

# Forest at a Standstill: Development at the Cost of Sundarbans

**A Study on the socio-environmental changes in the Indian part of the Sundarbans Delta**

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F o r P r i v a t e C i r c u l a t i o n O n l y

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**Ishita Bhattacharya and Tapojay Mukherjee**

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## INTRODUCTION

Deemed as a “World Heritage”, by the United Nations Educational, Scientific and Cultural Organization (UNESCO) - Sundarbans is one of the world’s richest biodiversity hotspots. The region, with arguably the world’s largest remaining area of mangroves, does not just support human settlements and houses a wide variety of flora, diverse fauna and rich aquatic life but is also a breeding ground for several globally threatened species, including the endangered Ganges River dolphin, the masked finfoot, the water bird, the Bengal tiger and various other species of reptiles. About 40 per cent of the nearly 10,000 square kilometres (sq km) of the Sundarbans Forest lies within West Bengal, and the rest in Bangladesh.



*Fig. 1. A stationary fishing boat (Mousuni Island, South 24 Parganas)*

The Sundarbans’ Forest forms a natural barrier, protecting around 14 million inhabitants of the Kolkata Metropolitan Region and other human settlements from cyclones, rising sea tides, and other adverse natural events. The forest ecosystem is also a major source of livelihood and contributes directly to the well-being, and cultural and life support functions of the inhabitants of the area (Uddin et al., 2013; Shameem et al., 2014). Lower rates of literacy and severe poverty leave the residents of the region heavily dependent on the mangrove forests and their ecosystem services. This dependence further creates a close relationship between these inhabitants and the Sundarbans, which is clearly reflected in the local culture through their songs, art, religions and myths.

Unfortunately, despite the Sundarbans Mangroves (Tidal forests) being declared as a protected area and a World Heritage Site in 1997 by the International Union for Conservation

of Nature (IUCN) and the United Nations Educational, Scientific and Cultural Organization (UNESCO), its ecosystem is in a very critical condition and is declining at an alarming rate. The decline can be attributed to a range of deforestation drivers due to climatic factors, biological invasions, and illegal human interventions (Iqbal, 2020). Furthermore, climate change, increasing weather variability and extreme weather conditions are likely to increase the vulnerability of the region and amplify the impacts on the dependent poor inhabitants.



*Fig. 2. A still from Raidighi Village, Block Mathurapur, South 24 Parganas*

The inhabited portions of India's Sundarbans are also characterized by severe poverty, with dismal living standards. An average of 43.5% of the population lives below the nationally designated poverty line. Inaccessible and hostile terrain conditions, ecological degradation and persisting natural calamities such as cyclones, tidal surges and floods are some of the challenges that the people face continuously (Shaw

et. al., 2014). The Sundarbans faces severe floods, almost every year and as a result, its existing water resources remain out of use for several months, certain areas lack infrastructure even for basic amenities; since the super-cyclone Aila of 2009, agriculture remains difficult and unavailing, and yet people's dependence on the same remains high due to lack of other alternatives.

The study, in this context, aims to further explore and understand the larger socio-environmental changes and the various socio-economic problems faced by the people in Sundarbans due to environmental degradation and climate change.

## LITERATURE REVIEW

### Introduction

The aim of this chapter is to review the literature available on the Sundarbans region. It will explore aspects like geographic location and vulnerability, socio-environmental changes in the context of economic growth and socio-economic problems in the region.

### Studies on Geographic Location and Vulnerability of the region

Covering more than 10,000 sq km of deltaic floodplains across Bangladesh and India, the Sundarbans Region contains the largest continuous block of mangrove ecosystem remaining in the world. Sundarbans, as discussed in the *Landscape narrative of the sundarban - Towards Collaborative Management by Bangladesh and India* by Nishat, B., Rahman, A. J. M. Z., & Mahmud, S. (n.d.) represents one of the most complex ecological and socio-political landscapes, as it spans a border, political and administrative boundaries thus creating uncoordinated management that impinge on the effectiveness of having an integrated approach.

The Sundarbans region is prone to nearly 4–8 cyclonic depressions in a year and is situated on three tectonic plates. Its history of hydrological disasters further aggravates the fragility of the region. This region is hit by tropical cyclones regularly from April to June and mid-October to mid-November. Cyclonic activity is more intense in the delta than anywhere else in the world. Andharia, J. in her book *Disaster Studies: Exploring Intersectionalities in Disaster Discourse* discusses coping mechanisms and how the villages in the risk-prone areas are surrounded by 20 ft embankments though these are breached by tropical cyclones like Aila and tidal waves that rise up to 250 ft high and then funnel their way through the channels, disintegrating entire villages built on and made of mud.

Besides this, climate change has caused imbalances in the ecology with devastating consequences. The sea is steadily eating into the Sundarbans, the world's largest delta and mangrove forest, threatening an ecological disaster for the Bengal basin region. Over the past few years, storms have become more intense here. A study by Mitra et al. (2009) examined temperatures between 1980 and 2007, showing that the surface water temperature of the Sundarbans has been increasing at the rate of 0.5 °C per decade for the last three decades, that is, eight times the rate of global warming. According to Danda et al. (2011), the Sundarbans

in India is experiencing a sea-level rise of 3.14 mm per year. In the past two decades, four islands — Bedford, Lohachara, Kabasgadi and Suparibhanga — have sunk into the sea. Two other islands Ghoramara and Mousuni—are fast going underwater. Other islands like Shikarpur, Gobindapur, Bankipur and Boatkhali have also been affected.

### **Studies on socio-economic problems in Sundarbans**

The Sundarbans region is one of West Bengal's salty and backward areas. It is a delta plain with an extensive network of streams and is ravaged by natural disasters every year. The residents of Sundarbans mostly rely on agriculture, aquaculture and activities involving other natural resources but the increased level of salinity in soil and water after what is called the “Aila effect” since 2009 has forced people to look for alternative livelihoods.

Purnendu Sekhar Ray, in his paper titled *Socio-Economic History in Sundarbans* has tried to analyse Sundarban's socio-economic vulnerability. While discussing in detail the various obstacles to overall socio-economic upliftment of the region, such as continued exposure to cyclones and storms, frivolous infrastructure, poor social structure; he has also suggested practical ways to improve communities' socio-economic conditions. Having consolidated infrastructure structures, an efficient early warning system, disaster surveillance centres, improved connected transit within isolated islands, and better livelihoods, education, and awareness are some of the identified adaptation solutions elaborated.

Meheub Sahan, Sufia Rehman, Ashish Kumar Paul & Haroon Sajjad, in their paper *Assessing socio-economic vulnerability to climate change-induced disasters: evidence from Sundarban Biosphere Reserve, India* explore ‘household vulnerabilities’ in the tenuous ecosystem of the Indian Sundarbans, using various socio-economic and sub-components. The paper revealed the blocks of Indian Sundarbans with the highest vulnerability and the factors responsible for the same, like extreme weather events, deprived social structure, low economic condition, meagre healthcare facilities, and how these further make the area socio-economically sensitive. They have discussed in detail how strengthening the social system with the provision of economic opportunities is crucial for lessening socio-economic vulnerability. Education and awareness among local communities may help improve the understanding of the magnitude and implications of severe weather events. The paper has effectively tried to analyse the impact of climate change-induced hazards on socio-economic conditions on the communities in coastal areas.

## Studies on Climate Change and its Impact on the Sundarbans Delta

IPCC (Intergovernmental Panel on Climate Change) established by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP), in their Fourth Assessment Report released in 2007, highlighted how “Warming of the Climate System Is Unequivocal”. Rising concerns about climate change have led to researchers across the globe making an attempt to not just understand climate change but also its impact on the ecosystem and solutions.

Yet, a vast disparity in information sharing and communication of theoretical scientific knowledge and practical implications of climate change, to the vulnerable population, makes developing consciousness about it very difficult. The paper *How to communicate climate change ‘impact and solutions’ to vulnerable population of Indian Sundarbans? From theory to practice*, discusses certain participatory methods of communication, to not just communicate theoretical knowledge, but also devise adaptation strategies to practically combat climate change problems. It also explores the successes of socio-environmental projects implemented at Indian Sundarbans targeting towards economic improvement.

## Studies on Eco-tourism and its Impact on the region’s economy and environment

Tourism being the largest economic sector in the world has an enormous developmental impact on the livelihood of people. It cuts across many sectors, levels and interests. While tourism in Sundarbans can offer various financial benefits; mass tourism in the protected areas of the region can be disastrous for livelihood and environmental sustainability in the long term. An absence of controlled tourism and destination management can pose significant levels of threat to the sustainability of the local habitat and natural resources.

Responsible tourism is very crucial for developing tourism in the region. It has to be planned in a way that does not just benefit the local communities, strengthens the local economy, employs the local workforce but is also ecologically sustainable, uses local materials, local agricultural products and traditional skills. Tourism activities need to respect the ecological characteristics and capacity of the local environment in which they take place. It has been globally observed, with tourism initially there is snowballing in economic terms but degradation of the environment over time jeopardises the future interests of tourists as well as the host populations unless sustainably managed. *Transformation of the Sundarbans Eco-region: Lessons from Past Approaches and Suggested Development Options*, examines

tourism in the Sundarbans in this light, and the various challenges in realising the potential of jointly managed transboundary tourism. Seeing how the currently implemented policies are not strong enough to achieve the pledges governments have made under the Paris Agreement (Danda A.A., Rahman M. (2019), it notes that options for resilient and sustainable development in the eco-region, also need to be explored.

“On one hand there is no permanent solution or source to earn a living in the Sundarbans, on the other the beauty of the Sundarbans is diminishing”

~ A respondent from Sundarbans during the Video Testimony

## METHODOLOGY

The chapter states the aim of the research along with the methodological approach adopted. It also discusses the method of data collection and the subsequent process of data analysis. Ethical considerations and limitations are included to present the findings in a definite context.

### 3.1 Introduction

The study used both quantitative and qualitative tools to examine the research questions and bring in insights from the field. The quantitative part of the study was through a survey with the aim to quantify the trends around broad themes of the study, while the qualitative part of the study was used to bring out the nuanced understanding of the themes along with the lived experiences of the community. The findings of the report are based on interviews, video testimonies and data collected from 1,205 survey respondents.

### 3.2 Aim of research

The following research questions have been addressed in the current study:

- What are the socio-economic problems faced by the residents of Sundarbans, due to environmental austerities and effects of climate change?
- What are the larger socio-environmental changes in the Sundarbans, in the context of economic growth and development?

### 3.3 Sampling method

The method of enquiry entailed deploying a purposive sampling technique. 16 blocks were identified across the districts of South 24 Parganas and North 24 Parganas with local youths trained as survey-takers to complete the data collection. Middle-aged residents of Sundarbans were identified, for the questionnaire made an attempt to understand the gradual change in perceptions of events over a considerable period of time. People engaged in particular professions were also identified to understand the livelihood patterns in the region.

The researchers partnered with local youth groups and grassroots associations working in the Sundarbans and respondents who gave their consent in taking part in the study.

### 3.4 Data collection

Data and video testimonies were collected in the months of September and October, 2021. Permission for voice as well as video recording was sought from respondents and after end of an interview session, the interviews were transcribed within a day. 41 participants – from 7 blocks of South 24 Parganas and 3 blocks of North 24 Parganas, representing a wide range of age groups – consented to give video testimonies. To protect the identity of the respondents further details have been withheld.



Fig. 3. The team of young surveyors for the study

In addition, a mobile application based survey was designed for the study. Youth members of the community conducted the survey in the field areas and a two-day workshop was conducted with them to get them familiarized with the application as well as to seek their suggestions on the questionnaire.

Around 1,200 responses were sought from the team which would have been *statistically significant* for the findings derived from the data. Yet, information was received from 1205 respondents which have been collated in the report.

### 3.5 Geographical Location

The study was conducted across 16 blocks which collectively determine the geographical limit of the Indian Sundarbans region. These blocks are spread over the districts of South 24 Parganas and North 24 Parganas in Southern West Bengal.

### 3.6 Data Analysis

The in-depth interviews were transcribed in the field after the completion of interview sessions. Post transcribing of the interviews, the transcripts went through a process of coding to ascertain themes that emerged from the written texts. Sub-themes were engaged to replenish the arguments around the main themes modelled on the central research questions.

The data collected through the survey was cleaned to represent the data mostly through univariate analysis. Bar charts and pie charts have been used liberally along with tabular representations of a few demographic data sets.

### 3.7 Ethical considerations

Consent was sought from the respondents and interviewees and anonymity of the respondents was ensured during the transcribing process according to the choices exercised by them. The nature and objectives of the study were fully disclosed to the participants and they were also made aware of the provision of withdrawal at any point of time during the process of the interview.

“Life in Sundarbans is not like before, as the population has increased, livelihoods are changing, income though has increased but things are expensive now”

*~~ A respondent from Sundarbans during the Video Testimony*

## MAJOR FINDINGS AND REFLECTIONS

### 4.1 Introduction

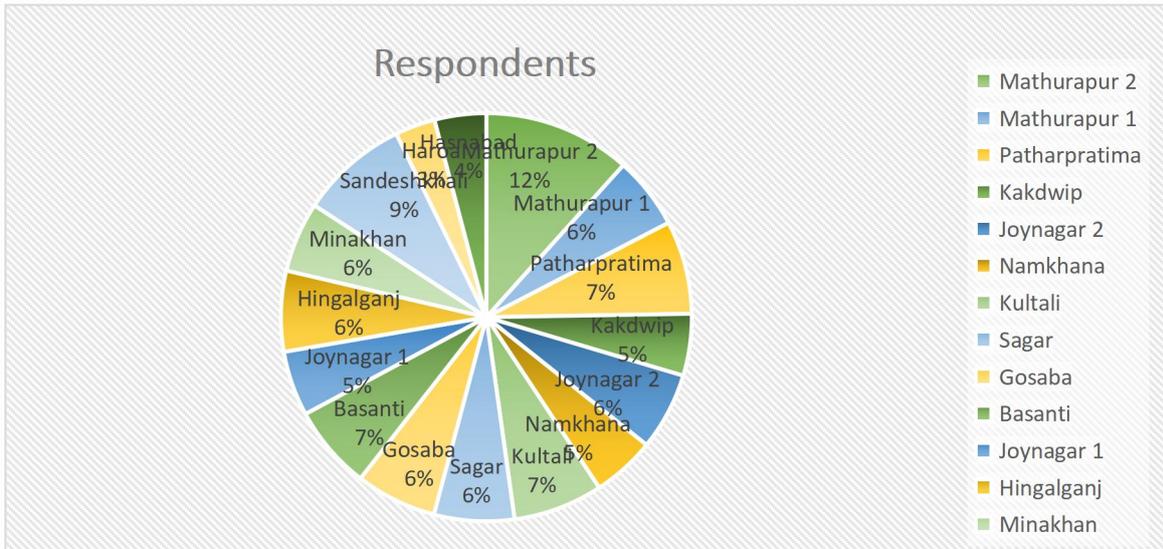
This chapter will draw upon the main themes and present the findings which arose out of the interview process as well as the data analysis of the quantitative data gathered with the help of 34 youth volunteers, who are also permanent residents of the Sundarbans region. 1,205 respondents from 14 blocks across the districts of South 24 Parganas and North 24 Parganas responded to a mobile application-based survey.

### 4.2 Demographic Details

Video testimonies were collected from 41 respondents, from 7 blocks of South 24 Parganas (namely - Mathurapur 2, Kultali, Mandirbazar, Patharpratima, Gosaba, Joynagar 2 and Namkhana) and 3 blocks of North 24 Parganas (Basirhat, Minakhan and Hasnabad).

Quantitative data has been collected from 1,205 respondents, with the help of a mobile application-based survey, designed for the study.

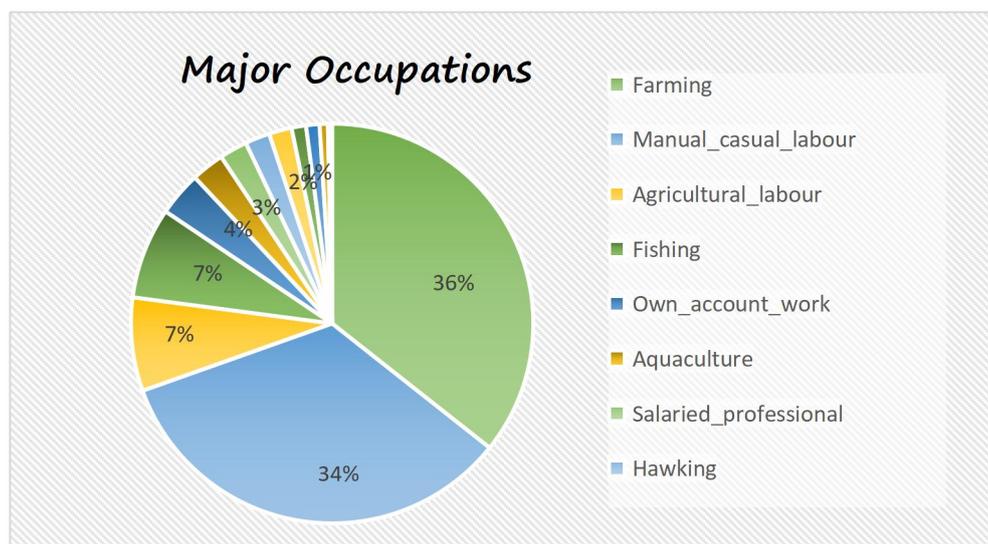
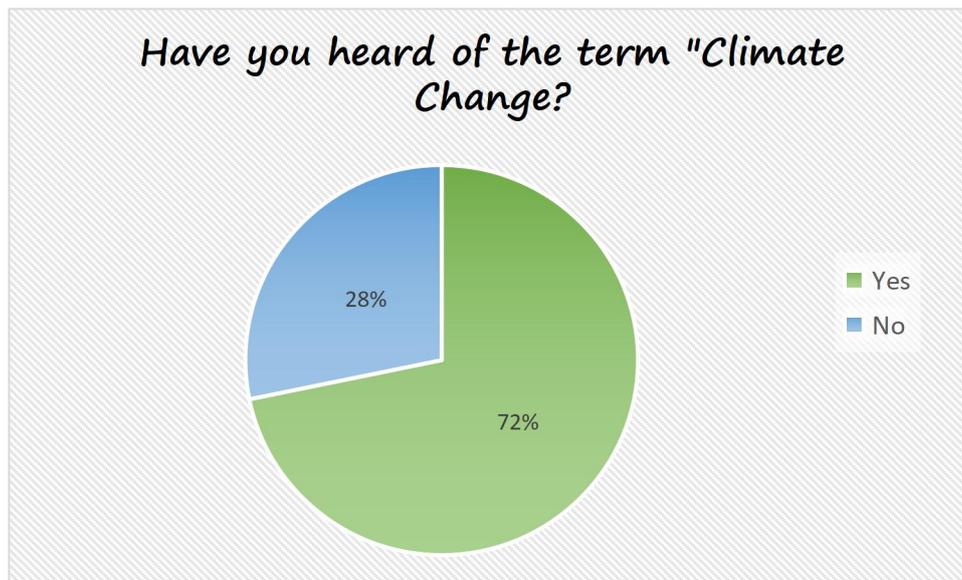
Out of the 1,205 respondents from whom the information was collected, 334 people were residents of 5 blocks of North 24 Parganas and 871 people were from 11 different blocks of South 24 Parganas. The blocks were divided into urban areas and forested, coastal or island areas. The blocks namely - Minakhan, Haroa, Hasnabad from North 24 and Joynagar 1, Joynagar 2, Kakdwip and Mathurapur 1 from South 24 were categorised into urban areas. The blocks Hingalganj and Sandeshkhali 1 from North 24 and Basanti, Sagar, Gosaba Patharpratima, Kultali, Namkhana and Mathurapur 2 were classified as forested, coastal or island areas, that often bear the brunt of nature's fury.



76% of the respondents of the survey were male and the remaining were female. The majority of the respondents (43%) said they are involved in farming or agriculture-related activities. This was closely followed by people working in construction or as manual casual labourers (37%). The number of respondents working in brick kilns or collecting forest produce and/or honey was very low, according to the data gathered in the survey. Only 3% of people said they are engaged in a more organised sector of work like textile or other factories or are salaried professionals. 6% of respondents mentioned being self-employed or involved in hawking.

### 4.3 Impact of climate change and or socio-environment changes

The adverse impact of climate change has been reported, particularly in terms of an increased propensity for bank erosion and gradual submergence of small islands at the mouth of the confluence of river Hoogly and the Bay of Bengal. The frequent use of the term ‘climate change’ in local interactions can be gauged from a high percentage (72%) of respondents reporting familiarity with the term.



The gradual loss of landmass is threatening the survival of the communities, especially the ones close to the sea. Mr. Subhas Acharya, the former joint director of Sundarbans Development Board, a policy-making body under the ministry of Sundarban Affairs expressed concern over the gradual loss of land in the region due to river bank erosion and rise in sea water level. *“Apnara eto kichu chaichen kintu Sundarban ta thakbe toh.....?”* (You all are demanding so many projects but will the Sundarbans be able to survive the repeated onslaught of bank erosion?) retorted Mr. Acharya during the end of his career on being frequently requested by public representatives to sanction various development projects for the region. The islands of Ghoramara and Mousuni are at a serious threat and the former was described by Mr. Acharya as a ‘sinking habitat’. He said, *“Rajnoitik netara prayei bole, Ghoramara chilo, ache ar thakbe kintu ekhon dwipti 3 square kilometres e ese thekeche. Sedin ei ekjon video pathalo tate dekhlam ki bhabe ekta iskool badi jole toliye gelo”* (The local political leadership often makes statements to establish that Ghoramara islands will remain habitable in the

near future but they disregard that fact that the land area has now shrunk to just 3 square kilometres. He referred to a video clip which was shared with him that showed a school building slowly collapsing into the water due to bank erosion). The local residents have also expressed concern at the gradual change in the environment of the region.

*“Sundarban er sundorjyo kome gaiche, nodir srot poriborton hoyeche, asomay bristi hoy, jhor o onek besi hoy ekhon”* (The richness of the biodiversity has reduced. Rivers have changed their courses, untimely rains are more frequent and occurrences of cyclones have increased) said Mrs. Jharna Seet, a woman engaged in crab collection.

*“Brishti bhaalo porimaane bereche, ekhon prokriti khub khotikor hoye utheche. Aage kal boisakhi aar ashwin masher jhor, bojha jeto; kintu ekhon jhor khub khoti korche”* (Rainfall has increased and natural events have become more destructive in general. In earlier times, the Nor’westers and storms in September-October (Ashwin or the 7th lunar month in a Hindu calendar) were predictable but now the storms have become more destructive) said Dukhram Sardar, an aged farmer from Hasnabad in North 24 Parganas.

The loss of tree cover and its adverse effects has been brought out by respondents which might have also contributed to the river bank erosion due to the loosening of the topsoil layer due to erosion. *“Bonya besi howar karon gaach kom, oneke jongol theke churi kore niye jaye gach, keu dekhe na”* (One of the reasons for increase in flooding events is the decrease in tree cover. Trees are illegally felled in the forests and there is virtually no surveillance to check it) said a marginal farmer from North 24 Parganas.

Pollution has also come up in the discussions with the respondents mentioning its adverse impact on the environment of the region. *“Dushon onek bere geche, aager moton poribesh ekhon ar nei. Plastic er bebohar khub bereche, charidike sudhu packet pore thake. Nikashi bebostha khub kharap hoyeche er jonne”* (Pollution has increased and the environment is not like what we have experienced before. The use of plastic has increased a lot and everywhere one can find plastic packets strewn across the region. This has affected the drainage region) said Munawara Bibi, an agricultural labourer from North 24 Parganas. The correlation between decrease in species of fishes, along with the shift of habitat of the crab population and the falling quality of water in the rivers and other water bodies has also been stated by a few respondents. *“Jol ekhon onek kharap hoye geche. Aage pukurer jole khele shorir o kharap hoto na. Nodir jol onek jaygaye kalo hoye geche. Maach shob chole geche, kakra rao*

*jongoler bheterer ongshe chole jacche*” (The quality of water in water bodies has decreased. Earlier we used to drink pond water and it was safe. Now the water has even turned black in some of the stretches of the river. Fishes are no longer available and the crabs are also moving to the deeper parts of the deltaic forests) said Haradhan Mondal, an agricultural labourer from Gosaba. The general deterioration in environmental conditions have also been repeatedly mentioned by the respondents with the words of Mr. Barun Mondal, a marginal farmer from Kultali summing up the mood of the local residents. “*Aager poribesh firiye ante hobe, nahole ar kichui bachbe na. Ei dustito poribeshe kichhu bachbe na. Aage poribesh ki aramdayak chilo! porishak hawa, porishkar jol.....ami toh ar ajker manush na. Dine dine kharap hoye jacche*” (We have to take steps to ensure that the environment gets healed and goes back to the earlier state. Otherwise, nothing will survive in this polluted environment. Earlier, it used to be so comfortable; clean water, clean air and what not. I am from the older generation. I am witnessing the gradual degradation over all these years) said the septuagenarian.

#### 4.4 Environmental refugees and Ecological challenges faced by the residents

Sukumar Mitra, noted journalist and author said, “*2021 e census kora hoini. 2011 r census ebong bigoto 60-70 bochorer decadal increase in population dekhle ekhon jonosonkha 50 lakkho chariye jabe. Ei jonosonkha nirdisto elakar moddhei ache jekhane 7 doshoke bhangone jomi komeche*” (The census could not be conducted in the year 2021. If we consider the decadal increase in population of the region and the 2011 census figures, then we will witness a steep rise in population of the region which may even cross the 50 lakh mark. This population is sheltered in a region which has witnessed loss of land due to river bank erosion in the past 7 decades. Hence, the land area has progressively decreased with the increase in population).

He went on to say, “*Jonobosotio besi ekhane. Ekhon eita holo 929/sq. km jeta desh ebong rajjer theke besi*” (The population density in the Indian part of the Sundarbans is higher than that of the nation and the state of West Bengal. It has now been pegged at 929/sq. km). It is imperative to gauge the impact on land holdings and above all on sustainable livelihoods due to increasing stress on existing natural resources.

Sukumar Mitra further shared the unique demographic characteristics of the Sundarbans. “*23% toposhili jati ache West Bengal r Sundarbone seta 39%. Abar toposhili upojati ache ekhane 23% jeta West Bengal er jonne 5.6%*” (The percentage of Scheduled Caste and

Scheduled Tribe population in the Sundarbans is 39% and 23% respectively. The corresponding figures for the state of West Bengal concerning the Scheduled Caste and Scheduled Tribe population is 23% and 5.6% respectively). This information is useful to understand the general state of the socio-economic conditions of the inhabitants of the Sundarbans.

The journalist and author also referred to a report published by Dr. Sugata Hazra of the School of Oceanography in Jadavpur University in his interview. *“1969 shal theke 2001 porjonto ei 32 bochorer gobeshona dekhiyeche je 163 sq. km upokuler bhangone bhumikhoy hoyeche. Oi shomoy environmental refugee r sonkhata chilo 7000 ebong pranhani hoy 500 manusher. Jotota jomi geche, tar ordhek toiri hoyeche - 82.505 sq. km. Kintu jader jomi gelo, shei jomiharader ei jomir upor kono odhikar thakbe na. Emni amader ayin. Jomir khajna dieche, dolil royeche, record o ache kintu notun jomi pabar kono bidhan nei. Notun je jomi toiri holo, ta toposhili upojati, toposhili jati ebong bhumihinder pradhanno diye deowa hobe. Land reforms ayin e okhane jara bhangoner jonno jomi haralen, tara ekhankar jomi paben emon kono assurance nei”* (The study has shown that from 1969 to 2001, 163 sq. km of landmass has been affected due to river bank erosion. This has resulted in 7,000 individuals being identified as environmental refugees with a conservative estimate of 500 lives lost due to the phenomenon. The river deposits the silt on the other side of the eroded bank which has led to the formation of 82.505 sq km of landmass. But the individuals who had lost their lands due to bank erosion do not have any legal claim on the new landmass formed on the other side of the river despite being displaced from their legally held homestead land or agricultural landholding for which they even possessed the necessary documents. The land reforms legislations do not have any provision of compensating the river bank erosion affected individuals.) The landmass formed due to silt deposition on the other bank of the river has to be distributed amongst the Scheduled Tribe, Scheduled Caste and landless population of the concerned area according to the stated provisions in concerned legislations.

The concerns of the environmental refugees highlight the ecological challenges being faced by the inhabitants of the Sundarbans. The loss of homestead lands and agricultural holdings lead to a loss in identity of the affected individuals, who are often the early settlers of the deltaic region. In absence of suitable compensation packages or rehabilitation and resettlement plans, the vulnerability of the households primarily dependent on land holdings for livelihood activities increase manifoldly.

“Sagar, the biggest island of the Sundarbans, having 2 lakh people is facing severe erosion on its western and south-eastern parts. The same trend can be observed in Jambudwip and Henry islands. Other than the natural processes like storms and sea level rise, anthropogenic factors like spread of aquaculture, port construction and other developmental activities also lead to coastal erosion, say experts” (Singh, 2018).

Sukumar Mitra emphasised on the vulnerability of the population residing in the deltaic region stemming from the increase in the intensity of the natural disasters in the form of cyclones. *“Bochore 14-15 ta cyclone toiri hoy ebong tar moddhe 1 ta achre pore. 60 bochor aage khoykhoti jolochaser jonno eto hoto na. Ekhon eki speeder cyclone byapok elaka plabito kore dey. 21 ta blocker moddhe 15 ta blocker ei khoti hoy”* (Every year 14-15 cyclonic storms get developed over the Bay of Bengal region and only one amongst them hit the coast. 60 years ago, cyclonic storms were not that destructive. Now, cyclones of similar intensity affect a significantly large area into the hinterlands. Out of 21 blocks or talukas in the region, nowadays 15 of them get affected due to such extreme weather events). It can be inferred that such an increase in the intensity of natural disasters contributes towards the increased vulnerability of the marginalized communities, particularly those near to the coast owing to the disproportionate impact on their lives and livelihood.

The senior journalist and author further said, *“ekhon bohu jomi ek fosili hoye okhane r crop intensity 1.2. Landholdings o khub choto jar jonno khet mojur der kajer sujog nei bollei hoy. Chasira nijerai sob kore ney. Khetmojur ra din mojuri korte rajjer baire chole jete baddho hocche jar jonno onek gram okhane ekhon purush shunno. Mohilara local train e kore Baghajatin, Garia, Ballygunge, Park Circus er moton jaygaye ese poricharika kaj korche”* (The cropping intensity in Sundarbans is now 1.2. Many agricultural lands are now monocrop with small landholdings diminishing the prospect of providing wage employment to agricultural labourers. Hence, they are resorting to distress migration and many villages can be found bereft of male members. The women folks can be found to engage themselves as domestic workers in the middle-class and upper middle-class localities of Kolkata like Baghajatin, Ballygunge, Park Circus and Garia). Migration patterns point to the interstate migration of the menfolk while women have been found to be restricted to intra-district migration, with Kolkata being the most preferred destination owing to proximity, railway connectivity and demand for domestic workers.



Fig. 4. Aftermath of Cyclone Yaas (2021)

The apprehension of personal safety in the face of frequent occurrences of cyclones and the threat of loss of assets also contribute to mental health issues amongst the vulnerable population. Sukumar Mitra added “*Proti bochor bhabte hoy flood centre e jete hobe kina, jetao hoyto nirapod noy. Tar opor corona. Samudrik jolochas, cyclone ittadi bishesh kore mohilader o bacchader opor manashik chaper sristi kore. Ostitto baponno manusher mental health boro dhoroner somossha. Jara barite gele 5 pod khete dey tader opor diye ki jaye relief camp e khichurir thala niye haath pete thakte, seta r ke bhebe dekhe*”

(Every year a section of the population remains anxious about the possibility of having to take shelter in flood centres, which at times may also fail to provide them with the desired security. Then, there is also the threat of being affected by the Covid-19 pandemic in the present times. Cyclonic storms and similar adverse weather events lead to anxiety and stress amongst the inhabitants, particularly affecting women and children. Mental health issues are at the forefront for people whose existence is even at stake. Those who offer more than five dishes to guests on hosting them over meals, have to stand in a queue with plates to receive a few handfuls of ‘khichdi’ in relief camps during flooding and other natural disasters.) We seldom think about the impact of such a turn of events on the psyche of the affected population.

The common health issues faced by the inhabitants were also highlighted by the journalist and author when he said, “*Tarpor nona joler songosporsho besi din thakle neel paykhana hoy. Bishesh kore jekhane salinity 2000 ppm ba tar besi. Antrik hoy manusher. Kala jar toh Sundarbaner ei rog. Skin er o nana rokom somoshya hoy*” (Excretion of bluish stool has been reported by people exposed to saline water, especially when the salt content is 2000 ppm or more. Dysentery is common and so is ‘Kala azar (Black Fever)’ which is quite prevalent in the region. Various skin problems also affect the inhabitants).

#### 4.5 Reflections

Despite the rapid spread of globalisation, privatisation and liberalisation, the inhabitants of Sundarbans still largely depend on the primary economic activities for sustenance, with

agriculture being the major source of livelihood for the majority. At the same time the region lags behind many inland areas, in terms of agricultural productivity and livelihood security of residents. Factors like climate change, salinity of soil and water, flooding, access to freshwater for irrigation are major constraints that force people into other primary economic activities like fishing, aquaculture, honey collection to name a few.

In terms of the environment, the forest cover of Sundarbans is declining rapidly due to reasons like reclamation of land for agriculture and over dependence of the population on the forest area. The man-land ratio is very high in Sundarbans due to the population pressure and limited economic opportunities, in a limited area of land. The overall environment of the region has considerably degraded, affecting ecological balance of the area.

Economic development has a substantial role to play in the overall development of a region. But what is evident in the Indian part of the Sundarbans delta is not just the lack of scope for economic growth and development but also large-scale losses due to environment austerities. Huge population pressure, their need for income generation to sustain their livelihoods and dependency on the forest area is creating an ever-increasing ecological backlash risking Sundarbans future and existence.

“The decreasing mangrove cover is a cause of concern for the whole world. How do we survive this? If the mangroves don’t survive, Sundarbans will not survive”

~ A respondent from Sundarbans during the Video Testimony

## CONCLUSION

The pressure on the landmass of Sundarbans is tremendous owing to the multiplying population and their ever-increasing needs and demands. Despite various policies and plans concerning the climate, in context to the region, a large-scale encroachment of people into Sundarbans Island could neither be avoided nor stopped. Indiscriminate diversion of forest land for agricultural purposes, expansion of settlement to the banks of the very fragile rivers of the region and spread of ineffective and inadequate number of embankments along the delta has rendered the area even more vulnerable. While the demand for development and development projects is constant but the need to consider the fact whether Sundarbans can sustain the same, needs to be in the centre of the discussion.

Climate change has further exacerbated the situation, by impacting almost every aspect of the lives of the locals from agricultural productivity, occupational structure, access to food and jobs to family structure and culture. The decline in food security, access to opportunities and the lack of other developmental choices has posed as a serious threat to the overall well-being and economic viability of the population. It has forced people to become environmental migrants. The local government and bureaucracy's apathy towards development in the region has left the region impoverished and in a structural dysfunction.

Despite rapid economic growth in the urban areas of West Bengal, the residents of the Sundarbans blocks have remained relatively isolated from various opportunities. The future of Sundarbans needs an eco-centric approach to development, proper coastal and infrastructural planning and most importantly paying close attention to the voices of the suffering of those who are central to the story of the Sundarbans - the locals.

“As a resident of Sundarbans since generations, I’ve often heard of how beautiful, comfortable and clean the region and it’s environment was”

~~ A respondent from Sundarbans during the Video Testimony

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