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CLIMATE CHANGE AND EVERYDAY-LIFE: NEGOTIATION OF WOMEN IN THE SUNDARBANS, INDIA

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Abstract: Climate change is a social phenomenon. The women and the men, however, do not experience climate change in identical terms. Gender disparity, in terms of vulnerability to changes in climate, persists across societies. Miserably poor economic status compounded by unavoidable dependence on natural resources for livelihood makes women relatively more vulnerable to climate change, everywhere.

The women of the Sundarbans (India) are not unaware of their status. However, these women, in course of their continuous negotiation with climate change, have developed viable strategies to survive the disruptive effects of climate change in everyday life. The climate change-driven crises, as encountered and the coping strategies pursued by the women of the Sundarbans (India), have, however, failed to attract adequate attention from social researchers. The present paper, based on empirically derived data, makes a modest attempt to bridge this gap.

N.B. This paper forms part of the author's unpublished doctoral thesis (Department of Sociology, University of Kalyani (2019), West Bengal).

Introduction

"This Gaang (river) is all that we have. We were born and we will die too, besides it. The river has 'eaten' everything that we possessed. The river sustained us also" stated 65 years old respondent, Balaram Garai during fieldwork.

Climate change[1] is being increasingly accepted as a social issue, across societies. It is not only that climate change is in part a function of human action but also that human society continues to be the worst sufferer. Again, human society is sincerely engaged in

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containing the adverse impacts of climate change. It is a social phenomenon, the women and men are experiencing climate change differently (IUCN 2015, 1). Women, compared to men, are more vulnerable to climate change because women comprise the majority of the world's poor. Additionally, for livelihood, the women are more dependent on natural resources to which climate change poses a threat (UN Women Watch 2009, 1). This happens to women, globally. As far as the Sundarbans[2] (India) is concerned, the gravity of the situation with respect to the women is somewhat different and demands sincere academic consideration. Biodiversity poses serious challenges to human beings and women in particular whose survival depends much on their successful negotiation[3] with biodiversity. The state of suffering of the women of the Sundarbans (India) and their negotiation with the challenges of climate change in everyday life and other related issues, though exceedingly important, have failed to bring enough notice to the social researchers. The present paper, based on empirically derived data, makes a modest attempt to bridge this gap.

The Research Problem: The particular focus of the present paper has been the inadequately explored position of the women in the coastal Sundarbans (India) Vis-a-Vis climate change. Studies on climate change suggest that women and more particularly, those living along the coastal areas, are relatively more vulnerable to the ill effects of changing climate. In the case of the women in the Sundarbans (India), the challenges of unique bio-diversity pose an additional threat to their life and property and unlike their counterparts living in non-coastal areas. Again, the Sundarbans (India) are sensitive to a variety of impacts of climate change such as rise in sea level, erosion of soil, increasing salinity, frequency, and intensity of extreme weather events with bearings on the position of the women. As well, the problems, exclusive to women, viz.; menstruation, pregnancy and widowhood, interfere with the women's initiatives against the disruptive effects of climate change in everyday life. The negotiation of the women in the Sundarbans (India) needs to be understood in light of these perspectives. The rationale of the present study lies in a critical examination of these and other inadequately explored dimensions for a better understanding of the position of the women in the Sundarbans (India) in the face of climate change with policy suggestions.

Review of Literature: Climate change poses diverse threats to women all over the world. As iterated, the majority of the world's poor are women who are also dependent on natural resources for daily life; they face several impediments created by climate change. Several authors researched the related issues earlier. Through this section, it will be described how the women of the entire world face the challenges thrown by climate change. The women and the men do not experience the burden of climate change in similar ways. According to IUCN (2015), it is usual that the women take up the task of preparing food, collecting water and sources of fuel for heating and cooking. With changing climate, these

tasks are becoming more laborious and complex. UN WomenWatch (2009) observed that the women are to undertake journeys to far-off places in search of food, water and sources of fuel and the resultant greater hardship for the women. This is because the sources of basic to survival are being endangered by climate change. To the poor, the effects of natural disasters such as droughts and floods are disastrous. According to IUCN (2015) report as women consist of seventy per cent of the world's poor, rural women, in particular, are disproportionately affected by climate change. Environmental degradation has a gender dimension. It limits the space for women. In many parts of the world, forest wood is used as the major source of fuel. In poor communities in most developing countries, the women and girls are entrusted with the task of collecting traditional sources of fuel, a physically exhausting task that absorbs a good part of everyday life. Un WomenWatch (2009) depicts that women have less free time to earn money, engage in politics or other public activities, learn to read or acquire other skills or simply rest. It is not unusual that the women and the girls are injured while carrying wood from faraway places. Again, the risk of sexual harassment and assault cannot be ruled out. IUCN's (2015) reports highlight that restricted rights on landed assets, minimal access to financial resources, lack of technological training, and limited access to political activities, prevent the women from taking part in making decisions on climate change from which they suffer most. Climate change has been resulting in the scarcity of water across societies. Changes in temperature patterns, rainfall, solar radiation, and winds are causing desertification of land. Bolivia, Colombia, Ecuador, and Peru of Latin America have already been experiencing a severe shortage of water. Again, productivity on land becomes affected due to high temperature together with lack of water. Depletion of crops and deterioration of soil properties are also a result of scarcity of water. Desertification of pastoral lands leads to the death of livestock. Abuya (2011) highlighted that absence of water security and problems arising out of this persists with adverse impacts on women. Inadequate drinking water disproportionately affects the women as the responsibility of collection of clean water for drinking, cooking and cleaning rest with the women and the girls in many communities in developing societies in particular. According to a UNICEF report (2016), worldwide, women and girls collectively spend 200 million hours per day fetching water for families and communities. This has necessary bearings on the proper use of the productive potential of the women and the girls. The women and the girls are prevented from income-generating jobs, attending school and caring for families. The risk of sexual violence against women and girls increases. The poor in developing countries do not enjoy access to proper sanitation and hygiene facilities. Mahon and Fernades (2010) opined that women, during menstruation and pregnancy, in particular, require water more than men. Lack of access to adequate safe water and sanitation is significantly responsible for maternal and child mortality. Increasing temperature and

changing rainfall patterns leading to vector-borne diseases, such as malaria or dengue fever in developing countries and India in particular. According to WHO (2014) report, poor women are more likely to bear the brunt of these types of health problems because of their limited access to health care facilities compounded by low awareness of risks. Reports of ICUN (2015) and UN WomenWatch (2009) suggest that the quantity of water fetched by the women and the girls from distant places often does not meet household needs allowing inadequate quantity for use by the women and the girls. As the result, the women and the girls become victims of poor sanitation. Women constitute the majority of the global agricultural workforce (including between 45 and 80 per cent in developing countries). When familial income falls due to crop failure because of drought or desertification, the women take care of agricultural assets including farming and productivity, a role usually assigned to the male member of the household. It is common that the male member, in the face of recurring crop failure and resultant fall in familial income, leaves home hoping to recoup declining income in exchange for the skill that he possesses. A report by United Nations International Fund for Agricultural Development (2010) states that the Woman becomes the head of the household in absence of her husband and takes up the responsibilities, traditionally assigned to men. The woman, however, does not enjoy the authority, decision-making power, or access to community services, education, or financial resources as enjoyed by the absentee male member. Reports of ICUN (2015) and UN WomenWatch (2009) notice that women are not only the victims but also effective actors of change. They can assume an important role in climate change adaptation and mitigation. The women have the necessary knowledge and understanding regarding the adaptation mechanisms of climate change. Such knowledge and understanding allow them to provide viable solutions. According to WHO (2014) report a gender analysis can rise the effectiveness of measures to guard people against climate variability and change. Women can contribute to disaster reduction by participating in disaster management and acting as agents of social change.

Research Scope: After discussing the previous research works, it is noticed that there are several works on climate change and its impact on women but there are very few studies on Sundarbans' (India) women regarding climate change and their negotiation with it. The present research tries to unravel this under-explored area of social research.

Research Objectives: Studies on climate change across societies focus on women in a dual role; victim and change agent. Women are indeed the worst sufferers because of their location in the economic structure besides their dependence on natural resources for livelihood. It is also true that women effectively play the role of an agent of climate change adaptation and mitigation. Our major interest has been to explore the women of the Sundarbans (India) in these 'dual roles' in the context of climate change. To be specific

a) What are the major impacts of climate change on the inhabitants of the Sundarbans (India)?

b) How do the women of the Sundarbans (India) encounter and experience the burden of climate change in everyday life?

c) How do the women of the Sundarbans (India) negotiate the challenges of climate change?

Research Methodology: The present paper forms part of a larger empirical study. The Namkhana block, located in the district of South 24 Parganas, West Bengal (India) had been chosen as the area of study. A purposive sampling method was used. An in-depth interview technique, with the aid of a pre-tested interview schedule, was adopted for the collection of the relevant primary data. The interviews proved immensely helpful in eliciting data on the feelings, experiences and thoughts of the respondents. Also, an influx of secondary data was used. The sample size was kept limited to 300 hoping probing interviews. The sample included 88 women respondents. In course of our fieldwork, it is noted the dual role (a victim and a change agent) of the women of the Sundarbans (India) in the context of climate change. The present paper intends to present the women of the Sundarbans (India) in their 'dual role' based on their recounts. Name of the respondents, used in this paper, are fictitious.

The existing body of literature related to climate change, as presented above, does not adequately address the challenges and negotiation of women in the Indian context in particular. The present paper, based on empirically derived data, proposes to focus on these and other related issues for a better understanding of the situation. The part on findings and analysis of major issues that follows is divided into three segments. Section I examines the impacts of climate change on the Sundarbans (India) and its inhabitants based on data drawn from secondary sources, also. Section II relates to the encounters and experiences of the women. The concluding segment (Section III) makes an attempt to understand how the women of the Sundarbans negotiate climate change in everyday life. The recount of the women, the victims and the change agent, of the Sundarbans, provide the basis of our observations.

Major Issues- Findings and Analysis: Section I

Climate Change and Inhabitants of the Sundarbans (India): The Sundarban (India) consists of 54 islands and about 4.5 million people live on these islands. Poverty, deprivation and risk full life are features of their everyday life. Harsh geographical challenges compel the islanders to survive on subsistence-level returns from diminishing natural endowments. Rain-fed / mono-crop agriculture, the forest (for forest products) and the rivers/estuaries

(for fishing) are the common sources, which provide minimal support to their earnings (Kanjilal et al. 2010, 5). Some of the major impacts of climate change, as experienced by the inhabitants of the Sundarbans (India), are described herein below.

Submerging Sundarbans (India): The landscape of the Sundarbans (India) has been conspicuously changing. The available old geographical map of the Sundarbans (India) reveals that there were one hundred and two (102) islands and of these fifty-four (54) were inhabited. According to one estimate, between 2001 and 2009, coastal erosion in the Sundarbans (India) is about 5.50 sq km/year. Both sandy beaches and mud flats suffer from soil erosion. The Islands with dense mangroves on the east viz.; Bhanga duani/ Mayadwip, Dalhousi or Bulcherry have suffered substantially (Hazra 2010, 2-3). Analysis of data over the years indicates that the overall Sundarban-islands area has been experiencing a linear erosion trend; in 1904–24, the total island area was 11,904 km^2, which fell to 11,663 km^2 by 1967, falling further to 11,506 km^2 in 2001 and 11,453 km^2 by 2015–16 (Dasgupta et al. 2020, 8). During the fieldwork, it was noted that many villages (including Narayanganj) suffer from soil erosion. There are many *kancha bandh*[4] to allow a false sense of security to the inhabitants. Dasharath Das, a 56 years old man from Narayanganj village lamented, *"The whole village of Narayanganj is almost submerged under the Muriganga (a river). Only a few, maybe fifty, houses are not affected".*

Increasing Frequency of Cyclones: The frequency, as well as the intensity of cyclones, has been increasing, had been emphasised by all the respondents whom we met in course of fieldwork. Available reports on extreme weather events with respect to the Sundarbans (India) indicate that the frequency and intensity of the storm have increased in the northern Bay of Bengal. While only three depressions turned into severe and super-cyclonic storms between 1999 and 2005, there were seven cyclonic storms from a similar number of depressions in the Northern Bay of Bengal between 2005 and 2009 (Hazra 2010, 57). We noted that the experience of super cyclone Aila was still alive among the islanders. To quote Nilmoni Bari, a 63 years old man: *"The gigantic wind blew away the tiles of my house; the whole roof would have been smashed had not my son put a wet quilt on it."*

Rising Sea Level and Intrusion of Salt Water: The rise of sea level in the Sundarbans (India) is higher than the global average. The current rate of sea level increase in the Sundarbans (India) is much higher than the global average rise in sea level which was in the range of 1.7 mm/year between 1870 and 2000 and 3.27 mm/year between 1993 and 2010 (Gupta and Sarkar 2014, 106). The immediate impact of the rise in sea level is a breach of structurally weak embankments. Reports are available to suggest that the super-cyclone Aila damaged nearly 1,000 km of embankments in the Sundarbans (India). Tidal waves also destroyed embankments in the Namkhana block (Centre 2012, 12). Due to the rise in sea level, the mangroves are under threat and so are species like tigers and turtles.

Salinity is another proof of changing climate. The decline in freshwater has impacted mangrove growth. Along with this, agriculture is being affected due to the high level of salinity of the soil due to high tides, cyclones and water stagnation (Mahadevia and Vikas 2012, 9). Personal experience of rising sea level, intrusion of salt water and consequent damages to agriculture, as shared by 58 years aged woman, Anjura Khan, a respondent, may provide useful clues to an understanding of the situation: *"In my childhood, the sea level was lower; now, owing to the rise in sea level, heavy waves are breaking the embankments and forcing the salt water to intrude for several years. As a result, many agricultural fields, close to the embankments, are barren. Earlier, this area was known for the production of chilli but presently, chilli production has fallen substantially."*

Sea Surface Temperature: Reports indicate that the global average increase in Sea Surface Temperature during 1951–2015 is 0.7 °C (0.11 °C/decade), while the Tropical Indian Ocean Sea Surface Temperature has risen by about 1.0 °C on average (0.15 °C/decade), (Roxy et al. 2020, 1). Warming of water adversely affects the diversity, distribution and abundance of fish. Acidification of water brings problems to calciferous animals. Storms, floods and drought severely harm fisheries. The rise in sea level results in low fish production. Changing climate leads to the regional extinction of some tropical fish stocks. Some other fish migrate to higher latitudes in reaction to the situation (Bay of Bengal News 2008, 32-33). As Sudesh Mahato, a 38 years old fisherman, described: "*The temperature of the sea has been increasing. As a result, the fish are moving, I guess, towards Bangladesh. We bear the loss.*"

Major Issues- Findings and Analysis: Section II

Encounters and Experiences of Women: It has already been mentioned, that women are disproportionately affected by the adverse impacts of climate change, everywhere. The present study suggests that there is no reason to believe that the women of the Sundarbans (India) are exceptions. With climate change, the women are not only burdened with increased work but also suffer from uncertainties over necessary access to safe birth and hygienic sanitation. It is best put in some detail.

Water Scarcity: The Sundarban (India) is surrounded by water. Ironically, the inhabitants experience chronic scarcity of safe drinking water since the river water is salty and of no use for drinking (Kanjilal et al. 2010, 5). Scarcity of water increases the workload of the women and the girls. A 46 years old woman, Lakkhirani Mondal and also the respondent, observed- *"The women of my family and those of families of my neighbours are to go to faraway places to collect water. We collect water from the tube wells. Sometimes, the tube wells are found out of order; in such a situation, we cross this small river to collect water from another island. Collection of water is both time-consuming and tiresome".*

Increased Burden of Work: Apart from household chores, the women of the Sundarbans (India) undertake outside work such as crab collection, fishing in small boats, farming and even long fishing voyage. It is the responsibility of the women to collect natural resources for the household. They have to collect fresh water, firewood and dry leaves. Changing climate has made these works only more difficult. For example, saline water intrusion results in contamination of water bodies and ultimately makes women travel more to the collection of fresh water. More time for water means less time for education, politics and decision-making.

In Sundarbans (India), the collection of honey is a popular job. The honey collectors are called *mouley*. The *mouleys* go to the mangrove forest for collecting honey. They are often attacked by the tigers and succumb to injuries leaving behind their widows. The number of widows is increasing. Even, there is a village, called 'Bidhobar Gram' (i.e.; village of widows), meant exclusively for widows. In the absence of the husband, the widows undertake jobs to earn for the survival of themselves and their dependents.

The change in climate has adverse impacts on agricultural production and marine fishing with the declining income of the families associated with these two occupations. Incidentally, agriculture and fishing are two main occupations of the inhabitants of the Sundarbans (India). According to a study by Priyadarshini (2015), declining income leads to the migration of male members to other states/countries. In absence of male members, the female members are to take care of the family. It is usual that most women take up an odd job to meet the basic needs of the family. The burden on women becomes heavier, obviously. The increased burden of work among women is reflected in the observation of Mina Bauri, a 35 years old woman:

> *"We, the women, always remain busy to secure subsistence for our survival. We shuttle between home and place of work to undertake the domestic chores and income-generating jobs, respectively. This means that the women enjoy little space for anything else in life."*

Risk full Livelihood: 38 years old Kajol Das told, *"Our life is full of risks. When we go for a collection of crab or fish seeds, we do not know when we will have to face Dokkhin Rai[5]. Risk-taking, however, ensures subsistence for self and dependents"*. Crab collection is a popular job in the Sundarbans (India). This job is taken up mainly by women. They go to the creeks for collecting crabs. They are often attacked by the tigers hidden in the creeks. As the area of mangrove forests is decreasing, the space for tiger habitats is becoming smaller. This leads to an increase in the incidence of tiger-human confrontation.

Pregnancy: To a pregnant woman of the Sundarbans (India), even if she desires so, safe birth is becoming increasingly uncertain. The narration of the personal experience of an expecting woman during the cyclone Aila (2009) may be revealing:

> *Jalema Bibi, 32 years old married woman stated* "That day, it was raining heavily. The wind was blowing crazily from the south-eastern side. My husband went fishing. Suddenly, a neighbour told me that the embankment near our locality had broken, and the water had started entering. Everybody started to move to a safer place. He advised me to go to the disaster relief centre. I was 8 months pregnant then. It was very difficult for me to walk up to the centre. The weather was terrible, rainy and windy. But, I started walking. At one point, I felt it was impossible. Yet, I kept walking. Finally, I reached the centre and we survived."

Presently, 54 islands of the Sundarbans (India) are inhabited. Rivers, creeks, and canals are dispersed everywhere. Communication remains a problem. Medical facilities are inadequate in several areas. An increase in the frequency of natural disasters is making the situation worse. The condition of pregnant women can easily be imagined.

Menstruation: With changing climate, the frequency of natural disasters like cyclones, floods etc has increased. The women are more vulnerable in this situation. They hardly find any material for use during the menstrual cycle. The temporary shelters are not equipped with a proper toilet. It lacks clean water. The women suffer most. Lack of access to hygienic sanitation makes them vulnerable physically. They become susceptible to diseases. If the women are menstruating, the situation becomes worse (Bhattacharya 2021, 4).

Sanitation: Sanitisation is in a critical situation in the Sundarbans (India). Shortage of proper toilets often causes chronic health problems for women. The women bear the brunt of salinity because they are unable to stay away from saline water. The women survive by catching 'meen's (tiger prawn seeds) in saline water of the rivers, bathing in saline ponds, and living in saline waterlogged homes. This results in excessive bleeding during menstruation. For them, severe pain during sexual intercourse and burning sensation during urination are usual. Natural calamity forces about fifty thousand women in coastal villages of Sundarbans to spend five to six hours daily in saline rivers like Kalindi, Raimangal, Bidyadhari, and Gosaba throughout the year for catching 'meen's. However, the disease, to which most women are vulnerable in this situation, is Pelvic Inflammatory Disease. Poor hygiene leads to infection in the vagina and uterus as hypertonic saline destroys the vagina's own immune system and this allows the spreading of the infection easily. Health issues of the coastal women in the Sundarbans (India) have failed to attract adequate scholastic attention (Bhattacharya 2021, 4).

In another study, the study team sketched self-reported health problems from a list of 67 ailments identified by the surveyed women. The study revealed that those women who engage in saline-immersive prawn postlarvae catching reported significantly more health problems than other women who engage in otherwise comparable low-wage economic activities. Statistical analysis of the survey later discovered a subset of the 67 ailments; such as irregular menstruation, eyesight problems, gastric pain, pain in hands and legs,

knee pain, skin allergies, and itching. So, that study revealed a poverty-environment nexus that impacts the health and livelihoods of more than 100,000 women in the Indian Sundarbans (Dasgupta et al. 2020, 31).

Major Issues- Findings and Analysis: Section III

Negotiation of Women: Available support from the state and the non-governmental organizations is limited, the inhabitants rely more on the collective resolution of climate-change-driven challenges. The community, at stake, pursues certain adaptation strategies with however meagre resources at its disposal. The role of indigenous knowledge becomes extremely meaningful. In what follows, a sample of negotiation strategies pursued by the women of the Sundarbans (India) to overcome the adverse impacts of climate change is mentioned.

Role-Socialisation of Women: The women of the Sundarbans (India) are born to struggle for survival. The women learn the strategies to cope with the undying disruptive effects of climate change from their ancestors and pass on the same to the next generation. The uncertainties in everyday life-situation make the women develop the habit of contributing to the sustenance of the family according to her knowledge and skill. The process of role-socialisation begins as early as childhood. It is not rare to come across minor girls helping their mothers in isolating prawns of different species, sizes and weights. The contribution may not always be monetary yet invaluable. The male members look to the women for needful support in overcoming critical situations due to changes in climatic conditions. The situation is reflected in the following observation of 42 years aged Sunita Dhara,*"We survive and die along with climate change-driven disruptions in everyday life. The struggle remains the only option available for survival to a poor family like ours. Since my childhood, we are accustomed to seeing the women members of our families take up not only domestic chores but also outdoor work like fetching drinking water or collecting forest wood from distant places or taking up a job to supplement the family income. The menstruating women were no exceptions. The practice continues. We have learnt to blindly follow the women of our earlier generations. It is strongly believed that every woman should effectively contribute to the sustenance of the family at her best. It is socially valued."*

Recouping Falling Family Income: Intrusion of saline water has ruined agricultural fields. Saline water remains stagnant in the agricultural field and the field often looks like a pond. Use of the agricultural fields for farming, once filled with saline water, becomes only difficult. The intrusion of saline water into the agricultural field interferes with the earnings of the families dependent on agriculture. The women of families with falling incomes desperately look for additional/alternative sources to recoup their income. Fishing is accorded priority given their knowledge and skill as well as availability at the local. The other options available to them are- day labour, crab collection, working in *sabad*[6], binding

bidi and other casual and low-paid jobs, available locally. Taking up an additional job, even casual and low-paid, to recoup familial income is considered the most effective adaptation strategy. As Rakhi Barik, a 36 years old married woman recounts: *"Following intrusion of saline water into our agricultural field, the income of my family had fallen, substantially. I was desperately looking for a job to support my family. I could not remain attached to a particular job. For, no job was secure. Some jobs were available to males only. Most jobs were either seasonal or temporary. I was so desperate to get a job that I did not make a choice. So, I took up fishing, MGNREGA[7] work, day labour in sabad and even collection of wood from the forest as and when available though not simultaneously."*

Women and Indigenous Knowledge: The women of the Sundarbans (India) rely upon indigenous knowledge in their struggle against the wrath of nature in everyday life. The knowledge is culturally transmitted to them. The women negotiate with their biological concerns (to be specific, menstruation and pregnancy), domestic problems (for example, water scarcity) and environmental problems (for example, cyclones and soil erosion) through such knowledge. The respondents expressed that they had come to know the solutions to their everyday life problems from their parents. To be specific, they had gathered knowledge about how to collect water from faraway places, how to use different types of nets for fishing, how to survive in extreme weather, how to repair clay embankments with mundane tools, and how to even use saline water in everyday 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 while going to collect wood/ honey and how to balance the huge burden of work in this challenging environment. As Durga Mandal, a 60 years aged woman recounts: *"We learnt everything from our parents; how to survive in this risky environment. Our knowledge is our treasure. We will pass it on to our next generation so that they can also exist."*

Utilization of Saline Water: Sweet water is unavailable in some parts of Mousuni Island due to the intrusion of saline water. They use salt water for their daily chores. Salima Bibi, 48 years old woman from Mousuni Island observes: *"In this locality, we face the crisis of sweet water. The ponds have become salty. Sweet water is available only from tube wells, which are not only fewer in number but also remain crowded. We use saline water for daily chores. We even take baths using saline water. Also, saline water is used for the purpose of cooking. We do not, however, add salt when we prepare food with saline water. Saline water is used as drinking water only after boiling the same in order to reduce salinity. The boiled water is, however, filtered with the aid of clean cloth before the same is used."*

Use of Stagnant Saline Water: Saline water, stagnant in an agricultural field, is re-used. In the Sundarbans (India), an agricultural field, filled with saline water, is converted into ponds for the saltwater fish. Such a decision is considered gainful. The agricultural fields, filled with saline water, are found not suitable for agriculture and are virtually left abandoned. Those who lost productivity on agricultural land because of intrusion of saline water found gainful use of the landed asset.

It is important to mention here that the women of the Sundarbans (India) are not equipped with appropriate negotiation strategies to meet every challenge of climate change. The women, however, deserve appreciation for their undying patience for struggling against adversaries in an everyday-life situations with minimal resources at their disposal.

Summary and Concluding Observations

Climate change poses a serious threat to the Sundarbans (India). The increasing frequency and intensity of cyclones, rising sea levels, intrusion of saline water, and scarcity of drinking water continue to disrupt the everyday life of the inhabitants of the Island. Inadequate support from the state and the non-governmental organizations in critical situations compels the inhabitants to look to the community or self for reconstruction. Women are disproportionately affected by the adverse impacts of climate change, everywhere. The women of the Sundarbans (India) are no exception. The present research suggests that the women face additional gender-specific problems: biological (to be specific, menstruation and pregnancy) and social (to be specific, possible widowhood). A scrutiny of the role of the women in the face of multiple undying challenges of climate change reveals that they are engaged in a dual role, a victim and a change agent. The women are not only the victims but also in constant negotiation with the wrath of nature with limited resources at their disposal. The women take care of domestic chores along with outdoor activities for the sustenance of the family. The women have perfected the art of making a balance between two types (domestic and outdoor) of roles in everyday life situations. The process of role socialization has imbibed in them the wisdom to strike the balance. Again, the women pursue strategies to adapt to the demands of the changing climatic conditions. The women take up the job, as locally available, to compensate for falling familial income due to loss of earnings from agriculture. They adopt appropriate techniques for use of saline water. The agricultural field, filled with saline water, is converted into a pond for the breeding of saltwater fish. This helps them to compensate for falling income from agricultural land lying unproductive due to intrusion of saline water. The women are engaged in incessant negotiation for existence. The success of the struggle of the women has to be evaluated from the perspective of their ceaseless efforts to change. Also, the location of the women in the structure of decision-making, with regard to climate change at the local, has to be taken into account.

It is necessary that the state should take adequate initiatives towards building basic infrastructure like fresh water supply, proper sanitation, roads, medical facility and education for the inhabitants of the Sundarbans (India). Ensuring effective participation of the women in the process of decision-making with regard to reconstruction and rehabilitation of the victims of climate change will help to resolve the gender-specific issues. While indigenous

knowledge in resolving climate change-related challenges should be appropriately encouraged, provisions for financial support to the women, interested to undertake small business, need to be part of the rehabilitation programme. As well, repair of embankment and encouragement to the plantation of mangrove sampling should be accorded priority. Moreover, an effective programme for capacity building of the victims including the women may ease their everyday life situation. Future research should relate the findings of the present study to the condition and concern of the women of the Sundarbans (Bangladesh) for an understanding of the position of the women in everyday life vis-a-vis changing climatic conditions in the largest mangrove forest with tiger habitat in the world.

Notes

1. **Climate Change-** Climate change is a scientific issue, its impacts on human society and the societal concern to contain its adverse impacts on human society have made it a subject of social inquiry. It is being gradually accepted as a social phenomenon.
2. **Sundarbans-** The Sundarban eco-region, located in the tidally active lower deltaic plain of the Ganges-Brahmaputra-Meghna basin, hosts the largest mangrove forest and the only mangrove forest with a tigers habitat in the world. Spread over parts of Bangladesh and India, the protected area within the forested part has been designated by UNESCO as World Heritage Site in both these countries (Danda, 2019: 2). Also, the Sundarbans is known for its largest mangrove forest in the world with very high species diversity (25 true mangrove and 30 mangrove associates). This is the only mangrove wetland in the world where tigers live (WWF, 2010: 1). The biodiversity includes 100 species of vascular plants, 250 species of fishes, and 300 species of birds (Raha et al., 2012: 1290). The forest is frequented by animals like crocodiles, buffaloes, wild dogs, cats, deer, porcupines, sharks, Gangetic dolphins, snakes (king cobra, common cobra, and banded krait), red crabs, oysters etc. The Royal Bengal tiger is the most important animal of the Sundarbans (Sarkar 2010, 10). This biodiversity is making the situation more challenging for human beings and women in particular as they depend on natural resources for survival.
3. **Negotiation-** The everyday life of the inhabitants of the Sundarbans (India) is exposed to a variety of threats. These include the wrath of nature, ferocious animals and economic uncertainties. For the present purpose, the term negotiation refers to the struggle, in the form of an adaptive mechanism, of the women to keep the impacts of such threats to an unpreventable minimum.
4. ***Kancha Bandh-*** The term '*Bandh*' literally means an embankment. *Kancha bandh* means an embankment which is made with clay. It is prone to erosion. The clay gets washed away by the waves of the sea or heavy downpours.
5. ***Dokkhin Rai-*** The royal Bengal tiger is referred to as *Dokkhin Rai***.** *Dokkhin Rai* is known as the lord of the tigers and is worshipped in the Sundarbans. The inhabitants can hardly escape either the hungry tide or the hungry tiger or the hungry crocodile in everyday life-situation. It is their strong belief that survival is best ensured by way of appeasing the *Dokkhin Rai*, the lord of the tigers and the *Bonbibi*, the queen of the forest. *Bonbibi* is the deity of the forests and protector of

all. It is interesting to note that both the Hindu and the Muslim inhabitants of the Islands believe in the divine power of *Bonbibi*. Presumably, the shared worship reflects something else; a shared dependence on the forest and a very rational approach to protection (Ghosh, 2004: 102-105; Uddin 2011, 62).

6. ***Sabad-*** *Sabad* is a place where fish is dried. In the winter, the *sabad* continues for about four months. *Sabad* is generally spread over two kilometres and separated into squares by bamboo pieces. A number of steps are followed for making dried fish (*sutki*). These are as follows: first, fish are collected from the sea; second, the fish are hung on bamboo pieces. While the collection of fish is undertaken by the male fishers, the hanging of fish is undertaken by their female counterparts; third, the fish are scattered on the floor following a little bit of drying. The floor is covered with paddy straws with a net over it. The fish are spread on the floor after its necessary preparation as described above. After sunset, the fish are collected and covered with a plastic sheet to avoid dew drops/rain. The next day, the process is repeated and continues for three to five days until the fish are completely dried and become ready for sale in the market.

7. **MGNREGA-** Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) came into force on February 2, 2006. It is a unique Act wherein an economic safety net is provided to around 2/3rd of the population of India through the right to work. The scale on which it has been provided is just enormous, around 1/10th of the total world population. It was implemented in a phased manner; with the first 200 most backward districts had been covered in Phase I i.e. 2006-07. Phase II included 130 additional districts and the final phase covered the remaining rural districts. The Act currently covers all the 645 rural districts throughout India. Since its inception, the scheme has generated 1679.01 crore person days of employment at a total expenditure of Rs. 250310.81 crores. The primary purpose of the Act is to provide a minimum level of household security to rural households by providing on-demand right to work i.e. at least 100 days of unskilled labour (Ranjan, 2015: 55).

References

Abuya, John. (2011). How the Drought Affects Women. *Action Aid USA, http://www.actionaidusa.org/2011/07/how-drought-affects-women* (Accessed May 15 2018).

Bay of Bengal News. (2008). *Impact of Climate Change on Indian Marine Fisheries,* March-June. *https://www.bobpigo.org/html_site/bbn/march-june08/March-June2008-Pages32-37.pdf* (Accessed Dec 11 2019).

Bhattacharya, Swati. (2021). Jalabayur Sange Juddho, Raktokhorone Bipanno Upakul-Kanyara. *Anandabazar Patrika*, Sep 7, Editorial. *https://www.anandabazar.com/editorial/essays/once-its-flooded-it-takes-a-lot-of-time-for-the-salt-to-disappear-from-the-lands-and-farms-at-sunderbans/cid/1302385* (Accessed Sep 14, 2021).

Centre for Science and Environment. (2012). *Living with changing climate: Impact, vulnerability and adaptation challenges in Indian Sundarbans. http://cseindia.org/userfiles/Living%20with%20changing%20climate%20report%20low%20res.pdf* (Accessed Dec 14 2019).

Danda, A. A. (2019). Environmental Security in the Sundarban in the Current Climate Change Era: Strengthening India-Bangladesh Cooperation. *Observer Research Foundation, Occasional Paper No. 220,*

https://www.orfonline.org/research/environmental-security-in-the-sundarban-in-the-current-climate-change-era-strengthening-india-bangladesh-cooperation-57191/ (Accessed Jan 5 2020).

Dasgupta, Susmita, David Wheeler, Md. Istiak Sobhan, Sunando Bandyopadhyay, Ainun Nishat, and Tapas Paul. 2020. Coping with Climate Change in the Sundarbans: Lessons from Multidisciplinary Studies. *International Development in Focus*. Washington, DC: World Bank. doi:10.1596/978-1-4648-1587-4.

https://openknowledge.worldbank.org/bitstream/handle/10986/34770/9781464815874.pdf (Accessed July 19 2022).

Ghosh, Amitav. (2004). *The Hungry Tide*. London: Harper Collins Publishers Limited.

Gupta, Subhadip. & Gargi Sarkar. (2014). Climate Change and Economic Adaptability of Indian Sunderban. *International Journal of Science and Research* 3 (10): 105-110.

Hazra, Sugata, Kaberi Samanta, Anirban Mukhopadhyay and Anirban Akhand. (2010). *Temporal Change Detection (2001-2008): Study of Sundarbans,* Final Report of School of Oceanographic Studies, Jadavpur University, India. *http://www.iczmpwb.org/main/pdf/ebooks/WWF_FinalReportPDF.pdf* (Accessed Jan 5 2020).

IUCN. (2015). Gender and Climate Change Strengthening Climate Action by Promoting Gender Equality. *https://www.iucn.org/sites/dev/files/import/downloads/gender_and_climate_change_issues_brief_cop21__04122015.pdf* (Accessed Jan 7, 2020).

Kanjilal, Barun, Papiya G. Mazumder, Moumita Mukherjee, Swadhin Mondal, Debjani Barman, Sneha Singh and Arnab Mandal. (2010). *Health care in the Sundarbans: Challenges and plans for a better future. https://assets.publishing.service.gov.uk/media/57a08b24ed915d3cfd000b68/sundarbans.pdf* (Accessed Feb 20 2020).

Mahadevia, Kanksha and Mayank Vikas. (2012). Climate Change – Impact on the Sundarbans: A Case Study. *International Scientific Journal* 2: 7-15.

Mahon, Therese and Maria Fernades. (2010). Menstrual Hygiene in South Asia: A Neglected Issue for WASH Programmes. *Gender & Development* 18(1): 102-103.

Priyadarshini, Subhra. (2015). Climate change pushing Sundarban farmers into awkward jobs. *Nature India* doi:10.1038/nindia.2015.21. *https://www.natureasia.com/en/nindia/article/10.1038/nindia.2015.21* (Accessed Feb 24 2020).

Raha, Atanu, Susmita Das, Kakoli Banerjee and Abhijit Mitra. (2012). Climate change impacts on Indian Sunderbans: A time series analysis (1924–2008). *Biodiversity Conservation* 21: 1289–1307.

Ranjan, Rajiv. (2015). *Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA): A Critical appraisal of its performance since its inception*. Paper presented at 3rd Pan IIM World Management Conference, IIMI, Indore, Madhya Pradesh, India. Dec 16.

Roxy, M.K. *et al.* (2020). Indian Ocean Warming. In R. Krishnan, J. Sanjay, Chellappan Gnanaseelan, Milind Mujumdar, Ashwini Kulkarni and Supriyo Chakraborty, ed., *Assessment of Climate Change over the Indian Region*, 191-206. Singapore: Springer. *https://doi.org/10.1007/978-981-15-4327-2_10* (Accessed July 18 2022).

Roy, Ananya. (2010). Vulnerability of the Sundarbans Ecosystem. *Journal of Coastal Environment* 1 (12): 169-181.

Sarkar, Sutapa C. (2010). *The Sundarbans Folk Deities, Monsters and Mortals.* New Delhi: Social Science Press and Orient Blackswan.

Uddin, Sufia M. (2011). Beyond National Borders and Religious Boundaries: Muslim and Hindu Veneration of Bonbibi. In Mathew Schmalz and Peter Gottschalk, ed., *Engaging South Asian Religions: Boundaries, Appropriations and Resistances,* 61–82. New York: State University of New York Press.

UNICEF. (2016). *Collecting water is often a colossal waste of time for women and girls. https://www.unicef.org/press-releases/unicef-collecting-water-often-colossal-waste-time-women-and-girls* (Accessed July 18 2022).

United Nations International Fund for Agricultural Development. (2010). *Gender and Desertification: Making Ends Meet in Drylands. https://www.ifad.org/en/web/knowledge/publication/asset/39405857* (Accessed Dec 16 2020).

UN WomenWatch. (2009). *Women, Gender Equality and Climate Change. https://www.un.org/womenwatch/feature/climate_change/downloads/Women_and_Climate_Change_Factsheet.pdf* (Accessed 22 Nov 22 2020).

WHO. (2014). Gender, *Climate Change and Health. https://apps.who.int/iris/bitstream/handle/10665/144781/9789241508186_eng.pdf;jsessionid=EDC23E56A92872BE10B1A549821FC16C?sequence=1* (Accessed Oct 17 2020).

WWF. (2010). Sundarbans: *Future Imperfect, Climate Adaptation Report.* WWF, New Delhi, India. *http://awsassets.wwfindia.org/downloads/sundarbans_future_imperfect__climate_adaptation_report_1.pdf* (Accessed Nov 28 2020).