



Review Article

The Gendered Impact of Climate Change: A Socio-Economic Study of Women in the Sundarbans

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**Abstract**

Water, which is life to all, is a threat to few. Climate change and rising water salinity in India's environmentally delicate Sundarbans region pose a threat to women's lives and agency, especially for widows and households headed by women. This sociological study critically examines how women's social safety, hygiene, and reproductive health are disproportionately impacted by climate-induced changes, particularly the increased salt of drinking and agricultural water. The study demonstrates that limited access to water and rising saline levels are associated with poor maternal health, menstrual hygiene issues, and increased vulnerability to waterborne infections. It does this by using mainly secondary data sources, such as the National Family Health Surveys (NFHS) and published reports. The analysis, which is grounded in an ecofeminist framework, also makes the hypothesis that patriarchal dominance and household disputes are made worse by environmental shortages and changing patterns of livelihood. Finally, the results show how women's bodies and labour become sites of resistance and exploitation, urging a change from a resilience-based strategy to a climate justice paradigm.

Keywords

Women, Ecology, Violence, Water, Hygiene.

1. Introduction

The biggest delta in the world, the Sundarbans, which spans between Bangladesh and India and is known for its distinctive ecosystem and extensive mangrove forest, was inducted as a UNESCO World Heritage Site in 1987. In addition to supporting a diverse range of plants and animals, the vast mangroves are essential for shielding the coastal ecology from erosion and hurricanes. However, the consequences of climate change and global warming have resulted in casualties in this crucial area. Communities who rely on the land for their livelihoods are under tremendous strain and face existential threats as a result of increasing cyclones, rising sea levels, land salinization, and ecological degradation. Approximately 4.3 million people live in the entire region. In the middle of all the concerns that the general public faces, women have faced some significant challenges and have shown remarkable fortitude in protecting their communities.

About 4.5 million people reside on the 54 islands that make up India's Sundarbans. Their daily lives are marked by poverty, deprivation, and risk-taking. The islanders must rely on subsistence-level income from dwindling natural resources due to severe geographic obstacles. Their income is only marginally supported by rain-fed or monocrop agriculture, the forest (for forest products), and rivers and estuaries (for fishing) (Kanjilal et al. 2010).

There has been a noticeable shift in the Sundarbans' (India) landscape. There were 102 islands in the Sundarbans (India), and 54 of them were inhabited, according to the oldest geographical map of the area that is still available. One estimate

places the rate of coastal erosion in the Sundarbans (India) at roughly 5.50 sq km/year between 2001 and 2009. Soil erosion affects mud flats as well as sandy beaches. The eastern islands with dense mangroves, such as Bulcherry, Dalhousi, and Bhanga duani/Mayadwip, have been severely impacted (Hazra 2010).

In the Sundarbans, women work at various jobs to support themselves. Their occupations include farming, fishing, gathering honey, and more. They also operate mangrove nurseries and cooperatives to produce and sell mangrove goods such as honey, beeswax, shrimp, golpata, keora fruit, and others. Mangrove restoration is another activity in which they are actively involved. The majority of women also work in traditional crafts including basketry, fishing nets, and finely woven mats. Furthermore, they also participate in training harvesting techniques, patrolling protected areas, etc. As a result of climate change, the load and obligations increase, peaking during and following severe disasters.

The entire delta has been extremely susceptible to cyclones, which devastate farmlands, livelihoods, and necessities of life. Agricultural fields have been rendered infertile by the salinization of the soil brought on by strong cyclonic storms and tidal wave activity, which transports water from the Bay of Bengal back to the delta. This has put the local economy at risk.

The West Bengal State Action Plan on Climate Change states that the Sundarbans region's increased salinity is caused by the sea level rising by roughly 1.4 mm annually during the past few decades. Everyone suffers as a result of this. Now, it's also critical to comprehend what motivated these women to participate in the local economy and why the socioeconomic patterns of women in the Sundarbans differ from those of women in other areas. Women were forced into the workforce by an increase in male migration, which raises the question of whether they are forced to work there or if they choose to, like women in other regions of the nation. When the area experiences cyclone attacks, tidal surges, embankment breaches, etc., the migration of male counterparts, both domestically and outside, increases.

The burden of climate change falls primarily on women, who are members of underprivileged communities. In the absence of their spouses, they gain the confidence to become the family's primary provider by working from home and negotiating with the outside world. Therefore, our goal is to ascertain whether their participation has truly given them more power, whether they have faced additional difficulties, or whether the social fabric has just undergone a superficial alteration.

Women play a dual role in climate change studies across countries, acting as both victims and agents of change. Apart from their reliance on natural resources for a living, women are the ones who suffer the most from their position in the economic structure. It is also true that women adapt and mitigate the effects of climate change in an efficient manner. Examining how Indian women in the Sundarbans perform these "dual roles" in light of climate change has been our main focus.

- a) What are the main effects of climate change on the people who live in India's Sundarbans?
- b) In what ways does the burden of climate change affect the daily lives of women in the Sundarbans (India)?
- c) What strategies do Indian women in the Sundarbans employ to deal with the effects of climate change?

2. Methodology

This study is a secondary qualitative inquiry that explores the gendered impacts of climate change in the Sundarbans region of India using a range of available data sources. In an environmentally sensitive setting, the technique aims to produce a nuanced understanding of women lived experiences.

Data Sources: Only secondary data is used in this study. Among the sources are

- The National Family Health Surveys (NFHS) are designed to collect information on maternal health, cleanliness, and other pertinent factors.
- District Health Records: For health information specific to a region.
- Census information: To give background information on demographics.
- Reports from the government and non-governmental organizations (NGOs): especially from groups such as WWF India, Oxfam India, and UN Women.
- According to the International Union for Conservation of Nature (IUCN): Special attention was paid to these papers because of their observations regarding the relationship between gender and the environment.
- Current ethnographic research: To offer comprehensive qualitative viewpoints on the Sundarbans and their people

2.1. Data Collection

Document analysis and a thorough literature study were used to gather data. All accessible sources were methodically located, examined, and evaluated for their applicability to the main ideas of the study.

2.2. Analytical Methodology

The research utilizes a thematic analysis methodology. By arranging and analyzing the qualitative information from the secondary sources, thematic parts were created. Additionally, the study employs data triangulation, which is a technique for cross-checking results from several sources to guarantee the accuracy and comprehensiveness of the analysis. A thorough grasp of women's experiences is made possible by this method, which focusses on the intersectional vulnerabilities that widows and female-headed families face. An ecofeminist framework frames the investigation, which establishes a direct connection between gendered exploitation and resilience and environmental degradation.

3. Literature Review

Women around the world face a variety of dangers from climate change. Women, who rely on natural resources for their daily needs, make up the bulk of the world's impoverished, and they face several challenges brought on by climate change. Previous study on the relevant issues was done by a number of authors. The difficulties that women worldwide confront as a result of climate change will be discussed in this section. There are differences in how men and women bear the consequences of climate change. It is customary for women to handle food preparation, water collection, and fuel sources for cooking and heating, according to [IUCN \(2015\)](#).

3.1. Background

Tasks are growing more difficult and complex as a result of climate change. Women are expected to go too far locations in quest of food, water, and fuel supplies, which may lead to increased hardship for them, according to [UN Women Watch \(2009\)](#). This is because climate change is threatening the sources of essential resources for survival. Droughts and floods are examples of natural calamities that have terrible impacts on the poor. [The IUCN \(2015\)](#) research states that women make up 70% of the world's impoverished, and that rural women in particular are disproportionately impacted by climate change. Gender is a factor in environmental degradation.

There is a gender dimension to environmental deterioration. It restricts the room for women. Forest wood serves as the primary fuel source in many regions of the world. The women and girls in impoverished communities in the majority of developing nations are tasked with gathering traditional fuel sources, a physically taxing chore that takes up a significant portion of daily life. Women have less time to work, participate in politics or other public activities, learn to read or develop other skills, or just relax, according to [UN Women Watch \(2009\)](#). Injuries to women and girls when transporting wood from far locations are not uncommon. Once more, it is impossible to eliminate the possibility of sexual harassment and assault.

The limited rights on landed properties, limited access to financial resources, lack of technological knowledge, and restricted access to political activities, as highlighted in [IUCN's \(2015\)](#) studies, keep women from participating in climate change decision-making, which disproportionately affects them. Water scarcity has been a consequence of climate change for all societies. Desertification of the land is being caused by changes in rainfall, winds, solar radiation, and temperature trends. There is currently a serious water deficit in Latin American countries including Bolivia, Colombia, Ecuador, and Peru. Again, the combination of the high temperatures and the scarcity of water reduce productivity on land. Lack of water also causes crop depletion and deterioration of soil qualities. Animal deaths result from pastoral regions becoming desertified.

3.2. Health and Ecological Consequences

[Abuya \(2011\)](#) emphasised that the lack of water security and the issues that result from it continue to have a negative influence on women. Women are disproportionately affected by inadequate drinking water because, in many communities, especially in developing nations, women and girls bear the burden of gathering clean water for drinking, cooking, and cleaning. UNICEF research from 2016 states that 200 million hours are spent daily by women and girls around the world fetching water for families and communities. The appropriate utilisation of women's and girls' productive potential is impacted by this. The girls and women are unable to work for pay, go to school, or take care of their family. Sexual violence against women and girls is more likely to occur. In underdeveloped nations, the impoverished lack access to adequate facilities for hygiene and sanitation.

According to Mahon and Fernades (2010), women need more water than males, especially during menstruation and pregnancy. Maternal and infant mortality is largely caused by a lack of access to sufficient, safe water and sanitary facilities. In emerging nations, especially India, rising temperatures and shifting rainfall patterns are causing vector-borne illnesses including dengue fever and malaria. According to a WHO (2014) report, poor women are more prone to experience these kinds of health issues because they have less access to medical services and are less aware of the hazards. UN Women Watch (2009) and ICUN (2015) reports indicate that the amount of water that women and girls get from far-off places frequently falls short of household needs, leaving insufficient amounts for their usage. The women and girls suffer from inadequate sanitation as a result. The majority of people working in agriculture worldwide are women, with between 45 and 80 percent of them being employed in developing nations.

When crop failure from drought or desertification lowers family income, women handle agricultural assets like farming and productivity, which is often the responsibility of the male household member. In the face of repeated crop failures and the resulting decline in family income, it is typical for the male member to leave the house in the hopes of receiving compensation for his expertise. A 2010 report by the United Nations International Fund for Agricultural Development claims that when her husband is not around, the woman assumes the roles that have historically been performed by men and becomes the leader of the household.

3.3. Cultural Influences

However, the woman lacks the authority, decision-making ability, and financial, educational, and community service resources that the missing male member possesses. ICUN (2015) and UN Women Watch (2009) reports observe that women are both successful change agents and victims. In the adaptation and mitigation of climate change, they can play a significant role.

The ladies possess the information and comprehension required to comprehend the mechanisms of climate change adaptation. Their comprehension and expertise enable them to offer workable answers. The WHO (2014) research states that a gender analysis can increase the efficacy of policies aimed at protecting people from climate change and variability. Through their involvement in disaster management and their role as social change agents, women can help reduce the number of disasters.

3.4. Research Gap

Although a substantial amount of research has demonstrated the overall vulnerability of women to climate change in a variety of international contexts, such as studies conducted by the IUCN (2015), UN Women Watch (2009), and UNICEF (2016), a large gap still exists. The majority of the research that is now available concentrates on broad topics including the growing difficulty of gathering fuel and water, the absence of involvement in decision-making, and general health concerns associated with vector-borne illnesses and water scarcity.

In particular, there are clear gaps in the following areas:

Regional Specificity: The micro-level effects of climate change on women in India's Sundarbans region are not thoroughly and specifically examined in the literature currently in publication. Although broad patterns are recognised, the distinct ecological and sociocultural processes of this particular region have not been sufficiently investigated.

Particular Environmental Stressors: The numerous effects of rising water salinity, a significant environmental stressor in the Sundarbans, on women's health are not particularly covered in the studies that are now available. Water scarcity and infections like malaria are the main causes of the health problems described; the risks of saline water exposure to menstrual hygiene, maternal health, and reproductive health are not specifically mentioned.

Intersectionality of Vulnerabilities: Research that breaks down the effects of climate change to examine how intersecting identities—in particular, the special vulnerabilities of widows and families led by women—influence ecological stress is lacking.

Ecological Stress and Gendered Violence: The causal relationship between intimate partner violence (IPV) and environmental shortage has not been adequately examined in the literature. Studies recognise the greater burden and social hardship experienced by women, but they do not critically analyse how resource scarcity brought on by climate change intensifies household disputes and patriarchal control over women's bodies and labour, as this study suggests.

By examining the understudied relationship between ecological stress and gendered violence and offering a nuanced, context-specific analysis of how rising water salinity in the Sundarbans disproportionately affects women's health and social safety, especially for marginalised groups, this paper aims to close these gaps.

4. Results and Discussion

There are roughly 4.5 million people living on the 54 islands that make up India's Sundarbans. Their daily lives are marked by poverty, deprivation, and risk-taking. The islanders must rely on subsistence-level income from dwindling natural resources due to severe geographic obstacles. The common sources that barely support their incomes include rain-fed or monocrop agriculture, the forest (for forest products), and rivers and estuaries (for fishing) (Kanjilal et al. 2010). Several of the most significant effects of climate change, as reported by Welfare Reports.

4.1. Growing Cyclone Frequency

As the inhabitants are concerned, they have always underlined that both the frequency and the intensity of storms have been rising one of such greatest affairs was Aila in the year 2009. The frequency and severity of storms in the northern Bay of Bengal have grown, according to reports on extreme weather events related to the Sundarbans (India). There were seven cyclonic storms from a comparable number of depressions in the Northern Bay of Bengal between 2005 and 2009, whereas only three depressions between 1999 and 2005 developed into severe and super cyclonic storms (Hazra 2010).

4.2. Elevated Sea Level and Salt Water Infiltration

The Sundarbans region of India is seeing a greater rate of sea level rise than the global average. Compared to the global average rise in sea level, which was between 1.7 mm/year between 1870 and 2000 and 3.27 mm/year between 1993 and 2010, the present rate of sea level rise in the Sundarbans (India) is significantly higher (Gupta and Sarkar 2014). An embankment breach caused by structural weakness is the direct result of sea level rise. There are reports that indicate the super-cyclone Aila caused damage to around 1,000 kilometres of embankments in the Indian Sundarbans. In the Namkhana neighbourhood, tidal waves also wrecked embankments (Centre 2012). Mangroves and animals like tigers and turtles are under danger as a result of sea level rise. Another indication of a changing environment is salinity. The growth of mangroves has been influenced by the freshwater depletion. Additionally, agriculture is being impacted because of the elevated incidence of salinity of the soil as a result of water stagnation, cyclones, and high tides (Mahadevia and Vikas 2012).

4.3. Sea Surface Temperature

According to reports, the average global increase in sea surface temperature between 1951 and 2015 was 0.7 °C (0.11 °C/decade), however the average rise in sea surface temperature in the Tropical Indian Ocean was almost 1.0 °C (0.15 °C/decade) (Roxy et al. 2020). Fish quantity, distribution, and variety are all negatively impacted by water warming. For calciferous creatures, water acidification causes issues. Drought, floods, and storms all seriously damage fisheries. Fish output is negatively impacted by sea level rise. Certain tropical fish stocks are regionally going extinct as a result of climate change. In response to the circumstances, some other fish move to higher latitudes (Bay of Bengal News 2008).

4.4. The Effects of Climate Change on the Health of Women

Obtaining fresh water is a challenge across the Sundarbans. The sole supply of fresh water is groundwater, which is also under stress from demands for agriculture. Thus, this, along with limited access to healthcare and food instability, leads to a public health disaster. According to statistics from rural hospitals, the majority of patients—mostly women—visit the hospital for reproductive health problems, UTIs, dermatological conditions, including dermatitis and open sores, and stomach disorders brought on by drinking dirty, highly salinized water. On the other hand, commercial brackish water prawn farming has also been prompted by increased salinity.

Women working in the low-paying profession of prawn seed harvesting must stand in seawater for up to six hours a day, which is extremely harmful to their skin and bones. One of the less well-known effects of climate change is on women's menstrual health, which is caused by the long-standing custom of bathing in pond water, which is becoming increasingly saline and contaminated over time. Action-research by SaciWATERs found that 77% of the 400 women surveyed had menstrual and reproductive health problems, including rising rates of leukorrhoea, irregular bleeding, pelvic inflammation, miscarriages, cysts, and endometriosis.

Many pregnant women who come in for delivery have vaginal infections, which raises the risk of infection for the foetus. Two villages each from the Gosaba and Pathar Pratima blocks in South 24 Parganas, were chosen for this study, which included identifying ways to mitigate the consequences of climate change on menstruation and reproductive health. However, the absence of modern diagnostic tools and sanitary standards makes therapy difficult for people who are impacted. A Women for Development survey found that 70% of women in the Sundarbans region utilise extremely archaic and unsanitary methods during their periods since they cannot afford sanitary products due to the extreme poverty in the area.

4.4.1. Women's Experiences and Encounters

As was previously established, women worldwide are disproportionately impacted by the negative effects of climate change. According to the current study, there is no reason to think that Indian women living in the Sundarbans are an exception. In addition to having more work to do, women are especially affected by climate change since they are unsure of their access to sanitary facilities and safe childbirth. The best way to describe it is in detail. Water Scarcity: Water envelops the Indian Sundarbans. Ironically, because the river water is salty and unfit for human consumption, the locals suffer from a persistent lack of clean drinking water (Kanjilal et al. 2010). The workload for women and girls is increased when there is a shortage of water.

4.4.2. Increased Workload

In addition to domestic duties, women in the Sundarbans (India) engage in outside labour like gardening, fishing in tiny boats, crab collecting, and even extended fishing expeditions. The gathering of natural resources for the home is the duty of the ladies. They must gather fuel, dry leaves, and fresh water. These tasks have become even more challenging due to climate change. For instance, saline water intrusion contaminates water sources and eventually increases the number of women who travel to fetch fresh water. Less time for politics, education, and decision-making results from more time spent on water.

Honey collection is a common job in the Indian Sundarbans. They are referred to as mouley honey collectors. For honey collection, the mouleys visit the mangrove forest. They are frequently attacked by tigers and die from their wounds, leaving their widows behind. There are more widows than ever before. Even yet, there is a community designated solely for widows named "Bidhobar Gramme," or "Village of Widows." Widows work to support themselves and their dependents when their husbands are not alive.

Climate change has a negative effect on marine fishing and agricultural production, as evidenced by the diminishing incomes of the families involved in these two industries. By the way, the two primary jobs of the people who live in the Sundarbans (India) are farming and fishing. A study by Priyadarshini (2015) found that male members migrate to neighbouring states or nations as a result of decreased income. The female family members are responsible for taking care of the family while the male members are not present. In order to provide for their families, most women typically take on odd jobs. The burden on women increases.

Individual accounts provide an insight into women's lived experiences, even in cases where institutional data indicates maternal health hazards in climate-vulnerable areas. For instance, 32-year-old Sundarbans pregnant Jalema Bibi described her terrifying experience trying to go to a disaster relief centre following Cyclone Aila in 2009:

'It was pouring rain that day. The wind from the southeast was blowing wildly. My spouse went fishing. A neighbour abruptly informed me that water was beginning to enter because the embankment close to our neighbourhood had collapsed. Everyone began to relocate to a more secure area. I should visit the disaster assistance facility, he suggested. At the time, I was eight months pregnant. I had a really hard time walking up to the centre. The weather was awful; it was windy and rainy. However, I began to move. I thought it was impossible at one point. But I continued to walk. I finally made it to the centre, and we made it out alive.' (Karmakar, 2022)

Her story illustrates how pregnant women in climatic crises face extreme physical vulnerability and psychological stress. Jalema's experience, even though she was in the latter stages of pregnancy, highlights the inadequate support provided during evacuation as well as the extraordinary fortitude that women must muster during these times. According to district health reports and NFHS secondary data, maternal mortality rates and delivery problems are much higher in ecologically vulnerable, flood-prone locations like the Sundarbans. This particular account supports these findings. Climate resilience is not just an infrastructure issue; it is also a reproductive justice issue, as these narratives demonstrate the intersections between environmental risk and body and reproductive danger.

There are currently 54 inhabited islands in India's Sundarbans. There are rivers, creeks, and canals all over the place. There are still communication issues. There are various places with insufficient medical facilities. The issue is getting worse due to an increase in the frequency of natural disasters. Pregnant women's conditions are easily envisioned.

4.4.3. Menstruation

Natural disasters such as floods and cyclones have become more frequent due to climate change. In this case, the women are at greater risk. Throughout the menstrual cycle, they scarcely locate any useful materials. There are no functional restrooms in the makeshift shelters. It doesn't have clean water. Women are the ones that suffer the most. They become physically vulnerable when they are unable to obtain sanitary facilities. They grow more prone to illnesses. The situation deteriorates if the ladies are menstrual (Bhattacharya 2021).

4.4.4. Sanitation

The state of sanitation in the Indian Sundarbans is poor. Lack of adequate restrooms frequently results in long-term health issues for women. Women are particularly affected by salinity as they can't avoid saline water. In order to survive, the women bathe in saline ponds, live in saline flooded dwellings, and catch "meen" (tiger prawn seeds) in the salty river water. As a result, there is profuse bleeding when menstruating. Severe pain during sexual activity and a burning feeling when urinating is common for them. Due to natural disasters, over 50,000 women in Sundarbans coastal villages are forced to spend five to six hours every day in salty rivers like Kalindi, Raimangal, Bidyadhari, and Gosaba in order to capture "meen" fish throughout the year. Nonetheless, Pelvic Inflammatory Disease is the condition to which the most of women are susceptible in this circumstance. Bad hygiene causes infections in the uterus and vagina because the vagina's immune system is destroyed by hypertonic saline, which makes it easier for the infection to spread. According to [Bhattacharya \(2021\)](#), the health concerns of the coastal women in the Sundarbans of India have not received enough scholarly attention.

In a different study, the research team drew up a list of 67 illnesses that the women who were surveyed reported having. According to the study, compared to other women who participate in similarly low-paying economic activities, those who catch prawn post larvae in saline immersion reported noticeably greater health issues. A subset of the 67 conditions were eventually identified by statistical analysis of the poll, including irregular menstruation, eye issues, stomach pain, hand and leg pain, knee pain, skin allergies, and itching. Accordingly, that study found a link between poverty and the environment that affects the livelihoods and health of over 100,000 Indian women ([Dasgupta et al., 2020](#)).

4.5. Negotiation of Women

The residents rely more on the group effort to solve climate change-related problems, and there is less assistance from the government and non-governmental parties. The community at stake uses the limited resources available to them to pursue certain adaptation techniques. The significance of indigenous knowledge is greatly enhanced. In the following, an example of the bargaining tactics used by women in the Indian Sundarbans to combat the negative effects of climate change is discussed.

4.5.1. Socialisation of Roles of Women

The women of India's Sundarbans are innately adapted to a life of survival. The women pass on to the following generation the coping mechanisms they learnt from their ancestors to deal with the irreversible, disruptive consequences of climate change. Because of the uncertainties in daily life, women have developed the habit of using their knowledge and skills to support their families. As early as childhood, the process of role-socialization starts. Seeing young girls assist their mothers in separating prawns of various species, weights, and sizes is not unusual. Even while the donation might not always be monetary, it is still priceless. Because of the shifting climate, the male members turn to the women for the necessary assistance in getting through difficult times.

4.5.2. Recovering Falling Family Income

Agricultural fields have been destroyed by saline water intrusion. Agricultural fields frequently resemble ponds because of the stagnant saline water. Once the fields are filled with salty water, it becomes quite challenging to use them for farming. Families that depend on agriculture for their income are hampered by the influx of salty water into the fields. Women from households with declining wages are in a desperate search for new or different ways to make ends meet. Since they are knowledgeable, skilled, and readily available locally, fishing is given priority. They also have the option of working as day labourers, collecting crabs, working in sabad⁶, binding bidi, and other low-paying, temporary employment in the area.

4.5.3. Women and Indigenous Knowledge

The women of India's Sundarbans region depend on indigenous knowledge to help them fight against nature's wrath on a daily basis. They receive the wisdom from their culture. The women use this knowledge to deal with their biological issues (namely, menstruation and pregnancy), home issues (like water scarcity), and environmental issues (like soil erosion and cyclones). Women learn from their parents who taught them how to solve the challenges they faced on a daily basis. More specifically, they had learnt how to gather water from distant sources, how to fish using various kinds of nets, how to survive in harsh weather, how to fix clay embankments with commonplace tools, how to even use saline water in daily life during the water crisis, how to give birth naturally, what to eat during pregnancy, how to use clean clothes for menstruation, what to do in the forest when going to gather wood or honey, and how to balance the heavy workload in this difficult environment. The extent to which ecological degradation has pushed local populations—especially women—into adaptation practices that are both harmful to their health and accepted as normalised by daily necessity is demonstrated by the frequent use of salt water for household uses. A dramatic example is provided by Mousuni Island, one of

the Sundarbans' most severely damaged regions, where the growing incursion of sea water into freshwater ponds and aquifers is making sweet water more and more scarce. Salima Bibi, a Mousuni resident who is 48 years old, shares:

"The sweet water dilemma is a problem in this area. They've made the ponds salty. There are fewer and still crowded tube wells that are the only source of sweet water. Everyday tasks need the usage of saline water. We use saline water even for baths. Moreover, cooking is done using saline water. On the other hand, when we cook with saline water, we don't add salt. Only when saline water has been boiled to lower its salinity is it fit for human consumption. However, the boiled water is filtered using a clean cloth before being used." (Karmakar, 2022).

The gendered costs of water adaption under climate stress are crucially illuminated by this account. In addition to being the major water managers in the home, women like Salima are also responsible for coming up with, negotiating, and maintaining makeshift methods of purifying water when there is no institutional support. The use of boiling and cloth filtration, which are by no means long-term, sustainable solutions, reflects a desperate environment influenced by marginalisation, poverty, and poor infrastructure. Despite being seen as "routine," bathing and cooking with saline water poses significant health concerns. Prolonged exposure to saline water can cause gastrointestinal issues, skin conditions, and reproductive tract infections, all of which are mainly overlooked in district health data. These customs also show how eating habits have changed throughout time, with meals now being prepared with salty water, negating the need for salt, and the very flavour and composition of food changing to suit a weakened environment.

From the perspective of sociology, these adaption techniques show both structural neglect and resilience. Women bear the whole weight of caregiving and innovation, juggling the obligations of running the home with the dangers of declining health. The absence of proper infrastructure for desalination, rainwater collection, or public water distribution represents a larger kind of structural violence in which marginalised women are forced to make physical concessions in order to survive. Even though it is essential to maintaining life in the Sundarbans, the daily task of gathering water becomes a gendered kind of ecological labour that is invisible in policy discussions. Salima's story, when analysed through the feminist political ecology lens, further demonstrates the close connection between the intimate and the ecological; salinity changes her home, her cooking, and her body, demonstrating how climate change is experienced not only statistically but also sensory.

4.5.4. Use of Stagnant Saline Water

In an agricultural field, stagnant saline water is recycled. Ponds for saltwater fish are created in an agricultural field in the Sundarbans (India) using saline water. This kind of choice is seen as profitable. Since they contain salty water, the lands are deemed unusable for farming and are essentially abandoned. The landed asset was put to profitable use by those who lost output on agricultural land due to salt water intrusion.

A key perspective through which to see the slow, unseen, but profoundly ingrained types of suffering that women in the ecologically vulnerable Sundarbans endure is Johan Galtung's idea of structural violence. Structural violence is the term used to describe the systematic ways in which social structures deprive people of their essential requirements, such as dignity, livelihood, security, or health. In contrast to direct violence, it is institutionalised, normalised, and frequently accepted as the status quo; it also does not require a visible perpetrator. In the context of my research, structural violence is demonstrated by the way that women are consistently neglected in state planning and catastrophe response, resulting in their denial of safe water, proper healthcare, sanitation, and protection. These disparities—the lack of freshwater infrastructure, the disregard for reproductive health requirements, and the exclusion from climate-related decision-making—are examples of slow violence ingrained in patriarchal policy frameworks and bureaucratic inactivity. Not because nature gave them no choice, but rather because systems did not see their needs as important, women had to fetch water from far-off, frequently dangerous sources.

Galtung's approach also sheds light on the legitimisation of this type of violence, which is frequently concealed under statistical abstraction or technocratic rhetoric. District reports, for instance, might mention increasing salinity levels, but they rarely describe the burning feeling a woman has when using saline water during her period or the fear a pregnant woman feels when she must wade through floodwaters to get to a cyclone shelter. Instead of being considered extraordinary, these experiences are normalised by being removed from the official record and assimilated into women's everyday lives.

Applying Galtung's theory, in my opinion, compels us to change the topic of discussion from climate resilience to climate justice. While justice necessitates accountability, acknowledgement, and redistribution, resilience entails adaptation, frequently laying the burden on those impacted. Women in the Sundarbans are not just adapting when they boil salty water to make it potable or turn flooded fields into fishponds; they are fighting against a system that still disregards them. In an environment of systemic violence, their daily actions of negotiation serve as survival tactics.

As a result, my contemplation goes beyond simply recording misery to include analysing the underlying violence. Galtung tells us that equality, not just the lack of conflict, is what constitutes peace. The Sundarbans are not at peace by that metric. Not only is the silent suffering of women here an environmental problem, but it is also a political one. And this violence, cloaked in the rhetoric of resilience and the stillness of routine, will continue until systems change—unless women are seen, heard, supported (Galtung, 1969).

5. Conclusions

This research of the Sundarbans shows that climate change has profoundly social, gendered, and systemic implications in addition to environmental ones. Three important conclusions can be drawn from the findings:

First, women's struggles derive from structural inequities and patriarchal systems and range from health problems associated with salinized water to increased workload and physical vulnerability. Lack of access to clean water, sanitary facilities, and medical care—all of which are made worse by climatic stress—is the direct cause of their struggles.

Second, these women's much-praised "resilience" is a testimonial to their ability to endure without institutional support rather than a sign of empowerment. Their everyday adaptations, like working in flooded fields or boiling salty water, reveal a structural inadequacy in providing necessary resources and protection.

Lastly, there is a strong call to action from the experiences of women in the Sundarbans. They force us to adopt a framework of climate justice instead of just talking about climate resilience. In order to address this issue, more thorough qualitative research that elevates the voices of women on the frontlines of climate change is necessary in addition to legislative improvements.

5.1. Theoretical Implications

The study emphasises that rather than being the inevitable result of climate change, the struggles women experience is a type of systemic violence. This theoretical framework emphasises how patriarchal systems and systematic negligence increase environmental vulnerabilities.

5.2. Practical Implications

In order to address gendered vulnerabilities, policy frameworks need to go beyond infrastructure-based resilience. This covers funding for sanitary infrastructure, gender-sensitive healthcare, and freshwater access. Rather than only valuing women's endurance, development measures should focus on eliminating their unfair burdens. Interventions that use an intersectional lens will also be able to identify the hidden layers of pain experienced by marginalised women.

5.3. Limitations

The majority of the sources used in this study are secondary. Direct fieldwork in the Sundarbans would have given the results more substance and significance.

5.4. Future Research

District-specific mapping of the effects of climate change on women should be the main focus of future research. Even if some Sundarbans regions receive a lot of scholarly attention, other regions are neglected and need just as much care. It is critically necessary to conduct more qualitative and field-based empirical research to directly hear women's voices, record their knowledge systems, comprehend the psychological and physical costs of adaptation, and track the minor acts of resistance they perform. Without this, even the best-laid plans to address climate change run the risk of failing those already fighting on the front lines—not of combat, but of water.

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Conflict of Interest

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