

Climate Change Adaptation and Maternal Health through Legal Frameworks and Policy

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Abstract

Climate change debate generally ignores intersectionality despite its intense challenges to the wellbeing and maternal health of women in Pakistan where socio-economic inequalities intersect with climatic vulnerabilities. This study examines Pakistan's legal framework concerning the protection of wellbeing and maternal health of women in the context of climate change adaptation with the help of a qualitative approach. The paper emphasizes the intersectionality of environmental and gender-related issues through a comprehensive review of Climate Change Policies of Pakistan, amplified by analytical, empirical and reform-oriented research. It also identifies challenges to effective implementation, including gender-based inequalities, inadequate healthcare infrastructure, limited access to healthcare resources and less involvement of women in decision-making. To sum up, this research highlights the necessity of incorporating gender-sensitive perspectives into climate change mitigation and adaptation efforts. Consequently, this will not only safeguard the well-being of women but also contribute to sustainable development in the country. Policymakers can help protect maternal health by advocating gender-responsive approaches, improved healthcare access, and community-based adaptation strategies. Moreover, this paper suggests policy recommendations to address these challenges and strengthen women's resilience to climate change impacts.

Key Words: maternal health, climate change, women rights, environment, gender inequality, sustainable development, Pakistan, policy implementation

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1. INTRODUCTION

Climate change represents one of the most critical challenges of our era, with profound and far-reaching impacts on communities worldwide. However, its effects are not uniformly distributed, disproportionately burdening vulnerable populations, particularly women (Women, 2022). In Pakistan, a country characterized by significant socio-economic inequalities and environmental vulnerabilities, women face amplified threats to their well-

being and maternal health due to the intersection of gender inequality and climate-related stresses (Okesanya, 2024).

Women constitute nearly half of Pakistan's population, yet they bear a greater brunt of climate change impacts. Approximately 70% of those living in poverty in Pakistan are women, a group already more susceptible and vulnerable to environmental damage (Khaliq, 2009). The combination of inadequate healthcare infrastructure, limited access to resources, and minimal involvement in decision-making processes exacerbate their vulnerability. This issue is further compounded by traditional gender roles and socio-cultural norms, which restrict women's ability to adapt and respond to climate-related challenges effectively.

The urgency of this research is highlighted by the increasing frequency and severity of climate-related events in Pakistan, such as floods, heatwaves, and droughts. These events disproportionately affect women, compromising their health, safety, and livelihoods. For instance, the devastating floods of 2022 left nearly 650,000 pregnant women without access to healthcare, forcing many to give birth under precarious conditions. Additionally, the lack of basic menstrual hygiene products and sanitation facilities during such crises underscores the dire need for gender-sensitive climate adaptation strategies.

This research paper aims to examine Pakistan's legal framework concerning the protection of women's well-being and maternal health in the context of climate change adaptation. By employing a qualitative approach that includes legal analysis and policy assessment, this study provides a comprehensive analysis of existing laws and policies, evaluate their implementation, and identify the challenges hindering their effectiveness. The research addresses critical questions, such as how current laws and policies in Pakistan address the impacts of climate change on women's well-being and maternal health, the barriers to effective implementation, and the formulation of policy recommendations to enhance resilience and adaptive capacity among women.

By illuminating the intersectionality of environmental and gender-related issues, this study aims to inform policymakers, stakeholders, and the international community about the critical need for targeted interventions and reforms. Ultimately, this research strives to contribute to a more inclusive and resilient approach to climate change adaptation, ensuring that the unique needs and challenges faced by women in Pakistan are addressed and mitigated.

2. LITERATURE REVIEW

Climate change is increasingly recognized as a significant threat to global health, with implications for vulnerable populations such as women in developing countries like Pakistan. This literature review aims to provide a comprehensive overview of existing research on the intersection of climate change, gender inequality, and maternal health in Pakistan.

Ebrahim (2023) highlighted that women's voices in Pakistan are often ignored in climate change discussions. Sonia Arif, a 40-year-old beautician and mother of four, is facing financial hardships after her husband Arif had to close his tailoring shop due to their inability to pay the monthly rent of 40,000 Pakistani rupees (USD 139). "I am sick of the yelling that has become a norm in my house for the past two years. The unbearable heat has added to my plight. In my next life, I want to be born as a man," she says. The restricted role and freedom of women in Pakistan has added to their challenges in coping with climate-related extreme events. The limited roles and freedoms of women in Pakistan exacerbate their difficulties in dealing with climate-related extreme events. Climate change affects every aspect of women's lives: their economic stability, marital relationships, and physical health" (Ebrahim, 2023). The author has not shed any light upon any legal means through which this issue can be cured.

Ullah (2023) noted that Pakistan is among the countries most vulnerable to climate change impacts. The northern regions of the country have faced numerous extreme cold weather events, such as floods, heavy snowfall, and torrential rains, which have significantly affected maternal and infant health. Pregnant women or those trying to conceive are particularly susceptible to the negative effects of extremely cold weather on their reproductive health, including decreased fertility, menstrual cycle irregularities, and even miscarriages. The Paris Agreement on Climate Change, the United Nations Framework Convention on Climate Change, and the Sustainable Development Goals (SDGs) have all recognized the connection between climate change and women's health and emphasized the crucial role women play in combating climate change. Additionally, the World Health Organization (WHO) has highlighted the link between gender, health, and climate change and proposed measures to mitigate its impact on women's health (Ullah, 2023). The author has cited the legal framework and international treaties concerning women's health and climate change, but he did not mention the reason for failure of implementation of these laws in Pakistan. This aspect is catered by the research in question.

In the book "Climate Change and Women: A Study in Selected Sites in Rural Sindh, Pakistan-2011" by Shirkat Gah (2012), it is highlighted that recent studies indicate an increase in women's vulnerability to the effects of climate change due to shifts in weather patterns. Although climate change is expected to impact all sectors of society, women are likely to be more severely affected due to their dual roles in both reproductive and productive capacities (gah, 2011). While the book thoroughly details the impacts of climate change on women, it falls short of providing strategies to address these challenges. The current research focuses on addressing this gap by proposing solutions.

Chauhan (2014) analyzed the deeply patriarchal nature of Pakistani society, highlighting significant gender disparities in health, education, income opportunities, employment, personal security, asset control, and political participation between women and men. The study mentioned that it is due to the lack of a comprehensive government policy and program on the equitable representation of women in public sector organizations. Like many other developing nations, Pakistan's affirmative action programs focus on ethnic and income inequalities rather than addressing gender inequalities. While his paper provides comprehensive insights into the various aspects of the current research, it does not address the reasons behind the ineffective implementation of laws designed to protect women in Pakistan.

3. METHODOLOGY

A research paradigm is a guiding philosophy that directs a researcher in exploring, assessing, and comprehending a situation, especially in the context of social sciences research (Lewis, 2015; Krauss, 2005). Research paradigms consist of three main components: ontology, epistemology, and methodology. Ontology is the study of the nature of reality, questioning whether there is a single reality, multiple realities, or no reality at all (Blaikie, 2009). For instance, does climate change in fact effect women differently? Is there any law which provides protection of maternal health and wellbeing of women? Epistemology is the study of knowledge and how we can understand reality. It encompasses the scope and methods of acquiring knowledge, as well as the processes for validating that knowledge (Saunders, Lewis, & Thornhill, 2009). For example, whether there is an effective implementation of such laws in Pakistan? Methodology is the study of the approaches and techniques used to investigate the environment and validate the knowledge obtained (Gelo, Braakmann, & Benetka, 2008). For example, how to know that such reality exists? The present study adopts the constructivism

paradigm, as it is believed that reality is multifaceted, with various interrelations and interdependencies. These can be understood by exploring different ideas and perspectives (Dnezin & Lincoln, 2005). This approach encourages the full involvement of the researcher in social inquiry to generate a deep and comprehensive understanding of reality (Gelo, Braakmann, & Benetka, 2008). This school of thought considers the qualitative research method appropriate for gaining insight into research problems. The major strength of this approach is that it leads to a profound understanding of a research problem within a specific setting, due to the close interaction of the researcher with the phenomenon (Baxter & Jack, 2008).

The study focuses on rural areas in Pakistan, recognizing their unique socio-economic and environmental challenges. Targeting diverse regions in Punjab, Sindh, Khyber Pakhtunkhwa, and Balochistan, the research aims to capture a broad spectrum of conditions and vulnerabilities. These areas experience significant climate-related challenges like water scarcity and extreme weather, which exacerbate socio-economic inequalities and impact maternal health. Rural women in Pakistan experience significant disparities in healthcare access, economic opportunities, and environmental conditions, leading to compounded maternal health challenges. The findings of this study aim to provide actionable insights for enhancing policy implementation and protecting the maternal health and wellbeing of women in Pakistan's rural areas amidst the challenges posed by climate change.

This study is undertaken to cater the problem of implementation of laws on climate change regarding the maternal health and wellbeing of women in the rural region of Pakistan. The methodology used to conduct research is analytical research, empirical legal research and reform-oriented research. The technique for analyzing data is qualitative. A comprehensive review of existing literature on climate change, maternal health, and socio-economic inequalities in Pakistan is conducted. This includes academic articles, government reports, policy documents, and NGO publications as well as examination of legal documents, policies, and international agreements related to climate change, public health, and women's rights in Pakistan. These methods are best to analyze the existing legal framework and practical challenges of policy implementation concerning women's wellbeing and maternal health in the context of climate change. Through this methodology it is easy to evaluate the effectiveness of current policies and legal frameworks in addressing the intersection of climate change, socio-economic inequalities, and maternal health.

4. RESULTS

4.1. Overview of the Data

The data is collected through a qualitative method using analytical research, empirical legal research and reform-oriented research. According to data from the United Nations, 80% of individuals displaced by climate change are women. The catastrophic floods of 2022 left nearly 650,000 pregnant Pakistani women without access to healthcare, compelling many to give birth in the open. Additionally, the persistent floods deprived eight million girls and women of basic menstrual hygiene products and toilets needed for managing their periods (Waheed, 2023). The data included socio-economic status, environmental conditions, health records, and case studies.

4.2. Key Findings

4.2.1. Impact of Climate Change on wellbeing and Maternal Health

Due to geographical location and socio-economic conditions, Pakistan is extremely susceptible to the effects of climate change. Women in Pakistan encounter numerous overlapping challenges, such as restricted access to healthcare, socio-economic disparities, and traditional gender roles. These factors increase the impact of environmental damage and climate variability on their wellbeing and maternal health (Habib SS, 2021). After disasters, women are disproportionately affected by limited access to clean water and sanitation facilities. The impact of climate change on women's health can vary significantly, even within Pakistan. There is a strong call to integrate women's reproductive health into national climate strategies and disaster relief efforts (Berninger, 2024).

The rise in both average and extreme temperatures is expected to increase heat-related illnesses and fatalities among vulnerable populations, including pregnant women (Asokan & Dutta, 2008). Pregnant women are particularly vulnerable to rising temperatures and heat waves due to their reduced ability to regulate body temperature. As a result, they experience heightened susceptibility to the impacts of climate change (Wells, 2002). According to the World Health Organization (WHO), 99% of all maternal deaths related to childbirth occur in developing countries (Costello, Abbas, Allen, Bell, & Bellamy, 2009). Ensuring good maternal health is vital for achieving healthy birth outcomes and maintaining a healthy pregnancy (Organisation). In a recent review (Bhutta, Lassi, Blanc, & Donnay, 2010), a clear link was established among reproductive health, maternal health, and perinatal birth outcome. Nearly 3 million neonatal deaths and stillbirths each

year are linked to maternal health issues, including inadequate nutrition, poor living conditions, and infectious diseases (Friedman, Mital, & Kanzaria, 2007). The heavy floods of 2022 in Pakistan are just one of many examples where women were hit the hardest by the crisis through malnutrition and dehydration; at the same time, female genital mutilation, child marriage and gender-based violence rose (Berninger, 2024). Exposure to heat can lead to health harms for pregnant women, including hypertensive disorders of pregnancy and its complications (CDC, 2024). According to United States Environmental Protection Agency (USGCRP, 2016), climate change can worsen environmental hazards that threaten the health of pregnant women and increase health risks for the baby. Maryum Shabbir Abbasi, Khansa Naeem, Danish Hasan Ansari conducted a study in the areas of Muzaffargarh and Tharparkar districts of Pakistan which highlight the profound impact of environmental and socio-economic factors on maternal health and wellbeing of women from these areas.

Rajju,34, Sanghar, Tharparkar, Sindh, Pakistan

"I was seven months pregnant when we migrated due to drought in our village (Sanghar). We migrated on camel and worked as labor to lift weights and as a result lost my infant. My family took a loan of 10,000 Rs (95.2 USD) from the landowner for meeting my health expenses. I went into depression after losing my baby (Abbasi, Naeem, & Ansari, 2021)."

Maya, 40, Islam Kot, Tharparkar, Sindh Pakistan

"I was pregnant at the time of migration. Owing to lack of health and nutritional facilities, my situation got worse. In such a bad condition, I went to Islamkot where I delivered a baby girl, who died three days after her birth due to malnutrition. My aged mother-in-law was also with us. During migration, she fell ill and died of prolonged illness for four years. Meanwhile, we did not receive any relief package from the government. We finally took a Rs 30,000 (285.7 USD) loan from a microfinance bank to make our both ends meet. However, few women received some amount through Benazir Income Support Program (Abbasi, Naeem, & Ansari, 2021)."

Kausar,23, Mohalla Bukhari Wala, Muzaffargarh

"During floods, I was 4-month pregnant. I got sick due to malnutrition and was referred to a city hospital for treatment. I also had other kids at that time and would give them muddy water by mixing sugar into it to feed them as a replacement of milk. I used to eat leftover food from the temporary place we were staying at (Abbasi, Naeem, & Ansari, 2021)."

4.2.2. Environmental Vulnerabilities

Women's vulnerability to climate change arises from a combination of social, economic, and cultural factors (Osman-Elasha, 2009). Women have restricted access to and control over environmental resources and services, minimal involvement in decision-making (Raza & Murad, 2010), and are excluded from the distribution of environmental management benefits. As a result, they are less equipped to address climate change (Osman-Elasha, 2009). During extreme weather events like droughts and floods, women often work harder to sustain their households, limiting their time for education, skill development, or income generation. Despite comprising 70% of those living in poverty and heading 40% of the poorest urban households, women, who produce 50-80% of the world's food, own less than 10% of the land (Osman-Elasha, 2009).

Women make up a large portion of impoverished communities that heavily rely on local natural resources for their livelihoods, especially in rural areas. They bear the primary responsibility for household water supply, energy for cooking and heating, and ensuring food security (Osman-Elasha, 2009). In Pakistan, socio-cultural norms and childcare duties often prevent women from migrating, seeking refuge, or working when disasters occur. This situation places additional burdens on women, such as traveling farther for drinking water and firewood. Women already encounter gender inequalities in areas such as human rights, political and economic status, land ownership, housing, exposure to violence, education, and health (Osman-Elasha, 2009). Climate change will further exacerbate these vulnerabilities. Additionally, it is well-known that during conflicts, women face increased risks of domestic violence, sexual intimidation, human trafficking, and rape.

Rural women have no say in decision-making, whether it is about household or the migration because she is not considered the family head. Owing to patriarchy, it is men who decide everything, and women had to follow (Abbasi, Naeem, & Ansari, 2021). In the Focus Group Discussion (FGD) and in depth interviews conducted for the study by Maryum Shabbir Abbasi, Khansa Naeem, Danish Hasan Ansari in the areas of Muzaffargarh and Tharparkar districts of Pakistan, it was revealed that 100% women have no say in decision-making (Abbasi, Naeem, & Ansari, 2021). This study also involved cases in which women were left behind and other family members, mainly men, were migrated internally or internationally for a job. Even in such cases, women can't decide where to migrate, if there is flood or drought. It is out of the question for a single woman to move without any of her family

members. The reason for not having power to decide is that women in rural and even in urban migrants are not literate. There were very few respondents who went to school (Abbasi, Naeem, & Ansari, 2021). One of the respondents during the study's (Abbasi, Naeem, & Ansari, 2021) interview said that the decision to sell seeds during drought was of her husband. She said:

“We had to sell the seeds, which we had during drought, at a very low rate of Rs 1000 due to illness and shortage of money. Later we bought the seed at Rs 4000 (Abbasi, Naeem, & Ansari, 2021).”

4.2.3. Socio Economic Inequalities

In Pakistan, women face additional disadvantages: 9.1 million (Zaidi, 2022) women work in agriculture, contributing significantly to food production and security. However, they are mostly unpaid, experience higher time poverty, and are more susceptible to exploitation compared to men. Women's ownership of land, and control over physical assets is minimal: only 2 percentage of women report owning a house or agricultural land as compared to 72 percentage men. Only 55% of women have access to adequate healthcare, and 48.1% of women and girls aged 15 to 49 in Pakistan, particularly in rural areas, have no say in decisions regarding their own health care. Only 28 percentage women aged 15 to 49 have reported intimate partner violence in their lifetimes (ICF, 2019). and roughly 1,000 women are killed for honor every year (Watch, 2021).

In a study (Abbasi, Naeem, & Ansari, 2021) of Muzaffargarh, a woman participating in a study said:

“After the 2010 floods, we moved to city (Mohalla Bukhari Wala) with the help of our relatives. Everything, including result cards of kids, got lost during floods. The school is away from here. Girls stay at home because we can't bear the expenses of school van. However, boys go to school on bicycle.”

In a largely patriarchal society, gender relationships face multiple challenges. Women's access to health and education is mostly limited compared to men, which is evident from a large gap in boys' and girls' literacy rate or schooling years (Shah, 2010).

4.2.4. Failure of Policy Implementation

Mitigating the negative impacts of human-induced climate change demands more effective policy decisions and superior governance practices (Biermann, 2014). Effective climate change adaptation policies offer a path to establish mechanisms that enhance resilience in various communities (Dupuis

& Knoepfel, 2013). While substantial efforts are being made to develop a framework for climate change adaptation, the effectiveness of these efforts has so far failed to materialize. Since the climate change policy was developed in 2012, there has been little evidence of effective implementation on the ground (Masud & Khan, 2023). Given Pakistan's strategic location in South Asia and the severe impacts of climate change, it is crucial to closely examine the barriers to adaptation (Spires, Shackleton, & Cundill, 2014).

1. Coordination barriers

Currently, there is no provincial Climate Change Council to coordinate with the Federal Climate Change Council, leading to a lack of clear authority for implementing climate change policies at the provincial level. Establishing a federal climate change authority would be ineffective, as it would merely duplicate the efforts of existing disaster risk management agencies (Masud & Khan, 2023).

2. Lack of common understanding on how to govern climate change related actions

Creating provincial-level climate change policies results in a waste of time and resources due to duplication. There is also a lack of alignment between the national disaster protection plan and the flood risk management plans of disaster management authorities, which weakens sectoral cohesion (Masud & Khan, 2023).

3. Issues of differing federal and local priorities and knowledge gaps

The lack of alignment between federal and provincial priorities is causing coordination problems. Weak technical capacity at the provincial level has led to challenges in prioritizing climate change issues. As climate change is a relatively new field, advancing this agenda at local levels, particularly when driven federally, is difficult. Climate change is often viewed as an extension of broader environmental issues (Masud & Khan, 2023).

Although, the National Climate Change Policy (NCCP) document addresses essential public sector areas and includes both adaptation and mitigation measures, which are crucial for a strong policy however, it lacks other key elements necessary for a fully comprehensive climate change policy (Masud & Khan, 2023). The policy has been criticized for being vague and generic, with unclear prioritization of actions and identification of responsible authorities or organizations. It also lacks a mechanism for coordinating with other sectors. Additionally, the policy faces challenges in implementation due

to insufficient information on the financial resources needed and the sources of funding (Masud & Khan, 2023). The drawbacks (Masud & Khan, 2023) of policy documents are as follows:

1. The policy does not prioritize vulnerable sectors;
2. With 24 objectives and 215 actions, the policy is overly ambitious and impractical;
3. There are no target-oriented programs to specifically address climate change issues;
4. There is a lack of accountability for shared responsibilities among different sectors and governing bodies;
5. The policy is based more on political decisions than on real and thorough assessments;
6. It lacks connections with the Sustainable Development Goals (SDGs) and other regulatory frameworks;
7. It fails to identify complementary actions within existing sectoral policies, such as those related to national forests, agriculture, and water.

A key flaw in the policy document was its failure to clearly define target-oriented projects that separate climate change interventions from general development efforts. It has been noted that this ambiguity allows existing projects to be rebranded without yielding substantial climate change outcomes. Without clear targets, it will be challenging to measure the policy's effectiveness in driving adaptation actions, particularly at lower governance levels (Masud & Khan, 2023).

5. DISCUSSION & POLICY IMPLICATIONS

Pakistan's vulnerability to climate change, due to its geography and socio-economic conditions, significantly impacts its population, particularly women. Limited healthcare access, socio-economic disparities, and traditional gender roles worsen the effects of environmental degradation and climate variability on women's health and maternal well-being. Pregnant women are particularly at risk from rising temperatures and heatwaves, which affect their ability to regulate body heat. This vulnerability is concerning given that nearly all maternal deaths related to childbearing occur in Pakistan, as reported by the World Health Organization (WHO). Pakistan's diverse geography, including arid zones, river basins, and mountainous regions, exposes it to frequent floods, droughts, and extreme temperatures, significantly impacting communities, especially women. Socio-economic inequalities further exacerbate these impacts, as women from lower socio-

economic backgrounds face greater challenges in accessing resources, healthcare, and education, making them more vulnerable to climate change. Extreme weather events can worsen these issues, leaving poor women with fewer resources to adapt. The impact of climate change varies between urban and rural areas. Urban women may face heat-related issues, while rural women deal with agricultural losses and water scarcity, requiring localized strategies to address their specific needs. Rising temperatures can lead to heat-related illnesses and complications for pregnant women, such as dehydration and preterm birth, necessitating targeted health strategies. Beyond immediate crises, climate change affects women's health in various ways, including worsening menopausal symptoms, prenatal stress, and exposure to harmful pollutants, which have long-term health implications.

Women's vulnerability to climate change in Pakistan is deeply rooted in social, economic, and cultural factors. These vulnerabilities are manifested in various ways, significantly affecting their ability to cope with and adapt to the impacts of climate change. Socio-economic inequalities significantly compound the challenges faced by women in Pakistan, particularly in the context of climate change. Women in Pakistan face significant environmental and socio-economic challenges exacerbated by climate change. Limited access to and control over resources such as land, water, and forests hinders their ability to manage these assets effectively. Despite their crucial role in food production, women own less than 10% of land globally, including in Pakistan, restricting their decision-making power and benefits from resource management. Their minimal participation in environmental decision-making processes further marginalizes women, leaving their specific needs and perspectives often overlooked. This exclusion perpetuates policies that fail to address their unique vulnerabilities, reinforcing their marginalization.

Women in rural areas, who heavily depend on natural resources, face heightened vulnerability due to climate-induced resource scarcity. Their socio-cultural norms restrict mobility and limit their ability to escape or adapt during climate disasters, increasing their exposure to risks and reducing adaptability. Gender inequalities, including limited land ownership, unpaid labor, and restricted access to healthcare, compound the effects of climate change. Women's minimal land ownership and control over assets, combined with inadequate healthcare access and high rates of gender-based violence, further undermine their resilience and well-being. Addressing these challenges requires comprehensive, gender-sensitive policies that enhance women's access to resources, decision-making, and economic opportunities.

Prioritizing women's empowerment can improve resilience to climate change and contribute to a more equitable and sustainable future.

Combating the negative impacts induced by anthropogenic climate change requires robust policy decisions and effective governance practices. While climate change policies designed for adaptation provide a potential pathway to build resilience in various communities, the effectiveness of these policies in Pakistan has yet to materialize. Despite substantial efforts to develop a framework for climate change adaptation since the introduction of the National Climate Change Policy (NCCP) in 2012, there is little evidence of effective implementation on the ground. The severity of climate change impacts in Pakistan, coupled with its strategic location in South Asia, necessitates a closer examination of the barriers to adaptation.

Effective climate change policy implementation in Pakistan faces several challenges. Coordination barriers arise from the absence of a provincial-level climate change council to connect with the Federal Climate Change Council, leading to inefficiencies and overlapping responsibilities. The lack of a unified understanding and governance structure further complicates efforts, with provincial and national plans often misaligned. Differing priorities and knowledge gaps between federal and local governments exacerbate these issues, as climate change is frequently treated as an extension of environmental issues rather than a critical standalone concern.

Criticisms of the National Climate Change Policy (NCCP) highlight its vague nature and lack of clarity on action prioritization and authority designation. The policy lacks a detailed financial plan, accountability mechanisms, and integration with Sustainable Development Goals (SDGs) and other regulatory frameworks, reducing its effectiveness. Its generic nature and absence of target-oriented projects further hinder progress, making it difficult to quantify and measure outcomes. To address these challenges, Pakistan needs to improve coordination, develop clear governance structures, prioritize vulnerable sectors, and establish specific, targeted projects. Enhancing these aspects is crucial for building resilience and achieving sustainable development in the face of climate change.

The United Nations' Adaptation Gap Report 2022 emphasizes the urgent need to scale up climate adaptation efforts. Given the evidence presented, it is crucial to integrate maternal health care into these adaptation processes UNFCCC (2021). Addressing the impact of climate change on maternal health requires comprehensive strategies that prioritize women's

health and well-being. This includes improving healthcare infrastructure, enhancing access to clean water and sanitation, and promoting education and awareness about climate-related health risks. Policies should also support women's empowerment and resilience by providing economic opportunities and addressing socio-economic inequalities. Integrating reproductive health services into climate plans and disaster relief efforts is essential to ensure that pregnant women and their families receive the care they need during climate emergencies. Based on the challenges identified in the research paper and the need to address the unequal impact of climate change on women's maternal health in Pakistan, the following policy recommendations are proposed:

1. Gender Responsive Legal Framework;
2. Multifaceted Approach to Legal Implementation of Environmental laws;
3. Recommendations for Policy Makers;
4. Women's Leadership, and Climate Resilience;
5. Supporting Human Rights.

5.1. Gender Responsive Legal Framework

Gender equality is a core principle in building a just and equitable society, universally acknowledged as a fundamental human right crucial for sustainable development. Legal frameworks are essential in defining gender relations, offering tools to remove systemic barriers and create an environment where all individuals, regardless of gender, can access equal rights and opportunities.

In Pakistan, gender equality is a multifaceted issue shaped by cultural traditions, legal advancements, and social norms. The Constitution provides a foundation for gender equality by guaranteeing non-discrimination and equal protection for all. This is further supported by specific laws aimed at combating discrimination and safeguarding women's rights (Usman, Muhammad & Kanwel, Sidra & Khan, Muhammad Imran & Khan, & Asif, 2021). To effectively address the impact of climate change on maternal health, it is essential to enhance and enforce existing laws such as the Pakistan Environmental Protection Act and the Reproductive and Healthcare Rights Act with gender-sensitive provisions. Climate change impacts and responses are not gender-neutral; integrating gender considerations is crucial for achieving equality, reducing poverty, and ensuring effective climate action. Additionally, national climate policies should include gender-focused language to prioritize women's health. Key principles for development policies include:

1. Addressing gender inequality requires confronting power imbalances and involving both men and women in the process;
2. Effective solutions must account for diverse gender experiences and contexts, avoiding one-size-fits-all approaches.
3. When designing climate change policies, it is important to consider how gender roles influence the issues and how the policy will address these dynamics. Evaluate the risks and benefits for different genders, strategize to close gaps, and maximize opportunities. Ensure that resources, needs, and success metrics are gender-inclusive, and clearly define accountability for gender-related impacts (Berger, 2011).

Given the significant impact of climate change on women's well-being, it is essential to incorporate women's reproductive health into national climate plans and disaster relief efforts. Ensuring access to reproductive health services during climate emergencies can mitigate adverse outcomes for women and children. This integration also supports gender-sensitive approaches in climate adaptation and mitigation strategies.

5.2. Multifaceted Approach to Legal Implementation of Environmental laws

Pakistan faces major environmental challenges that require updates to its legislative, institutional, and judicial frameworks. Although laws like the Constitution, the Pakistan Environmental Protection Act (1997), the Reproductive and Healthcare Rights Act (2010), and the Maternity Benefits Ordinance (1958), along with international agreements such as CEDAW, have been enacted, there is a significant gap between their introduction and effective implementation. This gap is due to factors like limited resources and capacity within enforcement agencies, insufficient stakeholder awareness and training, poor coordination among government bodies, and cultural norms that may obstruct gender-sensitive measures. Political and bureaucratic delays also add to the problem. Addressing these issues requires a multifaceted and comprehensive approach that includes strengthening enforcement, improving coordination between agencies, raising public awareness, and incorporating gender perspectives into policy execution to effectively address both environmental and social challenges.

5.3. Women's Leadership, and Climate Resilience

Resilience, a concept from ecology and sustainable livelihoods, describes a system's ability to recover and adapt after a disturbance. It hinges on the system's capacity to respond to and adjust to changes (Langston, 2017).

Women's agency outside the household is a vital aspect of resilience with transformative potential, as it can lead to significant changes in food systems, promoting greater sustainability and equity (Bryan, 2023). Women's leadership in climate governance can empower other women and influence how governments and communities address climate change. Increased representation of women in policymaking often results in more effective and inclusive climate policies that better address women's needs and preferences.

Women's empowerment can boost resilience by allowing women to access resources and respond more effectively to climate change. This, in turn, enhances welfare outcomes for themselves and others during recurring and intensifying climate shocks and stressors (akeshima, 2022). Enhancing women's leadership in climate governance is a crucial aspect of well-being. Sustainable Development Goal 5.5 seeks to ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making across political, economic, and public spheres.

5.4. Increasing women's representation in policy processes

Quotas are used in many countries to increase women's participation in policy and decision-making roles. Higher female representation in climate-related decision-making bodies boosts their influence and makes governance seem more inclusive. Quotas also offer female role models, which can inspire more women to participate in public life (Elizabeth Bryan, 2023). In addition to mandates and quotas, private sector incentives are employed to enhance gender equality and representation. These incentives include equity certificates for local governments or certifications for private entities to encourage women's involvement in climate-smart agri-food supply chains. For example, Uganda's Climate Smart Agriculture Program used equity certificates to motivate local governments to incorporate gender considerations into local development plans and boost women's participation and representation. In key ministries and organizations handling climate change responses, strategies to recruit, hire, and retain female staff are crucial. These strategies ensure that women are not only present in policy-making bodies but also actively involved in implementing climate solutions (Ragasa, 2013).

5.5. Enabling policies, commitments, and processes

Countries are increasingly incorporating gender equality into climate policy documents such as National Adaptation Plans (NAPs), Nationally Determined Contributions (NDCs), and national development plans. Although

these policies often recognize women's vulnerability to climate change, few treat women as key agents of change or include mechanisms to monitor progress. Women can impact climate solutions by advocating for policies through civil society organizations, leading initiatives within ministries, and participating in policy consultations. Additionally, national policies should include gender targets, and ministries must fund, monitor, and track these targets using sex-disaggregated data. Engaging women's grassroots organizations and including gender experts in policy design and implementation are essential for effective climate solutions. Policies should address legal barriers, such as limited land rights, by expanding women's land rights and supporting these efforts with awareness campaigns and enforcement to enhance access and ownership.

5.6. Population Perspective: Supporting Human Rights

In the 1994 International Conference on Population and Development (ICPD) Program of Action, advancing gender equality, eliminating violence against women, and ensuring women's control over their fertility were identified as key elements of effective population and development policies. These principles are still highly relevant for climate change policies today. Therefore, both mitigation and adaptation strategies should adhere to ICPD principles, which emphasize a human rights-based approach to reproductive health and rights. This approach is preferred over focusing solely on demographic targets and should be central to shaping climate change and population policies.

In simple terms, the ICPD's focus on gender equality and reproductive rights should guide how we address climate change, ensuring that policies not only consider population numbers but also uphold individual rights and gender equity.

6. CONCLUSION

The intersection of climate change, socio-economic inequalities, and maternal health in Pakistan presents a critical challenge demanding urgent attention. This research highlights the disproportionate impact of climate change on women, especially in rural areas, where limited access to healthcare, traditional gender roles, and environmental stressors compound their vulnerabilities. Rising temperatures, extreme weather, and shifting precipitation patterns directly and indirectly affect women's health, posing significant risks to pregnant women, developing fetuses, and young children. Socio-economic factors further exacerbate these challenges, as women often

lack control over resources, decision-making power, and access to healthcare. Despite policy frameworks like the Pakistan Environmental Protection Act, National Climate Change Policy and Reproductive Healthcare Rights Act, implementation remains inadequate due to coordination, capacity, and prioritization issues. Effective climate adaptation strategies must incorporate gender-sensitive approaches, ensuring women's participation in decision-making processes, improving access to healthcare, and providing education and resources to build resilience.

Addressing socio-economic inequalities through policies empowering women economically, providing education, and ensuring equal rights can mitigate climate change's adverse effects on maternal health. International collaboration and support are crucial for enhancing Pakistan's capacity to implement effective strategies. Future research should focus on conducting longitudinal and cohort studies to monitor the long-term health impacts of climate change on maternal and neonatal health in Pakistan, particularly in rural areas. Research should also explore the development and implementation of climate-resilient healthcare infrastructure, the role of education and awareness programs in empowering women to adapt to climate change, and the integration of traditional knowledge with modern healthcare practices. Additionally, examining barriers to the effective implementation of gender-sensitive climate policies and proposing actionable solutions can ensure these policies are effectively executed at the grassroots level. By addressing these research areas, future studies can contribute to developing targeted interventions and policies to enhance resilience and protect maternal health in Pakistan. By prioritizing women's health in climate policies, Pakistan can build resilience against climate change, safeguarding maternal health and contributing to sustainable development and gender equality, creating a more equitable and resilient future.

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