I have gathered above. I aim to try to answer these in my research, or at least to set a ground for a further study focusing on these questions.

### **Gap in the Literature**

It could be observed in the literature as well as is pointed out by some authors that no theoretical study is available to understand the recovery process through a gendered lens. The above-mentioned literature had a comprehensive methodological diversity including quantitative methods, interviews, surveys etc. however, most of them were focused on deriving empirical facts and we require a theoretical perspective to understand the 'why's of all these differences in vulnerabilities, post disaster impacts, social structures etc. (Fothergill, 1996). It is also important to take into account very less data is available in terms of qualitative indicators of community wellbeing or social recovery of the communities (Hofmann, 2021). Moreover, a major gap in literature in my opinion, lies in the masculine perspective of gender roles alteration. There is limited to no less discussion on how men might feel vulnerable to post-disaster recovery processes due to their emotional distress or societal pressure of being a 'man'. I believe it is important to take into account both the genders as there might be a relationship between their exchange of roles and responsibilities post disaster, worth ex-

ploring. Therefore, my study will be focused on doing a qualitative analysis of the gendered experience in terms of gender performativity of both men and women during post-disaster recovery, from the perspective of relief workers, who have engaged with affected communities in post-disaster situations.

## **THEORETICAL FRAMEWORK**

According to Butler (1999), "gender proves to be performative—that is, constituting the identity it is purported to be." This means that gender isn't a natural concept as it is supposed to be rather it is a social construct that depends on the society one is living in and the gender norms one follows. Butler also argues that through our stylized actions, behaviors and expressions, we perform the gender. Since it is an act of "doing," it is open to alteration and change depending on the social conditions (Eriksen and Waitt, 2016). Thus, it can be argued that when the social arrangements change as a consequence to flood, there is a scope of altered gender identities or performances in the communities.

## **RESEARCH METHODOLOGY**

Given the nature of the research question, this study is a qualitative exploratory study. Fundamentally, the qualitative approach helps us in first dissecting the "how" and "what" in the research, and then only allows us to move on the "why" of it (Silverman, 2020). Hence, this paper is also similarly designed to first document the experiences of the individuals and the daily life instances where the relief workers have observed a change in gender roles, and then seeks to answer the "why" of it. Next, the exploratory nature complements the effort to fill the gap in the literature and to investigate thoroughly about a topic that has not been explored in-depth previously (Swedberg, 2020).

For this study, I have only focused on one natural disaster, i.e., flood because it is the most common natural disaster that causes the maximum loss of lives and destruction of communities each year in Pakistan. (Yaqub et al., 2015). Flooding itself becomes a natural disaster when the increased threat to climate change results in changed weather patterns and unusual increase in rainfalls. Additionally, although gender is a category with many configurations, given the complexities of the issues I have, for the scope of this study focused on only the gender binaries of male and female. Moreover, I have interviewed relief workers working in the field to ensure my research does not pose any major ethical risks and reliving of trauma for participants, and to get a comparative view of different post-flood recovery processes across Pakistan.

### **Sampling**

In this research, a non-probability purposive sampling approach was employed. The sample size included 4 health workers, affiliated with relevant organizations or working individually, who were actively involved in post-flood recovery efforts. All of these workers had mainly worked in Sindh, however, some of them have also had experiences of working at Baluchistan or Northern Pakistan. The inclusion criteria for participants required that they have practical experience in at least two post-flood recovery processes and possess a fundamental understanding of gender roles. The exclusion criteria pertain to individuals who are unable to communicate effectively in English or Urdu. A snowball recruitment technique was used and the recruitment plan included making a study letter for organizations or officials who were reached out through referrals. This was followed by calling or messaging the relevant person and explaining them the study letter over the phone or sending it to them. If they agreed to participate, consent form was sent and interview was scheduled.

### **Data Collection and Analysis**

Data for this research was primarily gathered through semi-structured interviews with the selected participants. The data collection period extended from mid-November to the first week of December. Each interview ranged in between 45 to 60 minutes. I interviewed the selected sample of participants for data collection process, and took notes and voice recordings to refer to them later. This was followed by transcription and re-taking notes. For analysis, MAXQDA and MS Word were used for coding using color codes and memos. A thematic approach was employed to code and analyze recurring themes in the data. To ensure data security and privacy, the collected data was secured at a password-protected secure drive on my laptop and will be deleted after one year.

### **Ethical Considerations**

Due to ethical considerations stemming from the primary trauma experienced by survivors, this research primarily involved discussions with relief workers. Written/recorded consent was sought from each participant (available in both Urdu and English), emphasizing the importance of confidentiality throughout the study. The interviews were conducted in English and Urdu, as per the exclusion criteria, so that there was minimum risk of misinterpretation in terms of recording the experiences as I am only fluent in these two languages. It's important to note that there were no monetary or other forms of compensation for participants. While no foreseen risks were associated with participation in this research, participants had the freedom to withdraw from the study at any point without facing any consequences. To uphold ethical values and behaviors, continuous oral consent was obtained at every stage of data collection and analysis, including activities such as voice recording. These comprehensive measures helped in ensuring that the research is conducted with the utmost ethical integrity.

## FINDINGS

The findings of the study were very diverse. Where some relief workers had numerous experiences and observations of a shift in gender roles, others indicated that most gender norms were followed regardless of the aftermaths of flood. These findings help us analyze if gender is a performative trait depending on the norms and the expectations of the society that may or may not have changed due the influence of a natural disaster.

### Varying Outlooks

In this regard, there were some recurring aspects in which the relief workers had contrasting views of variations in gender roles. These aspects have been discussed below.

### Household Chores:

*“phir tou mardon ne nadi ke pas jake kapre  
bhi dhoye”*

(then the males even washed clothes by  
the river)

All of the relief workers agreed on observing a shift in gender role in household duties. These included help in cooking, washing, and cleaning. Some of the workers mentioned a greater shift with majority men in the community indulging in household chores that previously only women used to do, such as kneading dough or cleaning the tents/houses, with little to no hesitation. While the others indicated that the extent of the shift was not as much in their respective areas, as in some men did help with household related jobs but in a smaller capacity such as chopping vegetables or setting the table while still leaving the rest of the job for their wives.

*“kuch gharon mei jabke mard bahar mazdoori  
ke liye nahin bhi jaraha hou, tab bhi ghar pe  
madad nahi karvata tha”*

(in some houses, even though the husband

wasn't going out for labor work, he  
wouldn't still help with household chores)

On the other hand, in cases where the extent of shift was not massive communally, the workers did mention that some families stuck to the traditional gender roles where females only were responsible for household chores. Even if the men lost their jobs and were sitting idle at home, they would still not help with chores considering that it was not their job.

### Mobility:

*“pehle ke muqable mei bohat azaadi mili  
aurton ko bahar nikalne ki”*

(comparatively, women were allowed to go  
out more often)

Relief workers quoted many instances of women getting the freedom of mobility due to destruction caused by the floods. This is because the venue to collect ration, river where utensils and clothes could be washed, medical camps etc. were cumulative for many villages/*mohallas* in the vicinity. Thus, the women were required to inevitably walk to these places which normalized the movement of women inter and intra-villages.

*“un khandanon ka yeh nazariya yeh tha ke  
aurat ek heera hai, uske pairon mei chain hee  
achi lagti hai”*

(those families were of the perception that  
a woman is a like a diamond, chains look  
suitable in their feet)

This dialogue was an interesting simile, which the relief workers elaborated as the concept of women being the *gairat* of their families and that if anything inappropriate happens with them, the families will lose all their honor. Hence, the mobility of the woman was restricted to avoid any such circumstances, particularly after the floods when the cases of rape and sexual violence

were at a rise. One of the relief workers also narrated a story where there was a family with 8+ women restricted to one room in a school during temporary displacements because they would not allow those women to go out. Some families, however, were adamant on the restricted movement of women because of their stringent perceptions of the role of man—the one who should go out and find means of providing or do the physical labor of bringing home ration.

#### Work/Provider:

*“aurton ne shehar jaaker courses karke  
nokriyan ki”*

(women completed courses after moving to the city and then did jobs)

Some relief workers who mentioned stories of displacements towards the city, indicated that women were more flexible about taking short courses of parlor, teaching or sewing to secure jobs to support their families. Most of the men were supportive of this change since these jobs helped them adjust comfortably at a new place. On the other hand, a few relief workers narrated stories of women in villages who willingly took up the labor work instead of the men in their houses. This included bringing in wood or rebuilding or helping in putting up tent cities. In numerous interviews, it was mentioned that some women did this because their husbands were injured or sick, and some did it to avoid putting their husbands and son(s) at the forefront where there was a risk of getting harmed.

*“yeh sab tou mard ka hee kaam samjha  
jata hai”*

(this is all understood be a man's work/responsibility)

Upon asking a few relief workers about the division of work or about the provider of the family, it was maintained that this was known to be the man's respon-

sibility to provide for the family and it remained the same. However, this was the case in villages where the traditional norms were held onto tightly. This was also partially due to the understanding that Islam has made man responsible for providing for the family and hence they strongly believed this should be the case even if there is a financial or social disruption like this one.

#### Childcare:

*“tent cities mai bachon ki daikh bhaal mei abu  
ka bhi bohat hath rehta tha”*

(in tent cities, fathers had a significant role to play in childcare)

A few relief workers mentioned the shift in the role of men, who were now actively taking care of children at home due to their increased time together. It was also noticed by one of the workers that men were more involved in the healthcare matters of the children in the tent cities. The shift showcased a broader reevaluation of familial role in families displaced to the cities as well, as men actively embraced caregiving responsibilities while women worked, that transcended conventional gender norms.

*“maayein pregnant bhi hon, tab bhi door door  
lage medical camps tak bachon ko lejana unka  
kaam tha”*

(even if mothers were pregnant, it was their job to take the children to far-away medical camps)

On the other side, many relief workers noticed no shift in the responsibility of females in a lot of *mohallas* as they were still understood to be the primary caregivers to the sick or injured children, as well as to ensure the general wellbeing of the children, even if now it meant leaving the quarters of their house to walk to medical camps. It was a recurring theme to notice that the workers mentioned that even if the mothers were pregnant they were still expected to

walk miles to take the children to medical camps or buy their medicines, as the husbands were busy rebuilding their houses/finding labor.

### Acquiring Funds:

*“ab tou jese wo paise lene k liye program  
hochuke hain”*

(it seems as if they are now programmed  
to take funds)

As per most relief workers, men were initially reluctant to take financial aid or funds because they felt it was a threat to their masculinity. However, with frequent floods every year, they made peace with the idea of taking funds. Interestingly, the relief workers mentioned, they now look forward to getting the funds annually post-floods. There was a very evident shift in the idea of masculinity and its interaction with the stereotype around it in terms of taking funds in many communities.

*“kuch gharon mei bache teen din se bhooke  
thay, lekin admiyon ne humse paise lene se  
inkaar kardiya”*

(some households had hungry children  
for three days, but the men refused to take  
money from us)

Even though all the relief workers mentioned how the act of taking funds was gradually normalized and at times also exploited, a few of them also narrated stories of exception. They presented a few cases where the men were ignorant of their family's condition and continued to present themselves as stable. One of the workers shared that some women came up to them and requested to counsel their husbands to take the aid because the children are suffering. Upon inquiring, the men of those families said *“yeh aurtein dhindhora peet rahein hain aese he, sab theek hai yahan humme kisi cheez ki zarurat nahin hai”* (these women are making a fuss, everything is fine here, we

don't need anything). This showed their extreme reluctance to abide by the traditional gendered expectations, and not take funds.

### Persistent Outlooks

There were some aspects about which there was a persistent outlook and similar observations of all the relief workers. These aspects, that largely depict unchanged gender performance, have been discussed below.

### The Silent Struggle:

*“mard sehleta hai bolta kahan hai”*

(it seems as if they are now programmed  
to take funds)

It was frequently mentioned in the interviews that aftermaths of the flood such as displacements, children's suffering, lack of food and finances, and the overall helpless situation for the men to provide for their families, led to a toll on their mental and emotional health. It was due to the societal expectation from the males to be the one responsible for providing, and the emergence of a question mark on their masculinity if they could not. The workers observed behavioral differences such as men being angry more often, either the fights amongst husbands and wives increased or it showed a rise amongst the community members like neighbors or relatives. Most men seemed to lose their patience very quickly. There were also instances of sexual violence and marital rapes reported to a few workers, which they deduced was due to the need that the husbands felt to show their power and dominance over their partners. Additionally, it was a common observation of all the relief workers that the men did not explicitly express their distress or grief, rather channelized it through these behavioral shifts.

### Rushed Nikkahs:

*“apni beti unke ghar deke uski zimedaari bhi  
unhe dedete thay”*

(they used to give away their daughters, along with her responsibilities)

Visualizing the social conditions post-flood, women, particularly the daughters living in the tent cities around other *na-mehram* men, were more open to the risk of harassment, and most importantly acting as an added burden on the family's scarce resources. The workers presented us with a crucial finding during the recovery period where there were cases of families prioritizing that they marry off their daughters as soon as possible so that their honor and expenses were not the parents' responsibility anymore. The rationale for this was rooted in the society's norm to transfer the responsibility of the daughter, while she is still pure, to their husbands as a means to safeguard her honor and reduce the burden off her parents, particularly during a desperate time like this.

### The Gender in Healthcare:

*“chahe kuch bhi hojaye, agar doctor mard hai  
tou aurtein nahi jasktein thein”*

(no matter what happens, if the doctor is a man the women couldn't go)

A prevalent observation of all the relief workers was that women were not allowed to access healthcare or get themselves checked at the medical camps if the staff or the doctors were male. No matter how serious the situation got, most families preferred letting the local lady health worker take decisions but did not allow their wives, daughters, or sisters to access the male medical professionals on ground. This was in line with the religious and cultural norm of not letting the females get in contact with *gair-mard*, a stranger man.

### Consequences of Challenging the Pre-Existing Gender Norms

While there were a lot of accounts of how traditional gender roles shifted and many norms set by the society were challenged, there were numerous positive and negative consequences that accompanied this change. Firstly, as mentioned above, there was a rise in the cases of rapes and sexual violence accounting for the frustration of men due to the change of roles and power dynamics. Secondly, the men seemed to become more dependent on the funds, aids, and women's added contribution to provide for the house while they also manage household and childcare duties. This led the men to completely give up on their contribution to the household duties or finances and to become entirely ineffective. These implications were also fueled by the community's judgement of the morale of the families that chose to alter the gender roles. Many neighbors and elders were of the view that these changes led to the elimination of *gairat* (dignity) from the families because of the freedom that women got or the roles that male played at the home.

Nevertheless, there were also positive effects of the altered gender roles which majorly included a rise in parent's desire to educate their children, particularly daughters. This was due to the difficult realization that there were little to no female doctors available in the villages when they needed. There were not enough lawyers, activists, engineers to help rebuild their areas and communities with ease. Thus, many families showed an interest to educate their children. Moreover, these shifts were an opportunity for women empowerment in these communities. The way women were gradually allowed mobility, education, employment and help in household duties was an important step in igniting a change for a better future for them. Lastly, the sharing of responsibilities and difficulties together led to an increase in affection and love in many

families. The displaced families held each other up, the spouses shared their roles and responsibilities, the children supported their parents and hence, families got stronger due to their shared experience of pain and sufferings.

## DISCUSSION

Drawing back these findings to the lens of Gender Performativity, it can be seen that the concept of being of a particular gender was indeed dependent on the social circumstances that either prevailed or changed post-flood. Many families and individuals chose to perform against their traditionally defined gender roles, while many strived to keep “doing their gender” in order to preserve the cultural norms and expectations set from their gender. However it can be said that there were various factors that contributed to the action of changing an individual or family’s gendered performance or held back families from defying the standard gender roles.

Following are some of the factors that enabled the change of gender roles, and allowed the individuals and communities to perform differently than how they are expected to:

- Displacements due to the flood played a major role in changing the social settings of the families or individuals involved. This means that they were now living amidst a different set of gendered expectations and roles. This enabled them to shift according to the new norms and settings such as the concept of working women in the cities.
- The influence of the relief workers was also a pivotal factor in enabling this change. Many relief workers mentioned accounts of them counselling the elders or the head of the households to allow women and daughter of mobility to

avail healthcare facilities, or to take the financial help offered. They also, at times, spent time with the community to have conversations with the individuals about the influence that various social stigmas have on the families.

- The imperative of survival led them to change. They had to take certain decisions like women doing physical labor or men being the primary caregivers due to the urgent need of the time. In cases where men were injured, it was survival instinct of women to take up the responsibility, similarly it was for the survival of the children and spouses that men accepted monetary help, keeping aside the expectations set from their gender.
- The affection amongst the families or the realization of each other’s presence made families shift the gender roles to a much easier equation where the males and the females took up roles associated with each other in order to assist the counterpart in the difficult time post a natural disaster.
- Finally, the most interesting yet complex outlook that helped the communities alter gender roles was to support other gender roles. For example, the reason some women risked themselves at the forefront doing the physical labor, instead of their husband’s was due to the role he plays in providing for the family and that his loss will be a greater loss for the community than his wife’s. Similarly, a lot of husbands allowed mobility to the women in their houses so that they can take their children to the medical camps that were far away and hence, the man did not have to do the “female’s job of childcare.”

While there were many factors that contributed to enabling the change in also

gender performance, some of the factors also held back these changes:

- The reinforcement of the community's norm was an essential aspect that held back many families and individuals from changing their traditional gender roles post-flood. The ones who were temporarily displaced were also more conscious of the social norms prevailing in their communities since they knew they had to go back to the same social environment.
- The concept of dignity, which was also based on the society's expectation from certain genders, was also a crucial reason why individuals chose their social capital over embracing the change of gender roles. This enabled them to keep their image as an individual who did their gender as it is supposed be.
- Finally, religion and its interpretation also navigated a lot of decisions related to the expectations and responsibilities of a certain gender. This was one of the strongest factors that held back families and communities to alter the gender roles that they believe are set by their religion.

These numerous factors that held back or enabled the change of gender roles depict the existence of the fluidity that Butler engages with in his theory of gender performativity (Butler, 1999). The concept of having different roles as a man or a woman pre and post flood is a representation of how gender is a state of being and is dependent on the social expectations set for each gender. It also shows how one similar event, in this case the floods, influenced gender in numerous different ways and influenced it, for each individual or family involved, differently.

## LIMITATIONS

The study was conducted within two months due to which it faced a significant constraint in terms of time. Moreover, there is a potential to geographically limit this research to different areas in Pakistan for more specific findings. Beyond this research report, there is an opportunity to explore alternative avenues for sharing the research findings in a format accessible to a non-academic audience. Finally, this research is based on the perspectives of the relief workers, therefore, the inclusion of survivors' experiences may contribute more depth and nuance to the research findings.

## CONCLUSION

This exploratory study was based on the analysis of the gender roles during post-flood rehabilitation in Pakistan, with the standpoint of Judith Butler's theory of gender performativity. It aimed at filling the gap in literature that required the recovery process to be studied through a gendered lens, and to understand the consequences of diverse gender dynamics post-flood on the communities as well as individuals. It also largely supported the findings made through the literature about changes in common gender roles like mobility and household chores, while still maintaining the varying experiences of individuals based on their social settings, and also verifying the situation of reverting back to traditional gender roles or normalizing new gender roles post-rehabilitation.

The study suggested that gender revealed itself to be a concept that is performative and a state of "being." While some relief workers noticed significant shifts like men taking up household duties or women taking up labor work, some narrated stories of traditional concept of being of a particular gender being reinforced such as provider roles or restricted mobility of females. The

study also discussed the enablers and hindrances in this process such as communal norms, displacements, survival instinct, religion etc.

This study gives us the opportunity to tailor the rehabilitation process in a better suited way in order to accommodate these cultural and religious factors that influence the interaction of recovery with certain genders. It also paves a path for analyzing which shifts heed positive consequences and thus, as a relief worker, which customized interventions can help the community rehabilitate better. Finally, this study also opens up the platform for intersectional research that caters to more factors in play such as age, background, level of education etc. with gender and post-flood rehabilitation for a more nuanced understanding of this subject.

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## APPENDIX

### *Informed Consent (English)*

I am Imra Rahim Hemani, an undergraduate student of Social Development and Policy at Habib University. I am conducting this interview with regards to a research for my capstone on the topic “Exploring Gender Performativity during Post-Flood Rehabilitation in Pakistan.” The primary objectives of this research are to investigate the construction and performance of gender roles within the context of post-flood rehabilitation in Pakistan, employing Butler’s theory of gender performativity. This study aims to analyze how gender performativity influences and is influenced by post-flood reha-

bilitation efforts, while also examining the impact of altered gender norms and expectations, and finally explores what enables or holds back the changing of gender roles during post-flood rehabilitation.

Thank you for taking out the time for this interview.

### Benefits:

We would like to inform you that your participation in this exploratory study exploring gender dynamics in flood-affected communities in Pakistan can have valuable implications for various stakeholders. Firstly, it will contribute to a better understanding of the gender roles and dynamics within these communities. This valuable knowledge can benefit organizations and individuals working towards post-disasters community development by enabling them to tailor their strategies more effectively. Additionally, this study sheds light on how communities can enhance their resilience to future disasters by examining decision-making processes and gender roles. Overall, your participation in this exploratory study may lay the groundwork for informed policy development, community empowerment, women’s empowerment, and more effective disaster management strategies.

This consent form is necessary for us to ensure that you understand the purpose of your involvement and that you agree to the conditions of your participation. Would you therefore read and sign this form to certify that you approve the following:

- This interview will be approximately 60 minutes long.

### **Confidentiality:**

- All the data collected will remain safe with me for analysis and will be discarded one year after the research has been completed.

- This interview will be voice recorded. Please check if you agree:  
\* I consent to be recorded.

**Risks and Discomfort:**

- There are no potential risks associated with your participation, apart from any discomfort while discussing the topic. You have the right to stop me during the interview at any point, if needed.

**Withdrawal:**

- There won't be any consequences of your withdrawal from this study. You can withdraw your consent within 2 days of the interview. Please contact me in case of withdrawal.

**Voluntary Participation:**

- The participation in this interview is voluntary and there will be no monetary compensation for your contribution.

I have read all the given instructions carefully and I consent to give this interview that shall be recorded.

Participant's Name:

Participant's Signature:

Researcher's Signature:

For follow-ups, feel free to contact me:

**Imra Rahim Hemani**

ih06934@st.habib.edu.pk

For concerns and questions, feel free to contact the course lead:

**Dr. Shama Dossa**

shama.dossa@ahss.habib.edu.pk

**Informed Consent (Urdu)**

Mera naam Imra Rahim Hemani hai. Mein Habib university mein Social Development and Policy ki final Year student hun. Mein ap ko interview apne final year project ke liye karna chahti hun jo ke "sailab ki wajah se badalte mashrati halaton ka asar sinf or

uspe mustamil mashrati kirdaar" ke uper hai. Is research ka bunyadi maqsad ye janna hai ke kya sinf ke bais ap par aid ki gayi mashrati zimdariyon mein selab ki wajha se koi tabdeeli aati hai ya nahi? Agr han, tou us ka ap ki roz mara ki zindagi par kya asar hota hai? Or wo kya aese awamil hain jo ke in badalti sinfi zimdariyon par masabat asar dalte hain ya inhe badalte hain?

Ap ke waqat ka bohut shukriya.

**Fawaaid:**

Mein ap ko is baat se agha karna chahti hun ke ap ki is research mein hisa lene ke liye razamandi kayi idaron or logon ko faida pohncha sakti hai. Ap se hasil ki gayi malomat mutaliqa logon aur idaron ko behtar hikmat-e-amli bananay mein madad desakti hai jo selab se mutasir logon ko behtar zindagiyan farham karte hain. Majmoi tor pe, ap ki shirkat is research mein hamein behtar policies ki bunyad rakhne mein madad karegi jo ke communities aur khas kar ke auron ko baikhtiyar banana or kudrati aafat se nimatne ke liye behtar hikamt-e-amli injam dene mein hamae madad degi.

Ye form mere liye is baat ko yaqini banane ke liye zaroori hai ke ap is research mein apni shirkat ke maqsad ko samajhte hain or apni shirkat ki sharayit se itfaq karte hain. Kya ap is form ko parhke phir akhir mein apni dastakhat kar sakte hain take is baat ki tasdeeq ki jasake ke ap mandarjazel ki manzori dete hain:

- Ye interview/guftago andazan 60 minute ki hogi.

**Razdari:**

- Jamaa kardah tamaam maloomat tajzia ke laye mere pass mahfooz raheen gay aur tahqeeq mukamal hone ke aik saal baad delete kar diye jayen ge.
- Ye interview/ap ki baton ko record

kia jaye ga. Bara-e-meharbani  
mandarjazel khano ko tick karein  
agr ap mutafiq hain tou:

- \* Main apni baton/apni awaz  
ko record karwane ke laye  
razamand hun.

#### **Khatrat aur Taklif:**

- Ap ki shirkat se wabista koi  
mumkinah khatra/khatrat nahin  
hain, is ke ilawa kea agr ap uper  
bataye gaye mouzo par baat karne  
mein koi hichkhichat rakhte hain.  
Agr han, tou ap ko pura haq hai ke  
interview ke duran ap kabhi bhi  
mujhe rok sakte hain ya kisi sawal  
ka jawab dene guraiz bhi karsakte  
hain.

#### **Mustafi Hona:**

- Is research se ap ke mustafi hone ke  
koi nataij nahi hain. Ap interview ke  
do/2 din ke andar apni razamandi  
wapis le sakte hain. Razamandi  
wapis lene ke liye ap mujhse rabta  
karein ge.

#### **Razakarana Shirkat:**

- Is interview mein ap ki shirkat  
razakarana hai and ap ke tawan ke  
badle ap koi mali faida nahi diya  
jaskega.

Mein ne de gayi tamam maloomat  
ko ahtiyat se parha hai aur mein inter-  
view dene par razamand hun jo ke record  
kiya jayega.

Sharka ka Naam:

Sharka ki Dastakhat:

Researcher ki Dastakhat:

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Mazeed kisi sawal ke liye, mujhe se rabta  
karein:

**Imra Rahim Hemani**  
ih06934@st.habib.edu.pk

Khadshat ya sawalat ki surat mein, is re-  
search ki sarbara se rabta karein:

**Dr. Shama Dossa**  
shama.dossa@ahss.habib.edu.pk

#### **Study Letter**

I am Imra Rahim Hemani, an undergradu-  
ate student of Social Development and Poli-  
cy at Habib University. I am conducting this  
interview with regards to a research for my  
capstone on the topic “Exploring Gender  
Performativity during Post-Flood Rehabil-  
itation in Pakistan: Perspectives of Relief  
Workers.”

#### **Objectives/Purpose:**

The primary objective of my research firstly  
is to delve into the construction and per-  
formance of gender roles within the con-  
text of post-flood rehabilitation in Pakistan,  
utilizing Judith Butler’s theory of gender  
performativity as a guiding framework.  
Through this exploration, I aim to under-  
stand how gender roles are shaped and en-  
acted in the aftermath of floods. Secondly, I  
aim to investigate the reciprocal influence of  
gender performativity on post-flood reha-  
bilitation efforts, probing how it both affects  
and is affected by these recovery processes  
in Pakistan. In accordance with these objec-  
tives, my research questions seek to illumi-  
nate the implications of post-flood recovery  
on the construction of gender roles, the im-  
plications of adhering to traditional gender  
norms during recovery, the outcomes and  
effects of challenging these norms, and the  
role of gender roles in enhancing communi-  
ty resilience in the post-flood context.

#### **Participation in the Study:**

I need to interview relief workers who have  
worked in the domain of post flood reha-  
bilitation in Pakistan with the communities  
and can meet me in person or online for  
an interview. Participation in this study is  
voluntary, and will only take place after an  
informed consent is signed/given.

**Inclusion Criteria:** The relief work-  
ers should have worked with at least two  
communities for post-flood rehabilitation  
on ground. They should be able to either

converse in Urdu or English. Lastly, it is preferable if the relief worker has undergone any sort of gender training, however, not necessary.

The time, date and mode of the interview can be decided as per the interviewee's convenience.

Thank you for taking out the time to read this study letter, looking forward to hearing from you soon.

### Questions

Jesa ke apko maloom hai jins aur sinf do mukhtalif cheezain hain jahan jins apko padaish se dediya jata hai wahan sinf apke masher per mushtamil kirdaron se banta hai. Iss interview ka maqsad yeh janna hai ke jab sailab k bais mashrati halaat tabdeel hojate hain tou kiya yeh sinfi kirdaar bhi tabdeel hojate hain or iske kiya nataij hain.

1. Yeh mashrati kirdaar sailab ki wajah se kese badalte hain?
  - Kiya koi aesi kahaniyan bata sakte hain jinme apne yeh tabdeeliyan dekhi hon?
  - Apne istarha ke kaunse qisse sunne hain ya dekhe hain jahan mardon ne auraton wale kaam kiye hon ya auraton ne mardon wale?
  - Kiya ap inke muqable mei purine mashrati kirdaaron ko humme samjha sakte hain?
2. Kiya sailab k baad aurat ya mard hone se kisi jins ko faida ya nuksaan houta hai or kese?
  - Apke nazariye mei kin wajoochat ya rawaiyaat ki bunyad pe masher mei yeh farq mehsoos kiya jata hai?
3. Logon ko mashrati halaat tabdeel karne k basi kiya faide ya nuksanaat hue?
  - Jinhe nuksanaat hue unhone kese in surate haal ka saamna kiya?

- Jinhe faide hue kiya unhone apne badale hue rawaiye barqadar rakhe?
- Kiya kisi ek sinf ko inn badalao se zyada madad hue?

4. Aas pass ke gaon walon or parosiyon ne yeh mashrati kiradon ko badalne wale logon k sath kesa sulooq rakha?
  - Parosiyon or gaaon wala ka inn khandanon per kitna asar tha?
  - Inn gaaon walon ne agar munfi rawaiya dikhaya tou uski kiya wajoochat nazar atein thein?
5. Aapke nazariye mei aur kaunsi cheezon ne mashrati kirdaaron ke badalne mei madad ki?
  - Kiya sailab ka asar khatam houte hee kirdar phirse badal gaye?
  - Agar han, tou apke khayal mei aesa kyu hua?
  - Agar nahin, tou kaunse badle hue kirdaar sabse zyada asar andaaz rahe?
  - Inn kirdaron ka khandon or logon ki zindiyon pe baad mei kiya asar raha?

### Timeline

DATES	TASK
1–12 November	Recruiting participants
12 November–6 December	Interviews with participants
6 December onwards	Begin data analysis
10–13 December	Compilation and writing the final paper
13–15 December	Review + final changes (if needed) and submission



# EXPLORING GENDERED EXPERIENCES OF URBAN FLOODING IN KARACHI'S INFORMAL SETTLEMENTS: A QUALITATIVE STUDY

INSHA HASHMANI  
(hashmaniinsha@gmail.com)  
Habib University

## ABSTRACT:

This study investigates the intersection of gender and urban flooding in Karachi's informal settlements. With climate change intensifying weather events, vulnerable populations are disproportionately affected. This research explores how gender identities shape experiences and coping mechanisms during urban floods, focusing on women, men, and transwomen in Gujjar Nala, Orangi Town, and Lyari. Through in-depth interviews with 23 residents, the study reveals distinct gender-specific challenges. Women face limited access to washrooms, heightened health risks, and dual responsibilities of household management and childcare. Transwomen encounter unique economic vulnerabilities, often resorting to begging during floods. Men, while less directly affected, bear the burden of sustaining families under harsh conditions. The findings underscore the necessity for inclusive disaster management policies that address the diverse needs of different gender groups, highlighting the urgent need to tackle infrastructural shortcomings and social inequalities exacerbated by climate change.

**Keywords:** Gendered experiences, urban flooding, disaster management, informal settlements

## INTRODUCTION

The study project dives into the complex intersection of gender and urban flooding in Karachi, Pakistan's informal settlements. As climate change causes more frequent and severe weather events, vulnerable populations living in informal settlements are disproportionately affected, emphasizing the importance of comprehending how gender identities shape individuals' experiences and coping mechanisms during such disasters.

Pakistan has seen a succession of severe floods throughout the years due to its geographical vulnerability to climate-related disasters. The country's largest metropolis, Karachi, is no exception to this trend. Rapid urbanization, poor planning, and inadequate infrastructure have worsened the effects of urban floods in the city's informal communities. The goal of this study is to explore the gender-specific obstacles and coping techniques that arise in this environment, putting light on the frequently neglected and different ways in which women, men, and transwomen experience and respond to urban floods.

## LITERATURE REVIEW

Pakistan is one of the most climate-sensitive nations in the world as a result of its geographic position, making it particularly prone to being affected by climate catastrophes more frequently than other areas (Sawas et al., 2020). Additionally, Pakistan has constantly been rated highly in the long-term risk index according to the Global Climate Risk Index GermanWatch (Anjum et al., 2021); underscoring the seriousness of the problem. However, the mega floods of 2010 and 2022 in Sindh, Punjab, and Northern Pakistan, as well as heat islands within the urban centers were a manifestation that Climate change is not just a threat but a dire reality that Pakistan is suffering from. It poses severe consequences includ-

ing internally displacing millions of people, causing food insecurity in the country, and aggravating physical and mental health issues of the victims (ibid).

With an unprecedented increase of floods in Pakistan in the past 20 years (1990–2010), it has been hit by Fifty-four floods of diverse intensity (Kreft et al., 2015; Rehman et al., 2015; Sardar et al., 2016). According to one scholar, these floods caused losses of 8,887 human lives and an indirect economic impact of \$19 billion (A. Ali et al., 2022). However, these are the visible, quantifiable, and reported losses known, but the intangible economic losses are still unknown. In retrospect, the glacier outburst in the Upper Indus Basin, urban flooding in Karachi and Hyderabad, heavy rains and runoffs in Baluchistan, flash floods in southern Punjab, and extraordinary rainfall in central Sindh were just a few of the climatic catastrophes that occurred in 2022, that caused the loss of 750,000 animals, three million acres of crops were ruined, and a startling third of the country's surface underwater. Thousands of roads and bridges gone, and about 24,000 schools suffered damage. According to estimates, the 2022 floods damaged the economy by more than \$30 billion due to the destruction of infrastructure, crops, and food production (Bhutta et al., 2022).

Similarly, Pakistan's largest metropolis, Karachi has been rapidly urbanizing, inevitably leaving several environmental, social, and economic impacts on the city. Due to poor planning and not being able to timely adjust to the needs of the rising population have resulted in unplanned constructions on the natural drainage radically transforming the landuse and landcover (LULC) of the previous drainage pattern of Karachi (Zafar et al., 2016; Sajjad et al., 2009).

As the majority of the streams got blocked, people living in the informal settlements faced flash flooding in the city after heavy rainfall each year due to the infrastructural shortcomings in the settlements. These infrastructural shortcomings are also referred to as infrastructural violence in the city, referring to systematic disregard and unequal distribution of basic amenities like power, water, and sewage that disproportionately harm marginalized populations. Social and economic inequalities are bred by inadequate infrastructure, which feeds the cycle of poverty and instability (Sawas et al., 2019).

Lack of access to needs like food and water causes social tensions to rise and growth to be hampered. It mirrors larger problems with government and urban planning, where disadvantaged groups suffer the most from structural flaws that compound socioeconomic imbalances and promote instability and injustice. In other words, these infrastructural failures are in fact infrastructural violence strategically carried out by the state or state led corporations to prevent and hinder the growth of certain segments of the population in the society to evolve (Ibid) by ensuring unfair state institution deepen and reinforce urban inequalities. By not providing access to basic services evenly across the urban area, “inequalities are spatially produced and reproduced” and the marginalized citizens residing in these areas confront various forms of infrastructural violence when exclusion is materialized (ibid).

Another manifestation of infrastructural violence faced by Karachi is weather alteration of the city which has given emergence to the Urban Heat Islands (UHIs are areas with elevated air temperatures within the urban center) because of growing concrete surfaces, shrinking green space, and industrial pollutants in the city (Hasan et al., 2017). Additionally, another aspect of

climate change is that those who are most marginalized and live in low-income regions are also the most exposed to and sensitive to its negative impacts (Kaijser et al., 2013), making it harder for them to deal with the climate catastrophe than it is for those in the medium to upper strata of society. The magnitude of this issue can be highlighted by the fact that more than 1,300 people lost their lives in a heatwave in Karachi in 2015 alone and most of those who suffered from heatstroke belonged to low-income households mostly residing in the informal settlements of the city (Hasan et al., 2017).

Due to the enormity of climate catastrophes, several research studies have demonstrated the emotional torment that victims experience in their daily lives including increased stress, anxiety, panic and persistent feelings of hopelessness and PTSD in both sexes, but in women higher than men (Fatima et al., 2017; Anjum et al., 2021; Aslam et al., 2016; Memon, 2020). A recent paper examines the ways in which Sexual and Gender-Based Violence (SGBV) against women has gotten worse as a result of climate change, posing a fresh legal problem for international law. It explores the complex relationships between environmental conditions and the occurrence of SGBV, emphasizing how vulnerable women are in areas hit by climatically linked calamities. According to the report, climate change-related disruptions like resource shortages and relocation can exacerbate already-existing gender disparities, rendering women more vulnerable to violence (Desai, 2022).

Another paper using feminist ethnographic inquiry as the research methodology explored how the relationship with the water is gendered in the informal settlements of Bangladesh, Farhana Sultana and their team (2013), found women to be the major administrators of water in the house, hence

the absence of safe water had a substantial impact on their labor, time, and livelihoods. This consequently creates important gendered variations in experiences with water, and furthermore illustrates the intersections between gender and class and demonstrates how, despite the fact that patriarchal standards have an impact on women of all socioeconomic classes, where richer women were not as impacted by water shortage or as concerned about it as poorer women—because water could be bought and handled by their servants with the money and privilege they have.

Digging further into the intersectional analysis of human society and comprehending how various people and groups react to climate change differently as an outcome of how they are situated within hierarchical power structures built on dynamic, context-specific social classifications, Kaijser and her team (2013) used an intersectional approach developed within the critical feminist theory to shed light upon the vulnerabilities people face. These classification of power structures include but are not limited to their gender, socio-economic status, ethnicity, nationality, health, sexual orientation, age, and place—claiming that these factors are crucial in determining how responsible, vulnerable, and how much power one has in the face of any climate change catastrophe. Additionally, they also emphasized how society and even academics reduce gender to cis men and cis women—disregarding and often marginalizing the existence of other groups, which most of the time face the jarring impact of climate change. Researchers also stressed how reducing the genders to binary, women are often depicted as disadvantaged and vulnerable victims. While this might be true in some cases, however, in doing so, there is always risk in reinforcing these categorizations because it is forgotten that these differences are socially created, context-specific, and subject to change because of climate

change. Hence, for intersectional research, it is prime to comprehend what are the context-specific social categorizations they are part and part of—in order to get a holistic view of reality.

## RESEARCH METHODOLOGY

For this research, in-depth interviews were conducted in three localities of Karachi including Gujjar Nala, Orangi town, and Lyari, with 23 people—including 16 women, three men and four transwomen to explore the real-life stories of urban flooding in the informal settlements of Karachi and to see understand how it impacted genders differently. The objective of this research was not to see which gender it affected the most but rather to gain a comprehensive understanding of how gender identities influence coping strategies, vulnerabilities, and access to resources during flooding events. Therefore, in-depth interviews were employed as the primary data collection method, allowing for a nuanced exploration of participants' perspectives, experiences, and insights related to the research topic. However, the study's focus on three informal settlements means the findings may not be generalizable to other regions, and the relatively small sample size may limit the breadth of perspectives represented.

### *Data Collection and Analysis*

Conducted face-to-face interviews at participants' preferred locations within the settlements. Utilized audio recording with participant permission and took detailed field notes during the interviews.

Transcribed the interviews in a Word document and used QDA minor lite to employ thematic analysis to identify patterns, themes, and subthemes by using coding techniques to categorize data related to gendered experiences of urban flooding.

## RESULTS AND DISCUSSION

### *Geography of the Settlements*

Gujjar Nala, Orangi Town, and Lyari, the three informal communities that were the subject of this study, are dispersed among three different administrative jurisdictions within Karachi. As a result, each of these areas faces a variety of comparable yet unique issues related to poor infrastructure that have been made worse by the unusually severe rainfall episodes the city has seen. Lyari River and Malir River are connected via the strategically placed towns of Gujjar Nala and Orangi Nala, which are situated close to the respective waterbodies with those names. These water bodies known as *Naala* in the native Urdu language were originally intended to handle rainwater and sewage from nearby areas, these rivers were accredited as natural drainage systems. Their importance comes from both their crucial role in reducing water runoff during rain and their contribution to the city's extensive drainage network.

Upon talking to the residents of these areas, the following are the main findings of the study:

### *Urban Flooding and its Impact on Communities:*

There was a clear pattern among the 23 interviewees: every household had experienced floods during the monsoon season. Due to the simultaneous effects of climate change and escalating infrastructure problems, this situation has been trending worse over the past few years. The situation has also worsened as a result of the involvement of government and government-led corporations, which frequently leads to the demolition of houses built over four decades under the facade of development and growth in places like Orangi and Gujjar Nala.

The residents of all three informal settlements expressed their traumatic

emotions and past experiences at the time flooding had hit their houses. One question I asked everyone I interviewed was, *Jab mai baarish ka lafz istemaal karti hu, tou aap ke dimaagh mai sab se pehle kiya aata hai?* (What is the first thing that comes to your mind when you think about rain?).

Despite different local locations, the respondents' opinions (see Figure 1) are startlingly similar. Their collective responses undoubtedly reveal a common dislike of monsoon. Additionally, a consistent trend shows that a sizable portion of responders adopt a survival-oriented mindset, particularly concerned with protecting their own lives and the lives of their families. Beyond simply worrying about their own safety, they additionally worry about protecting their homes and the possessions they keep in the house.

### *Impact on Woman:*

#### Access of Washrooms:

The research unveiled distinct coping mechanisms adopted by the women within these communities amidst the adversity of house flooding. Predominantly, a significant number of women undertook the dual responsibilities of managing household affairs and attending to their children's needs. Some women worked from within their homes or sought employment in richer neighboring households. A notable challenge emerged when their houses were flooded with rainwater and sewage, resulting in restricted access to their own washroom facilities. The confinement within their homes for extended durations during flooding posed significant hardships. Consequently, a range of responses ensued: certain women sought aid from neighbors situated in higher-elevated structures, while others temporarily relocated to the residences of relatives. Additionally, some chose to rent alternative accommodations until the cessation of the monsoon and flood-related disruptions.

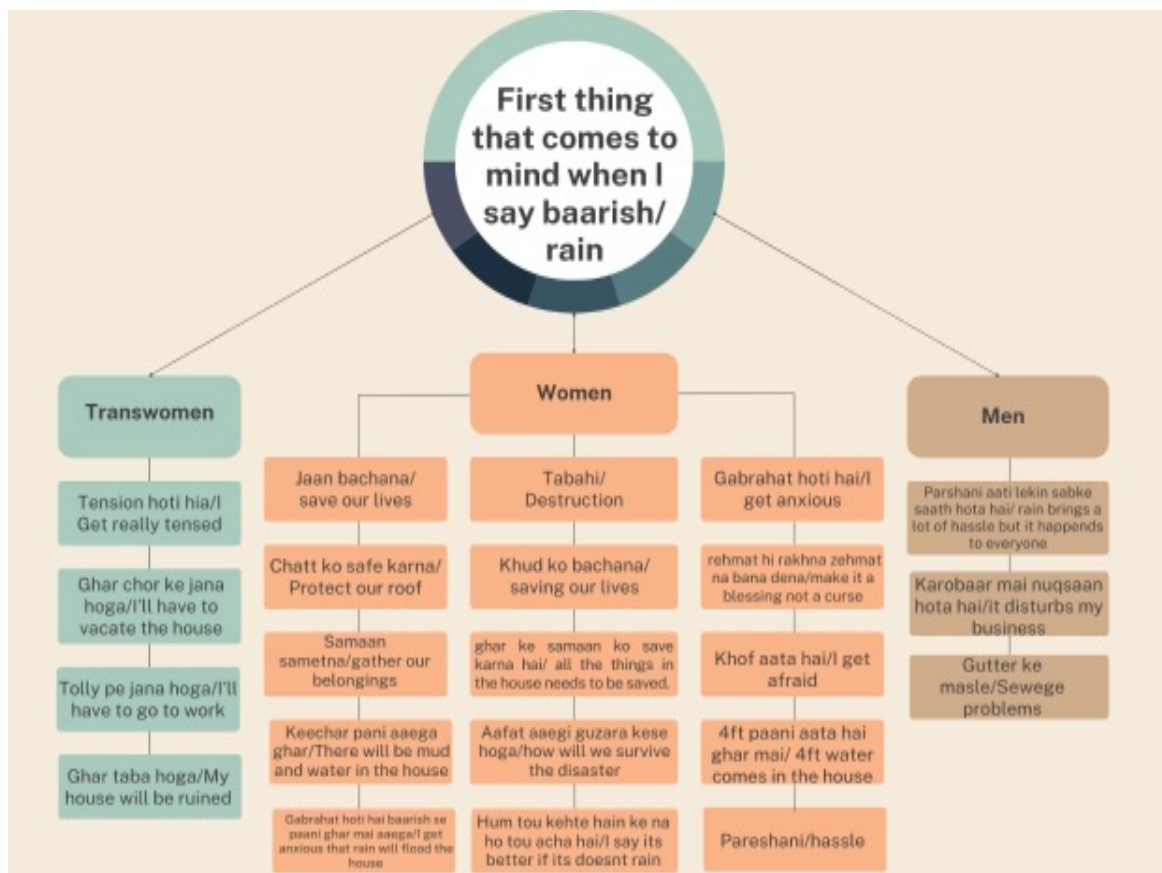


FIGURE 1: First Response Thinking of Rain

Contrastingly, women also shared their stories, illuminating a significant gender gap in how they dealt with the problem of limited bathroom access at home. Unexpectedly, males were less affected by this problem because they were free to go outside and use public facilities like mosques, public restrooms, or even open spaces for their sanitary needs. Unfortunately, due to societal standards and safety concerns, women could not realistically contemplate such possibilities. The gendered aspect of the problem is highlighted by the gap in available solutions, emphasizing the additional challenges that women encounter when washroom accessibility is constrained.

#### Demolished Houses:

In the localities of Gujjar and Orangi, residents are facing an unprecedented challenge: the demolition of their homes. Some residents' homes have been completely razed while others are left with partially demolished houses in which they continue to reside. These houses, with their unfinished walls and deteriorating roofing, serve as a striking reminder of the unsettling fact that development frequently takes a toll on society's most vulnerable members.

This dismal scenario parallels Judith Butler's contention that certain lives are arbitrarily regarded as disposable and consequently of lower worth than others. In light of their socioeconomic situation and the treatment meted out by the state, the recurring and catastrophic flooding that interrupts the lives of these citizens on a yearly basis is certainly a tragedy. The suffering of these citizens clearly reveals not just the harsh disparities maintained in the name of development, but also the arrogance with which the governmental machinery occasionally treats their plight.

#### Serving Food to the Family:

In addition, women in these communities



*FIGURE 2: One of the Many Demolished Houses of Gujjar Nala*

had to take on all of their domestic responsibilities, including cooking, cleaning, and feeding the entire family. However, the arrival of the rain posed a unique set of difficulties. During such conditions, there were regular power outages in the area, depriving residents of vital energy supplies like electricity and gas. Consequently, alternative cooking methods, such as utilizing wood as fuel, were adopted. This shift, however, positioned women in close proximity to open flames for prolonged periods, multiple times a day. The emission of fumes, particularly from wood combustion, without adequate ventilation, resulted in an alarming upsurge—approximately 70-80%—in the presence of toxic gases that these women were exposed to, particularly amid rainy conditions. The ramifications were evident in their health, marked by constant coughs, chest congestion, and fluctuating blood pressure levels.

#### Impact on Women's Health:

The vast majority of the women examined reported a marked worsening in their health during rainy seasons. Surprisingly, four of them had experienced serious health conditions. One woman experienced a paralytic

attack as a result of the rain and the sudden temperature fluctuations. Two others suffered minor heat-related diseases, while another suffered from shock after most of her home appliances got ruined from the flooding, highlighting the significant toll that these adverse circumstances took on their physical well-being.

#### Impact on Transwomen:

Transwomen, on the other hand, described unique experiences that distinguished them from cisgender women. All four transwomen discussed their individual obstacles, which were mostly related to their work and economic survival tactics. Despite the rain, these transwomen felt obliged to go out to work, driven by the need to earn a living. The heavy rains frequently resulted in the suspension or postponement of weddings and other celebratory functions around the city, hurting their usual sources of revenue. As a result, their subsistence became dependent on “*tolly*,” an indigenous term for solicitation or begging in the name of God.

A 27-year-old transwoman described the devastation caused by years of relentless rain in Karachi. She described how she had been away from home for an extended amount of time owing to job obligations, and how she would return to find her household appliances destroyed. Water had drenched and badly destroyed her ceiling fan, electric kettle, and mini refrigerator and because she couldn't afford the continuous costs of repair in the case of repeated rain damage, she was forced to abstain from acquiring and maintaining electrical items in her home. Furthermore, she articulated a great sense of longing stemming from their separation from their family and the isolated living they lead in a bustling metropolis like Karachi. This alienation deprived them of the ongoing family support that cisgender women and men generally have, includ-

ing the ability to seek help from their families in times of need. Despite the absence of traditional family support, they emphasized the mutual dependence they nurture among themselves as a substitute, building a surrogate family unit comprised of fellow transwomen. Within this circle, they extend help to one another in any way possible, forging a bond akin to kinship.

Furthermore, all four of these individuals described their disturbing encounters with insults from members of society when they were out on the streets. Well-meaning cisgender people frequently urged that they avoid labor during rainfall, seemingly unaware of the fact that their livelihood depends on their participation in *tolly*. Each of them also attested to the negative health impacts of extended exposure to rain and the biting chill of the wind. The constant dampness would very certainly result in repeated spells of illness and fever. When asked how they managed to work under such conditions, they confessed that they take medication and go on despite their illness.

A 25-year-old transwoman revealed her own experience overcoming flood-related difficulties. During times of floods, she revealed her urge to seek safety in her guru's house because of her anxiety of being alone at home during severe rains made her worry that the downpour could lead her ceiling to fall apart. This highlights the particular safety concerns and support dynamics that transwomen face during natural catastrophes. While their difficulties may be comparable to those encountered by cisgender women, they remain different. Transwomen's experiences in such situations emphasize the junction of gender identity and vulnerability, offering a complex interaction that requires careful consideration in disaster response and relief operations.

### Impact on Men

I was surprised how often the women I interviewed would say that their husbands did not come home during rains and flooding because they were mandated to show up at work and coming home during those times was not a possibility because the roads were often clogged and flooded. Due to this reason, they would have to stay in the factories and other workplaces to not lose their work hours and employment. However, once they would come home, they would help their wives mend the broken walls, guard the door to minimize the water seeping into the house, and, most importantly, bring income to feed their families. Even though I found some women home-based workers, the income they were able to generate was lower than the minimum wage, therefore, it was not substantial enough to run the house. So, the burden of sustaining and providing for the house would fall on the men of the heteronormative families having to work away from home even on the rainy brutal days of the city. Even though I only managed to talk to three men in total because most of them would be out of the house working in the daytime, I was able to talk to a local jewelry seller who would put up a stall of jewelry and other cosmetic items in Orangi. The man showed me pictures on his cell phone of what happened to his cart due to 2022's urban flooding. His entire cart flipped and smashed into a wall and even though he carefully packed his products and put them in the store room, the water still managed to get in and destroy most of his things. Upon asking whether he got any aid from the local government, he shared his disappointment and anger towards the government and its institutions and told how help from the government is an alien concept here and that they always have to manage and survive on their own.

Another thing I noticed while talking to the men was their response to climate change. Even though most of them would

agree about the adversity in the climate, they would usually just brush it off by saying "It has always been hot," or "Yeah rains have always been an issue" even though flooding in these areas is preventable by proper drainage, sewage, and infrastructure from the people who are responsible for managing it. Not to forget the *apni madad aap* (self-help) everyone talked about mostly came from the men of the area who would try to clean the blocked *nala* and even try to save people and houses damaged by the floods.

### CONCLUSION

As climate change exacerbates the frequency and severity of climate-led disasters, it is essential to consider how gender identities shape experiences and coping mechanisms. Addressing infrastructural shortcomings and social inequalities is vital to mitigate the disproportionate effects on vulnerable populations. The research illuminated the differential impact of urban flooding on gender identities where women assumed dual roles during flooding, managing household affairs and childcare, while also facing challenges related to limited access to washroom facilities. Transwomen faced unique challenges in sustaining their livelihoods during flooding, resorting to begging due to disrupted income sources. Their experiences underscored the intersection of gender identity and vulnerability.

Conducting similar research in different geographical locations, mainly the richer regions of Karachi could help identify commonalities and differences in gendered experiences of flooding, expanding the understanding of this issue. Investigating the long-term physical, mental, and economic impacts of recurring flooding on marginalized communities, especially women and transwomen, could provide insights into sustainable mitigation strategies. In addition to that, exploring the potential policy changes required to address the specific

needs of vulnerable gender groups during flooding could lead to more inclusive disaster management strategies. Further research could delve into the resilience strategies employed by communities in informal settlements, especially by women and transwomen, to better understand their agency and resourcefulness in the face of adversity. In conclusion, this research sheds light on the intricate ways in which gender identities intersect with urban flooding experiences. The findings emphasize the importance of recognizing and addressing the specific challenges for policymakers faced by different gender groups in disaster management and recovery efforts.

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# EXPLORING WOMEN'S PERCEPTIONS OF CLIMATE CHANGE IMPACT ON AGRICULTURE, HEALTH, & FOOD SECURITY IN UPPER HUNZA, GILGIT BALTISTAN

**AMBREEN<sup>1</sup>**

(*rambreen35@gmail.com*)

Aga Khan University Institute for Educational Development

**ELINA NIZAR ALI<sup>2</sup>**

(*elinanizarali@gmail.com*)

Aga Khan University Hospital

**TAIBA YAR BAIG<sup>3</sup>**

(*baigtaiba696@gmail.com*)

Aga Khan University Institute for Educational Development

**FOZIA PARVEEN<sup>4</sup>**

(*baigtaiba696@gmail.com*)

Aga Khan University Institute for Educational Development

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- 1 Ambreen is working as a research intern at Aga Khan University Institute for Educational Development (AKU-IED), Karachi Pakistan.
  - 2 Elina Nizar Ali is working as Trainee Nurse Intern Aga Khan University Hospital (AKUH), Karachi Pakistan.
  - 3 Taiba Yar Baig is working as a Research Specialist at Aga Khan University Institute for Educational Development (AKU-IED), Karachi Pakistan.
  - 4 Dr. Fozia Parveen is working as an Assistant Professor at Aga Khan University Institute for Educational Development (AKU-IED), Karachi Pakistan.

## ABSTRACT:

The Hindu Kush Himalayan (HKH) region, renowned for its towering mountains and major river basins, sustains nearly 1.4 billion people worldwide and is pivotal to global food production. Glacial melt from the HKH region nourishes agriculture, livestock, and horticulture, supporting the livelihoods of mountain communities. However, climate change is accelerating the melting of glaciers, and shifts in wet seasons significantly impact food security in these communities. Sectors such as water resources, agricultural land, and human health, particularly women's health, are significantly affected by these changes. For centuries, agriculture has been the backbone of Gilgit-Baltistan's economy, with over 70% of livelihoods depending on it (Habib, 2021), either directly or indirectly. Women make equal or more contributions to agriculture, functioning as essential custodians of agro-related operations, water management, reproductive care, and social services. Additionally, with men moving out of the region for socioeconomic opportunities, women face the effects of disasters as frontline actors but are not educated or equipped with any training to deal with it. Therefore, it is crucial to explore women's perceptions and understanding of climate change and their readiness to adapt to these unpredictable changes.

This study aims to investigate women's perceptions of climate change and its impacts on agriculture and health in Upper Hunza. A mixed-method approach was employed, involving face-to-face interviews with 30 female participants from Passu and Moorkhun villages in Upper Hunza, Gilgit Baltistan. The findings reveal a nuanced understanding of climate change among women, with notable impacts on agricultural activities and income generation. Adapting to changing climatic conditions remains a challenge, highlighting the necessity for tailored interventions and the preservation of traditional knowledge.

Currently, adaptation strategies primarily consist of development agency-endorsed climate-smart techniques, such as tunnel farming. Although initiatives like food preservation are being modernized, they appear less equipped to meet the adaptive capacity needed. Recommendations include empowering women through education, enhancing healthcare access, and promoting climate-resilient agricultural practices. Bridging gaps in research and fostering interdisciplinary collaboration is crucial for developing context-specific strategies to mitigate the impacts of climate change on mountain communities in the HKH region.

**Keywords:** Food security, Gilgit Baltistan, mountain communities, climate changes, agriculture, women's health, tunnel technique, disasters, crops, vegetables, proper nutrition, and sustainable agriculture

## INTRODUCTION

The Hindu Kush Himalayan region has the world's tallest mountains and 10 major river basins. Providing freshwater to nearly 1.4 billion people, it is becoming the greatest contributor to global food production. The region spans over 3,500 km and is made up of interconnecting mountain ranges and plateaus (Habib, 2021). The Himalayas, Karakoram, and Hindukush (HKH) ranges host more than 5000 glaciers in Pakistan's geographical limit, feeding the Indus River System together with the summer monsoon. (Chaudhary, et al., 2011). The livelihood and food security of mountain communities depend heavily on agriculture, livestock, and horticulture, which are supported by the glacial ice/snowmelt (Tiwari, 2008). The glaciers are losing their reserves at an unprecedented rate, and the number and extent of climatic events—such as glacial lake outburst flood (GLOFs)—are increasing (Chaudhary, et al., 2011). GLOFs refer to the out bursting of the lakes that are formed on the glaciers. Alongside glaciers, the forests, rangelands, and pastures have faced deterioration in the recent past because of increased demand for natural resources. Both men and women play an important role in the agriculture sector but in the rural areas, the role of women in agriculture is more pronounced, and most of the agricultural activities revolve around them (Begum & Yasmeen, 2011). For agriculture crop production, women are involved in sowing, transplanting, weeding, harvesting, and post-harvest operations such as threshing, winnowing, drying, grinding, husking, and storage, while for livestock they are involved in milking, feeding, treating sick animals, herding, cutting and collecting fodder, poultry care, breeding, weaning, cleaning shelters, converting manure to fuel or fertilizers, processing milk, and processing wool hair, etc (Bhandara & Samee, 2015).

Agriculture has been the primary economic driver in Gilgit-Baltistan since ancient times supporting 70% of people's livelihoods directly or indirectly (Habib, 2021). Mineralized glacier water nourishes soil, leading to an abundance of healthful food for people. The land is split evenly among male heirs, ensuring that everyone gets a part to sustain themselves and their families (Habib, 2021). Mixed agro-livestock production is practiced for diversified income. While agriculture remains the main source of income, small companies, wage labour, tourism, and the gathering of herbs and other therapeutic plants can also support the livelihoods and food security of mountain communities (Drolet, 2012). Since a majority of the farmers are subsistent farmers, low productivity, changing climate, inadequate infrastructure and transportation options, limited market access, and susceptibility to natural disasters make them vulnerable and food insecure (Poudel et al. 2017). Changing weather can also affect human health through the agricultural workforce's exposure to extreme temperatures (Watts, et al., 2018) in summer months. These changes can lead to physical and cultural health changes (IPCC, 2019).

The region's climatic conditions show significant variability in rainfall, leading to a severe potential threat to the agricultural sector. This variability, characterized by both excessive and insufficient water, along with the risk of floods and unpredictable rainfall patterns, is likely to affect agricultural activities in the area. The climate is changing but communities are also changing in response to land change and the socio-economic needs. As those changes happen, many aspects of local heritage and culture are lost. With men moving out of the region for socioeconomic opportunities, women face the effects of disasters as frontline actors but are not educated or equipped with any training to deal with them (Nizami & Ali, 2017).

The capacity of mountain communities to deal with these climatic hazards is limited. The poor are becoming more vulnerable (Wu, et al., 2019). During disasters, the displacements (Cerna-Turoff, et al., 2019), separation of families and collapse of social and community control can also lead to violence against women and young girls (Kolbe et al., 2010). Women make equal or more contributions to agriculture, functioning as essential custodians of agro-related operations, water management, reproductive care, and social service in Hindu Kush Himalaya (HKH) countries (Bano et al., 2023). The environment is under extreme strain on mountain ecosystems due to the fast population growth and rising food insecurity. Therefore, it's critical to solve the issues mountain communities confront in a sustainable way. People living in low and middle-income countries (LMICs) and vulnerable populations are disproportionately impacted by the effects of climate change yet, less is known about how the region's many resources, way of life, and quality of life will be impacted by climate change (Watts et al., 2018).

Climate change impacts are not gender or wealth-neutral. Studies have shown that their adverse impact on men and women is as different in effect as their impact on the wealthy and the poor. Evidence shows that women, on account of their gender, experience greater inequalities during any climate-stressed situation (Hafeez, et al., 2023). Climate change has overwhelmed women by increasing the strain of adapting measures with current activities, particularly in the absence of male family members who have relocated to cities for greater economic prospects (Bano et al., 2023). According to the World Health Organization (WHO) and the American College of Obstetricians and Gynaecologists (ACOG), "Women are at higher risk due to biological, political, and cultural factors" (WHO, 2019). The subordinate role of women in Pakistani so-

ciety also adds to the vulnerability of women. Women's role as primary caretakers of the injured, ill, elderly, and children, further increases their workload, which in turn leads to emotional stress (Dasgupta et al., 2010). Despite this, women at this age have adequate knowledge about climate change priorities, trends, and implications at the local level since climate change is directly influencing their livelihoods in their roles, responsibilities, and workplaces (Saenz and Thompson, 2017).

This study, therefore, aims to explore the perceptions of women about climate change and its impact on women's health, and food security in a localized setting in Pakistan's Upper Hunza. Since relatively little study has been done in Gilgit-Baltistan about climate change in particular, there are still a lot of gaps in our understanding of the literature found. The study aims to answer three main questions; (1) the perception of women about climate change, (2) the perceived impact of climate change on agriculture, and (3) women's health and measures taken to overcome challenges rising in agriculture. This is essential to increase the adaptive capacity and resilience of communities to the impacts of climate change.

The study is based on locally grounded perspectives on climate change and its effects on the social, ecological, and economic spheres could help scientists, practitioners, and policymakers comprehend the situation on the ground and react suitably by organizing and carrying out adaptive measures, such as policy development. This work can be regarded as an addition to the national and international literature from an area-specific perspective. It provides a valuable descriptive quantitative and qualitative study of climate change's effects on livelihoods, particularly on women's health, food security, and agricultural changes.

Furthermore, various studies have been conducted previously on various aspects of climate, natural disasters and their socio-economic impact on environment, agriculture, and infrastructure. Also, there are undoubtedly climatic changes occurring worldwide, but the evidence of how the locals view these changes influences their health, food, and land is still insufficient, particularly in the context of Northern parts of Pakistan. Therefore, this study will contribute to filling this research gap by providing awareness to environmental scientists, policymakers, researchers, educationists, local bodies, and other leadership to acknowledge the existence of some changes in climate crises and, thereafter, implement measures to adapt to them.

## METHODOLOGY

A mixed-method study was adopted for the research for baseline investigation of women's perceptions. This cross-sectional descriptive study focused on the perception of climate change, and its impact on agriculture and women's health.

### *Demographic Setting and Participants Profile*

As stated, the economy in Gilgit Baltistan (GB) is dominated by agriculture, with products such as wheat, potato, corn (maize), barley, and fruits being the mainstay. Over 90% of the population is engaged in agriculture (Pakistan Bureau of Statistics, 2010). The Upper valleys of Hunza in the north of Pakistan, situated in the Upper Indus Basin (UIB) possess permafrost and receive over 2,000 mm of annual precipitation, whereas glaciers get less than 100–200 mm and extend into semi-arid valleys. Summer temperatures in this semi-arid region regularly exceed 25°C. The winter season in this region lasts from November to March, with freezing temperatures. January typically has the lowest temperatures, with average minimum and maximum temperatures

below 10°C and –2°C, respectively (Habib, 2021). When it comes to Upper Hunza, also known as Gojal Valley, it is recognized as one of Pakistan's most beautiful regions, with a rich cultural legacy (Map provided in Appendix A). Gojal is home to the Wakhi people. The Wakhi people reside around the Pamir knot, which spans four nations. The study was carried out in two villages: Passu and Moorkhun in upper Hunza, Pakistan. A group of female participants were selected as they are collective farmers in their respective areas. Simple random sampling was used to shortlist candidates in both villages. A total of 30 females (women) from the two villages of Upper Hunza-Gojal (Passu and Moorkhun) were selected focusing on all the age groups ranging from 15–90 years. Women are front-line observers and responders of climate change. They play a crucial role in adapting and building resistance to climate extremes. Their resilience is driven by hard effort and diverse livelihood resources (Habib, 2021).

The data was collected through face-to-face interviews with the participants ensuring door-to-door home visits from the diverse groups of women in Passu and Moorkhun. The data collection tool was a set of semi-structured interview questionnaires consisting of five major areas, i.e., (i) demographic questions, (ii) perception of climate change, (iii) impact of climate change, (iv) women health, and (v) strategies to cope with the challenges. Each main question had sub-questions to elicit more detailed responses from the participants. The questionnaires were directly administered to collect data.

The data was analyzed in two parts. For the analysis of quantitative data, descriptive statistics were calculated for quantitative variables like age, gender, qualification, skills, associated industry and change in temperature and rainfall patterns. However, for the analysis of qualitative data, the-

matic analysis was utilized. During thematic analysis (Duwadi, 2021), initial codes were generated. Patterns and relationships were identified across the entire set of data for the identification of the major themes and sub-themes. This was followed by a review of themes to communicate the data effectively which is presented in the results and findings section.

### **Ethical Considerations**

At every stage of the study, confidentiality and anonymity were guaranteed, as was the subjects' voluntary participation. At each step, participants' names and information were kept anonymous, and participants' consent was obtained prior to conducting interviews. Throughout the interviews, their space, time, and comfort were also respected.

### **Limitations and Challenges**

The findings of the study cannot be generalized, i.e., in the research conducted, there is bias in the selection of the sample size. It was conducted on a small population due to traveling and time constraints, for accurate findings researchers should have a large sample size. The participants were not very aware of climate change and what it means. The questions were not in their native language, as both the villagers were Wakhi (native language)-speaking people. Somehow, the researchers thought that they did not have a clear understanding of some of the questions.

## **RESULTS AND FINDINGS**

### **Participant Profile and Responses**

A total of 30 female respondents from both Passu and Moorkhun in the Upper Hunza Valley participated in the study, comprising 50% (15) from Passu and 50% (15) from Moorkhun. As illustrated (in Figure 1), 37% of the respondents fell into the 15–24 age group, with the remainder distributed across the 25–85 age categories. Given

the predominantly young population, only 23.30% of respondents reported no formal or informal education. Among the respondents, 13.30% had completed secondary education, 23.35% had completed higher secondary education, and 20% held master's degrees. Additionally, 6.70% were pursuing postgraduate studies. Regarding skills and occupational affiliations, participants possessed a diverse range of abilities, including cooking, athletics, sewing, and teaching among others. The majority of women were engaged in domestic activities such as cooking (43.30%) and sewing (30%). Furthermore, the data revealed a significant connection to agriculture (63.30%) among the participants, surpassing other provided options.

In terms of their understanding of climate change, 80% of respondents reported an increase in temperature, while 20% noted a decrease. Similarly, a majority of respondents (60%) believed that climate change significantly affected agriculture, with additional impacts observed on infrastructure (3%), livestock (13.3%), transportation (10%), healthcare (10%), and tourism (3.3%). Overall, diverse perspectives and understandings of the climate crisis were evident among the women surveyed, regardless of their educational qualifications. Nearly 98% strongly agreed that pollution negatively impacts healthcare facilities, especially women's health. Additionally, participants emphasized the greater negative impact of inadequate nutrition (56.70%) on women's health compared to the lack of health education, communication, and transportation during natural disasters such as floods, rain, droughts, and avalanches (see Figure 2b).

### **Key Themes**

Three major themes emerged from the thematic analysis of the data based on participants' views and perceptions. These themes are mainly: 1) the impact of climate change

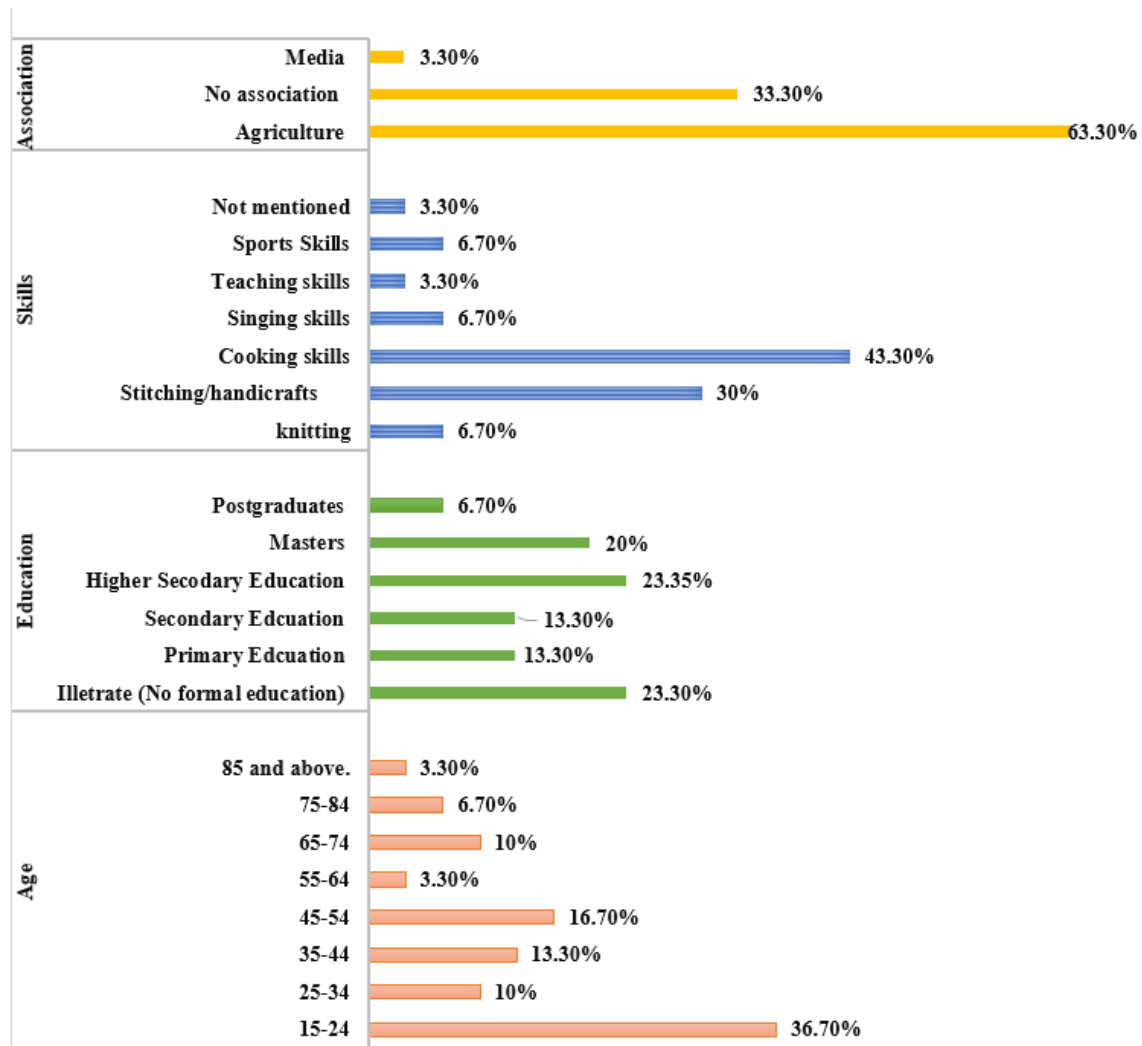
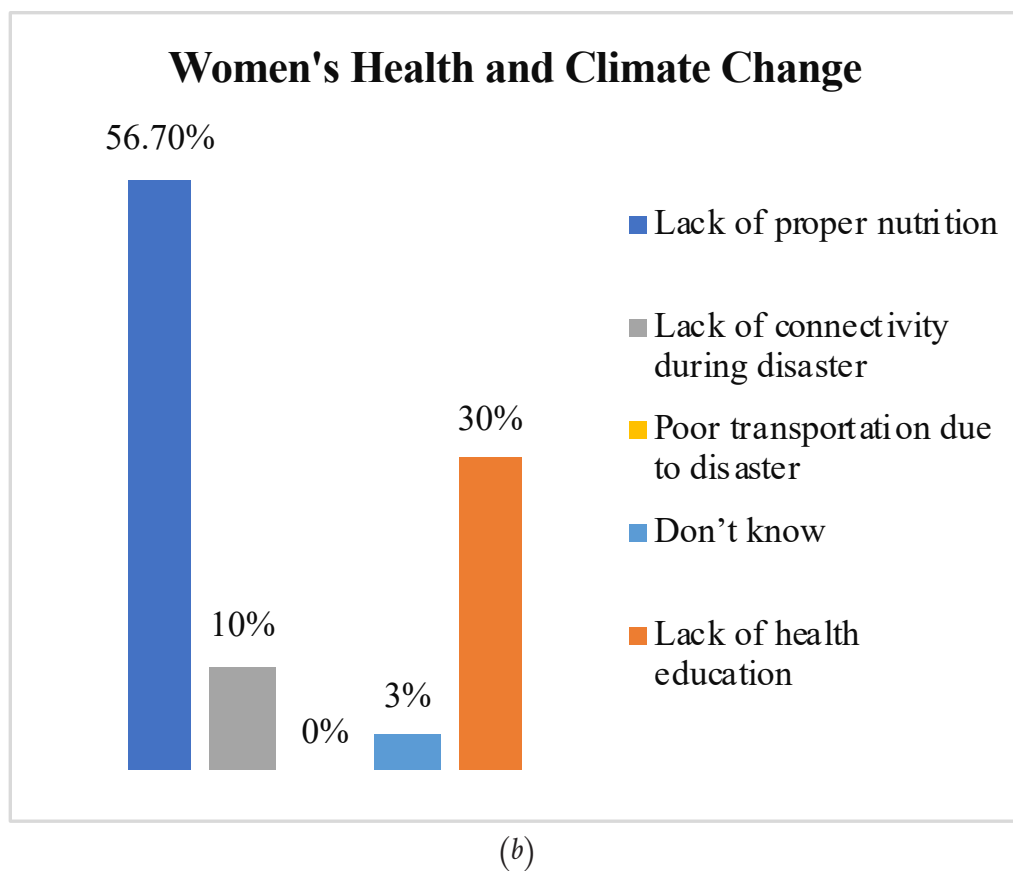
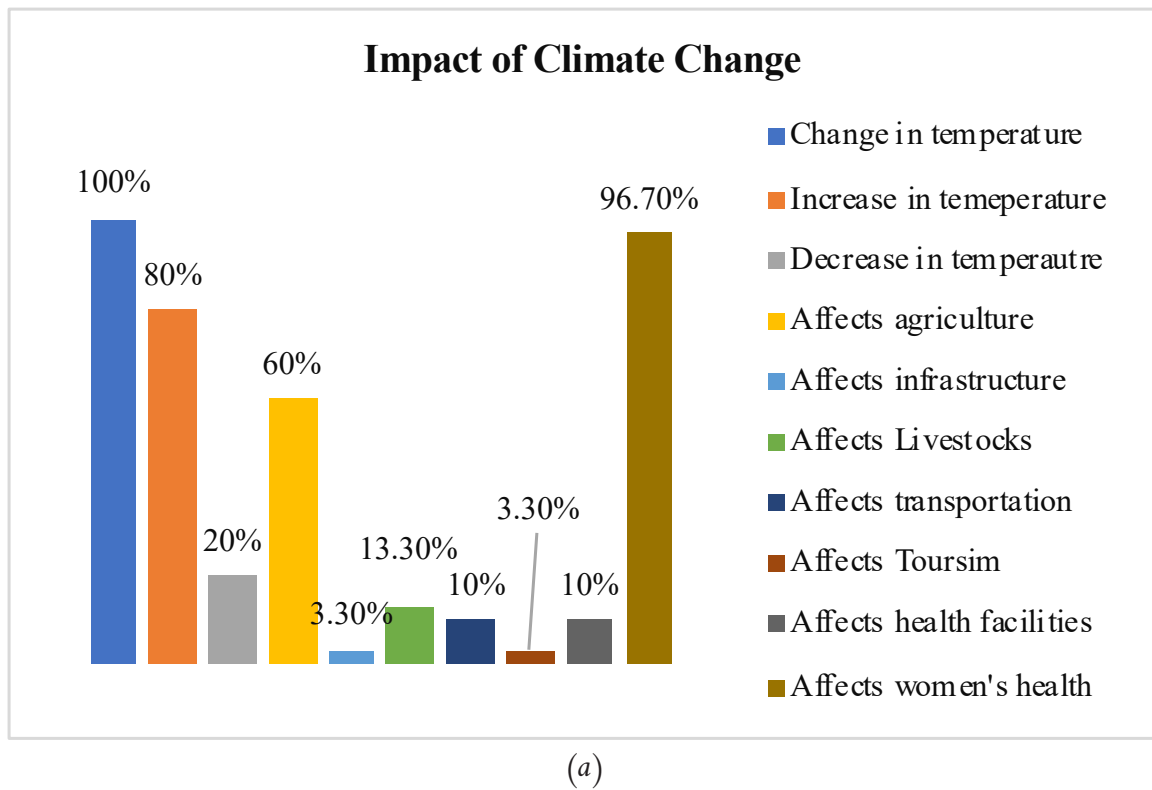


FIGURE 1: Demographics of the Participants



**FIGURE 2:** a) Impact of Climate Crises on Various Socio-Economic Aspects b) Reasons for Decline in Women's Health

on agriculture, 2) the impact of climate change on income, and 3) adapting to climate change.

Several challenges are faced by the people of the Upper Hunza Valley due to climatic changes. To address these challenges, they have opted for various climate-smart practices such as tunnel farming (9.99%). Additionally, they preserve their products by drying them and storing them properly (63.33%). Some of them have reduced the production of crops that are sensitive to temperature. Interestingly, a few respondents (3.33%) stated that they do not take any major actions to cope with the climate changes influencing their crops and vegetation.

Regarding income (refer to Figure 3), participants stated that they sell their goods in the market at higher rates, grow more crops, preserve more food, and sell it during the winter. They are also planting more fruit trees, engaging in diverse business and employment opportunities, and selling handicrafts to increase their income. The most common practices among the respondents were selling their goods in the market (36.66%) at higher rates and the preservation of food (33.33%) to sell in winter. It is important to note that despite the challenges, they are diversifying their sources of income, but agriculture remains their key income-generating activity. More details on income and agriculture are provided in Figure 4.

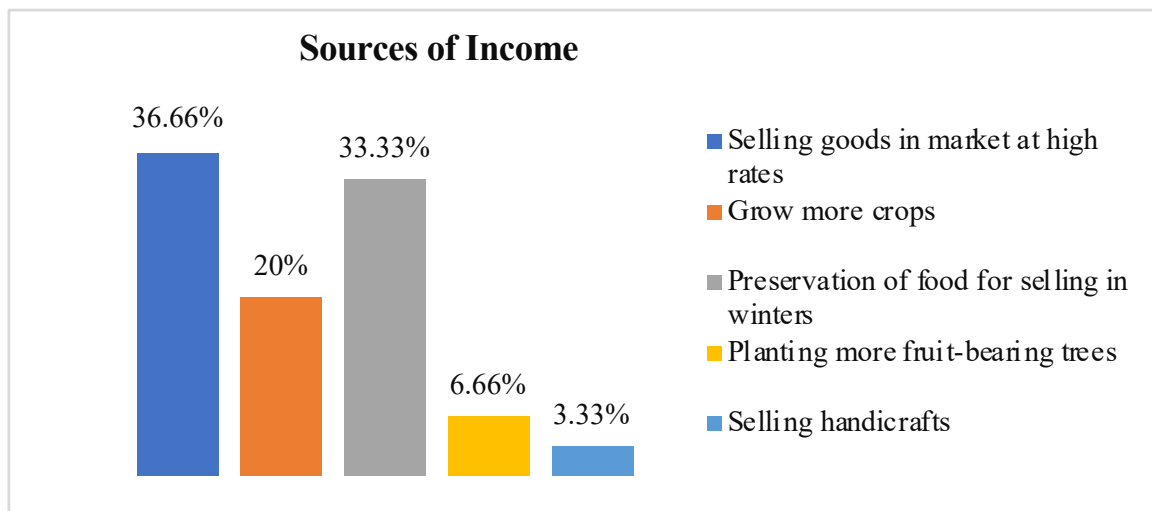
The respondents agreed that climate change is impacting their produce. A total of 26.66% of participants shared that an increase in temperature damaged the crops and resulted in fruits going to waste, leading to inconsistency in income.

As mentioned earlier, changes in temperature impact agriculture, resulting in reduced income. A total of 13.33% thought

that their income had reduced owing to the devastation of agricultural areas, while 6.66% claimed that their revenue grew because of harvesting twice a year. Nearly 43.33% reported that their income was impacted by harsh temperatures when the temperature was too low.

Changes in meteorological conditions, such as significant snowfall, have an impact on people's ability to travel from one location to another due to landslides and desolate roadways. There were also a few individuals (10%) who reported no impact on their income from climate change. This could indicate a lack of knowledge about the true impact of climate change, highlighting the need for increased awareness.

In summary, the extreme temperatures in Hunza (Gilgit Baltistan) have significant impacts on agriculture, including changes in crop productivity, cycles, orchard flowering, water scarcity, and deforestation. Adapting to these changes and implementing sustainable agricultural practices is essential for coping with the challenges of climate change in the region. The income of the region's people is mostly dependent on agriculture. When agriculture is damaged due to low and high temperatures, the income level is also affected. Due to land erosion, they have lost their agricultural fields, which has damaged all the fruits and agricultural products they sell for income. The influence of climate change on the socioeconomic status of mountain communities includes economic and health losses due to frequent and intense disasters, events of extreme weather, and loss of biodiversity and natural resources, leaving marginalized communities to struggle in extreme poverty. While there is a broader consensus on the impacts on produce and overall food security, the adaptation strategies were still quite limited and mostly modern. It is important that the community is more empowered to



*FIGURE 3: Sources of Income Generation to Improve Lifestyles*

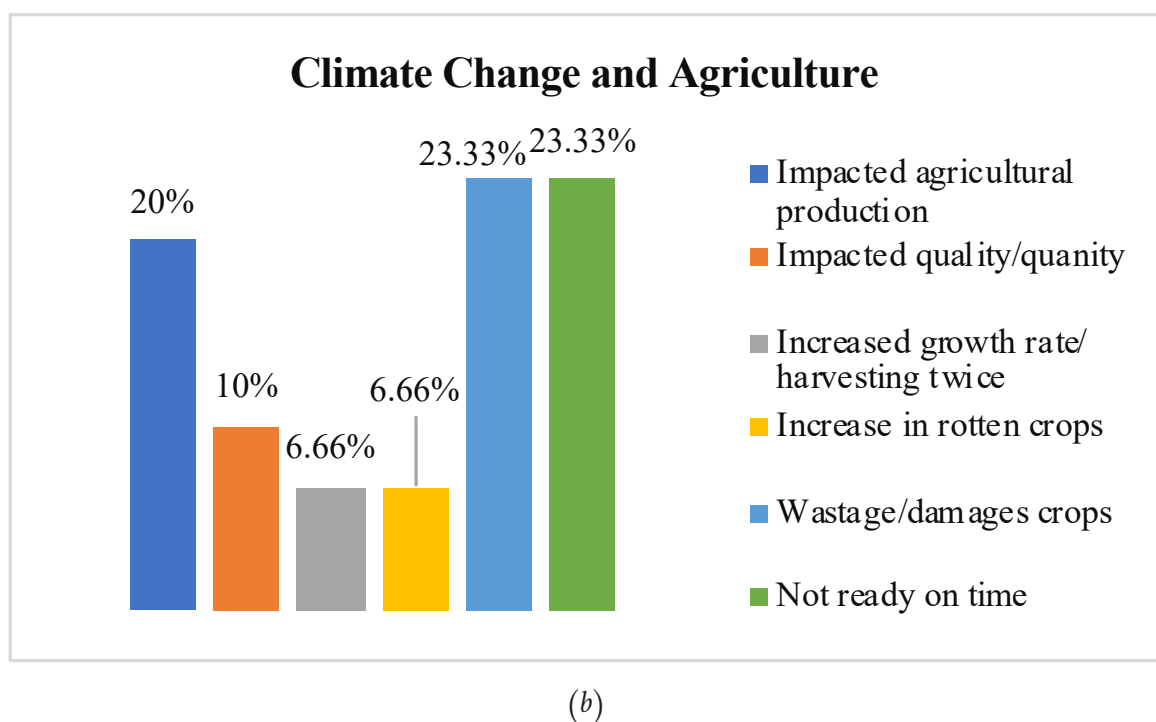
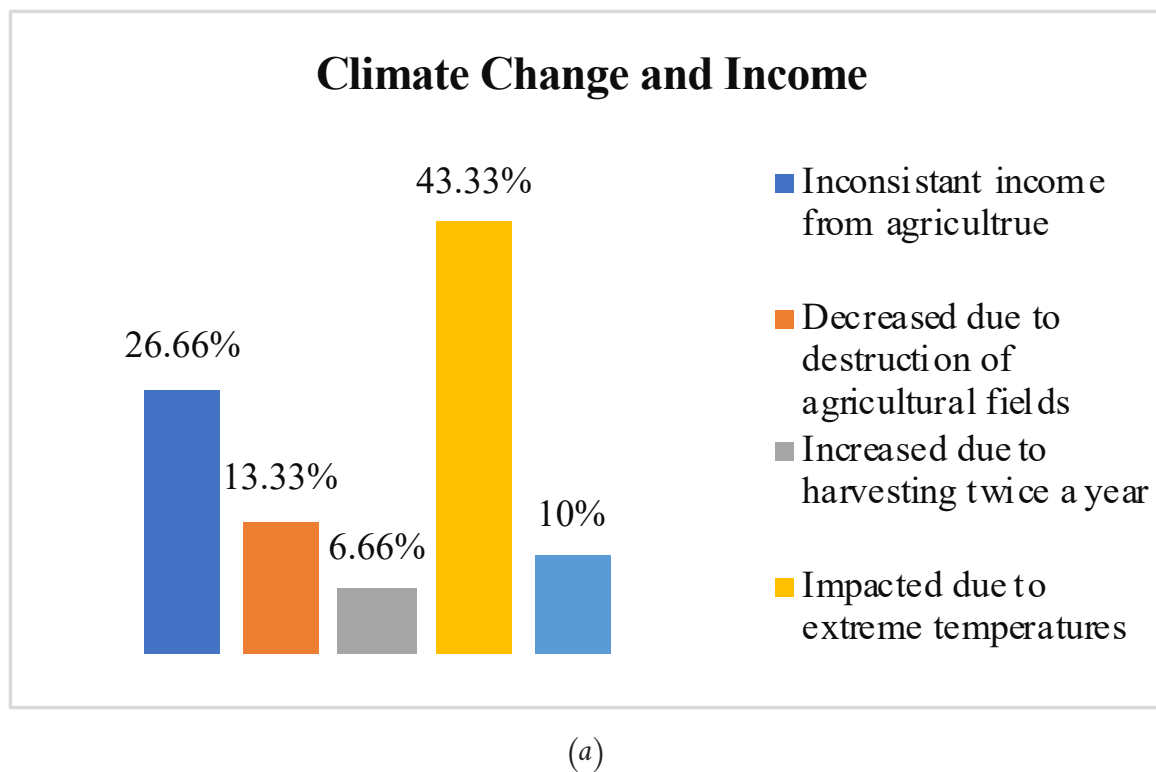


FIGURE 4: Impact of Change in Temperature on (a) Income and (b) Agriculture

learn to live with their traditional knowledge and wisdom as well.

## CONCLUSION

The Himalayan population has become more vulnerable to the impacts of climate change due to poverty, inadequate health and education services, poor infrastructure (like roads, transportation, water supply irrigation etc.) lack the adaptive capacity and resilience towards climate irregularities (Negi et al., 2012). Climate change is a real threat in the region of Gilgit-Baltistan. Yet the issue is not widely understood by the communities in GB. This study tried to engender the perceptions of women on some key themes relating to agriculture to create a baseline study. When they were asked relevant questions relating to changes in temperature and yield, it seemed that they were aware of the changing climate and the impacts it may have. We must work with government authorities to raise awareness, implement sustainable practices, and support conservation efforts. There is also a need for markets where they can bring their products and sell them at a good rate. Overall, changes in supply chain and value chains can also be suggested. It was observed that because of agencies introducing climate-smart agriculture, especially tunnel farming communities are aware of it. Despite the role of NGOs in improving access to health in GB, qualified doctors and access to doctors is still a challenge that was not highlighted in the study.

## RECOMMENDATIONS

Based on the findings of the current study, the following recommendations can be made:

- More vocational and non-vocational training should be provided to women on how to protect and sustain food security through local support

organizations and platforms. This will assist them in promptly addressing the issues posed by climate disasters that affect their income generation and crop production. It will also help them to produce, store, and preserve more food products for each season, thereby improving women's livelihoods and adaptation. However, mountain communities still lack access to markets, which also needs to be explored.

- There is also a need to raise awareness and knowledge of indigenous methods and approaches to the sustainable production of high-quality crops and products through awareness sessions, events, talks, and local-level training. The current focus on climate-smart agriculture is still being piloted and tested by donor agencies and NGOs, but it hasn't been proven yet that it will improve the livelihoods and food security of the masses in mountain communities. Re-exploring traditional wisdom and organic agritourism, among other methods, can be some of the ways in which both ecosystem and food security can be enhanced.
- While GB is known for its high literacy rate and progressive response to health and education, and various facilities are available, there is especially, for people who reside in villages, a lack of access to proper healthcare. It is important to provide adequate healthcare and nutrition for women during natural catastrophes to mitigate the challenges they encounter due to climate change, as most women's health is at risk due to the climate crisis.
- There is a need to empower women by increasing their knowledge and understanding of the significance of their health, education, and nutrition, and enabling them to make decisions about their health, education, and nutrition on their own.

- There is a need to promote and adapt more strategies to climate challenges including using tunnel techniques, temperature-resistant crops, food preservation and revitalizing local food systems, strengthening social safety nets, and increasing knowledge and awareness about quality nutrition.

There is a need to conduct thorough research on this area, especially by gaining data and insights from agriculture, environment, met, health and economic departments.

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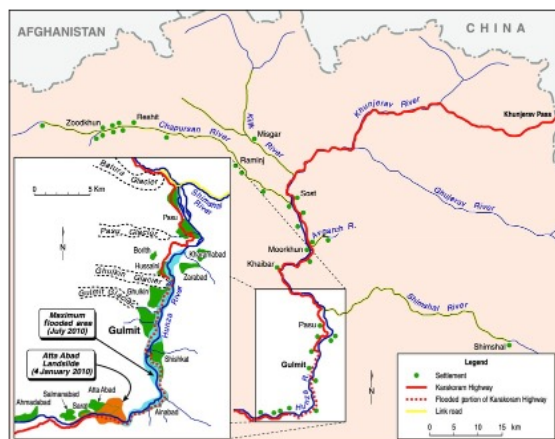
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## APPENDIX

### Appendix A

#### Map of Upper Hunza Valley Gilgit-Baltistan:





## Appendix B

### Semi-Structured Questionnaire:

#### “Perceptions of women in the mountain communities about climate change, women’s health and food security”

*Note:* This survey has been created to gather the experiences and observations of the two villages (Passu and Moorkhun) about the impact of climate change on women’s health and agriculture in these two regions of Hunza. Through this survey, we would find out their understanding of climate change and its impact on their livelihood. We will also try to understand how local communities are adapting to these perceived and real impacts.

Choose (✓) the appropriate answer.

#### 1. Name of Village

- Passu
- Moorkhun

#### 2. Age

- 15–24
- 25–34
- 35–44
- 45–54
- 55–64
- 65–74
- 75–84
- 85 and above

#### 3. Qualification

- No formal education
- Primary education
- Middle school
- High school
- College
- Graduate
- Postgraduate
- Other (specify): \_\_\_\_\_

#### 4. Skills

- Knitting
- Stitching/handicrafts
- Cooking
- Other (specify): \_\_\_\_\_

#### 5. Are you associated with any of the following industries? (Check all that apply)

- Information and technology
- Manufacturing
- Agriculture
- Chemical
- Mining
- Other (specify): \_\_\_\_\_

#### 6. Do you think the temperature has changed in your area?

- Yes
- No
- Don’t know

#### 7. Are there any changes in the rainfall pattern in your area?

- Significant changes
- Slight changes
- No changes
- Don’t know

#### 8. If yes, then has it:

- Increased
- Decreased
- No change

#### 9. Climate crises (high temperature, flood, drought, avalanches) have highly affected:

- Agriculture

- Infrastructure
- Livestock
- Health care
- Transport
- Education
- Other (specify): \_\_\_\_\_

**10. How has the increase or decrease in temperature impacted agriculture?**

**11. How has it impacted your income?**

**12. In your view has pollution ever affected the health of women in your area?**

- Yes
- No
- Don't know

**13. If yes, what could be the reason for decline in the women's health due to climate change?**

- Lack of proper nutrition
- Lack of health education
- Lack of communication during disasters (floods, rainfall, drought, avalanche)
- Poor transportation due to disasters
- Other (specify): \_\_\_\_\_

**14. What changes have you made in your agricultural or food preservation practices to cope with the challenges of climate change and how are you improving your lifestyle?**



## HIDDEN VALUE OF RIVERS: FEEDING THE COMMUNITY

BEENISH SARFARAZ  
([beenish.s.ali@gmail.com](mailto:beenish.s.ali@gmail.com))

### ABSTRACT:

The world's river systems possess a diverse range of values for the planet and its inhabitants. However, they have been degraded by conventional management which hinders more sustainable outcomes. Based on focused case-study research of four different rivers around the globe, we recognized a palpable need for a major paradigm shift in river management planning, practices, and associated decision-making: (i) Prioritizing management to recognize and address the broader sets of hidden values of rivers and (ii) incorporating local and indigenous communities in decision making and management. These case studies included the Colorado River in the United States, the Malir River in Pakistan, the Karnali River in Nepal, and the Bakel River in Senegal. The Colorado River case study distills the learnings from the Navajo Nation's long-standing battle with the government of the state of Arizona U.S. over the quantification of their water rights. The case study on the Malir River unravels solutions for the degrading ecosystems and environmental health induced by blatant neglect of the river's values and services caused by haphazard infrastructure development. The Karnali River case study considers the impacts of regulating a river for a narrow set of values through hydropower and irrigation dams and suggests possible pathways for more holistic management. The study of the Senegal River examines the negative impacts on socioeconomic and cultural resources from the Manantali Dam and proposes solutions to restore the vitality of the river. The case studies in this paper illustrate the consequences of managing rivers for a narrow set of values (hydropower, irrigation, sand mining, and construction). It is inevitable that climate change will have major impacts on rivers and the primary way we feel those impacts will be through water stress, floods, droughts, and associated disasters. These risks and vulnerabilities drive the need for river management practices to be diversified, inclusive, broad, and resilient. The four case studies also illustrate the potential for this broadening, by examining movements to diversify the level (towards more localized) and the range (from narrow to broader and more inclusive) of decision-making for the management of river systems.

**Keywords:** *River systems, river management planning*

## INTRODUCTION

Since the beginning of civilization, the inherent value of rivers has been known by many, and elucidated by historical settlements along the river systems such as the Nile. As the communities began to thrive within the bounds of these life-giving waterways, they went on to develop more meaningful connections with these waters. These connections are inscribed in local heritages, reflected in the religious faith and cultural values of tribes and communities, maintained by the indigenous practices of co-existence, and portrayed through art forms, folklore, and poems. Even in modern societies, rivers provide multiple services and support diverse ecological, economic, socio-cultural, and aesthetic values. Rivers provide us with the pure water we drink, one-third of the global food we produce, the sheer amount of hydro energy we extract, green and scenic wild riverbanks we visit, exhilarating white water adventures we revel in, and the aquatic and riverine biodiversity we share this planet with. However, rivers around the globe have typically not been utilized and maintained for the broader spectrum of value they possess (Opperman, 2018). Furthermore, the concerns, necessities, and often rights of the riverside communities and indigenous groups are also being set aside for optimizing a narrow set of values for short-term benefits.

This paper presents a case study of four different rivers around the globe. These rivers and their issues are the Colorado River and the Navajo Nation's fight for water rights, the Malir River's degrading environmental health due to unregulated urban projects, the Karnali River and the disregard of its multifaceted significance in planning and management, and the Senegal river at the community of Bakel where the impacts from an upstream dam have disrupted the ecological balance and the pre-existing socio-economic and cultural interface. These

studies also provide specific solutions to diversify management for addressing these issues and also capitalize on the immense potential of other hidden values.

## SECTION 1:

### COLORADO RIVER & NAVAJO NATION'S FIGHT FOR WATER RIGHTS

#### *Problem Statement*

Tribes in the Colorado River basin, such as the Navajo, have struggled to quantify and secure water rights because they lacked a designated role in government discussions. Further, Arizona has consistently placed obstacles in the process of quantifying water rights for the Navajo Nation leaving roughly 20% of the tribal population in Arizona without access to running water (Navajo Water Project, n.d.). With the revisiting of the Colorado River Compact (CRC) in 2026, decision makers will have the opportunity to integrate the 30 federally recognized tribes in the basin into future decisions about water allocations.

#### *Background*

The Colorado River has been flowing for over 6 million years, and for nearly a millennium the Navajo Nation has been living off this river system. The tribe was federally recognized in 1861 through a treaty written to pledge peace between the Navajo Nation and the federal government in exchange for creating a permanent Navajo homeland with the basic infrastructure that it requires and the tools to establish an agricultural economy (Smith, Olalde, & Farooq, 2023).

The Navajo Nation straddles multiple river basins (the Colorado, San Juan, and Rio Grande), and spans three states, New Mexico, Utah, and Arizona. To the Navajo, the Colorado River and its waters are sacred, and as tribal leaders have stated, are not "troughs for everyone to gorge from". Rather, the river is a connecting life

force that the people need to respect, honor, and nurture (Cordalis, 2022). This case study examines the challenges the Navajo, and other tribes, have experienced securing their water rights and how, going forward, the tribes can be equitably included in water allocation decisions.

### ***Lacking Access***

Along the Colorado River, the 30 tribes have the rights to the surface water source along with groundwater aquifers. The aquifers on the Navajo reservation, particularly within Arizona, are too salty for use, even limiting the development of hospitals. The Navajo lack many of the technologies needed to get running water to the communities. An average of 30% of families on the reservation that lack access to running water instead use a hose attached to a water barrel on the outside of their house that is used to haul the water inside when they want to use it (Howe, 2021).

In these instances, water that is stored externally is not safe for consumption, leading families to buy bottled water to satiate a basic human need. Empty promises by governments left indigenous communities with delayed or never-developed pipelines, wells, and water tanks. There have been several attempts to directly delay tribal access to more reliable sources of water and limit their economic development (refer to annex on architects' view on limited water).

### ***Unmet Treaties and The Winters Doctrine***

The 1861 treaty did not explicitly reference water rights, it was inferred by the tribe at that time that those rights were a part of the agreement, but when the states became more developed, they did not see those water rights being directly outlined in the treaties (Smith, Farooq, & Olalde, 2023a). The tribe argued that the treaty's commitment to an established agriculture-based economy implies water availability for the reservation that they are confined to. A 1908 Supreme

Court decision, in *Winters versus the United States*, resulted in a finding that when the federal government created tribal reservations, the designation included a reserved right to use a sufficient amount of water to fulfill the purpose of the reservation (e.g., to support irrigation on arable acres within the reservation) (Team, 2023). Essentially, this case implied that the land is useless without water. (Terms of the Winter Doctrine explained in the Annex)

### ***The Arizona Issue***

Tribes such as the Navajo have been seeking to resolve their water rights for decades, largely because resolving these rights is crucial to securing investment in water-management infrastructure such as pipelines. Arizona took its CRC allotment to be more flexible towards the individual tribes' visions however, with the drought conditions, the state is not easily letting go of their share of water (Farooq, 2023). Ten of the 22 tribes in Arizona have yet to qualify for their water rights—including the Navajo Nation. The Navajo have been trying to quantify their rights; however, the state keeps trying to attach unrelated conditions to an agreement before they settle.

### ***Take it to the Supreme Court: Arizona vs. Navajo Nation***

The most recent debate on this ongoing issue affecting Navajo water rights comes from the Navajo Nation versus Arizona Supreme Court case in June 2023. The Navajo nation attempted to sue Arizona in order to accelerate the quantification of water rights without any extra concessions by calling upon the federal government, stating that they had a responsibility to take affirmative steps in forcing the state of Arizona to quantify Navajo's water rights faster and without caveats. Some of the recent concessions that the state of Arizona attempted to bargain with were the state approval or renewal of casino licenses, which were to be made contingent on the settlement of water

rights by the nation, and the threat to keep a controversial coal mine active on Navajo land until a settlement was made. This, in addition to other attempts to get the tribal land for state benefits and allow for government expansion in their territory, caused the Navajo to sue the state to get federal intervention in the settlement of tribal water rights. However, in a 5–4 decision the court denied the Navajo’s request that the federal government is required to act in a timely manner to help the tribe’s request to quantify, settle, and access its water rights. Jason Robinson, a tribal law professor at the University of Wyoming who has been deeply engaged on these legal issues, says it is important to not forget that “this case did not undo the Winters Doctrine, and that is a huge win.”

### *Plans and Hopes for the Future*

The newly elected governor of Arizona, Katie Hobbs, included aiding tribes in securing water rights as one of her campaign commitments. However, since taking office, she has yet to address these issues. Shay Dvoretzky, a member of the Navajo Nation, says that the Navajo Nation has “been waiting half a century for the political branches to solve this problem for the Nation” and it has yet to happen.

Fewer than half the people who are enrolled in the Navajo Nation live on the reservation due, in part, to the lack of reliable water sources. Resolving the water rights claims of the 12 tribes with outstanding claims will require reallocating water from Arizona’s share under the Compact, underscoring the importance of revisiting the Compact in 2026. During this process, all of the Compact’s amendments will expire, reopening dialogue on water allocation, and the hope is that the tribal nations along the Colorado will have a say in future amendments. There are no written commitments to this, however, the Upper Basin states are trying to make it more solidified (refer to

annex on Upper Basin’s Attempt on Integrating Tribes).

As things stand, Arizona is uniquely aggressive in using water as a bargaining chip to force concessions on other issues compared to the other states of the CRC. Tribes are working to include discussion of native water rights, not just for the agricultural but to include the cultural values of water (refer to annex on cultural water rights issues). While the tribes are struggling to be heard by the higher authorities and government systems, there’s a large community behind them that wants to see them succeed. Bringing more eyes to the situation and involving more people to pressure the government to make change helps tremendously, and one day (hopefully soon) the tribal nations will have an easier time securing their water rights and then benefiting from the increase in investments in water infrastructure, and other developments which will follow.

## **SECTION 2:**

### **CARING FOR THE MALIR RIVER: AN URBAN INTERVENTION TO BUILD AWARENESS OF KARACHI’S DEEP CONNECTION TO ITS RIVER**

#### *Introduction*

Nature demands our immediate attention. Climate concerns are experiential and non-discriminatory. Pakistan is no exception. Its largest city Karachi faces a crisis driven by a lack of care for its natural resources, especially in urban planning, which harms its most essential natural waterway—the Malir River and the life it supports.

Running from the north-western corner of Karachi all the way south into the Arabian Sea, this seasonal river recharges groundwater to maintain a reliable source of freshwater for Karachi’s 20 million people (Digital Team, Ary News, 2023). Along with supporting water and food needs, it

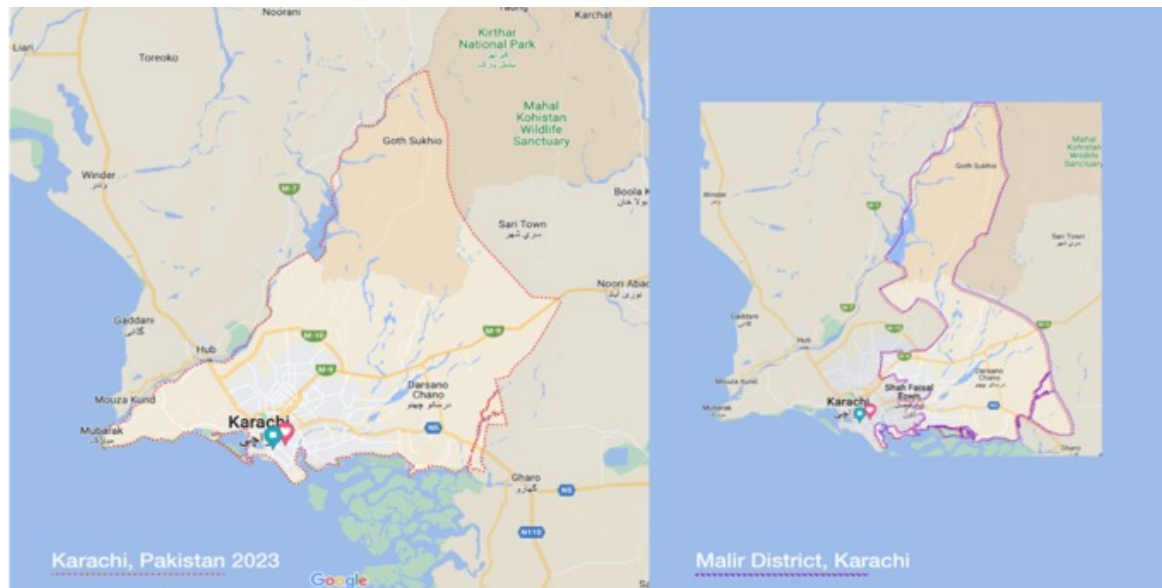


FIGURE 1: Karachi resides in the Sindh Province of Pakistan. Malir District demarcates the largest district in Karachi.



FIGURE 2: The Malir River's map and its smaller tributaries.  
(Map: Akhtar Baloch | Image: Shahana Rajani)

also supports a huge biodiverse ecosystem and green fertile belt that helps moderate the city's temperature. However, rampant construction, excessive sand mining, and encroachment into green spaces are now affecting the river's health (Rahman, n.d.). Ongoing construction of the Malir Expressway, a 39 km public-private partnership roadway project by the Sindh Government, is radically transforming the Malir's riverbed, exacerbating flood risk to the city. The roadway connects new gated real-estate projects to the south. Its construction has ignored environmental/social safeguard processes and concerns, putting the local Indigenous community at risk. Here we explore the need for an immediate re-assessment of infrastructural decisions, including meaningful consideration of community voices and the Malir's diverse values.

### *History of the Revered River*

Since the 10th century, the Malir has supported livelihoods. The word Malir comes from the Balochi language and means "three coming into one." This name reflects the confluence of the Mali's three tributaries; Mol, Jharando, and Khadeji upstreams of Karachi.

Hafeez Baloch, an Indigenous resident and activist from the Sindh Indigenous Rights Alliance, cites evidence of the river being an important trading route from Iran to Balochistan. Their indigenous local art form is archived in the graves of Kalmatiya Wari Room graveyard. The area is revered by local people as it holds traces of the footsteps and resting ground of one of the most prominent Sindhi Sufi saints and scholars Shah Abdul Latif Bhittai.

An 1889 exchange of letters (Pritchard, 1889) between the Sindh Commissioner and the British Governor, documented the Malir's significance as an agricultural site. Later, the Malir's role in replenishing the underground aquifers was

highlighted. This groundwater resource prompted the construction of the Dumlotte wells, with the assistance of the British administration. With Karachi's population growing, this conduit system ensured that as long as the system was in use, Karachi could remain an agricultural forested land with natural reserves and a river of its own.

### *Current Challenges*

In the post-independence years from 1947–1960, it was recorded that the Malir flowed year-round. In subsequent years, reduced precipitation, along with excessive sand and gravel mining, resulted in a sharp reduction in flow. This change means the river's ability to store water for its underground aquifers significantly fell. A 2019 report from WWF confirmed that these changes have contributed to a water shortfall in Karachi of approximately 500 million gallons per day (Opperman, 2018). The green corridor of the Malir is still home to diverse fauna, including 73 butterfly and bee species and 176 bird species from which two identified species have endangered status as per the IUCN red list (Public Private Partnership Unit, Finance Department, Government of Sindh for the Asian Development Bank, n.d.).

Further, the river corridor has always been important for local agriculture, as reported in the "Story Of Malir (2009)" by historian Gul Hassan Kalmati, who described the fruits and vegetables that came from the fertile fields along the Malir. However, these biodiversity and agricultural values are now at great risk.

The current provincial administration of Sindh, which has been in power for over a decade, has allowed real estate construction projects to proceed at the cost of the environment, ecosystems, and loss of heritage sites. These construction projects illegally acquire land from local people, leading to the destruction of the riparian forest and fruit orchards. Cumulatively,



FIGURE 3: Map showcasing the Malir River, 1955.

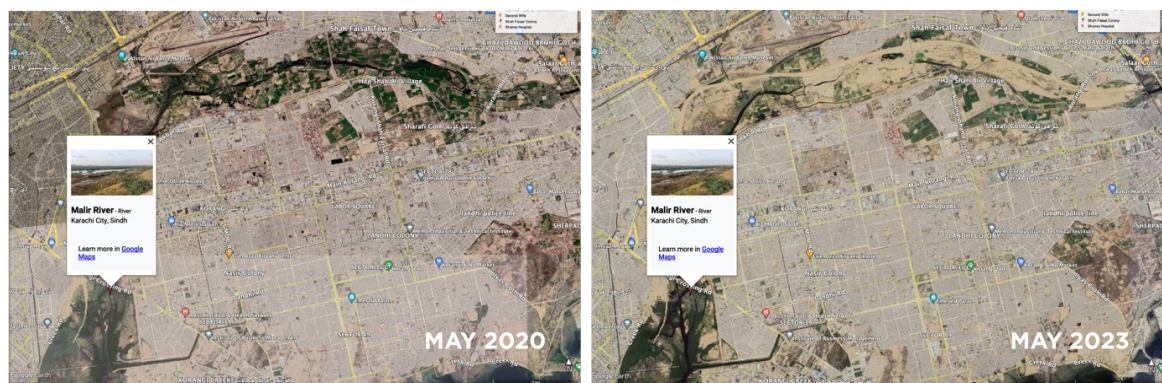


FIGURE 4: Google satellite image comparison of the Malir riverbed from May 2020 and May 2023 after the MEX project excavation.

these developments led to the constriction of the green corridor along the Malir. There are now only 4% green spaces left within the city's boundaries and, due to the loss of fields and orchards, people who live along the Malir are seeking alternative sources of sustenance (World Bank, 2018). Currently, with the government approving the ongoing construction of the 39 km long Malir Expressway (MEX), the surrounding area's habitat is in danger of additional losses. The Sindh Environmental Protection Agency (SEPA) failed to provide an Environmental Impact Assessment (EIA) report at the beginning of the project in 2020. After the Sindh Indigenous Rights Alliance and the Indigenous Legal Committee began environmental awareness building, filed a legal petition over the potential for increased urban flooding possibility, and released a report in July 2022. These efforts contributed to the Asian Development Bank withdrawing their funding on the grounds of environmental breach.

Under the Sindh Environmental Protection Act, 2014, SEPA must review the environmental assessment and then invite members of the community to comment. However, objections raised by the community have not been addressed as MEX construction continues and the flow of capital remains opaque to locals. Infrastructure projects that fail to incorporate local concerns can exacerbate social isolation, economic marginalization, and loss of privacy and freedom of movement, with women often bearing the greatest negative impacts.

### **Looking Ahead**

The Malir River case study highlights how unregulated developmental projects can harm environmental well-being and the livelihoods of local people. However, research on-ground and discussions with stakeholders, activists, and lawyers illustrate that meaningful local participation can still

prevent powerful interests from endangering the equilibrium of this fragile yet crucial river system, as we outline below.

- **Goal 1:** Build a shared vision for a livable and sustainable Malir with the residents including local people, especially women and young people, who are often excluded from developmental conversations due to language barriers and other challenges.
- **Goal 2:** Enlist educational institutes and local NGOs beyond Malir to promote awareness about the issues. Providing local people with training in environmental journalism could help bridge the knowledge gap by archiving local history, native produce and fauna, and the diverse values of this urban river system.
- **Goal 3:** Improve institutional governance and interventions focusing on reforms for accountability. This case study underscores that decisions that affect rivers and local people require improved accountability from organizations such as SEPA.
- **Goal 4:** Include an environmental impact assessment of any developmental project before its approval and initiation of construction. The long-term impact would be a time-bound checklist required for each project to undergo in order to be approved by the government—as well as community members—prior to project implementation.

The ability for people to access nature is crucial for a city to be livable. Maintaining or restoring this relationship between nature and people requires effort. To repair our damaged connection with the Malir River and its greenbelt, we must focus attention on its protection and care, for which active input from the citizens and interaction with the community members is urgent. By doing this, we can restore the

lost balance of Karachi's ecosystem and the diverse values of the people that it supports.

### SECTION 3:

#### THE CASE OF THE KARNALI RIVER: TO MANAGE A PRISTINE RIVER FOR MULTIPLE HIDDEN VALUES

Nestled amidst the breathtaking terrain of Western Nepal, the Karnali River is a testament to the profound influence a free-flowing river can have on ecosystems, economies, and cultures. Karnali River Basin covers 43,147 km<sup>2</sup> of Nepal and encompasses 742 lakes and 1,459 glaciers along with its seven major tributaries (Aryal, Panthi, Basukala, & Kharel, 2023). The river originates in Tibet and flows through the Himalayas, temperate mountains, and fertile lowlands to its confluence with the Ganges in the sub-tropics.

Its values are multiple yet often hard to quantify in monetary terms, widely distributed yet inadequately communicated, and thus poorly understood and neglected by both the wider public and decision-makers.

Although the river has very distinct and diverse values, current management, and future planning, focus on a limited range of resources. Its upper region is prioritized for hydroelectricity generation while the lower parts of the basin are being utilized for riverbed mining for construction and irrigation to a limited extent (USAID PAANI program, n.d.).

#### *Valuing Karnali for Diverse Benefits*

The first step towards holistically managing this river is the recognition of its myriad services and how they benefit local communities, stakeholders, and interest groups. Mr. Megh Ale, a river advocate, shares five basic principles to value the Karnali: (i) a center of devotion for multiple religions, (ii) a source of culture and civilization, (iii) a hub of geological and biological di-

versity, (iv) a living climate museum with the rarest heritages, and (v) a door for prosperity via tourism and agriculture.

In 2019, a group of scientific experts was assembled to analyze the diverse values of rivers in Nepal. They identified a set of traits associated with a High Conservation Value River (HCVR)—a river that is clean and free-flowing, one that maintains ecosystem services for the present and future, ensuring habitat for rich biodiversity, and possessing socio-cultural significance. They found that the Karnali met the criteria to be an HCVR and, in fact, was the most pristine and the last free-flowing mainstream river in Nepal (Aryal et al., 2023).

The conservation values of the Karnali could translate to economic values in the region. Proponents of sustainable development have proposed the concept of "Green Karnali" based upon environmental tourism, potentially positioning the region to take advantage of the tourism value of protected forests and rivers, as demonstrated by Costa Rica (Hunt & Harbor, 2019). The upper region of the river basin can be developed for whitewater adventures, pilgrimage, and cultural tourism. The mid-region comprises scenic wilderness, colorful mountains, and diverse geography, ethnic groups, cultures, and biodiversity. The region is also a hub for rafting and angling. The fertile plains are also rich in freshwater and terrestrial biodiversity. The key is to build green infrastructures and enterprises and intensify landscape marketing for ecotourism. A healthy river corridor would ensure multiple benefits to the underdeveloped and poverty-stricken communities in Karnali.

#### *To Strike a Balance: Conservation Values and Hydropower Dreams*

Although local people have a range of objectives for the Karnali, policy-level decisions are generally taken within a limited sphere of bureaucratic and political entities,

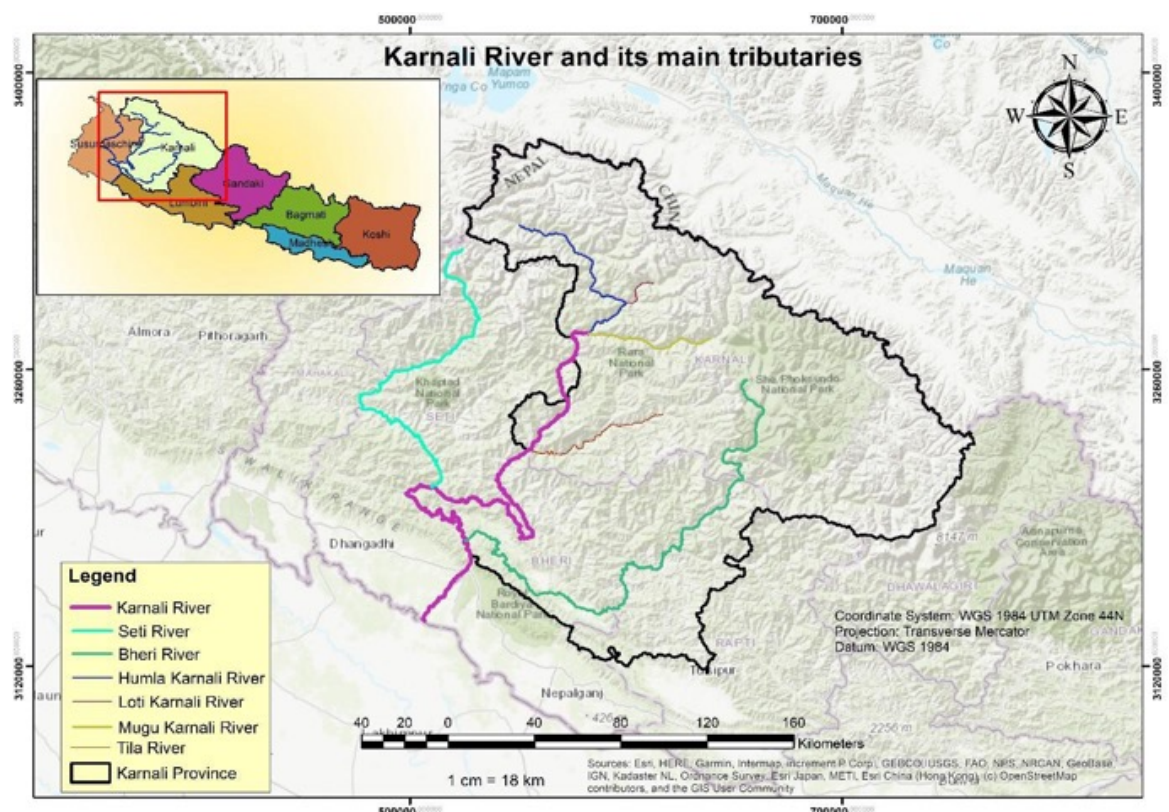


FIGURE 5: Karnali River and its Tributaries.

often with limited involvement from local communities (Crooto, Shrestha, Albrecht, Ptak, & Scott, 2021). The government's strong preference for hydropower development could also threaten the integrity of the Karnali River to an irreversible extent, with multiple large-scale hydropower projects (HPPs) proposed for the Karnali mainstream. These include the nationally prioritized Upper Karnali Project (UKHP) of 900MWh, the Betan Karnali HPP (688MWh), and the Phukot Karnali HPP (426MWh).

There has been little focus on the impact of these megaprojects on prevailing socioecological interactions, river morphology, sediment dynamics, and freshwater and terrestrial diversity. The USAID PAANI program conducted basin-level planning in Karnali and derived a framework to inform decisions about hydropower. For example, they developed an option that maintained the mainstream undammed with some hydropower development on tributaries. Such a scenario minimizes high-risk impacts on a large section of the river, with essentially no change in cost (<1% cost difference from the "least cost" scenario) and providing 7.2 GW of further electricity generation (Keeton, 2021).

Such alternatives show the potential benefits of planning hydropower at a national scale to balance multiple objectives. However, the government of Nepal (GON) has not currently adopted a system-scale approach to planning or approving hydropower projects. Under these circumstances, a case has been filed against the Office of the Prime Minister and the Council of Ministers and is under consideration at the Supreme Court of Nepal. The argument is centered on the assertion that the diverse significance of the Karnali merits consideration over single-purpose use and legalized protection of vital river stretches is necessary. On August 15, 2023, the court issued

a stay order and prohibited any actions that impact environmental balance and the aquatic system in the river including the ones that affect the river flow (the case will resume in mid-September). It also highlights the state's role as outlined in Article 51 clause (g) of the constitution of Nepal which accords the "priority and preferential right to the local communities regarding the protection, promotion and use of natural resources" (Secretariat, Constituent Assembly, & Singha Durbar, 2015).

### *Toward Local Solutions and Advocacy for Action*

Linking local watershed management approaches to national planning is pivotal to ensuring inclusive, transparent, and accountable decision-making and sustainable management of water resources. Water flow variation and sediment trapping by dams will affect small-scale irrigation, fishing, ceremonial usage, household needs, and tourism within the communities (Suhardiman, Clement, & Bharati, 2015). So local communities should be allowed to make decisions on managing and monitoring their river stretches. USAID's PAANI project facilitated the formulation of Community Aquatic Animal Conservation Groups (CAACGs) in 36 local governments that enacted Aquatic Animal Biodiversity Conservation Acts by 2021 based on the framework provided by the Aquatic Animal Protection Act of 2017 [1960]. 101 CAACGs were formed, of which 62 were legally registered in 8 watersheds. These groups governed sustainable fishing, monitored riverbed mining, and established and regulated environmentally sound river flow with considerable success.

Given that Nepal has built dams on every other major river and that the Karnali maintains inherent and distinct values, we recommend formal protection of important river stretches under existing legal mechanisms (which could be linked to community-level river management) or, if necessary,

with the development of new mechanisms. The highly successful community-based forest management, recognized by the National Forest Act 2019, is based on a model for managing a common pool resource (Sharma et al., 2020; Stibbe, 2022; Libois, Baland, Delbart, & Pattanayak, 2022) that has not been extensively applied to rivers yet. A similar modality for engaging local riverside dwellers to sustainably utilize the multiple values can be applied based on the learnings of CAACGs. This would also function as a tool for integrating local people into water resource management decisions.

However, successful legal protections can only happen if both local people and the wider public understand the diverse values of the Karnali and how a “Green Karnali” could benefit the region and the country. So, scaling up awareness through media communication targeting the local community and the general public is suggested as the foremost advocacy strategy.

#### **SECTION 4:** **REVIVING THE SENEGAL RIVER (BAKEL** **CASE STUDY): BALANCING DEVELOPMENT** **AND COMMUNITY NEEDS**

The Senegal River, a vital source of livelihood, culture, and history, has faced challenges due to the construction of the Manantali Dam. The dam has advantages and disadvantages—providing hydropower and storage for irrigation but also causing a range of environmental impacts that affect downstream communities. The river’s abundant resources supported families, agriculture, and trade, but the dam has disrupted traditional fish migration patterns. Collaborative solutions, such as cross-border discussions and fish passage structures, are needed to restore the river’s natural balance and boost fish populations (Gari, Newton, Icely, & Delgado-Serrano, 2017).

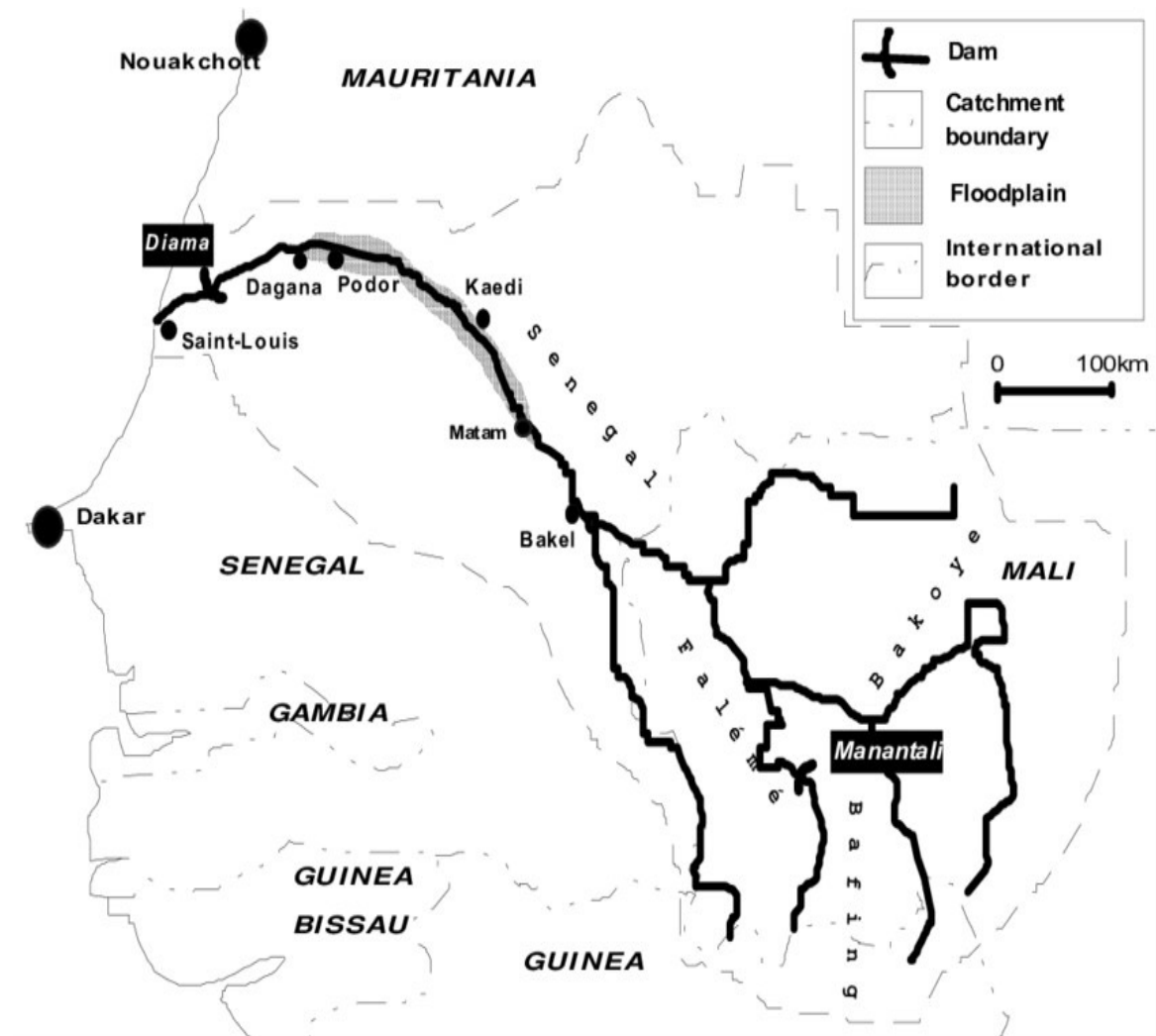
Addressing the challenges posed by the Manantali Dam can lead to a better future for the river and communities that depend on its resources.

#### ***The River as a Lifeline:*** ***Community Perspectives***

The Senegal River stretches 785 kilometers in length, and its valley varies in width from 10 to 25 kilometers from the Bakel to Dagana region, featuring a complex network of tributaries, flood basins, and rocky sills. Its water, used for drinking, washing, and transport, is of immeasurable value and utility, with an alluvial plain covering an area of 255,000 hectares (Baldé et al., 2020).

Until the 1950s, the Senegal River was a source of prosperity for fishermen, hunters, and herders.

The Senegal River, a vital resource for the Bakel community particularly Sampané, Simbé, and Traoré families who are the main fishermen and farmers since their grandparents, has been disrupted by the construction of the Manantali dam, affecting the local economy. The river’s importance extends beyond economics and ecology, representing a profound connection between people and its waters. Rotational fishing practices, which ensure a fair distribution of resources, and flood-recession agriculture have been critical to the livelihoods and cultural identities of people living along the river. A study highlights that the river has been a vital resource for generations (Gari, Newton, Icely, & Delgado-Serrano, 2017). The river’s waters also serve as a liquid highway connecting Bakel to Guourey in Mauritania, facilitating trade and cultural exchange. The river’s contributions also extend to agriculture and transportation, and the belief that its banks were blessed by their ancestors underlines its cultural significance. Collaborative cross-border solutions and ecological assessments are crucial for revitalizing the river and fisheries resources.



**FIGURE 6:** *The Quest for Integrated and Sustainable Water Management in the Senegal River Valley (Fraval, P & Bader, J-C & Mané, L & David-Benz, Hélène & Lamagat, J-P & Diagne, O. [2023])*



**FIGURE 7:** *Photo Taken in Bakel at Ndiayega 3 (empty and parked fishermen's pirogues caused by fish scarcity)*

### ***Changes to the River from Manantali Dam and Current Challenges***

The construction of the Manantali dam in Mali, financed and managed jointly by Senegal, Mauritania, and Mali, has significantly altered the Bakel section of the Senegal River, once a thriving source of sustenance and culture for the Bakel community. The dam disrupted fish migration patterns, leading to a decline in fish stocks and impacting fishing and agriculture. The community seeks collaborative solutions, including cross-border discussions among member countries and installing fish passage structures to restore the river's natural balance and boost fish populations. Assessments of the dam's impact on the river ecosystem are recommended to inform decision-making. Local communities, fishermen, scientists, and political decision-makers must work together to develop sustainable solutions. Aquaculture is proposed as a viable solution, offering sustainable income diversification, particularly beneficial to rural women in Bakel. In conclusion, the story of the Bakel River and the challenges posed by the Manantali dam highlight the complex relationship between human activities and environmental well-being.

The construction of the Manantali dam disrupted this balance, leading to a reduction in fish stocks and impacting livelihoods. This transformation has prompted fishermen to adapt and has transformed fishing from a sustainable practice into a challenging undertaking. The cyclical nature of farming is aligned with rotational fishing practices, creating a harmonious synergy between resource use and agricultural sustainability. The decline in fisheries resources has highlighted the interdependence of ecological processes, impacting fishing and agriculture. The inhabitants have lost their natural and economic capital, mainly linked to the river, severely affecting their livelihoods. The loss of livelihoods has resulted in increased unemployment, a shift from

fisherman to farmer, insufficient production, a lack of livelihood security, and, consequently, increased poverty (Faye, 2018).

The river's historic nurturing role in agriculture underlines the need for holistic solutions that restore its multifaceted contributions. The decline in fish stocks brought about a change, with fishermen now donning the hat of transporters, sailing its waters for a different purpose. The construction of the Manantali dam has disrupted this complex trade route. The transformation of the river's role in transport reflects a broader story of change, revealing the delicate balance between development and ecological preservation.

### ***Community Recommendations and Collaborative Solutions for Change***

The community of Bakel, facing challenges from the Manantali Dam, is demonstrating resilience and proposing pragmatic solutions based on a deep understanding of its river. They emphasize the need for cross-border discussions and a common framework for fish migration and management, ensuring a fair distribution of resources between member countries. The community envisions a future where ecological vitality and well-being are again in harmony. Collaborative solutions are being sought to restore the river's abundance, and community members have proposed recommendations for resolving pressing issues, such as installing fish passage structures at the Manantali dam to increase habitat access and movement for migratory fish.

Aquaculture is a viable solution offering sustainable income diversification, particularly for rural women in Bakel, as it offers low entry costs and proximity to households, allowing the river to recover simultaneously. The solutions proposed underline the importance of international cooperation and scientific rigor, with in-depth assessments of the dam's impact on the riv-

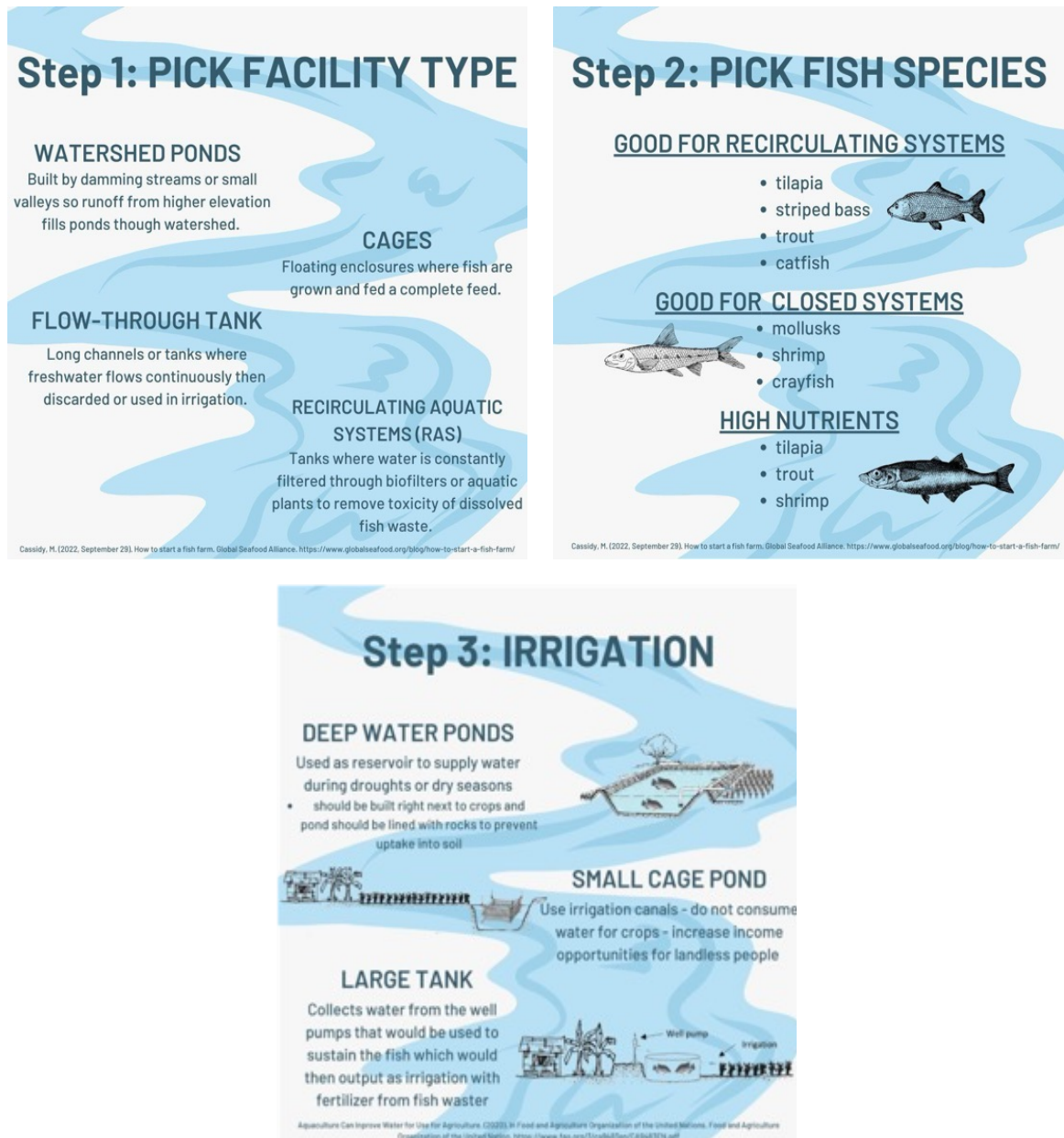


FIGURE 8: Isabella Feldmann's Infographic

er's ecosystem focusing on fish populations and ecological balance (Nandi & Sarkar, 2021).

Facilitated dialogue between the Manantali Dam member countries can pave the way for a unified framework that prioritizes fish migration and resource management. The involvement of local communities, such as the Fishmongers Association, ensures solutions are rooted in the realities of the people directly affected. The story of the Senegal River especially in the Bakel community encapsulates the complex interplay between human development, ecological sustainability, and community resilience (Ba et al., 2009). By recognizing the river's importance beyond its resources and promoting international cooperation, a path is paved toward restoring its vitality. This journey is not just about ecological rejuvenation but also a testament to the enduring spirit of the community, determined to safeguard its heritage and ensure a future where the Bakel River thrives once again.

### **CLOSING POINTS:** **RIVERS OF CHANGE**

Rivers have long been honored by poets and revered by people as a source of life. However, typical management has often been limited to a narrow set of rivers' values, as illustrated in the case studies, when their true worth goes beyond what is prioritized.

Governments have long managed these life-giving sources by regulating the rivers through engineered infrastructure such as dams and barrages e.g. for hydropower and irrigation. Rivers have been extremely undervalued, treated as receptacles for pollution or unsustainably exploited for their resources such as sand and gravel. As observed with the Navajo Nation, the values supporting Indigenous and natives are often neglected in favor of the ever-growing demands of larger and more developed are-

as and populations. These discrepancies are the product of very narrow decision-making - narrow in terms of participation (limited decision makers, not open to diverse stakeholders), resources (limited purposes of management, not for the rivers' diverse values), and power structure (top-down, not bottom-up). Consequently, river-dependent communities have often lost access to the resources and services they have relied upon, and sustainably managed, for centuries.

Similarly, through this narrow focus, nations risk losing out on multiple possibilities including economic gains (e.g., from nature tourism and fisheries) and resilience against the climate crisis. The consequences are already being intensely felt in communities around the world. For example, the long-term drought in Colorado—which most scientists attribute to climate change—has certainly exacerbated the challenges the Navajo face to secure their water rights. The current narrow management approaches are extremely unlikely to be resilient in the face of the rising frequency of droughts, water scarcity, flash floods, decreasing productivity, and other climate-driven disasters. For a sustainable future in the face of a shifting climate, rivers should be managed for increasing community resilience and for a broader set of values.

Bringing Indigenous and local communities into decision-making for their resources will bring back resilience to their rivers and promote their multiple values. The struggle here is convincing those in power that the less easily monetized benefits of the river deserve priority whether that may require regulation of sand mining, official quantification of water diversions, or a revised approach to river basin planning and management. Managing these limited objectives (hydropower, sand mining or water diversion to cities) has often directly affected the local communities and the riverside dwellers. In order to rectify

things and maintain the rivers with all the values they hold, there needs to be a shift in the diversity of decision-making, primarily by the inclusion, and direct involvement of the local communities that are being directly affected.

However, it is also extremely difficult to get recognition for these diverse values, as they are often hidden, or mean significantly more to the local and indigenous people as compared to the view of higher governmental powers. A monolithic approach to thinking about rivers reduces them to a conduit of highly managed water. But, if you ask an indigenous person, a poet, the sage one would see how the river expands into a life of its own - pouring into many more as it flows through. Illustrated within these case studies are the explainers and infographics of these 'difficult to tackle values', emphasizing why these changes in decision-making are so critical and so is our reimagination of the future relationship with these living-breathing freshwater biomes—the rivers.

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## ANNEXURE

### *Terms of the Winter Doctrine*

Winter Doctrine Rights consist of (1) rights are considered as having been established as the date the federal government created the reservation involved, meaning older tribes have senior priority to current users of Western Water; (2) rights cannot be forfeited by non-use as can the rights held under state law according to the principle of prior appropriation; (3) the scope of these rights are quantified as being the amount of water necessary to support the practically irrigable acreage of the reservation - once quantified this allocation can be used for non-agricultural purposes; (4) rights involve the future needs of a reservation, not just present needs (Klesseck, 2021). Essentially, this case implied that the land is useless without water.

### *Conditions of the Colorado River Compact*

The outcome of this was the river's mean annual flow (15 million acre-feet (maf)) would be divided amongst the Upper Basin States (Colorado, New Mexico, Utah, and Wyoming) were given 7.5 maf and Lower

Basin States (Arizona, California, and Nevada) who were given 8.5 maf to divide amongst the states (article 3 of the CRC).

### *Hopi Tribe's Sacred Water in the Struggle for Water Quantifications*

Based on the difficulty that the Arizona-based tribes have had, there are numerous court cases that resulted from trying to determine their practically irrigable acreage (PIA). One of these cases involved the Hopi tribe. In this case, the Hopi tribe was trying to determine their practically irrigable acreage, which is based on the amount of water that was used to maintain crops and livestock. When the Arizona Department of Water Resources went to assess their land, they discovered springs within the Hopi Nation that the Hopi were trying to keep secret in order to preserve them due to how sacred they were to the tribe and the fact that it would not be used for agricultural purposes, however, it was still taken into consideration as water to be drawn from for religious ceremonies, but also as a part of their water allocations (Umar, 2023). After going to court in May of 2022, the Hopi tribe was awarded less than  $\frac{1}{3}$  of the water sought in the proposal (Umar, 2023). It is consistent with the Winter Doctrine rights of being the amount needed to provide a permanent homeland—according to the state. Many residents of the tribe were extremely distressed by this outcome. One of the members of the Hopi, Nuyangyaoma, stated that withholding water—“which is life for the Hopis”—until an undetermined time is “really a position to kill off a tribe that's been there since time immemorial” (Smith, Farooq and Olalde, 2023). If the imposed decree survives, it will be harder for other tribes, forcing them to be subjected to the same scrutiny.

### *If Negotiations Remain Stagnant—1978 Water Adjudication*

If negotiations remain stalled between the Navajo and the state, the other option is to

continue the 1978 water adjudication case (focused on the Little Colorado River and aimed to determine the necessity and urgency of water rights within the Colorado River watershed), of which there are a total of 14,000 claims made already that have not all been met.

### ***Cultural Water Allocation Issues***

The issue with the cultural aspect is that there is an issue with how to integrate this into policy; would there be a guaranteed minimum stream flow or water quality assurance, or would there be another way for the cultural aspects of water to be assured through these compacts?

### ***Architect's Views on Navajo's Lack of Water Access***

Architects have commented on the length it takes to implement many of these basic water infrastructures, and the federal government has rebuked Arizona's approach, however, they did not think they had a place in this when the case hit the Supreme Court.

### ***Upper Basin's Attempt at Tribal Integration***

In the Upper Basin States, the CRC commission is trying to organize regular meetings with the Upper Basin tribes (of which there are six). The current idea is that tribes are informed about discussions with river management and incorporate tribal interests into the discussions. An example of this is institutionalizing, which has been a previously informal arrangement between the states and tribes in regard to river distribution. The Upper Basin States want to come up with permanent governance structures with the tribes, this would include developing infrastructure to better utilize the unused water that the tribes are allocated.



## KARACHI AND ENVIRONMENT

**HASAN SALMAN**

(*hs05815@alumni.habib.edu.pk*)

Habib University

Environment and urban life are inherently linked together. Although urban areas and urban life are usually considered as something that is devoid of nature, the environment has a profound effect on how life goes on in the city. Cities have been blamed nowadays by environmental activists to be a cause of climate change. The carbon footprint of modern cities has been a great cause that contributes to climate change. This is why the development discourse has now started including sustainability as a factor in the maintenance and creation of urban centers as well.

The most important factor that contributes to cities being a cause of climate change is that they erase a lot of natural flora and fauna. Whenever a new project is initiated for urban development, it cuts down much of the natural flora and transforms the land into buildings or roads which affects the wildlife in the area as well.

An example of this is the rapid expansion of Karachi. The urban sprawl in Karachi that began in 1947 with the arrival of Muslim migrants from India has transformed Karachi from a small coastal town to a megacity that covers over 3,000 km<sup>2</sup> of area. This caused two of Karachi's rivers—the Lyari River and the Malir River—to become filled with sewage and their freshwater became totally contaminated after the untreated sewage from the rapid population rise began being dumped directly into these rivers. The Lyari River “has come to be known as the ‘deadly river’, for becoming a dangerous mix of human and industrial waste” (Raza, 2019). This shows how a massive inflow of population totally rendered the rivers unusable which caused great damage to the marine life in these rivers and other wildlife as well as the local flora which was dependent on these rivers.

This caused the life of many native communities in Karachi to be disturbed. Communities that had used these rivers for fishing and agriculture were left without a source of income because of these urban activities.

The growth of urban areas within the catchment areas of these rivers has also led to the degradation of these rivers. Due to the rivers being encroached upon by urban infrastructure, urban flooding has become a common problem in Karachi. On 27 August 2020, Karachi “had more rainfall in one day than the past 92 years. Entire settlements were washed out” (Hasan, 2020). This happened even though Karachi had not experienced much rainfall before this day. The reason for so much urban flooding despite there not having been much rainfall before. Arif Hasan explains that this is because “Karachi’s development plans [are] stalled and space pressures for commercial activity, the local government constructed *bazaars* over the *nalas*. Meanwhile, the government of Sindh constructed car parking facilities, offices, and hostels on the *nalas*, and even part of the registry of the Supreme Court of Pakistan” (2020). Although the encroachment over drains and rivers was done by the government and the people alike, the adverse effects have mostly been felt by the poor people living in informal settlements.

The most important example of this is the Gujjar Nullah case, where the Supreme Court of Pakistan ordered the demolition of all informal settlements in order to restore the Nullah. According to a report by Karachi Bachao Tehreek, about “4900 households, that means a total of 47,530 people will be affected” by this demolition (Qureshi & Qazi, n.d.). However, none of the projects that were initiated by the government that encroached upon the nullahs or the rivers were ordered to be demolished. This shows how environmental activism can also discriminate against the poor.

Another problem that Karachi faces is the lack of fresh groundwater. Due to rapid industrialization and urbanization, Karachi’s groundwater has become unfit for human consumption. 86% of Karachi’s groundwater is “contaminated and unsafe for drinking” whereas “the major contamination was bacterial” (Imran et. al., 2016). Due to the groundwater being contaminated and non-potable, people are forced to rely upon the municipal water supply network, or the private water suppliers.

In Karachi, “around 60% of the households [are] connected to the [KWSB] supply network. KWSB operates 12 water hydrants to meet supply and demand gap – but it is not enough, forcing consumers to obtain unmet demand from tankers” (Ahmed, 2016). This means that although the Karachi Water and Sewerage Board supplies water to 60% of Karachi’s households, these households still need to rely on private resources for a sufficient water supply. Due to the groundwater being unfit for consumption, people are left with no other choice but to rely upon water tankers that charge higher rates.

The water tanker mafia has become a huge part of the water supply network in Karachi. Due to a lack of water supply from the Karachi Water and Sewerage Board, “the tanker mafia transports approximately 260 MGD of water every day. The sheer quantity of water that it transports and sells illicitly makes the illegal water industry in Karachi a lucrative industry. The amount of money that this generates warps the social and political fabric of Karachi and can act as a constant enticement towards corruption of the civil bureaucracy and politics” (Sajjad, 2019).

This shows how this water tanker mafia not only exploits the natural resources but also influences the state machinery into giving them space while terrorizing the

people as well. “As a GEO News report said, ‘In 2013 a social activist Parveen Rehman was gunned down in Orangi area allegedly by the tanker mafia for speaking out against them, police and her family claims’ (Shoaib, 2016). She was supposed to be providing residents of slums with proof of their own-ership. This got in the way of the land mafia, who were trying to swindle slum dwell-ers out of their land” (Sajjad, 2019). The grave consequences that the people of Kara-chi have faced for combatting these mafias show that they cause adverse effects to not only the environment but also the overall safety and peace of the citizens as well.

Another problem that is faced by Karachi is the lack of natural and local flora and fauna. Due to rapid development, local flora has almost disappeared from the streets of Karachi. Although the govern-ment had initially planted Neem trees along roadsides and streets, they started relying on exotic species instead. According to a “study recorded 62 species (30 native and 32 exotic) along city’s streets. Of them, the proportion of 54 species, many of which were native, was less than one percent” (Ilyas, 2019). The exotic trees have also re-placed the native trees in great numbers as “the street tree community, according to the study, had 62 percent plants of *Conocarpus*, demonstrating its dominance on the streets” (Ilyas, 2019).

The plantation of *Conocarpus* trees has also been a huge problem for Karachi’s environment as a whole because according to the researcher “Dr. Zafar Iqbal Shams, *Conocarpus* is suitable for coastal areas but not for arid zones as it takes up large amounts of water” (Dawood, 2022). This means that while the *Conocarpus* species may have been suitable for planting in the coastal areas of Karachi. However, the species being planted all across Karachi altered the climate of the city significantly and

created many side effects that affected Kara-chi’s environment.

Due to the lack of diversity among the trees being planted, Karachi’s climate was altered enough that it affected rainfall patterns. Because native species like *Euca-lyptus*, *Neem*, and *Banyan* have not been planted by the government, heatwaves have become a norm. Since the *Conocarpus* is also being planted in arid areas of Kara-chi, a lack of water has caused the inten-sity of these heatwaves to increase signifi-cantly. This causes people to be affected by the change in environment and experience major health issues—even death—during these heatwaves.

The heatwaves have become a big problem because “the highest maximum temperature in Karachi was 44.8 °C on 20th June 2015 with a departure of 11.1°C from normal, which was the highest temperature for the month of June after year 2000 (45.5 °C). The heat wave was unprecedented in terms of persistence. There were incidences in Karachi when the temperature departures were +5°C” (Chaudhry et. al., 2015). This shows how the change in Karachi’s climate is slowly increasing Karachi’s average tem-peratures which are causing spells of heat-waves. These heatwaves make it unbearable for many people to survive, especially those who cannot afford air conditioners or have a lack of a stable supply of electricity.

Another problem that affects the lower classes within urban areas is the rapid rise in temperatures within urban areas. Ka-rachi has seen a rapid rise in average tem-peratures within the city which has caused great spells of heatwaves in the city. These heatwaves—while being difficult for every-one—affect the poor classes much more than others. The poor people who live in informal settlements or downtrodden are-as have a lack of electricity which causes the heatwaves to intensify, whereas a lack

of facilities such as air conditioners has also caused the poor people to succumb to these heatwaves in great numbers.

In conclusion, it appears that urban life and urban development within cities significantly alter the natural flora and fauna within the place. These activities then have a serious impact on the environment, which affects the lives of native communities who have intermingled with nature in the area for centuries. The impacts of the change in environment can also affect the lives of the people occupying the new urban areas as well. This was seen in the case of Karachi where due to rapid urban growth, the local rivers of Malir and Lyari were contaminated and the people living in Karachi were forced to rely upon the Hub River and the Keenjhar Lake, which are far away from the city itself. In order for the change in environment and climate to be countered, the government needs to focus on planting more native tree species and allowing for the rivers in the city to return to their natural form by creating proper sewerage networks and sewage treatment plants. The government also needs to develop a policy that would spur sustainability in urban areas and make them a lot more inclusive of not just the poor people and informality within the city but also become inclusive of the native flora and fauna that naturally exist within the area.

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**LITERATURE REVIEW:**  
**EXACERBATION OF GENDER-BASED VIOLENCE AMONG  
WOMEN IN KARACHI'S INFORMAL SETTLEMENTS AMIDST  
CLIMATE-INDUCED DISASTERS, SUCH AS URBAN FLOODING**

**ANSA ASHFAQ**  
([ansa766@gmail.com](mailto:ansa766@gmail.com))  
Habib University

**SAHAR MAKHANI**  
([saharmakhani2002@gmail.com](mailto:saharmakhani2002@gmail.com))  
Habib University

**MAHA SHAHID**  
([mahashahidd10@gmail.com](mailto:mahashahidd10@gmail.com))  
Habib University

**SANIYAH SALMAN**  
([saniyahsalmaan2@gmail.com](mailto:saniyahsalmaan2@gmail.com))  
Habib University

**TANEES ABBAS**  
([tanees.abbas2001@gmail.com](mailto:tanees.abbas2001@gmail.com))  
Habib University

**ABSTRACT:**

According to the 2022 Global Livability Index published by the Economist Intelligence Unit (EIU), Karachi is one of the most unlivable cities, ranking 168th out of 172 cities. Pakistan is ranked 145th out of 146 countries on the World Economic Forum's 2022 Global Gender Gap Index. Furthermore, approximately 62% of the population in Karachi lives in Katchi Abadis. Urban flooding is regarded as an unnatural form of disaster as its problem stems from a lack of infrastructural planning in the city. Karachi experiences this phenomenon every year. The aim of this research is to understand and investigate the role urban flooding plays in the exacerbation of gender-based violence (GBV) experienced specifically by women within informal settlements across Karachi. The objective of this research is to investigate the resources and strategies accessible to women in Kachi Abadis who seek refuge from gender-based violence and design an intervention. Due to the ongoing nature of the study, the results are yet to be conclusive. However, given the aims and scope of the research, it is expected that the unique experiences of women and other vulnerable populations residing within the informal settlements of Karachi would be addressed through the proposed program-based intervention.

**Keywords:** *Gender-based violence (GBV), urban flooding, informal settlements*

## INTRODUCTION

Pakistan ranks amongst the top ten countries that are most vulnerable to climate change. One of the most prevailing forms of climate-induced disasters is urban flooding, which is exacerbated from a lack of city infrastructure planning. This unnatural form of disaster has a severe impact on the people residing in the informal settlements or Katchi Abadis of Karachi, which constitute a substantial portion of the city's overall population. With the loss of homes and other assets in urban flooding, the social and cultural role of women as caretakers with minimal economic independence often places them at the receiving end of violent and coercive behaviors from the men of the households. The aim of this research is to understand and investigate the role urban flooding plays in the exacerbation of gender-based violence (GBV) experienced specifically by women within informal settlements across Karachi. The objective of this research is to investigate the existing resources and strategies that are accessible to women in Katchi Abadis who seek refuge from gender-based violence. Based on this, the study aims to design and propose a program-based intervention that addresses the unique experiences of women and other vulnerable populations residing within the informal settlements of Karachi in light of urban flooding.

## BACKGROUND

### *Climate Change*

Climate change is a global phenomenon characterized by modifications in weather patterns and temperatures (*What is climate change*, n.d.). The impact of climate change is manifested in the form of glacier melting, floods and rises in temperatures like heatwaves. Pakistan is one of the most vulnerable countries that is to be impacted by climate change. According to the Global Climate Risk Index, Pakistan is ranked as one of the

eighth most vulnerable countries to the effects of climate change. 33 million people (about twice the population of New York) nationwide were devastated by the 2022 floods in Pakistan, which resulted in a significant number of fatalities and displacements (*Devastation in Pakistan: Deadly Floods Displace Millions*, n.d.). Research indicates the nexus between gender-based violence and climate change where climate change is seen as a threat multiplier whose effects are exacerbated due to pre-existing social structures (*The Climate-Gender-Conflict Nexus*, n.d.). In this sense, climate change should be seen as a gendered phenomenon.

### *Urban Flooding*

Flooding in an urban setting occurs when areas that are not normally inundated get immersed in water. Due to excessive rainfall, the capacity of the drainage system in urban cities reduces, leading to extreme runoff (Iftikhar & Iqbal, 2023). The lack of flood-resilient structures in informal settlements leads to severe damage to people, households and livelihoods, while also contributing to the destruction of transportation networks, that disrupt urban life.

In a coastal megacity like Karachi, urban flooding has become an inevitable event that warrants anticipatory action. In August 2020, Karachi experienced record-breaking rainfall, marking the city's highest single-day downpour in 52 years, and leading to unprecedented urban flooding (Record-Breaking Rainfall Submerges Karachi, Leaving More than 20 People Dead, Pakistan, 2020). A study claims that Karachi's land is sinking at a rate that is almost five times faster than the sea level rises (EE News, 2022). One factor that may be responsible is the rising degree of development on reclaimed land, urbanization, and inadequate sewage networks (Kanwal et al., 2022). Existing literature highlights how women are disproportionately impacted by such disasters, while also acknowl-

edging that it is the intersection of gender with various other factors such as their age, caste, class, geographical location and their sociopolitical and economic standing in society (Singh, 2020).

### *History and Context of Katchi Abadis in Karachi*

Katchi Abadis are the informal communities that were established either through squatting or informal divisions of either state-owned or private land (United Nations Human Settlements Programme, 2003). Katchi Abadis can further be classified into two main types namely, Settlements Formed during Partition and Informal Subdivisions of State Land (ISD). Settlements Formed during Partition emerged through unorganized encroachment on state lands when there was a sudden increase in population during the partition. ISDs can also be further divided into two subcategories: a) Notified Katchi Abadis and b) Unnotified Katchi Abadis. Notified Katchi Abadis were the settlements that were regularized through a 99-year lease under the Goth Ordinance Act while the Unnotified Katchi Abadis are the settlements that will not be regularized as they are situated on valuable land intended for development or on unsafe grounds (United Nations Human Settlements Programme, 2003).

Today 62.2% of Karachi's population lives in Katchi Abadis (Arif Hasan, Pervaiz, and Raza, 2017). There are a host of factors which contribute to this staggering figure. The first factor is the more-than-average population growth that Karachi experienced at the time of partition. Between 1947 and 1951, approximately 600,000 migrants came to Karachi (United Nations Human Settlements Programme, 2003). The state struggled to accommodate this huge influx of people on multiple occasions. From 1988 to 1993, the first major slum upgrading and poverty alleviation programme was proposed however due to

faulty land records, corruption and non-inclusion of grassroots organizations it was able to regularize only 1 per cent of the Katchi Abadis per year (Ahmed and Tehseen, 2017). The Social Action Programme of 1993 also failed due to a lack of capacity and incompetence (United Nations Human Settlements Programme, 2003). As a result, many Katchi Abadis are still not regularized despite being made before 2000 according to the Goth Ordinance Act.

Secondly, national policies such as the green revolution also caused unemployment in rural areas. While on the other hand, rural-to-urban migration grew due to industrialization. Therefore, Karachi experienced many cycles of migrations in the early decades of the newly built nation and even till today (Ahmed and Tehseen, 2017). Furthermore, the unregulated expansion of informal settlements is facilitated by an organized network. This includes land brokers, who illicitly seize large areas of land on the outskirts of urban areas in collaboration with local law enforcement, government officials, and cooperative housing associations (Ahmed and Tehseen, 2017).

### *Gender-Based Violence*

According to the European Union, Gender Based Violence or GBV is defined as when violence is targeted towards an individual because of their gender. Although GBV can be committed against any gender, women and girls are the main victims of GBV. GBV can take mainly three forms, physical, sexual and psychological. Physical violence refers to beating, strangling, pushing, and the use of weapons. Sexual violence refers to attacks directed at an individual's sexuality, unconsented sexual acts and attempts to obtain sex. Psychological violence refers to forms of control, coercion, blackmail, and economic violence. Two common examples of GBV are domestic abuse and sex-based harassment. Domestic abuse can contain but is not limited to previously

mentioned forms of violence in a domestic circuit or unit and sex-based harassment refers to all acts of unconsented, unwelcomed, verbal, and non-verbal forms of harassment that have a sexual nature.

## SUMMARY & CRITICAL ANALYSIS

### *Informal Settlements in the Face of Climate Change*

According to Hasan, Pervaiz and Raza (2017), approximately 62 percent of Karachi's population lives within informal settlements, i.e., *Katchi Abadis* due to an increase in the average cost of living, land property and demand for land ownership by the middle class. As such, between 1973 and 2010, the density within informal, low-income, semi-permanent settlements more than tripled from 450 p/ha to 3,500 p/ha. Nonetheless, while the numbers increased, cost estimates showcased that in 2016, the rent for a semi-permanent *katchi abadi* cost "10 times the daily wage for unskilled la-

bour" (Hasan et al., 2017). Therefore, leading the authors to conclude that "living on the periphery" meant an absence of amenities, state benefits, and informal settlements being further removed from workplaces and recreational centers thereby leading to "intense" economic stress and a decrease in the overall standard of living (Hasan et al., 2017). In the face of such vulnerability-proneness, it becomes crucial to evaluate informal settlements' propensity to the adverse effects of climate change given Pakistan's ranking as the fifth most vulnerable country to climate change in 2020.

Bearing in mind the identification of informal settlements as 'vulnerability-prone' due to their unsustainable shelter provision in Karachi's peripheries (along pavements, nullah streams or widely ignored regions); their location intricately exacerbates "the impact of flooding on the urban poor" (YCR, 2022). Such climate-induced impacts become routinely visible during the

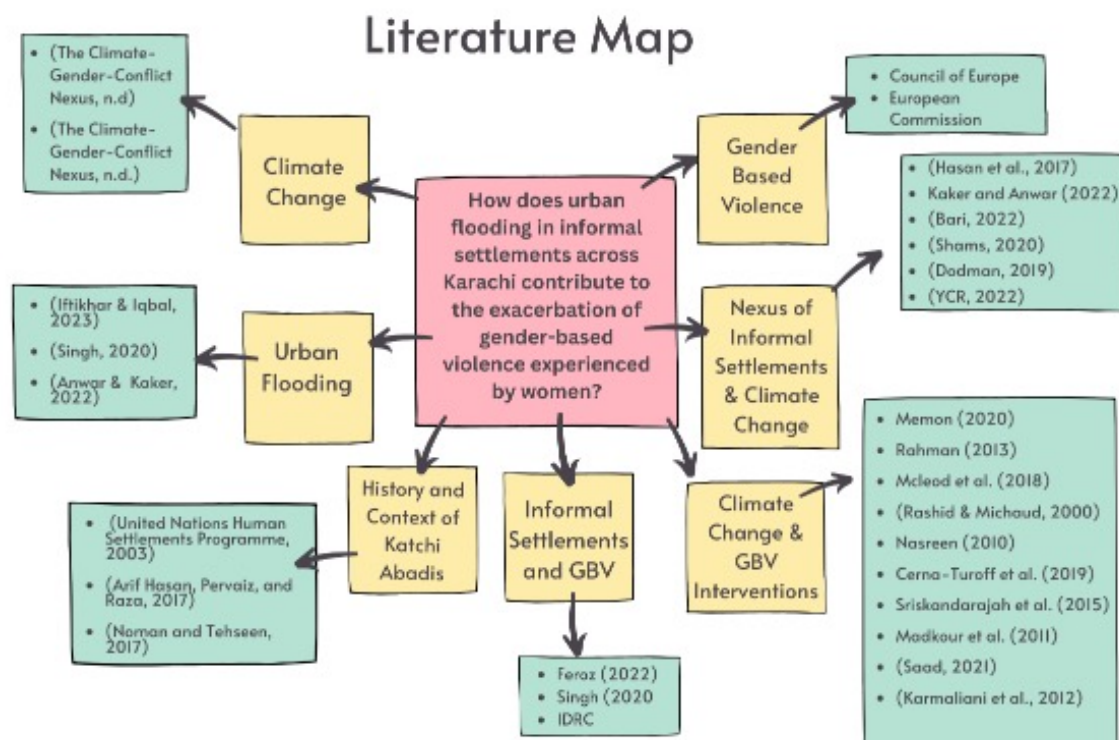


FIGURE 1: Literature Map

monsoon season and torrential rain spells, which combined with economic stresses lead to not just loss of life and shelter, but also land dispossession (YCR, 2022). For instance: in August 2020, Karachi received 604 mm of rainfall, hiking the death toll in the city to 47 (Bari, 2022). Therefore, addressing and building *katchi abadis*' resilience development in the face of climate-induced calamities (particularly urban flooding) becomes crucial and requires a range of measures to be considered.

According to Kaker and Anwar (2022), in the aftermath of floods, public outrage, and the resulting blame-game, a reshaping of urban landscapes takes precedence with a crackdown on informal settlements and resultant eviction drives in Karachi. Such mitigative action stems from the infrastructural observation that clusters of informal settlements across drainage lines "have obstructed the flow of water" and thereby, urban flooding may be relieved through a displacement of the population settled within *katchi abadis* (Shams, 2020). In the face of such crackdown and the presence of alternative reasons for urban flooding (such as municipal waste mismanagement, unregulated construction, and local-government failure), Kaker and Anwar (2022) cite a need for anticipatory action rather than mere crackdown against the poor that much of government policies opt for.

A form of anticipatory action that takes the majority in much of the literature pertaining to the nexus of informal settlements and urban flooding, highlights climate-adaptative strategies. For Dodman et al. (2019), while informal settlements might have "coped" with environmental risks, their strategies focus on short-term risk management rather than climate change adaptation. As such, the most effective strategy would require a combination of notable urban agendas such as pover-

ty reduction and disaster risk reduction so that *katchi abadi* dwellers may support their own dwellings through grants and state provisions (Dodman et al., 2019). Moreover, to finance such climate change adaptive resilience, a 'climate finance' may be used to provide "integrated packages of climate-compatible services and infrastructure" (Dodman et al., 2019). However, such a climate finance fund, according to the article, remains in theory albeit there is evidence to suggest that its implementation across the local level may provide a catalyst for positive climate adaptive reinforcement.

In addition, further research on the subject emphasizes the hand-to-mouth living conditions of informal settlement dwellers, their food insecurity and inability to access "reliable and timely information" concerning hazards, inadequate provision of basic services (healthcare or hygiene), their marginal community collaboration, and an overall distrust in the Sindh government's ability for assistance (Hasan et al., 2017). As such, to address such dissent from informal settlements, their socio-economic burden must be realized and their marginalization by the government subdued.

### *Informal Settlements and GBV*

According to Feroz (2022), due to predisposed conditions such as a lack of educational qualifications, economic dependence and cultural requisites, women are more vulnerable to climate-induced disasters as compared to men. This comes as no surprise considering Pakistan's ranking as the second worst country in the world in terms of gender parity according to the Global Gender Gap Index. As such, within the broader framework of *katchi abadi* dwellers as a marginalized group, women are subjected to greater subjugation and limitations. This means that in the context of urban flooding and climate change, at large, "women and children are 14 times more likely than

men to receive fatal casualties when disaster strikes” (Feroz, 2022).

Owing to the semi-permanent and risk-prone state of informal settlements, research undertaken across working-class neighborhoods (including those in Karachi), suggests that the intricate ties between infrastructure and services (or lack thereof) affect the ways in which “men and women interact” (IDRC, n.d). Further, the research findings revealed that gender-based violence was heightened in cases of traditional gender roles which meant that in cases of urban flooding, “stagnant waters in homes and streets” exacerbated cases of domestic violence against women (IDRC, n.d). To address such cases, the research recommended intervention measures that may seek to increase education and awareness concerning gender roles. While such awareness campaigns are necessary, they fall short of addressing the problem of GBV exacerbation particularly within the context of informal settlements.

According to Singh (2020), the dual burden of work for women (both domestic and unorganized) meant that during cases of urban flooding in Mumbai, there were “escalated” instances of domestic violence that were borne from socio-economic stresses. Therefore, the conditions of food insecurity and hand-to-mouth earnings coupled with government-enforced evictions and marginalization within informal settlements, fuel instances of GBV against women and girls in Karachi. Additionally, for Gaisie et al. (2021), while the linkages between gender, vulnerability, and resilience to climate change induced disasters in informal settlements remains largely unexplored, research undertaken across Ghana showcases that household resilience requires a gendered dimension in order for climate adaptive measures to be successfully undertaken considering women’s stake in the restoration process (as a fragment of

their gendered labor). Together, both Gaise et al. and Singh’s work highlight how the intersection between urban flooding, informal settlements and gender-based violence requires urgent attention.

### *Climate Change, Informal Settlements, and GBV:*

Memon (2020) adds to the conversation about the intersection of gender-based violence and climate change, particularly in the context of urban flooding. She emphasizes women’s vulnerability to emotional, physical, and sexual violence during and after climate-related disasters such as floods. The emotional toll that women face in the aftermath of climate-induced disasters, such as floods, is a recurring theme highlighted by multiple authors. Memon (2020) sheds light on the profound emotional trauma, emphasizing feelings of guilt and stress caused by an inability to meet family needs, which are exacerbated by societal expectations. Rahman (2013), who shares this sentiment, emphasizes the heavy burden placed on women during such disasters, depicting their caregiving responsibilities as a form of psychological violence. This viewpoint is consistent with Memon’s findings, emphasizing how women, who are primarily affected by floods, bear the brunt of caregiving tasks such as providing food and water. Furthermore, co argues about the numerous challenges that women face when fulfilling these caregiving roles. The authors highlight the prioritization of women’s responsibilities, which leads to girls leaving school to help their mothers with tasks like fetching water and cooking. Domestic violence and partner separation have a compounding impact during stressful situations, with the resulting family breakdown contributing to increased psychological stress. This shared emphasis on the emotional strain experienced by women in the aftermath of climate-related disasters reflects an agreement among the authors, painting an in-depth

depiction of the multifaceted challenges women face in these situations.

The discussion on community-based violence against women in the context of climate-related disasters, such as floods, is brought forward by several authors, shedding light on the shared vulnerabilities and challenges faced by women in underserved situations. Many scholars have pointed out limitations on women's mobility in countries such as Pakistan, Bangladesh, and India, during such disasters (Rashid & Michaud, 2000). These gender norms limiting women's mobility and access to shelter homes and rescue facilities due to fear of societal ramifications are often commonly found reasons by different authors, contributing to the increased vulnerability during disasters. Memon (2020) expands on this shared narrative by highlighting the specific vulnerabilities women face during disaster relief efforts, adding depth to the community-based violence discourse. The discomfort and risks that women face in shelters, compounded by the lack of gender-appropriate facilities, sanitation, and safety, are critical to this discussion. This perspective reinforces the belief that ignoring women's needs during disaster relief efforts increases their vulnerability to community-based violence. The authors collectively highlight how a lack of mobility and inadequate infrastructure perpetuates the cycle of violence against women in post-disaster scenarios, emphasizing the critical need for comprehensive and gender-responsive interventions.

The discussion by various authors surrounding physical and sexual violence in the context of gender-based violence (GBV) during climate-related disasters is worth mentioning to add depth to the discussion. Memon (2020) delves into the topic of physical violence, emphasizing the structural inequalities and emotional stress that women face when they take on the role

of man of the house during spousal separation and male family member migration. Domestic violence is normalized in such situations, and women accept it because of societal norms, which is a shared concern among these authors. Expanding on the discussion, the authors highlight the prevalence of unreported and hidden sexual harassment and assault cases in shelter camps, revealing victims' and their families' reluctance to report due to societal stigma. Nasreen (2010) highlights the lack of personal hygiene facilities in refugee camps, which increases the risk of sexual harassment and poses serious threats to women's safety. This proves Rahman's (2013) assertion about the increase in rape, kidnapping, and human trafficking during floods, emphasizing the vulnerability of young girls and women. Cerna-Turoff et al. (2019) and Sriskandarajah et al. (2015) attribute it to the ingrained chauvinist practice of violence against women, as well as the tendency to conceal and underestimate the emotional and psychological consequences of it in post-disaster situations. Madkour et al. (2011) add a nuanced layer to the conversation, emphasizing the long-term consequences of such violence. This discussion emphasizes the importance of addressing both the physical and emotional dimensions of GBV during climate-related disasters, while also acknowledging the issue's complexity.

## CONCLUSION

Bearing in mind how pre-existent vulnerabilities of informal settlements- particularly GBV- are exacerbated during climate-induced calamities, it is essential for their consideration to be made during intervention design. As such, programs and interventions must attempt to "un-skew" development by adopting a risk-based and inclusive approach. Therefore, interventions targeting the empowerment of women within *katchi abadis* should prioritize resilience building and address their underlying causes of vul-

nerability. To do so, Saad (2021) calls for a focus on efforts to improve women's coping capacities to manage vulnerability through targeted resilience-development initiatives.

To address the issue of Violence Against Women (VAW), numerous psychosocial interventions, safety and shelter residency programs have been implemented around the world. While only a few such psychosocial interventions have been implemented in Pakistan, they have shown promising results. These interventions include group counselling delivered by community health workers who have previously received counselling training, including empathetic listening for systematic problem-solving. A study conducted in Karachi to assess the efficacy of this program on women found that group socialization increased women's sense of empowerment. Moreover, positive changes were observed, particularly in women's emotional self-management, which included anger management and improved communication with family members (Karmaliani et al., 2012).

To further alleviate economic stresses and the economic dependence of women within informal settlements, a study conducted in Pakistan by Karmaliani et al. (2012) found that economic building training has a positive impact on the self-efficacy of women and their inter-family relationships. Both interventions showcase the effectiveness in addressing the contributing factors of gender-based violence with minimal resources. However, while such micro-level measures provide positive results, macro-level assessment with increased participation from the local government level would have more successful outcomes.

In conclusion, our assessment of the existing interventions addressing the exacerbation of gender-based violence by urban flooding within informal settlements presents that most of the programs involve

either awareness-raising techniques or trauma-informed approaches. In comparison, our research on the subject aims to fill the gap in the literature by merging a combination of interventions such as evidence-based tactics to combat GBV, activities aimed at empowering women and social safety initiatives to ease the socio-economic stresses of informal settlements during urban flooding.

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# LIVING RESISTANCE: CLIMATE JUSTICE STRUGGLES IN THE SINDHU DELTA

BISMA BARKAT  
([bismabarkatali@gmail.com](mailto:bismabarkatali@gmail.com))  
Habib University

## ABSTRACT:

Climate change is not a purely scientific or environmental issue; the current climate emergency is a consequence of the modern anthropocentric political, social, and economic order built by a “few wealthy” and yet unequivocally affects a “global poor” most vulnerable to it (Nixon, 2002). The climate justice framing of climate change implies that responses to climate change cannot be just objectively devised scientific solutions but must be contextualized within the social, economic, and political structures of our current world order (UNEP, n.d). In this context, this study looks at the case of the Sindhu Delta to explore how geographical modifications along the river Indus or *Sindhu*<sup>1</sup> have affected the livelihood, socio-cultural imagination, and reality of the inhabitants of the Sindhu Delta. Subsequently, I aim to investigate the subjects (Foucault, 1983) of the Delta resist and respond to this anthropocentric ecological destruction and climate emergency by presenting a detailed discourse analysis (Jager & Maier, 2016) of the documentary film *Water Scars* that captures narratives of local resistance in lower Sindh. Ultimately, recognizing an overarching role of gender in lived experiences, this essay emphasizes how gender shapes resistance and intersects with environmental issues within the social and cultural space.

**Keywords:** *Geographical modifications, discourse, acts of resistance*

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<sup>1</sup> Common name used for the River Indus in local Sindhi lexicon

## INTRODUCTION

The Sindhu Delta, in the South of Sindh, is a triangular body of land and water where the river Indus meets the Arabian Sea. As a wetland off the Arabian Sea coast, the Sindhu Delta has gone through various ecological and environmental transformations owing to geographical modifications made in the region that exacerbate the effects of climate change (Karrar, 2021). These changes pose challenges for the vulnerable population and thus hold a critical place in global discourses on climate justice. Geographically, the Sindhu Delta stretches out to the districts Badin, Thatta, and Sujawal in Sindh. These districts, located on the Delta, have been home to richly irrigated land and freshwater streams that allowed it to be identified for its glory and riches (Hasan, 1989). However, the Delta is currently devastated because of the ecological changes caused by anthropocentric activities that altered the river's flow and climate change-induced rise in sea level (Karrar, 2021). This environmental transformation in the Delta has multifaceted effects that have changed both the environment and, thus, its extensions, such as the social, cultural, economic, and political landscape. It is, therefore, important to contextualize these effects and their causes in the various structures that contribute to climate change and the devastation of the Sindhu Delta.

The climate justice framing of climate change implies that the issue of climate change is deeply rooted within the social, economic, and political context of our current world order (UNEP, n.d). Climate justice then calls for action that is cognizant of the global inequalities of both responsibility and potential to gauge the issue of climate change (UNEP, n.d). Studying and researching the power systems that alter the natural forces causing material changes that inform climate justice struggles is essential in this context. In this context, there needs to

be more research in Pakistan to study local and grassroots climate justice movements, particularly outside urban activism and in the periphery. This research aims to expand on global literature on grassroots resistance and climate justice struggles in the Global South. The project explores the struggle for climate justice in the Sindhu Delta, which has long been facing the various geographical modifications that exacerbate the effects of climate change since the time the British occupied Sindh in the 1800s (Hasan, 1989; Kamal, 2019; Karrar, 2021).

The rationale behind the current study is the lack of engagement with peripheral climate justice struggles despite these spaces being very vulnerable to the effects of climate change. I aim to understand how mega-developmental projects of geographical modifications disrupt entire local ecosystems and fuel resistance in climate justice struggles. In this context, I analyze the documentary film *Water Scars*, which captures on-ground narratives of the horrors brought by the Left Bank Outfall Drain (LBOD) project by people living in these southern parts of Sindh. I aim to understand how the people of Sindhu Delta counter the institutional discourses that enable projects like LBOD. The study recognizes the overarching role of gender in the social fabric and its role in shaping acts of resistance. I thus delve into questions of how gender identities and relations in the Sindhu Delta influence the resistance strategies and experiences of individuals and communities affected by climate change.

The study aims to explore the following three questions:

1. How do the ecological changes and challenges caused by geographical modifications inform the cause of climate justice for activists of the Sindhu Delta?

2. What narratives and strategies are employed by the subjects of Sindhu Delta?
3. How does gender play out in resistance in the Sindhu Delta?

### Study Objectives

The local populations, their everyday narratives, and acts of resistance present alternative avenues and discourses of imagining climate justice struggles that are not centered in places of power but in grassroots organizations. Without engaging with climate justice struggles in these vulnerable peripheries, climate justice discourse has come to be dominated by a few powerful factions that are also the major contributors to it. In this context, the study both adheres to and contributes to research on the nexus of climate justice, gender, and conflict/peace by investigating how abstract conflicts in imaginations of natural elements cause ecological changes and how gendered lived experiences of these changes inform particular expressions of resistance in the struggle for climate justice.

## REVIEW OF LITERATURE

There is a plethora of global literature that discusses the centrality of natural elements in geographies such as that of riparian communities where the river flow determines the processes that shape and organize the physical habitat of biotic communities (Zeirnger et al, 2018). The physical flow and movement in a river, particularly through the movement of water and sediment, define the habitat of these wetlands. The physical forms of these Deltaic wetlands, the aquatic life, and the livelihoods are significantly shaped by the way a river flows; however, the global patterns of increasing water demand have reduced rivers to sources of water without taking into account the systems of life associated with it (Clift et al., n.d; Zeirnger et al., 2018). Consequently, engineering interventions of building dams,

barrages, and such reservoirs on rivers have already resulted in half of the world's water-accessible water being appropriated for human use (Zeirnger et al., 2018). This research study borrows from the concept of Terraforming discussed by Amitav Ghosh (2021) in his book *The Nutmeg's Curse* to locate anthropocentric colonial metaphysics that manifests in anthropogenic activities such as building on riverbeds that disrupt the natural flow of rivers.

### Terraforming and the Sindhu Delta

In his novel *War of The Worlds* (1898), HG Wells depicts an advanced race of aliens that aims to take control of Earth and reform its surface. Wells' inspiration for this work is said to have come from British colonial projects of conquest, extraction, and elimination of Indigenous people in Tasmania (Ghosh, 2021). This project of molding the land was later referred to as terraforming by Jack Williamson in 1942. Williamson's neologism *terra*, meaning land, and *forming*, meaning molding or making, makes up the conceptual framework of land-modification, land-making or land-molding. Like the legal fiction of *Terra Nullius*, *Terra* or land violently transformed material elements and indigenous imaginaries of lives and livelihood. Ghosh takes this science-fictional concept and applies it to the colonial transformation of planetary environments. Through terraforming, Ghosh shows how geographical modifications mold and engineer natural landscapes of Indigenous lands to resemble European models that enable European settlements. I juxtapose Ghosh's use of *Terraforming* in the context of this study to explore how reengineering the natural ways of rivers attempts to transform the ecology of the Sindhu Delta and, by that extension, the socio-cultural imaginaries of the people in the Sindhu Delta. Like Ghosh's exploration of Terraforming in the North American context, modifying the natural ways of the river Indus, the Sindhu Delta has been violently deprived of its life

source: its fair share of water. Subsequently, I employ Foucault's (1983) concept of Discourse as a "way of talking (linguistically or non-linguistically) that regulates and reinforces action and thereby exerts power" to discuss how the inhabitants of Sindh Delta as subjects in the Foucauldian sense are social constructions of the effects of this Terraforming respond to and resist these geographical modifications (Jager & Maier, 2016).

### ***Geographical Modifications as an Inheritance of Colonial Episteme***

Indus met this fate of geographical modifications when the British colonizers took control of India in the 1800s; they began to survey the rivers to maximize their irrigation potential (Gilmartin, 2003). Archival documents from the colonial era, published in *The Journal of the Royal Geographical Society of London*, paint images of the Delta and the activity on this piece of land (Carless, 1837; Tremenheere, 1867). Carless' account draws on the imagery of the multiple creeks he had witnessed, the jungles of mangroves, and the fisheries operating on the various creeks and their economic life. Colonial archival records of studying the Delta and the movement of flows of rivers and their significance to the life of the Delta and its inhabitants (Tremenheere, 1867). The British canal irrigation system gradually began to be installed at different points on the Indus under the Punjab canal colonies (Gilmartin, 2003). The premise behind this engineering project of altering the river ways was, Gilmartin explains, to reduce water from being wasted by flowing into the sea. The arbitrary Radcliffe line drawn by the British could neither discontinue the flowing rivers nor the logic that the colonial episteme of nature had imposed on the subcontinent's population. Thus, after the partition of the subcontinent, Pakistan and India got into a conflict over the division of the Indus River distributaries (Mustafa, 2010).

Conflict of water at the international level combined with tensions of subnational level hydro-politics between Sindh and Punjab (Anwar, 2014; Hadi, 2015; Mustafa, 2010). Sindh's conflict with Punjab was settled with the Inter-Provincial Accord of 1991, which allocates a share of the Indus to all four major provinces; however, due to the barrages and dams diverting the river's natural ways of the river (Hadi, 2015; Mustafa, 2010). This means the water flowing down the Indus does not flow below Kotri to reach the Delta except in the aftermath of floods due to excessive rains. Consequently, the Delta is deprived of its allocated 10 MAF (million acre-feet) of Indus waters, according to the Inter-Provincial Accord of 1991 (Hadi, 2015; Mustafa, 2010; Siyal et al., 2018).

Before the Punjab canal colonies had taken their full shape and the barrages were established to prevent "water from being wasted," the Indus River would discharge 200,000 water cubicles into the Arabian Sea (Hasan, 1989). Geographical modifications such as dams disrupt the natural ways of rivers, making way for further geographical modifications. The LBOD is such a project in the continuity of this colonial episteme. It was a mega project initiated in the 1980s and 1990s through the support of international financial institutions, the World Bank, and the Asian Development Bank, with the support of local bureaucratic agencies such as WAPDA and governing powers (Memon, 2006).

Geographical modifications such as dams that restrict the fresh flow of water and artificial drainages such as the LBOD disrupt all the natural mechanisms of water flow. In the absence of the flow of fresh water from the river and the increased saline effluents entering through the failure of the LBOD, the sea waves easily encroach on the land, destroying crops and causing salinity in the land in southern parts of Sindh (Si-

yal et al., 2018). Thus, due to this altering of the river's natural ways in the continuity of the logic of productivity and maximization, the people of the Sindhu Delta have been deprived of their livelihoods (Karrar, 2021).

### *Resistance and Action for Climate Justice*

Dunckmann and Hein (2020) recognize that one of the biggest avenues of hope in these times of current ecological destruction and climate emergency is how societies and communities respond to these climate-induced changes caused by a relatively small and wealthy section of the global population yet affecting those least responsible and most vulnerable to these changes. As discussed in the above sections, different circumstantial effects cause different vulnerabilities in the case of the Sindhu Delta, even when the entire population is vulnerable by geography.

Different groups of people are affected in different capacities based on their class, caste, and occupation (Bux Mallah, 2013). The circumstances of their vulnerabilities and effects endured by these groups based on generational suffering inform how they resist these challenges posed by climate change and the human-made social order (Dunckmann and Hein, 2020; Kotze and Knappe, 2023). A study by Daoud (2021) in Egypt draws the connections between gender and climate vulnerability; the study found that gender relations had a significant role in how different individuals experienced challenges caused by climate change (Daoud, 2021). In the same study, it is also shown that by the gendered position, these individuals resisted different impositions and challenges differently.

In this context, the current study aims to combine these various aspects of the effects of the geographical modifications in the Sindhu Delta and weave them together. Building on the various literature pieces

discussed above, I aim to explore how the effects of geographical modifications shape the imagination of the people of the Sindhu Delta, particularly how they resist the forces that transform their land and other natural elements deeply connected to their ways of life.

## METHODOLOGY

### *Discourse and Subjects*

This research study aims to determine how inhabitants of the Sindhu Delta conduct resistance and how the geographical modification of their living space informs their acts of resistance. The framework for this research concerns what modes of knowledge inform the action of resistance in the face of ecological transformation due to geographical modifications. Subjects acquire this knowledge from the discursive surroundings in which they are born and live. Therefore, knowledge of subjects is deeply embedded in their discursive surroundings, such as in the material, cultural, and social environment and the particular articulations of these discursive elements that make up the reality of these subjects (Jager & Maier, 2016). This research design aims to center the voice of the inhabitants of the Sindhu Delta as subjects fighting for climate justice. Building on Foucault (1983) and Link (1982), Jager and Maier (2016) develop a method that reads discourses as a material reality in themselves. Discourses are thus created by and further create subjects (Althusser, 2006; Foucault, 1982; Jager and Maier, 2016). The concept of subjects employed in this study emphasizes the active side of individuals in a living space who are shaped by discourses of that place and further to it. For this study, I conceptualize resistance in the Sindhu Delta as a discourse shaped by the material transformation of the ecological space of the Delta by its inhabitants, who are directly affected by these effects.

### Research Design and Rationale

This exploratory study explores the discourse of resistance in the Sindh Delta and how it is shaped by the geographical modifications of the land and rivers, affecting how these subjects imagine and experience their material reality. For this purpose, the study weaves together findings from a review of literature available on the Sindh Delta that discusses the geographical modifications made on the river Sindh and the adverse effects of these on the livelihoods of people living in the Delta. Subsequently, to study what I have conceptualized as a discourse of resistance in the Delta, I analyze a documentary film, *Water Scars*, produced by Lok Sujag in the aftermath of the 2022 floods. The reason behind looking at the resistance discourse in the Sindh Delta through the documentary *Water Scars* was two-fold. First, the documentary was made in the aftermath of the recent floods to present how these natural calamities do not appear in a vacuum but due to anthropocentric engineering of the natural environment; secondly, because the documentary is produced and made with local activists and experts. This documentary precisely features the narratives of people who are part of the climate justice struggle in the Delta and are engaged in the constant creation of the resistance discourse in the Sindh Delta.

### Method of Analysis

For the discourse analysis of the documentary *Water Scars*, I treat the film as a discourse strand (Jager & Maier, 2016). A discourse strand is a micro-unit of a discourse that looks at a larger discourse at the level of concrete utterances or performances in a particular text. Through a diachronic analysis of the documentary film, by looking at what is being said and done in the context of a larger discursive framework of time (since the Delta has experienced overt consequences of these geographical modifications) and space (the Delta), I aim to highlight the particular ways in which re-

sistance is conducted and executed in the Sindh Delta. I focus on the spoken word about how the space is imagined, which then translates into specific actions by the subjects of the Sindh Delta displaying specific kinds of resistance.

### DISCOURSE ANALYSIS: WATER SCARS

The documentary film *Water Scars* (2023) was produced by Lok Sujag, a platform for investigative multimedia journalism. Lok Sujag is a not-for-profit organization registered as a limited company in the United Kingdom. It operates as a digital news organization in Pakistan. The film was produced after the 2022 floods that devastated many parts of Pakistan, with Sindh and Balochistan being the most affected. The film particularly explores the effects of these floods in the Sindh Delta due to the diversion of natural waterways under the LBOD project. This project's focus to bring forth the effects of the floods on the Delta, which suffered not at the hands of the floods but because of the secondary effects of the LBOD, ties up to the platform's commitment to reporting from areas "that are ignored in the mainstream" (Lok Sujag, 2023).

The platform's website explicitly presents the standard of journalism they identify with, in that Lok Sujag is not interested in everyday fast news coverage. Instead, they present that they aim to give more value to context and critical coverage in whatever stories they present. They claim they cover 'hard news,' which is critical to "cover real places, tell the stories of real people, and report real events" (Lok Sujag, 2023). This is visible in how the film captures the lived realities and on-ground narratives of the locals of the Delta. The film features local academics, activists, poets, and residents to problematize the LBOD infrastructure instead of featuring any policy experts or bureaucrats, displacing the idea that prob-

lems of structures can only be evaluated by ‘objective’, third-party experts. It establishes that the most efficient evaluation of a policy comes from those who live the effects of it. This restores the agency of the locals often overlooked in mega-development projects such as the LBOD.

The LBOD is a massive engineering project initiated in Lower Sindh to resolve waterlogging and salinity issues emerging due to wastewater from industries built along the Indus River (Nawaz, 2022). The LBOD was primarily designed to reconstruct waterways to increase agricultural production in Sindh and targeted about 1.27 million acres of Cultivable Command Area (Vistro et al., 2021). It is this transformation and modification of the landscape that the film begins with, as Salman Jakhro, a poet from the district Thatta in the Delta, recites a few couplets from his Sindhi poetry. The first few lines from Salman’s recitation translate to: “Today where there is a road, yesterday the river used to flow from here.” As Salman sings his poetry narrating the transformation of the landscape in the Sindhu Delta, the film shows him sitting in different places in Thatta, such as between the deteriorating heritage sites of Makli or in boats at the shore of waters that can never be classified as the river or the sea. These lines reflect the fact that the natural ways of the river have been disrupted, which has impacted the physical, socio-economic, and cultural landscape and imagination of the people of the Delta.

One of the interlocutors in the film, Ali Nawaz Dalwani, refers to the rivers *Hakra* and *Puran* as a “blessing” for the livelihoods of the Sindhi people. He remarks that these natural streams of water would discard wastewater from the Indus to the sea; his narrative emphasizes the sufficiency of natural systems in their collective imagination. Dalwani presents that the natural drainage system consisting of the *Hakra*

and *Puran* could carry 100,000 and 125,000 cusecs of water, respectively, for disposal in the sea; on the other hand, the LBOD disrupts both of these and eats them up for a canal drain that can only carry 4600 cusecs. The LBOD modification plan, however, disrupted these natural flow systems by building four drains: Spinal Drain, Kadhan Pateji Outfall Drain (KPOD), Dhoro Puran Outfall Drain (DPOD), and a Tidal Link, that would discard the wastewater flowing from the upper parts of Sindh into the Shakoor Lake (Nawaz, 2022). The LBOD plan’s modifications were flawed; Nawaz (2022) identifies that since 80% of Shakoor Lake is under the control of India, this drainage needed to be repurposed so that the wastewater could land in the Arabian Sea. These modifications to drain the wastewater from upper Sindh into the Arabian Sea defied the natural riverways, allowing the sea to encroach on land in southern Sindh during high tides (Nawaz, 2022). The LBOD was built to re-route the passage of wastewater and saline effluents from lower Sindh districts to the Arabian Sea. However, this infrastructure has failed and is counterproductive (Nawaz, 2022).

Nawaz (2022) discusses a variety of reasons why the LBOD has been more harmful than useful for this purpose: The water system in Pakistan naturally flows from the North to the South, and the drainage laid out at Shakoor Lake under the LBOD project defies this natural logic neglecting the possibility of high velocity of coastal winds that can lead to cyclones that Southern Sindh is prone to. Another major issue arising from this geographical modification is that when the coastal tides turn high, water flow from the sea into the lands is reversed, causing salinity and affecting the flora and fauna of these southern districts. Thirdly, despite international funding, the LBOD infrastructure is visibly weak and has collapsed multiple times since the project was initiated. The KPOD collapsed in 1999;

various other segments in the spinal drain of the LBOD and the tidal link that directly connects with the sea through KPOD have also collapsed multiple times, making way for saline effluents to enter drinking water bodies, fertile land, and ultimately disrupting livelihoods of populations in these places. Finally, one of the biggest flaws of the LBOD infrastructure is that it is inadequate for the kind of water discharge that Sindh has been experiencing from rains due to climate change. The 2011 rains discharge was 14000 cusecs while the LBOD drainage capacity was only 4600 cusecs; this is telling of the effect that the 2022 rains, which have caused havoc in the region, was expected, as the discharge rate for these rains was more than twice the average capacity of the drainage system (Nawaz, 2022).

The rains in July of 2022 caused an unprecedented accumulation of water, which the LBOD drainage system could not manage (Nawaz, 2022). Around 1.07 million people residing in districts Badin, Umerkot, Mirpurkhas, and Tharparkar of lower Sindh were displaced with a loss of 5 lakh acres of Land (Pirzada, 2023). Dalwani is a resident of Sub Division Khairpur, Gambo, in district Badin, where he points towards a piece of land that used to be his family's mango gardens and recalls the prosperous times. He said the floods had taken away everything from him; this 'calamity' left everyone: men, women, and children screaming alike, and compares the literal darkness of those nights to the darkness they were to experience after it. Dalwani recalls these nights as 'qayamat,' a disaster not of nature, which he believes has always been this way; these 'disasters' he identifies are not caused by nature but because of systemic injustices and complicity of the governments and people in power. Similarly, Khadim Talpur, a local activist of Badin, recalls how a single night of the flood's wrath killed 70 people from his village and over 700 in a week.

Professor Ismail Kunbhar remarks that the Delta has dried out due to this disruption caused by geographical modifications and disruption of water. Various interlocutors emphasize these natural elements of land and water and how these are the fundamental source of all Delta livelihoods. The disruption of water, the source of livelihood in the Delta, has caused serious harm to the Delta's ecology, and the Sindhu Delta's socio-economic conditions have drastically deteriorated (Khan, n.d). The restriction of river water flows has restricted the deposits of silt and sediment that make these wetlands optimal irrigational lands for growing various crops like rice, sugarcane, banana, maize, and onion (Anwar, 2014; Karrar, 2021; Salik et al., 2016; Tremenhoe, 1867). Anwar (2014) shows that between 2008 and 2010, Pakistan incurred agricultural losses worth PKR 5,656.247=/million in the Delta due to a lack of fresh water. Furthermore, Sindh's total fish production declined from 464.7 (000) tons to 345.9 tons between 1999 and 2006 due to the loss of mangroves (Anwar, 2014). This loss brings the difference in fish production to 118.9 (000) in just 8 years. The artificial earthworks and canal building have disrupted the water equitably distributed through a natural system. Now, most areas are challenged either by water-logging or salinity, which has hurt agricultural activity in the Delta and caused food insecurity for its inhabitants, who rely on self-grown food (Karrar, 2021). These hazardous living conditions, such as food insecurity, are caused by the loss of crops, further exacerbated by a lack of financial capacity to afford food resources (Rasul G. et al., 2012). Most of the current population living in villages of Sindhu Delta are fisher folk living under constant threat due to a lack of fish and industrial fishing activities (Karrar, 2021). A 2018 report that extensively researched the socio-economic conditions of the Delta found that 62% of respondents from their sample size of people living in

the Sindhu Delta earned between 10,000 and 30,000 and believed that this income was insufficient for them even to meet their basic needs (Siyal et al., 2018). Under these circumstances, the living conditions in the Sindhu Delta are highly fragile, causing financial insecurity and occupational hazards.

Land relationality and cultural imaginaries are central to how most interlocutors perceive the LBOD and its effects. The Sindhu Delta and its surrounding habitats are made by and for various diverse ecosystems, including riverine forests, irrigated plains, brackish wetlands, creeks, mudflats, marshes, mangroves, and lakes (WWF Pakistan, 2023). This biodiversity of the Delta and its relationship with the socio-economic and cultural landscape is deeply embedded in the lore and stories. The Delta is also a seasonal home for migratory water birds important in Sindh's collective cultural memory and imagination, such as in various folk songs; the Delta also houses some rare fish, including giant snakehead (*Channa marulius*), Indus *baril* (*Barilius modestus*), Indus *garua* (*Clupisoma nazi-ri*), Rita catfish (*Rita rita*) and the rare and magnificent Indus river dolphin (*Platanista minor*) (WWF Pakistan, 2023; Raza SM et al., 2023). The transformation of the environment has also resulted in the reduction of biodiversity. Significant numbers of flora and fauna who find their habitat in the Delta have effectively, like the people of the Delta, been displaced and left homeless (Raza SM et al., 2023). The Indus Basin also houses 127 different kinds of freshwater fish species; one of the most famous and important among them is the Palla fish (*Tenulosa ilisha*), the palla fish migrates between the sea and the river spawning in two different seasons, whereby the most significant spawning occurs in the downstream segment of the Indus Delta (Raza et al. SM, 2023). However, building barrages and dams on the river has also reduced migration of the Palla, shrinking its breeding ground (Raza

et al., 2023). The loss of this biodiversity effectively transforms the sociocultural imagination of the people residing in these diverse ecosystems, who have passed down the stories from generation to generation.

Many interlocutors recall from what are collective memories of abundance that are consistent with the findings from the literature review as well. Dalwani explains that “if you read about these places and our villages, you will find that there were entire villages settled here; how else do you explain these shrines of saints, of course, there were people here who built these spaces and gave them life” (Lok Sujag, 2023). Karrar (2021) presents that in the memories of the locals, the ports of the Sindhu Delta were hubs of trade and commercial activity, which implies that the families of these locals used to live in abundance. In today's times, when the people of the Sindhu Delta have been pushed into poverty, living between scarcity, dispossession and under the fear and anxiety of leaving their lands, collective memory is an essential linguistic tool of meaning-making in the resistance discourse of the Sindhu Delta. Through the explicit language visible throughout the film, the people of the Sindhu Delta communicate their rage and disappointment in language that would otherwise be tone-policed and censored in mainstream media. The film is set in the aftermath of the August 2022 floods in Sindh that left many people displaced and much of the landscape devastated; however, the narratives that people present in the film are consistent with an established discourse of resistance. This discourse of resistance is grounded in strong relationality with the land and trust in the cultural knowledge of natural systems.

An interlocutor questions, “Why are we not given the water that was promised to us? I mean, that was a decision taken by the government, not my dad.” Two studies (Khuhwar et al., 2018; Naseem et al.,

2018) conducted at the Indus aimed to assess the quality of water in the Deltaic region found that the water possessed fecal material and other chemicals that made the water undrinkable as per the WHO guidelines (Khuhhuwar et al., 2018; Naseem et al., 2018). Under such life-threatening situations, many who can migrate and those who do not have the means to settle are forced to leave their lands for better living conditions. Studies project that there will be a surge in migration and displacement under these precarious living conditions of the Deltaic regions (Ebrahim, 2020). A recent study by the Asian Development Bank on the vulnerabilities of climate change in Pakistan presented that at the current rate of climate change, coastal areas of Pakistan are likely to be most vulnerable, with 50,000 people living at risk of being displaced (Khan et al., n.d). Khan et al. (n.d) also discuss how this climate-induced migration and displacement also results in a loss of identity for these people who move from their hometowns to fishing villages in Karachi but do not feel a sense of home, with no options for a secure life and future, these populations are forced to leave their homes. Another interlocutor remarks that in the Delta, the river is made to either leave us to dry out or drown us in the flood season; these are the extremes forced upon us.

Protests and marches are common acts of resistance in the Delta. Various interlocutors in the film refer to the many marches they have organized locally and outside their villages, towns, and the federal capital of Islamabad. These protests, marches, and verdicts are fresh in the memories of the locals and serve as the grounds for their climate justice struggles. Kamal (2019) traces the history of the grassroots organization Pakistan Fisherfolk Forum and their politics of resistance to mobilizing the fisher folk communities of Sindh Delta. Kamal shows that the fisher folk forum conducts its mobilization grounded in its particular

position of vulnerability and relationality to land. The language these fisher folk employ to claim their right to the river transforms it from being just a waterbody in the scientific sense to a “politically interpreted territory linked with the Darya and the people of the Darya—the fishers. Particular experiences and relations of various people then shape resistance in the Delta.

In another protest in Badin, several activists organized a protest under the ‘*jail bharo tehreek*’, this movement had clear goals, and what it called on was for authorities to “either give us water or put us in jail, at least we will get food and water there”. The protests’ language and narrative show how rivers and land are essential elements of being in their socio-cultural discursion. Dalwani remarks that “Protest is necessary for us; each day of protesting and marching costs us a meal on our children’s table.” This is particularly applicable for women, who, as runners of the household and caretakers of children, do not get to leave the house space to register their protest.

Resistance in the Delta is organized through systematic channels and official ways of the challenging institutional discourse of ‘development’ and progress that paints locals who resist it in orientalist tropes of being ‘backward’ and ‘ignorant,’ as the local journalist Abdul Ghafoor remarked. A group of local activists and experts, after the 1999 cyclone, reached out to the World Bank authorities to highlight the faulty infrastructure of the LBOD. Their efforts led to the World Bank sending a team to evaluate, ultimately acknowledging the faulty design of this mega-project. Interestingly, one of the interlocutors quotes projections from the same World Bank that by 2050, the sea will entirely eat up the Sindh Delta. He asks, “Where are we going to go then?”

So far, the documentary's depiction of resistance in the Delta is from a general point of view, that is, by men, except for just one female interlocutor, Makkal Shah. Toward the end of the documentary film, a sequence is depicted with particular engagement with the gendered challenges of women. According to Daoud (2021), women in Egypt, much like women in the Sindh Delta, are disadvantaged in different ways, with layers of vulnerability embedded in the social structures of patriarchy. A singular scene is depicted with women fetching water from the streams and hand pumps, Salman Jakhro reciting another one of his poetry; the lines translate to "the stream has become Salty, the vibrant green leaves have also wilted away" (Lok Sujag, 2023). In the Sindh Delta, too, women have a special vulnerable position in the socio-ecological landscape. Guriro (2020) writes in an article that "water is a female responsibility." in a landscape where drinking water is found far-fetched distances, it is the responsibility of the female in the household to collect water for the entire household, later on, when men move to urban spaces it is the woman's responsibility to look after the household in a fragile socio-ecological space where both the climate conditions and gendered norms limit her mobility (Guriro, 2020). In an article for the Friday Times, Zuhair Pirzada (2022) discusses the experiences of women who are forcefully displaced due to ecological destruction and have to face an additional layer of isolation and difficulty due to their gendered position.

This sequence, playing with Salman's poetry, presents how the ever-changing ecology of the Delta and its water bodies affects the inhabitants concerning their particular position. Various women from a village in Keti Bandar, district Thatta, articulate their particular challenges that range from difficulties in access to sexual and reproductive healthcare to the excessive burden of house chores. Haleema Bibi narrates

how one of her daughters-in-law had to give birth on a boat on their way to the city; she records that "our village has no hospitals, and all facilities have been distanced from us due to the flood water that we are being submerged into." Quoting the human rights activist and lawyer Abira Ashfaq, he writes that there are three ways in which women are particularly affected; first, during migration, men tend to move to settle and then bring their families; this leaves women in isolation and charge of more responsibilities than just household chores; secondly they lose access to economic activity due to displacement and loss of land which often goes unacknowledged because culturally women's labor is not given its due value; third and finally, women in areas such as the Delta, with lack of access to healthcare and education are further marginalized from accessing social facilities more than men who have greater mobility (Pirzada, 2023). Resistance for these women then becomes a part of their everyday acts of living in the face of this destruction as they continue to do their social and reproductive labor.

Similarly, by virtue of their particular gender position, men are culturally assigned the role of the breadwinners. When economic distress hits due to various climate-change-induced factors, it affects their mental health. A news article published by the Express Tribune in 2023 cited a public press conference in the Delta where local politicians cited that 41 suicides had been reported in Thatta district in a month alone; this number included both men and women (Tribune, 2023).

Even so, the subjects of the Delta display what in their discursive realm is a kind of radical hope, as reflected in the words of Dalwani: "We are holding onto hope, someday our nature will take its proper course, our villages will be green and vibrant again, we may not see it, our children might, if not them then their children might, but we will

continue resisting, we will continue hoping.” In the closing sequence of the documentary, Iqbal Haider, a Climate Activist and Development practitioner, emphasizes the need to center the narratives and knowledge of local Indigenous populations in institutional discourse. Their struggles, he implies, are central to all discourses of climate justice that take place at any level.

Iqbal Haider’s statement also echoes and underscores this research study’s aim.

## CONCLUSION

This study has highlighted how geographical modifications in the Sindhu Delta affect people’s social and cultural imagination. Employing the conceptual instrument of *Terraforming* (Ghosh, 2021) on literature about geographical modifications along the Indus River from colonial rule to the post-colonial state-led developmental projects such as the LBOD, this paper has shown how a change in the environment in the Sindhu Delta has altered the social landscape and cultural imagination of the inhabitants of Sindhu Delta. The paper explores resistance to these projects from a gendered point of view as a discursive system of knowledge shaped by the subjects of the Sindhu Delta, which simultaneously shapes these subjects. Through a discourse analysis of resistance discourse in the Delta portrayed in the documentary film *Water Scars*, I present that through various linguistic means and actions, the inhabitants of Sindhu Delta resist and disrupt institutional discourses of anthropocentrism that enable projects of geographical modifications on land and river. The paper weaves a nexus between conflicts in the imaginations of natural elements and how they translate into different material actions and relationships with natural elements. The paper finds that since the effects of geographical modifications in the Delta are gendered, where men and women experience these effects differently, how they

resist these changes and challenges is also gendered. While men have the means to express resentment and register their protest socially, women’s experiences of resistance are not as visible.

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# NAVIGATING CLIMATE CHAOS: A GENDERED ANALYSIS OF URBAN FLOODING IMPACT IN KARACHI'S VARIED SOCIO-ECONOMIC LANDSCAPES

**AMSAL MALIK**

(am07264@st.habib.edu.pk)  
Habib University

**NAJAM SAHAR**

(ns08421@st.habib.edu.pk)  
Habib University

**AAMNA AHMED**

(aa07629@st.habib.edu.pk)  
Habib University

**SYED AHAD**

(sa07753@st.habib.edu.pk)  
Habib University

**ZEHRA TEJANI**

(zt08576@st.habib.edu.pk)  
Habib University

**SYED ZASHIR**

(sz07208@st.habib.edu.pk)  
Habib University

## ABSTRACT:

Pakistan contributes to less than 1% of the global carbon footprint but it is one of the top 10 countries vulnerable to climate change disasters. Karachi, the metropolis of Pakistan, stands on poor urban planning and governance. Climate change events like heat waves and urban flooding have had a lasting impact on Karachi's population, disproportionately on women. This study adopts a gendered lens to qualitatively capture the lived experiences of flood-affected individuals, especially women in three different neighborhoods of Karachi varying in terms of economic income. The findings of this study will emerge from expert interviews and surveys of flood-affected individuals from Karachi. Our research contributes to the expanding literature on how climate change gives rise to gender inequalities and how women from different socio-economic backgrounds in Karachi are coping with the aftereffects of climate change disasters. Our findings aim to equip researchers, policy experts, and development practitioners with gender-sensitive insight when designing policies to mitigate the impact of climate change in Karachi.

**Keywords:** *Climate change, gender inequality, urban flooding*

## INTRODUCTION

The devastating monsoon rains in Karachi in recent years have highlighted the infrastructure failure at the city level. Climate change entails disastrous consequences for people's livelihoods. Women suffer the impacts of climate-related disasters disproportionately more than men (Adhikari, 2020). In a Pakistani household, the magnitude of a woman's role as the primary caretaker intensifies during the onslaught of urban flooding. This reality is especially complex for women in urban poor households, manifesting as low adaptive capacity, lack of resources, and minimal financial and social autonomy. Low-income communities mostly live in the least suitable urban regions regarding hygiene and safety (Douglas, et al., 2008).

Areas like "Defence Housing Authority" (DHA) Karachi get flooded with monsoon rainwater because many houses are built on the floodplain area (Iftikhar & Iqbal, 2023). In the context of climate change and gender, this reality disproportionately affects the livelihoods of women. Difficulties and challenges are compounded in terms of increased indoor labor such as housekeeping, looking after children, and the management (removal and prevention) of floodwater. Consequently, it is imperative to investigate the impacts of floods, the way they exacerbate gender inequalities, and how women from different socio-economic backgrounds in Karachi experience and manage them.

## METHODS AND METHODOLOGY

### Research Design

This study used a phenomenological approach to understand the lived experiences of people who experience urban flooding in Karachi (particularly women). To achieve this, open-ended surveys and expert inter-

views were conducted in three flood-prone districts in Karachi.

### Sampling

Quota sampling was used to recruit participants from three out of seven administrative districts of Karachi: Karachi East, Karachi Central, and Karachi South. Within every district, quotas were established to ensure equal distribution of genders. Even though the intent was to maintain a 50/50 ratio, the final sample was ( $n=87$ ) which resulted in a higher representation of females (62%) than males (36%). This was due to more willingness shown by female respondents to fill out the survey. For interviews, the study used purposive sampling, and specifically expert sampling to reach out to six experts who had some ground experience or academic knowledge about these communities.

### Data Collection

The survey comprised close-ended questions that were used to collect demographic information and open-ended questions that allowed the respondents to elaborate on their personal experiences.

Six in-depth interviews were also conducted with experts knowledgeable about urban flooding in Karachi. These experts were chosen based on their expertise and diverse areas of work. They were academics, practitioners, and activists. Interviews were collected at different stages of the study to get a better understanding of these communities. All interviews were structured differently as they were designed for various experts.

### Data Analysis

For data analysis, thematic analysis was used to gather emerging themes and patterns. This method was chosen as the focus was to capture the perspectives of residents during floods for further understanding.

## LITERATURE REVIEW

While Pakistan inhabits approximately 240 million people, it contributes less than 1% of the world's total greenhouse gas emissions. Despite this relatively low emission rate, the nation ranks as the eighth most vulnerable country to the climate crisis (Runde et al., 2023). Karachi plays a vital role, generating a significant 65% of the nation's tax revenue and contributing a substantial 25% to the overall GDP. Notably, Karachi's GDP alone amounts to a staggering \$449 million per day (Effendi, 2020). Haphazard urban planning and neglect of drainage infrastructure exacerbate the effects of urban flooding in Karachi (Sawas et al., 2020).

Adding to the vulnerability of Karachi in times of urban flooding, the government has failed to invest in a proper, well-functioning drainage system which has resulted in multifaceted problems during the monsoon season. Inadequate drainage appears as a significant factor that contributes to urban flooding in Karachi (Toheed, 2023). Karachi has slums and squatter settlements around its streams or nullahs. As Pakistan faced record-breaking rain in 2022, the Gujjar Nullah waterway overflowed. According to one of the flood-affected individuals, every time it rains in Kausar Niazi Colony, water flows into her house and into her neighbors' houses carrying diseases and mosquitoes (Siddiqui, 2022). Floodwater brings different sorts of organic waste into people's homes having disastrous implications for health and sanitation (Douglas, et al., 2008).

Marginalized groups in Karachi face heightened vulnerability to urban flooding due to a confluence of factors. Socio-economic inequalities play a significant role, as low-income communities are often relegated to areas with inadequate infrastructure, such as poorly maintained drainage systems or lack of flood barriers. This inadequate in-

frastructure makes these communities more prone to the devastating effects of flooding and creates unequal impacts across different social classes (Douglas et al., 2008; Qureshi et al., 2021).

Furthermore, gender inequalities exacerbate this vulnerability. Societal norms restrict women's mobility, decision-making power, and access to resources during disasters (Fatima, 2022; Singh, 2020). Studies by Kaker and Anwar (2023) highlight how socio-economic class and political representation further impact women's experiences of urban flooding in Karachi. Additionally, research by Sadia et al. (2016) and Nosheen et al. (2023) demonstrates that women are disproportionately vulnerable to the health risks associated with floodwater contamination.

Finally, the lack of representation of marginalized groups in planning processes further compounds their vulnerability (Rainard et al., 2023). Without a voice in decision-making, these communities are often left to bear the brunt of inadequate infrastructure and disaster preparedness plans.

The lack of understanding about women's issues stems trend of misinformation and incorrect assumptions about the impact of climate change on different genders is derived by the significant lack of feminist viewpoints and participation of women in disaster management strategies, as highlighted by Rainard et al., (2023). Awiti (2022) also discusses the need to incorporate a gendered analysis to come up with gender-responsive solutions to climate change, while also providing criteria for what it should look like.

This knowledge gap is particularly concerning because climate change disproportionately exacerbates existing gender inequalities. Studies by Fatima (2022) reveal

that women and children are 14 times more likely to perish during natural disasters compared to men. Furthermore, disaster events significantly increase women's caregiving burdens, forcing them to navigate disrupted routines and limited resources with minimal support (Singh, 2020).

While there is a lot of research covering urban flooding in Pakistan, a major gap is observed in understanding the nature of challenges that marginalized groups such as women face during these times. It is crucial to produce literature regarding the lived experiences of Karachi's residents during floods, with existing research largely focusing on political and socio-theoretical aspects and lacking inclusive perspectives on the intersections of gender and class, beyond those pertaining to poor women. They are not a homogenous group, and their individual experiences vary due to multiple social identities. They do not just face a disproportionate impact from disasters merely because they are female (Bradshaw & Fordham, 2015; Cutter, 2017).

Moreover, existing research often emphasizes the positive correlation between economic empowerment, education, and women's resilience to climate change-related disasters. However, this narrative may not fully capture the complexities of urban flooding in Karachi, where all strata of society are affected. Therefore, there is a need for qualitative research that delves deeper into these intersections and entails examining the unique challenges faced by women from different socio-economic backgrounds and identifying barriers that may prevent their participation in disaster management and mitigation efforts. Since most studies in Pakistan focus on rural and agricultural areas, they overlook the varying experiences of urbanization and flooding, despite their rapid increase in significance. Addressing these gaps is essential for

moving towards building strategies to navigate these challenges.

This study aims to address this gap by employing qualitative methods to explore the lived experiences of women from diverse socio-economic backgrounds during urban flooding in Karachi. By focusing on the intersection of gender and socio-economic inequalities, this research will contribute valuable insights for policymakers and disaster management practitioners. The findings will inform the development of gender-sensitive strategies to mitigate the impact of urban flooding on vulnerable populations in Karachi.

## RESULTS AND DISCUSSION

Before understanding the gendered impact of urban flooding, it is important to focus on what this term meant for the respondents. 62% of participants described urban flooding as a combination of rainfall and long-standing infrastructural issues. Their definitions of urban flooding were derived from the societal understanding and commented more on the systematic failure, but even that failure was not expressed through humanizing the phenomena. Around 44% of the respondents, primarily who resided in affluent areas, did not report any specific challenges faced by women. However, the rest did reveal some disproportionate impacts. To understand this fully, the following passages describe three overarching areas that help in understanding the gendered impact of urban flooding.

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## GENDERED IMPACT OF URBAN FLOODING

The data suggests that the impact of urban flooding is happening at three distinct levels across the three districts, and all levels highlight some sort of disproportionate effect based on gender. The first is the surroundings, which includes macro-level interactions with external domains beyond the home (e.g., access to transportation). The second is household, which is a meso-level category where connections between different household members are highlighted (e.g., division of chores). Finally, it comes down to personal, which represents the micro-level that focuses on individual experiences and vulnerabilities.

### Surroundings (Macro-Level) Mobility

Over 50% of the respondents mentioned that one of the biggest impacts of urban flooding is the disruption of infrastructure. Urban flooding quickly leads to a detrimental impact on the surrounding area with tons of water filling up the streets and damage being caused to public and private property. However, the damaging impact on public transport is highly significant since groups, like, women and people from lower socio-economic classes who generally rely more on public or service-based transport services are impacted the most. A

substantial chunk of this group is women. 41 respondents highlighted urban flooding directly impacting women by hindering their mobility. This majorly stems from the problem that women are unable to travel independently due to the public transport system being worsened after urban flooding. While offering a gendered perspective, an employed mother from Federal B Area (Karachi East District) responded:

*“Many working women are unable to reach their offices or workplaces, unlike most men who have a vehicle at least. Also, public transport prices hike up or public transport is nowhere to be found making getting around a difficult task.”*

While women from affluent neighborhoods can usually afford to have their own transport, the participant portrays the reality of a significant chunk of women of Karachi. Worthwhile, the participant also pointed out emotional distress caused by the urban sketching a reality of women’s experiences in urban flooding.

### Lack of Access to Basic Necessities

While urban floods damage public and private property, it also impacts the provision of other public goods and services essential for household tasks. Lack of access to necessities was reported by 8 respondents who particularly mentioned power outages as a challenge in accessing essential resources. This pointed towards a critical infrastructure challenge that significantly hampers the ability to manage daily life. Almost all respondents pointed to power outages by K-Electric (KE) as a major factor for this category and highlighted this issue as a cause of emotional distress. The prime reasons could be the inability to use home appliances and the lack of resources to do any work at home. It was also interesting to note that both male and female respondents reported that the male members of the fam-

ily were the ones responsible for calling the KE offices, reporting their problems, or inquiring about the status of their complaints. The female members of the household were more interested in finding alternatives to gas and electricity for cooking and maintenance purposes.

### **Household (Meso-Level)** **Reliance on Domestic Help**

Among middle and high-income households, 10 out of 20 respondents reported being directly affected by the destruction of their house help's residence. The reliance on domestic help is so prevalent that a male respondent belonging to a middle socioeconomic status reported:

*"Our maid's jhopri (house) was destroyed in the flood. She faced severe distress and could not work. My wife had to do all the housework."*

This scenario, while personal, reflects a broader pattern seen in Karachi, where the concept of husbands sharing the burden of household chores in the case of lack of domestic help is unusual. Therefore, it was noted that among those respondents, 10 females acknowledged an intensified burden of house maintenance and cooking responsibilities placed on them during urban flooding.

Interestingly, our findings reveal a consistent trend across middle and upper-income classes, where household responsibilities are predominantly perceived as the domain of women. This was reported by both males and females who were surveyed. Furthermore, 15% of the respondents also cited a loss of income in their household during urban flooding, triggering emotional distress within households. This issue particularly affected working women from a lower income class who faced harassment from their husbands and family.

### **Loss of Income**

Four respondents reported a loss of income during urban flooding and all of them belonged to middle and lower-income groups and lived in all three districts: Central, South, and East Karachi. While the higher-income people belonged to flexible professions, the lower-income and middle-income respondents comprised the people who were daily wage earners. Their wages were directly linked to the number of days and hours they worked. Urban floods, thus, impacted their work routine and adversely affected their income in numerous ways such as transportation, loss of work, and health issues. A male respondent belonging to a low socioeconomic status discussed the distress in his family due to the loss of income:

*"Meri amma kaam per jati hai paas wali building mai. Itna pani khara hojata hai to woh kaam per nahin jati aur woh paise kaat lete hain. Aese hi mohallay mai aur auratein hain jo kaam ki chutti nahin kar pati."*

### **Personal (Micro-Level)** **Harassment**

The pervasive issue of harassment tends to increase during flooding periods. The displacement of locals increases the vulnerability of women and children. Three female students, two from Karachi South and one from Karachi East share the traumatizing experiences of themselves or their house workers being harassed due to urban flooding. A female respondent from the Defense Housing Authority (DHA) Karachi highlighted how mere water on her clothes can cause her to feel emotional distress. She stressed:

*"...because of the closed mindset of people, if a woman is slightly drenched in rain due to unexpected weather, or lack of facilities, men around make such an uncomfortable environment by staring at her and objectifying her."*

Although the same experience could also stem from the rainfall only, it also ascertains how urban flooding can escalate the experience by making an individual stuck in one place or get affected by rainfall to a large extent. It is also important to recognize harassment at domestic levels where women and children are stuck inside their houses or in relief camps where they have no option to leave their male counterparts who may make them feel uncomfortable or force themselves on them.

### Emotional Distress

This aspect was noticeable across all income brackets. Although the intensity of distress differed, individuals during field visits universally initiated their conversations by expressing the troublesome and distressing nature of urban flooding in Karachi. Residents in Central Karachi shared their concerns about the overflow of Gujjar Naala, resulting in flooded streets and causing distress related to their location. In contrast, respondents in the South district emphasized water infiltration into their homes as a significant source of distress. A mother from Gulistan-e-Johar belonging to a middle-income group also highlighted transport issues causing her major distress as it would take her twice as long to commute from 'Paradise Bakery' to her home. The link between transportation problems and emotional distress is particularly evident among female participants who faced challenges in independent commuting and experienced an augmented burden of household maintenance responsibilities.

## CONCLUSION

The study employed a gendered lens in understanding the differentiated experiences of the citizens of Karachi, particularly women across diverse economic backgrounds. From our findings, we understood that Karachi is built on inadequate urban planning and governance, and it grapples with climate

change events leaving a lasting impact on its population. At the macro-level, disruptions in public transport disproportionately affect women, especially those from lower socio-economic classes, impeding their mobility. Lack of access to necessities, such as power outages, further compounds the challenges faced by households. Most significantly, the study revealed a consistent trend where household responsibilities are predominantly perceived as women's domain, reflecting societal norms. Moreover, the consequences of urban flooding on women are not only limited to house chores, but the increased level of domestic violence and harassment on the streets also makes women vulnerable in public spaces.

The disproportionately felt impact on women, whether in terms of mobility constraints, increased domestic responsibilities, or exposure to harassment, necessitates a comprehensive approach to address the unique challenges faced by women from different socio-economic backgrounds. These findings stress the urgent need for tailored solutions addressing women's diverse challenges amid urban vulnerabilities. It also aims to contribute to the evolving literature on the intersection of gender, climate change, and urban vulnerabilities, providing valuable insights for researchers, policymakers, and development practitioners working towards a more inclusive and resilient Karachi. By shedding light on these dynamics, the study enriches gender-focused research on climate change and urban resilience, offering insights for policymakers and development practitioners striving for a more inclusive and resilient Karachi.

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# WEAVING INTERSECTIONALITY: INVESTIGATING THE IMPACT OF CLIMATE CHANGE ON GENDER INEQUALITIES IN PEACEBUILDING AND CONFLICT THROUGH PROCESS TRACING

FAJEERA ASIF  
(fajeeraasif28@gmail.com)

## ABSTRACT:

The ever-increasing pace of climate change poses multifaceted challenges, especially at the intersection of environmental shifts, gender dynamics, and peace and security concerns in Pakistan. This research employs a process tracing methodology to scrutinize the intricate ways in which climate change exacerbates gender disparities within peacebuilding contexts.

Existing gender inequalities are magnified by the asymmetric impacts of climate change, influencing access to resources, socio-economic opportunities, and decision-making power. Understanding the nuanced pathways through which climate-induced changes perpetuate gender disparities is crucial for crafting targeted interventions and fostering inclusive peace and security.

Process tracing offers a lens to trace the causal mechanisms and interactions among climate-induced disruptions, gender dynamics, and security and peacebuilding outcomes. By employing this method, the research aims to untangle the complex web of relationships and identify key factors driving gender-based disparities in the face of climate change.

The findings will shed light on specific areas where climate change intensifies gender disparities, providing evidence-based insights for policymakers, practitioners, and researchers. The research contributes to the broader discourse on intersectionality, informing strategies that simultaneously address climate-related challenges, and gender inequities, and foster sustainable security and peacebuilding initiatives.

**Keywords:** Intersectionality, climate change, gender inequality, peace and security, triple nexus

## INTRODUCTION

Climate change is one of the most pertinent global issues (Gender, climate, and security: Sustaining inclusive peace on the frontlines of Climate Change, 2020). The impacts of climate change e.g. rising sea temperature, food insecurity, loss of livelihood, severe droughts, etc. bring havoc on the hard-won developments in many regions of the world. In conflict-affected and fragile states, political instability, violence, and limited governance leave the communities particularly ill-equipped to deal with the changing conditions (Gender, climate, and security: Sustaining inclusive peace on the frontlines of Climate Change, 2020). As a result, this has a compound impact on the affected areas as it exacerbates the existing tensions.

The interconnected challenges posed by climate change and peace and security are the most menacing issues globally. The ramifications of climate change are increasingly evident across different regions of the world. It is examined that the rapid increase in the earth's temperature, change in precipitation, and rise in sea level is causing severe droughts, floods, etc. This has numerous social, political, and economic implications such as disruption of the ecosystem, loss of habitat, loss of lives, loss of livelihood, jeopardizing food security, etc. The impacts of climate change exacerbate the condition of vulnerable communities, especially women (Oudraat & E. Brown, 2022). Compounded by fragile governance structures, political instability, and endemic violence in conflict-affected areas, communities confront profound vulnerabilities in confronting climate-induced stressors (Gender, climate, and security: Sustaining inclusive peace on the frontlines of Climate Change, 2020). These multidimensional challenges not only deplete resources but also worsens the existing tensions which intensify the complexity of the issue.

The literature available on climate change talks too little about the role of gender expectations and power dynamics that predict and shape the responses of men and women differently. The marginalized community faces a disproportionate economic burden. The situation worsens in the presence of existing tensions or conflicts. The threats posed by climate change call for an integrated approach to deal with conflicts and gender disparity.

By analyzing the literature on the nexus of climate change, gender equality, and peace and security this paper maintains that the interdisciplinary approach is required to deal with the challenges associated with them. This paper endeavors to fill this gap in the existing literature. The paper provides a comprehensive framework for understanding how gender, climate change, peace, and security intersect. By inspecting the link between climate change, gender dynamics, and peace and security, this research tries to uncover nuanced insights into how climate-induced stressors intersect with gender disparities, thereby impacting peace and security. The process tracing methodology will be employed to make a causal mechanism that will help in explaining the triple nexus seamlessly. The use of an interdisciplinary approach along with the empirical study of existing data will contribute to responding to these risks.

The main objective of the research is to analyze the intersectionality of climate change, gender inequality, and peace and security. The paper aims to explore how climate change impacts gender dynamics including the differential vulnerabilities and adaptive capacities of men and women. The paper will examine how the nexus of peace and security interplays with climate change and gender inequality with a focus on encouraging gender parity and social inclusivity. The paper aims to employ the process

tracing method of research to investigate the triple nexus.

## LITERATURE REVIEW

The United Nations (UN) report on the nexus of Gender and climate creates the link between Climate Change, Gender disparity, and peace and security (Gender, climate, and security: Sustaining inclusive peace on the frontlines of Climate Change, 2020). The report utilizes the intersectional approach to analyze the nexus of Climate Change, Gender disparity, and peace and security. The findings of the report suggest that the impacts of climate change affect men and women disproportionately. Climate Change highly affects those communities that often have fewer resources to adapt to the changing environment. Women and girls are more vulnerable to the risks of Climate Change as they are mostly the key providers of water, food, and energy. The impacts of Climate Change lead to a significant shift in the socio-economic conditions of the affected area. The shift transforms the traditional gender norms around various aspects of life e.g. leadership, decision-making, and economic activity. In return, the transformation of gender norms poses a threat to gender equality. The situation worsens in conflict-affected settings (Gender, climate, and security: Sustaining inclusive peace on the frontlines of Climate Change, 2020). The compound effect of political and social instability and violence leaves the communities ill-equipped to deal with it, ultimately exacerbating the existing tensions or disparities.

Oudraat et. al. also emphasizes the importance of an integrated and multidisciplinary approach to examine the complex nature of climate change, gender inequalities, and security issues (ibid). They posit that the lack of data for analysis of the problem exacerbates the integration approach. The study proposes that to fos-

ter inter-agency coordination commitment from political leaders is crucial. The study calls for the formation of a multidisciplinary research network supported financially and politically. The authors also stress the necessity of an inclusive approach to investigate the “triple nexus” i.e. climate change, security problems, and gender issues (ibid). They posited that gender encompasses both the proclivities of men as well as vulnerabilities of women. They identify that there is a need to give attention to male behavior in shaping gender relations, the environment, and security problems (ibid).

Research conducted by the International Union for Conservation of Nature (IUCN) for the United States Agency for International Development’s (USAID) Office of Gender Equality and Women’s Empowerment utilizes a multidisciplinary theoretical framework that integrates ideas from, peace and conflict studies, environmental studies, gender studies, and development studies (Boyer et al., 2020). The fragility theory employed in the study explains the factors that contribute to state fragility e.g. social, economic, and political vulnerabilities. The integration of fragility theory helps in exploring how fragile states are more susceptible to climate-related hazards and how gender dynamics intersect with state fragility. The intersectionality framework employed underscores how different social categories e.g. gender, class, race, etc. interact and intersect to form individuals’ experiences. The research highlights the interconnectedness of issues i.e. gender disparity, climate vulnerability, and state fragility (ibid). The research postulates that countries with higher gender disparity display higher levels of climate vulnerability and state fragility. It was emphasized in the research that an integrated approach is necessary to deal with these issues holistically. The mapping analysis suggested that the triple nexus of gender disparity, climate vulnerability, and state fragility is particularly

prevalent in areas i.e. Middle East, North Africa, and sub-Saharan Africa (Boyer et al., 2020).

Ide et. al. studied the climate-conflict dynamic by employing a gender lens. The paper identifies four crucial challenges: understanding gender norms' role in conflict, broadening the scope of security concerns beyond violent conflict, recognizing women's roles in peacebuilding, and documenting gender-based inequalities for informed policy responses (2021). The paper posited that the research on the nexus of climate, gender, and peace remains limited as scholars tend to analyze them in pairs neglecting the complex dynamics of their intersection. The authors postulate that without a gender perspective, the dynamics of climate-conflict nexus cannot be understood (ibid). Their study identifies that perceptions of conflict, resilience, and security are shaped by gender disparities, deeply rooted in social norms and power relations. The paper concluded that to make informed policy decisions the oversimplification of the climate or conflict issues must be avoided and agency and complexities within the communities must be recognized (Ide, T et al., 2021).

The number of researches that examine the climate-conflict nexus within the gendered perspective remains low. For instance, in one of the talks on the topic "Addressing the Impacts of Climate-Related Disasters on International Peace and Security" that was held in January 2019 at the United Nations Security Council a total of 75 members were asked to acknowledge the significance of gender perspective in responding to climate-related security concerns (United Nations Women, Peace and Security, 2019). Among 75 members only five supported the concern. This mere incident signifies the dire need for the recognition of the triple nexus approach to deal with security, climate, and gender challenges.

It is posited that power dynamics, gender norms, and expectations impact the way men and women respond and contribute to climate-related security risks. This was recognized in the UNSC annual of 2019. The report states:

*"The global threat of climate change and environmental degradation is poised to exacerbate the already increasing number of complex emergencies, which disproportionately affect women and girls. There is, therefore, an urgent need for better analysis and concrete, immediate actions to address the linkages between climate change and conflict from a gender perspective (United Nations Women, Peace and Security, 2019)".*

## CONCEPTUALIZATION

This part of the paper talks about the concepts explored in it. The conceptualization of the concepts will help in unpacking the intricate interplay of climate change, gender equality, peace, and security.

### Intersectionality

The intersectional approach is a sociological theory that emphasizes that individual political, social, or economic identities interact and shape a unique experience for them due to which they are either underprivileged or privileged (Collins et. al., 2020). Crenshaw posits that various intersections of gender, ethnicity, race, etc. interact and create individual experiences of discrimination. The framework emphasizes the overlapping impact the individuals face due to their identity and thus goes beyond studying the individual forms of discrimination.

### Climate Change

IPCC (Intergovernmental Panel on Climate Change) describes the climate as "average weather" and climate change as "average weather" change of temperature, precipitation, and wind over a period ranging from

months to thousands of years. In other words, climate change is the long-lasting variation in the earth’s oceanic, cryospheric, atmospheric, and land surface precipitation and temperature pattern. Climate Change occurs due to the increased level of greenhouse gasses (GHG) (Abbas et. al., 2022). Climate Change impacts different regions of the world as it has various political, economic, social, and ecological implications such as; loss of habitats and ecosystems, extinction of species, increases in vector-borne diseases, heat waves, air pollution, losses in agricultural productivity, infrastructure damage, floods, water scarcity, droughts, wildfires, population displacement, resource competition, and conflicts.

**Gender Inequality**

Gender as opposed to sex is a socially constructed concept. It can be defined as a socially constructed expectation, roles, and behavior associated with biological sexes, i.e., Males and Females (State of gender equality and Climate Change in South Asia and the Hindu Kush Himalaya, 2022). Gender disparity or inequality can be described as the difference in the treatment faced by individuals based on their gender. Gender

disparity can be seen in various fields of life in various forms. It is mostly women who are at the cutting edge of gender inequality because of socially accepted power dynamics and patriarchy.

**Security, Peace, and Peacebuilding**

According to the UN charter peace and security is defined as the absence of war, violence, tensions, and armed conflicts. The paper is based on a broader understanding of peace and security. It recognizes that insecurity can occur at different levels and across different dimensions (Oudraat et. al., 2022). Peacebuilding is referred to as the peaceful resolution of conflicts and disputes. These concepts are linked to national security. Peacebuilding refers to the process of supporting people in or at risk of conflict and addressing structural violence—the underlying inequalities, injustices, or conflicts between groups of people by established institutions or processes.

**RESEARCH METHODOLOGY**

The research methodology for this paper employs an intersectional approach to investigate the topic. Secondary data is used

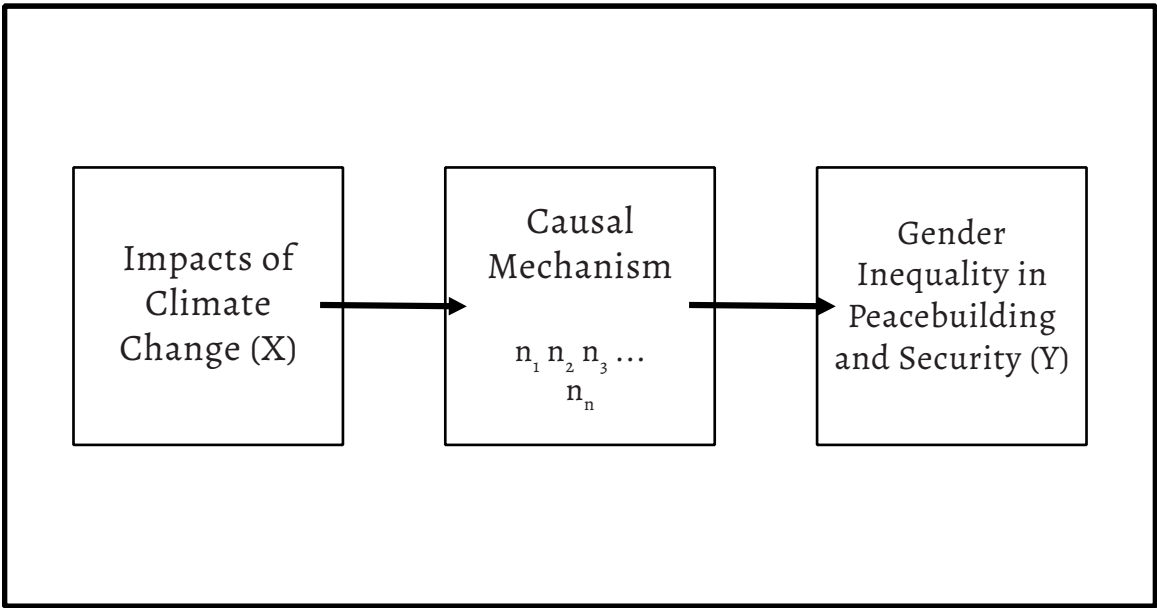


FIGURE 1: Research Methodology

in this research and the data is collected from sources such as official reports, NGO (Non-Governmental Organizations) reports, existing literature, and newspapers. The paper aims to provide thorough and reliable data to assist practitioners and policy-makers in making informed decisions. The paper utilizes the process tracing method of research to analyze the interplay of climate, gender equality, and peace and security in Pakistan. As described by Beach and Pederson, process tracing is “the single case research method that can be used to make with-in-case inferences about the presence and absence of causal mechanism” (Beach and Pederson, 2019). The methodology explores the cause-and-effect link by creating

a causal mechanism. This paper studies the impact of climate change as an explanatory variable and gender inequality in the peace and security perspective as the dependent variable. To create a causal mechanism this paper will divide the process from cause (climate change) to effect (gender inequality and peace and security) into a few steps. The below illustration explains the link between the impacts of climate change (Factor X) and gender inequality in peacebuilding and security (Factor Y).

The causal mechanism that explains the phenomenon is divided into a few steps. The illustration below explains the causal mechanism:

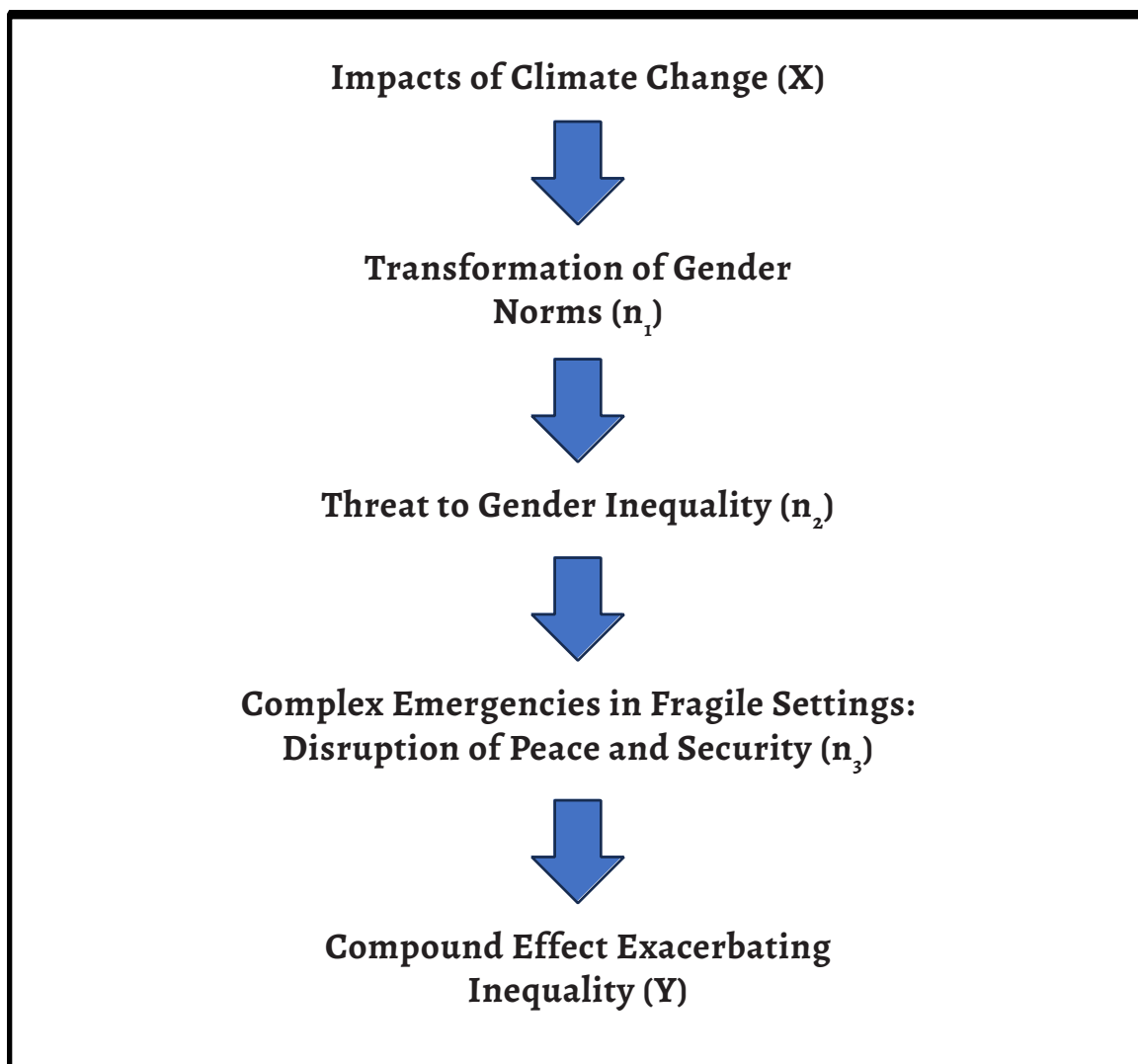


FIGURE 2: Causal Mechanism

## EMPIRICAL INVESTIGATION OF CAUSAL MECHANISM

Pakistan's unique geography exposes it to a high risk of climate-related hazards, leading to an increasing number of disasters such as severe floods and droughts over the past few decades. These events have caused long-lasting damage to infrastructure, livelihoods, and resilience, especially in urban areas. The most vulnerable communities, reliant on natural resources and informal work, find themselves in a perpetual cycle of economic, social, and political marginalization, which is further exacerbated with each disaster (Memon et. al, 2020).

Pakistan's deeply embedded patriarchal norms – at all levels of society and institutions – influence how men and women perceive and experience climate change impacts within the current security landscape. Findings from research across two provinces – Sindh and Punjab – point to some important trends in urban areas (Abassi et. al. 2019). Pakistan is urbanizing at a rapid rate, but decent livelihood opportunities and public services are not following suit, with the result that life in the city is often precarious on many fronts. The impacts of climate change are exacerbating this precarity and contributing to domestic violence and the formation of non-state armed groups.

The research finds that first, men and women are increasingly unable to live up to their prescribed gender roles which, in some cases, is resulting in domestic or communal violence. For example, damages incurred from extreme flooding have been found to keep men – who are typically daily wage or contract workers – at home, resulting in a loss of income and preventing them from fulfilling their prescribed roles as breadwinners (Patel et. al., 2019). Both women and men explained that the anxieties and frustrations associated with this lack of

fulfillment of their socialized responsibilities could lead to domestic violence.

Second, women illustrated that they faced increased structural oppression as a result of certain aspects of climate change, such as extreme water shortages. Many women are expected to continue to manage the household without problems, even with droughts affecting household water security in some of Pakistan's biggest cities. Women narrated experiences of tending to sick children with no resources and of disappointing their husbands or other men in the household (Abassi et. al. 2019). Women explained that they experienced physical forms of domestic violence for either failing to manage the existing water in the house or for breaking norms around women's mobility by venturing out to secure new sources.

Finally, water and energy shortages that have been exacerbated by climate change have been associated in some cases with the mobilization of men into non-state armed groups. For example, in Karachi, a network of informal water providers branded a "water mafia", has emerged (Memon et. al, 2020). This group is reportedly using water scarcity to gain power by intensifying water shortages through illegal extraction and then selling the water to communities via private tankers. The related frustrations have led to community violence and fighting between the "water mafia" and the local population.

## FINDINGS AND RESULTS

Climate change poses numerous risks that extend beyond environmental concerns and have significant security implications. In fragile contexts, the impacts of climate change can worsen existing conditions that threaten security, such as loss of livelihoods and competition over limited resources. At the same time, conflict and insecurity hin-

der resilience to external shocks and make adapting to the effects of a changing climate even more challenging (Rasul & Sharma, 2015).

Moreover, it is important to recognize that gender norms, roles, responsibilities, behaviors, and power structures play a crucial role in determining how different groups of people experience and manage these risks. By understanding and acknowledging these diverse experiences, we can uncover new avenues for building and sustaining peace. Conversely, a failure to integrate a gender perspective in addressing climate-related security risks overlooks the unique challenges faced by different groups and undermines effective solutions that promote peace and resilience. Addressing climate change and security risks requires an intersectional approach that takes into account the complex interplay between gender, power, and vulnerability.

Pakistan's deeply embedded patriarchal norms influence how men and women perceive and experience the impacts of climate change within the current security landscape. The impacts of climate change on gender dynamics in urban Pakistan are complex and multifaceted. They are influenced by socio-cultural norms and power dynamics, which shape access to resources, decision-making processes, and vulnerability to climate-related hazards. To address these challenges, it is crucial to develop strategies that promote gender-responsive approaches to climate change adaptation and mitigation in urban areas. Mitigating actions are urgently needed to protect the health and livelihoods of all people adversely impacted by climate change, especially those who are already marginalized.

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