



WWF

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# VOICES OF CHANGE

Stories from Ladakh and Sundarbans



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# Where



Ladakh in Jammu and Kashmir and the Indian Sundarbans in West Bengal are two of WWF's priority conservation sites. The increasingly threatening environment in these regions increases the vulnerability of their fragile ecosystems and the indigenous communities that live there.

Map prepared by IGCMC, WWF-India



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# ACKNOWLEDGEMENTS

This report has come a long way to become what you hold in your hand. Tireless research, meticulous surveys and personal interviews conducted by the WWF-India team reflects in every page, as you travel through to reach out to stories that would have otherwise, never been heard.

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Thank you for allowing us to tell your story.

## PROJECT TEAM

### Sundarbans

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### Ladakh

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# INTRODUCTION

Environmental change coupled with resource degradation and poverty is creating situations of extreme adversity in several parts of India. As the impacts of climate change become unequivocal, nature and ecosystems, natural resources and the people who depend on them will become more vulnerable during this century. This will imply less or uncertain availability of food and water, increased variability in the frequency and intensity of natural disasters, loss or migration of species, significant changes in ecosystems and tremendous risk to human populations and their livelihoods.

Impacts of climate change are likely to be felt more in developing countries such as India, given the greater reliance of its people on natural resources and ecosystems. In the fragile high altitude Himalayas, these changes cannot escape the notice of the people who have lived there for decades. Warmer seasons and erratic precipitation have influenced their daily lives in terms of agricultural patterns and produce, clothing, lifestyles, food, livestock and livelihoods. Moreover, incidences of pest attacks and weeds have increased to a great extent.

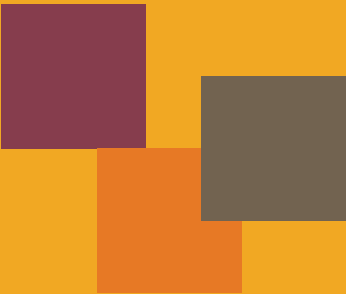
In coastal ecosystems, such as the Sundarbans, direct impacts of human-induced climate change can be felt with rising sea levels and increasing salt water incursion on agricultural land and water bodies, threatening life, property, livelihoods, and leaving local communities more vulnerable than ever, as climate refugees.

People over generations and even at present, continue to adapt to these environmental changes and develop their own resilience and coping mechanisms. However, due to the rapid and uncertain nature of the changes, old ways of coping are often proving inadequate.

As you turn the pages, what follow are voices. Voices of individuals who have witnessed change and are living these changes, of those who are finding ways to survive and move on in the hope of a better future by adapting to climate vulnerabilities and alternative livelihood options.

It is to these intrepid individuals who have told their tales and the thousands who are still unheard, that this book is dedicated to. Also to those who are at risk, but are finding new ways and alternatives to tackle change. The capacity for resilience and undaunted hope in the face of adversity shines through all these stories, worthy of being heard and read.

Their lives remind us of how precarious our existence is.







# Ladakh

JAMMU AND KASHMIR, INDIA

Ladakh represents the westernmost extension of the vast Tibetan Plateau, covering an altitude range of 2,700 to 7,650 m asl. The mighty Himalayas and the Karakoram demarcate its natural borders towards the south and the north respectively, while the Indus River flows through it. Located in Jammu and Kashmir, this region is also known as a high altitude cold desert and is characterised by severe, arid conditions. Temperatures may drop to  $-40^{\circ}\text{C}$  in the long winter months and rise to  $35^{\circ}\text{C}$  in the short summer season.

In 2008-09, 85 residents of Ladakh residing in remote locations like Zaskar, Changthang, Nubra, Leh and Kargil were interviewed. They belonged to two age groups - 20-45 years and 45-90 years and were asked about their experiences of climatic changes and subsequent impacts on agriculture, livelihood, ecology and livestock. On the basis of a set questionnaire and through candid conversation, they revealed testimonies of their changing environment, which often bewilders them. These have been recorded here.







change cannot be  
**stopped**  
 but can be given  
 direction to



## TASHI RABGAIS

LADAKH, INDIA

In his tastefully done, sunny living room, Tashi Rabgaia represents the hospitable and cheerful Ladakhi. He hails from Sakti, Ladakh and is one of the first scholars in that region. Being very fond of reading, he possesses a vast bank of knowledge and a sharp intelligence undaunted by his 82 years of age. He has three sons and two daughters and lives a retired life with his family.

Rabgaia believes that tourism is the primary cause of many changes in Ladakhi society, culture and environment. Ladakh was opened to foreign tourists in 1974, and since then, national and foreign tourism has flourished. Although, it is helping the economy of Ladakh, yet it has brought environmental problems in its fold. Rabgaia tells of a time when water everywhere was drinkable. Gradually, it has become polluted, especially in towns like Leh and Kargil, and the groundwater level has also dropped.

Rabgaia is also worried about the birds in Ladakh. As a boy, he used to see many birds, especially about 100-200 crows nested in trees during winter. But now he has stopped seeing crows in his village. He also used to see many species of eagles soaring in the skies which are not there any more. This absence of birds worries him and he feels helpless not being able to do anything about it.

He has observed all four seasons - spring, summer, autumn and winter getting warmer than before, especially winter. When he sits in the sun, it pinches his skin. Strangely, he doesn't remember this ever happening to him as a child. This could also be attributed to the rising vehicular pollution in Ladakh, he says.

Rabgaia tells of floods that have occurred when there has been a lot of snowfall in winter and spring comes early. Under the continuous glare of the sun the snow melts faster which then comes down in a torrent, damaging everything in its path. The water cycle in Ladakh has been preserved by the rainfall in summer and snowfall in winter. While in summer, glacial melt water would flow down in great volumes, in winter, the snow would compensate for it. But

**We are in a situation of change and the speed of change has become so much that it is difficult for anyone to control the situation. We cannot stop change but we can surely give direction to it.**

over the years, the melting process has quickened, not giving the already reduced precipitation in the region a chance to compensate for it.

In his view, the environment of Ladakh is strongly interlinked

with the lives of the people who are dependent on it. The region receives plenty of sunshine helping crops grow, while their livestock provides them with milk, butter, cheese and curd. Most areas higher up receive a steady supply of water from glaciers while in other places, where there are no glaciers, snow accumulation helps and also the wind which distributes the snow around.

Like this, for centuries the people of Ladakh have lived in close harmony with their environment which has provided for them. But the changes that have developed in the last few decades seem to threaten this harmony and delicate equilibrium giving Rabgaia solid reasons to worry about the future of his children and grandchildren.





I can't see  
the birds  
that I used to sight  
as a boy



## ABDUL REHMAN

### LADAKH, INDIA

Seventyyear old Abdul Rehman looks the picture of contentment while his frisky granddaughter jumps and giggles around him. His wife, children and other grandchildren gather around him as he tells his tale. His roots lie in Chemday Village, near Sakti. Rehman settled in Nubra after leaving the Indian Army in 1974 and getting married. He then took to farming, and with his wife and mother-in-law, grew crops like barley, wheat, black and green pea, mustard, turnip and radish, purely for consumption. They survived on Rehman's pension for expenditures, while also drawing an income from rearing cows and horses, selling cow's milk, butter and dry cheese and even lending their horse to others for transport.

Rehman feels that things are very different now from when he was a young man. Back then, rain and snowfall would come on time. Moreover, it was never as warm as it is now, nor were there such variations in the seasons because of which people have started threshing their crops in September instead of October. He has even observed tree leaves shedding later than usual.

The weather, Rehman says has become very uncertain. He is accustomed to a constant temperature throughout the summer, but these days sometimes it gets so hot that they have to bathe twice a day while other times it is so cold

that they require a jacket. As opposed to the warm *goncha* (traditional, long woollen coat) he used to wear in summer, he is now comfortable in just a pant and shirt during the day and only one blanket at night. In fact, Rehman has even bought a fan to escape the heat and to chase away the flies that have begun to enter the house - another new phenomenon.

Winters are also not what they used to be. They used to get one foot of snow till about a decade ago, but now snowfall is very light and melts away faster. Rehman and his family used to wear coats made of goat skin and wool from sheep, as well as, warm woollen pads for the legs and feet in the peak of winter (December-January). Now they wear only thermal pyjamas, pants, woollen *gonchas* and shoes. In autumn, the children roam around without socks with only a thin jersey on because they don't feel very cold. Rehman recalls how earlier at this time, the water in the tap used to be so chilly, that one couldn't touch it. But now, they can bathe in that same water!

All these changes have had an impact on various aspects of life. For example, the number and variety of pests plaguing his field have multiplied. The performance of his livestock has worsened, since the increase in the number of cows has led to the shortage of available fodder. It is also due to this that the

quality of milk has fallen. Birds like crows, partridges and the Golden Eagle, and mammals like fox, ibex and wolf, which Rehman used to sight as a boy are also declining.

**If it continues like this, we'll soon need an AC or a cooler in Ladakh!**

For Rehman, the environment around him keeps his livelihood going. But now he is facing water problems because of no rains, receding glaciers and scarce snowfall during winter. This has affected the agricultural production of the family. Less rain also means less vegetation in the mountains and forests for livestock to feed on. Rehman feels that there is a difference in the quality of water, especially since many hotels have come up and are polluting water sources with their garbage and newly installed flush toilets.

Rehman still remembers with fear and grief the severe flood on August 25, 2008 which destroyed their home and belongings. The water came from the Tingan *nullah* nearby. Floods were never a common phenomenon, but since the time he settled down in Nubra, he has experienced floods five times! He thinks that floods have a mind of their own. Just for a fleeting second, his face betrays a hint of fear.



# think

the fact is that  
**glacial melt**  
has become  
**dangerously**  
**fast**



## CHEWANG NORPHEL

### LADAKH, INDIA

Popularly known as the 'Ice man' in Ladakh for inventing artificial glaciers to solve the water crisis of the local people, Chewang Norphel is a man of action. This 74-year old Civil Engineer joined the government service in June, 1960 and was posted in Zaskar as the Sub-Divisional Officer.

Just like his fellowmen, Norphel too has observed changes in the environment around him. Besides being able to grow new varieties of vegetables which belonged only to the lower altitudes, Ladakhis are now being able to grow exotic horticultural plants like apricot, apple, mulberry, grape and pear. Moreover, the findings that he has read, lead him to believe that the apple belt has shifted from 2,743 m to 3,657 m, which only goes to show how temperatures have risen at high altitudes.

Norphel tells how crows, considered to be cold resistant birds used to lay eggs during the peak of winter. People used to say that if a crow fell off dead from a tree, it meant that the winter was extremely cold that year. Now one hardly gets to see a crow in Leh as they have moved to colder areas like Changthang.

This rise in temperature also impacts the production of *pashmina* (an important source of livelihood for some Ladakhis), since the pashmina goat needs drier and colder climatic conditions for good

quality fleece. Moreover, warm temperatures and increased atmospheric humidity are unfavorable for quality production. Erratic and untimely snowfall causes immense livestock losses as snow covers pasture lands leaving livestock to starve to death.

Norphel recounts that earlier, his people used flowing stream water for drinking as there was no garbage problem. Nowadays, streams have become polluted because of the increase in the local population, the presence of the army and the coming of tourists and labour in large numbers during the summer season. In the last few years, Norphel himself has seen a few springs totally dry up.

The 'Ice Man' perceives glacial melt as a massive threat to the people of Ladakh. Even at 5,000-6,000m, the glacier cover is shrinking, while the average rainfall is as low as 75-100 mm. He explains that with fewer glaciers, the melting process will slow down and occur in June, which is too late for farmers who need to sow their crops in April/May. If sufficient water is not available, the crops get ruined. With agriculture being the mainstay of Ladakhi life, this can have a devastating effect on livelihood and food supply. Norphel explains that rapid recession of the glacial cover could have two causes: warmer climate or erratic/inadequate

precipitation or both.

**Whether we attribute it to global warming or any other natural phenomenon, the fact remains that glacial melt is dangerously fast, calling for some urgent and serious thinking.**

Many areas in and around Leh occasionally face the fury of nature attributed to climate change. Norphel himself has seen droughts, cloud bursts and flash floods taking place with increased frequency. The violent floods of 2006 rendered many homeless and caused irreparable losses of livestock and property. Besides flash floods from June to September, heavy rainfall over a short period of time and heavy late season snowfall, have also become common.

As for the changing landscape of Ladakh, Norphel feels helpless since they are changes in the natural climate, and global changes at that. He sums up saying:

*"It is also now an established fact that the level of CO<sub>2</sub> is at its highest in the last million years. We need to address environmental degradation in a holistic manner to ensure both economic and environmental sustainability."*



# Leh

what will my  
**livestock eat**  
if there is  
**no vegetation**  
on the mountains?



## TSERING RIGDOL

LADAKH, INDIA

The last rays of the bright Ladakhi sun engulf the little shop as 50-year old Tsering Rigdol sits serenely attending to customers as and when they enter for commodities or conversation. Six years ago, he made his way from Zaskar to set up his grocery shop in Leh, which is known most for its golden butter made from yak and cow milk, a specialty that has existed in his family for generations. While he runs his shop in Leh, his family comprising his wife, six children, daughter-in-law and a grand child, still live in Zaskar.

In addition to the shop, Rigdol owns farmland in Zaskar which is tilled by his sons, both of whom are farmers and shepherds. They grow barley, turnip, spinach, radish and peas. Rigdol begins to tell of the tremendous change in the agricultural pattern that he has observed over the years, including the fact that they are now able to grow more varieties of vegetables in their fields.

Though Rigdol cannot help but feel glad at the increase in temperature which has enabled these new crops to grow on Ladakhi soil, he also believes that it is the worse for the future generations, if the temperature continues to rise. He figures that if there are no glaciers on the mountains, there will be no vegetation or crops. Then how would they feed their livestock he questions, a frown breaking

into his smooth forehead? His livestock provides the family with milk and wool from which they make ropes, quilts, sweaters and *gonchas*. Moreover, his village gets cut off from Kargil in winter, so they have to stock up on vegetables, wheat, flour and rice for six months and a fall in production can hit them hard.

At present, Rigdol is battling the widespread weeds that are a huge impediment to the crops in his field. He is also troubled about the fall in the quality of milk that his livestock is producing, which directly affects the butter which is the main commodity in his shop. A disturbed Rigdol tells that even the taste of butter is not the same anymore. He attributes this to the increase in the number livestock in the area and the paucity of fodder to feed all of them.

According to Rigdol, even the temperatures haven't been spared. When he was a child, there were no socks; so they would stuff hay into their shoes to keep their feet warm during winter. Soon they moved on to woolen socks, but now even nylon socks are enough for the season! During winter, Zaskar used to be closed for six to seven months due to heavy snowfall. Now it remains closed only for three to four months because of the thin snow cover which melts faster.

There was a time when Rigdol

would regularly sight birds like the Black-necked Crane, Ruddy Shelduck and Bar-headed Goose, but he hasn't seen much of them in the last 20 years. He used to see good numbers of blue sheep and herds of 20-30 Ibex roaming the hill sides, but now, only a few are seen alone or in pairs.

**People back then were worried about the huge amount of rain and snowfall. Now they are worried about receiving less or absolutely no rain and snow!**

Rigdol is anxious about the entire situation since he and his family are dependent on rainfall for the vegetation on the mountainsides, which is food for their livestock. If their livestock doesn't get to eat, their income will definitely be affected. In addition, they also need good rainfall for irrigating their crops. In Zaskar, there has never been a water scarcity so far because it has a good number of glaciers, but there could be in the future, if temperatures keep rising like this.

Rigdol feels that his life is almost over. But he fears for the generations that will come after he is long gone.





my fields are infested with  
**weeds**  
and insects  
that I cannot get  
**rid of**

## URGAIN CHOSTAK

LADAKH, INDIA

Few can resist the warm cheer that Urgain Chostak exudes as he rushes in Ladakhi tea in golden china cups. Having lived all his life in Diskit, Nubra, he has left home only for short intervals to study. For 10 years, he worked in the office of the Assistant Commissioner in Diskit, after which he was asked to run the branch post office. In spite of all the other posts he held, this 62-year old has been farming throughout since the time his father (an army man) fell and broke his thigh bone. Chostak is a father to three children - two sons and one daughter.

Chostak has observed a big drop in his farm produce, and is sure of this because once upon a time, his family would run out of space to store the produce. Now, they wait anxiously to see if they have managed to produce enough! He believes that this is because of the weeds in his fields, which he is unable to get rid of. He used to uproot them at least twice by which time the main crop could grow easily. Now with costly, unskilled labour, and more widespread and stubborn weeds, it has become tough to remove them. Moreover, three to four years back, he discovered a new species of insect in his field, which has been eating up all his plants, root upwards. Because summers have become hotter than before, these insects are now found in bigger numbers.

The quality of crops has deteriorated, for example, the grain size of wheat was bigger in the past. It has now been mixed with exotic varieties, which has led to the disappearance of the indigenous, better variety of wheat. Even the old, local variety of onion has diminished because new varieties are coming in and people are compromising on quality for quantity.

Chostak has been witness to the changing environment of Nubra. Summers have gotten warmer and so the moisture content in the soil has increased making it easier for vegetables to grow. On the other hand, excessive water in the soil is helping weeds to thrive as well. Usually, because of the cold climate, the soil stays compact, but last year he recounts, there was so much moisture in the soil that the field became slushy and the zos (cross breed between yaks and cows) ploughing the field sunk into it.

**Soon we will have to see glaciers in photographs.**

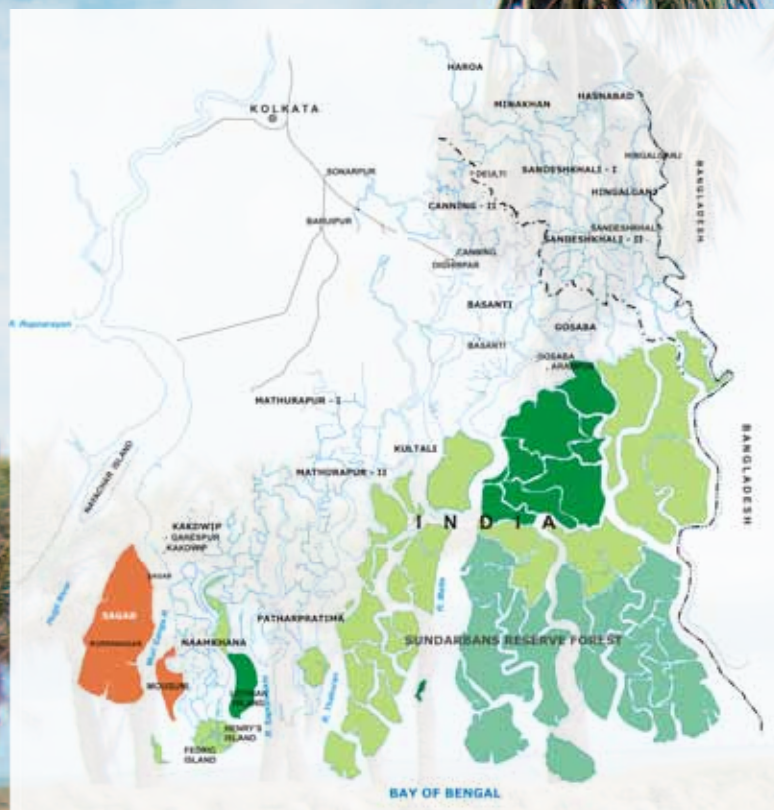
Even winters have changed. Once upon a time, in September-October, during the harvest period, the water in the stream would freeze. Now it doesn't happen anymore. It only freezes as winter draws closer. The Blue Sheep and Ibex would come to the lower reaches in search of vegetation, but now they are not

visible anymore. He remembers how it used to snow during the threshing season, spoiling the crop already cut and lying about. To save it from spoiling, they would cover it with cloth and pack it away in small spaces. In the present, since it hardly snows, they can thresh without worrying.

As a child, Chostak recalls the traditional way of judging the temperature as his grandfather told him. It was believed that the winter would be very cold, if the magpie built its nest lower than its usual high altitude. Unfortunately, the magpie has not visited their region in 10 years now, spelling warmer winters. Moreover, they have not received much rainfall this year as compared to his childhood when there used to be heavy rainfall, at least twice a year.

Even though Chostak is a smiling man, his apprehension and anxiety at the changing environment around him comes through.





# Sundarbans

WEST BENGAL, INDIA

Lying off the east coast of India, the Sundarbans is a cluster of low-lying islands in the Bay of Bengal, famous for its unique mangrove forests. These islands are spread across India and Bangladesh covering an area of about 4,267 sq km. The Sundarbans delta is formed from the silt deposits of the Rivers Ganges, Brahmaputra and the Meghna. The land here is dynamic and still under formation. This is also the home of the endangered Royal Bengal Tiger.

Twenty eight residents of Sagar, Mousuni, Kakdwip and Bali islands in Sundarbans were interviewed, majority of them being above 50 years of age. They were asked about their observations and experiences of seasonal changes, deforestation and loss of biodiversity, decline in agricultural productivity, water crisis and erratic rainfall pattern, extreme weather events, change in water temperature and loss of cattle. These recorded experiences were used as a base to devise resilience building strategies in the Sundarbans.





# Adapt

either our island is  
**sinking**  
or the sea  
**is rising**

## JALALUDDIN SAHA SUNDARBANS, INDIA

Sixty-year old Jalaluddin Saha was born and raised on Sagar Island, the largest and westernmost island in the Indian Sundarbans. He moved to a smaller island, Mousuni, east of Sagar in 1971 and has been working there as a school teacher ever since. Besides teaching, Saha also supports his family by farming a small plot of land.

Jalaluddin recounts the endless ordeal of embankments being built and destroyed by the tide. Shore erosion is a normal phenomenon in an active delta but it usually takes place gradually. However, human interference has hastened the process and made necessary the erection of embankments on the shore in order to keep the sea water out.

Four years after moving to Mousuni, Saha built a small house in 1975 on the western fringes of the island. Back then, their neighbourhood was protected by a seven metre high earthen embankment, almost 50 years old. Dense mangrove vegetation provided them protection. Saha, whose house was about 10 m inland from the embankment, owned about half a hectare of agricultural land, two freshwater ponds and nine cows.

Due to the steady increase in population on the island especially along the embankment area, the mangrove vegetation thinned considerably. Consumed rapidly as fuel wood, the

vegetation was not allowed to regenerate, causing the soil to slip away. By 1985, the remaining trees were washed away and with that the embankments also gave way in 1992. About 100 people lost their homes and land that year, Saha remembers sadly.

After losing his home, this school teacher built another house 60 m inland. The new embankment was higher than the

**Dense mangrove vegetation ran along the embankment on the outer side, providing additional security. But now it's all gone.**

previous one by four metres. It was also a lot stronger. Braving the odds, he managed to buy half a hectare of agricultural land again. However, the strength of the embankment was no match for the tide. Even though it was raised five times to 17 m by 2005, it collapsed again the same year, displacing 60 families.

A perplexed Saha believes that the frequency of tidal water flowing over the embankments has increased as have the height of the waves, which has resulted in their agricultural fields getting flooded with sea water more often. Every time salt water sweeps over their land, it is rendered useless for a few years. Shockingly, since 1969 this has affected five square

kilometres of the land on the island already!

Pushed to the brink, Saha had to build his third house about a kilometre and half inland from where his first house stood. Over the years, he bought two hectares of land, which was reduced to a little over one hectare after the 2005 disaster. Loss of land also pushed him to downsize his cattle leaving him with only one cow to support his family. Jalaluddin now feels like a "victim" of the environmental changes on his island.

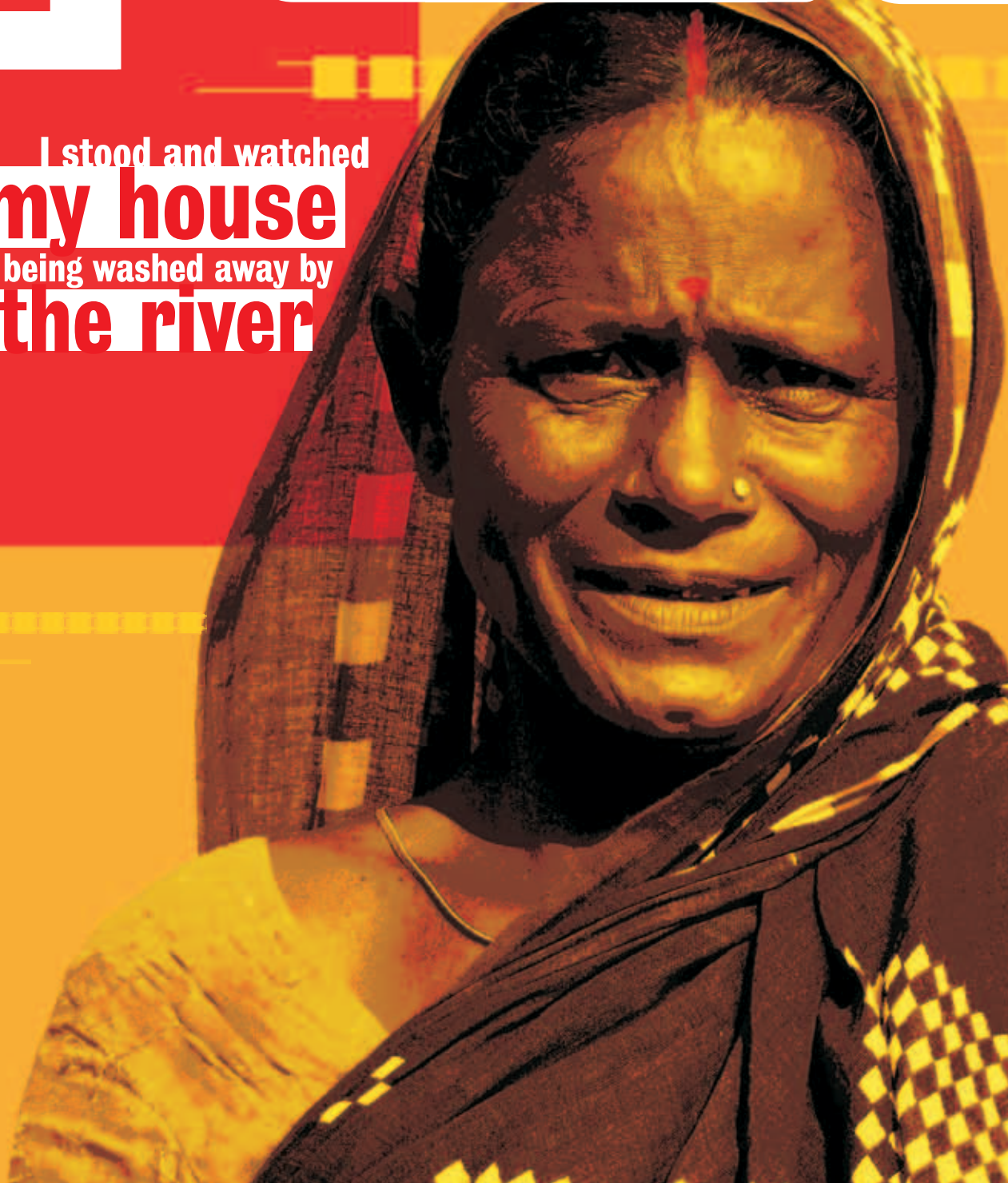
Agriculture is the mainstay of the economy of Sundarbans but impacts of climate change are forcing people to change crops or shift the harvest period. Watermelon, a popularly grown fruit on the island, can no longer be sowed since its harvesting period coincides with untimely, advanced hailstorms. Saha has also noticed a shift in the paddy planting season which he says has been pushed forward by two months over the last 30 years.

Unsure of the future and what it holds for him and his family Saha wonders when history would repeat itself and force him to abandon his home and construct his fourth. His advanced years convince him that another move is inevitable, even if it takes place after his lifetime.



# FEEL

I stood and watched  
**my house**  
being washed away by  
**the river**



## JYOTSNA GIRI

### SUNDARBANS, INDIA

A mother to five daughters and three sons, 55-year old Jyotsna Giri lives on Lohachara Island of the Sundarbans. Her daughters are married and her sons live with her. Giri studied till the fifth standard and then got married to Pashupati Giri at the age of 12. They settled on Lohachara Island, owing to the fertility and agricultural productivity of the land, in spite of her husband's ancestral house on the mainland.

Lohachara had three adjacent islands namely Sagar, Ghoramara and Suparibhanga. While Lohachara and Suparibhanga Islands don't exist anymore, Ghoramara is nearly on the verge of extinction due to accelerated coastal erosion. Suparibhanga was densely forested and never had any human habitation.

Back in the 1960s, Lohachara Island had a total population of 5,000-6,000. For Giri's family, as for most others, agriculture and fishing were the primary sources of livelihood. She owned three hectares of agricultural land on the island, on which they cultivated paddy and a variety of vegetables. Giri describes the fertility of the soil and praises how without the application of fertilisers they were blessed with bountiful harvests every season. Even the embankments near the river were used for cultivating vegetables, while the coastal waters teemed with fish and crabs.

However, Lohachara had its share of problems. The island did not have a source of drinking water and the only tube well the people had was eroded away by the river. Therefore, they had to cross the river and fetch drinking water from a nearby island. High sand content in the soil made the island more prone to coastal erosion during regular tidal action. Gradually, Giri was left with her homestead and domestic animals - 20 cows, 150 sheep, 35 goats and poultry.

Shakily, Giri recalls the fateful day, when she lost everything to the sea. She had gone to the neighbouring island to fetch some drinking water. Her husband was not at home that day and so she had locked the house, taking her son along with her. On her return, she found out that the only ferry service available was cancelled for the day due to some snag in the engine, because of which, she decided to stay back at her parents' house for the night. When the ferry service resumed the next morning, Giri boarded and was approaching her island when she was horrified by the sight of her sheep drifting in the river. She panicked and rushed to rescue them, but her fellow passengers stopped her from jumping into the river.

Never having felt more helpless in her life, Giri could not keep her tears back. After landing at Lohachara, she found that half her house had been washed away

by the river. Gradually, the entire island was submerged. The river seemed to have slowly eaten their whole island away.

She trembles as the entire scene flashes before her eyes again.

**Unpredictable weather and the threatening environment are making our lives miserable.**

The people living on Lohachara were rescued and rehabilitated to a refugee colony on Gangasagar Island. Giri and her family stayed there for a few days and then shifted to the northern part of the island where they constructed a new house, where they have been living for the last 15 years. They have no agricultural land and have to work as daily labourers. Her son who is now grown up works on a ship.

Giri complains that she is unable to grow enough vegetables in her kitchen garden due to the infertile soil and the absence of rain for many months. Fishing has been badly affected as well, as she is unable to find a sufficient catch.

A mother and a wife, Giri looks more like a survivor whose boat is sinking fast.



# 1st

when the  
**mangroves**  
disappeared  
the sandy  
**shoreline**  
got swept away



## IDRIS ALI BANDAR SUNDARBANS, INDIA

Ever since his birth, nothing has separated Idris Ali Bandar from the only home he has ever known—Mousuni Island. This 42-year old has studied till high school, with science as his major subject. Bandar recalls how his father used to tell him of the times when the island was covered with dense jungles 70 years back. Only when people started migrating to Mousuni from 1935 onwards, they started clearing forests to make way for agricultural land and houses. Ultimately, in 1942 the British Government granted unhindered land rights to these migrants.

In his childhood, Bandar used to play near the embankments, which had dense mangrove forests, and was abound with wildlife species like crocodiles, leopards, snakes and wild boar. People started exploiting local forests for fuel wood, while some of the forest got washed away by the tide. Gradually, the forest cover was destroyed and one day, the sandy shoreline also went missing, tells Bandar gravely. Hence forth, the embankment was left devoid of any vegetative cover and became vulnerable to the strong tidal surges hitting it directly.

Bandar remembers when his family and he were woken up in the middle of the night to find brackish water gushing fast onto their island. The breach of the embankment had caused this, destroying houses, agricultural lands, fishery ponds

and other moveable, as well as, immovable property. A new embankment was constructed again, but this too was flattened within a span of two years. He lost his house, as well as, two hectares of agricultural land.

This frequent occurrence led to the loss of several hundred hectares of land and about a hundred houses. Bandar says that they cannot do anything to help the situation as he raises his hands helplessly in the air.

In an attempt to find some logic in this, Bandar figures that the depth of the river has decreased due to heavy sedimentation, significantly increasing the water flow in the river. He tells that tidal surges lately have become very powerful, hitting the embankments very hard and knocking them down, only to enter their home and land to flood them. He fears for the lives and livelihoods of his family and his people.

Bandar seems disillusioned by the workings of government bodies which promised to build a huge concrete embankment, two feet thick but ended up giving the people only four inches of protection. Moreover, neither do the bodies consult the local people, nor do they show them documents before initiating a project like this. While earthen embankment compaction was supposed to be carried out using rollers, it was found that they were merely using low quality

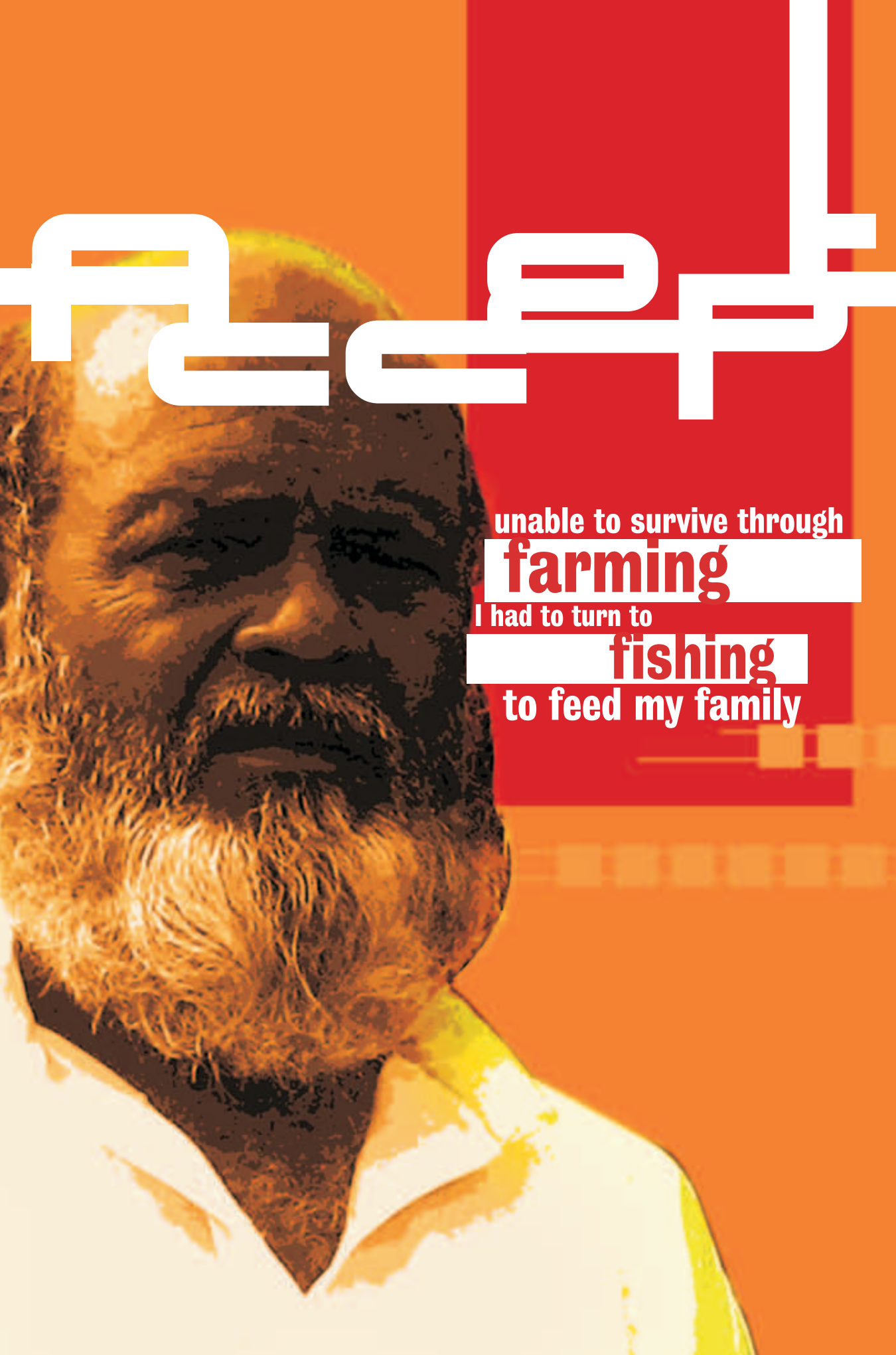
bricks, sand and cement over loose earth to construct the embankment. He firmly believes that measures should be taken to ensure proper implementation of such projects and good use of public money.

**It's been said that this embankment will stand for the next 30 years, but I fear that it may not even last for three years!**

Furthermore, Bandar has noticed that while digging out earth for embankment construction, most of the soil is excavated from the outer perimeter of the embankment which provides the river an easy access to the base of the embankments. This weakens the base of the embankment and it collapses soon, defeating the purpose

Owing to his scientific bent of mind, Bandar has a few measures ready on his fingertips that he advises the authorities to follow, to reduce people's vulnerability on the island. These include timely implementation of government projects, mangrove plantation along the coastal stretch, and the installation of boulders and wooden fences along the coast, to aid the deposition of sand on the coast.

Though Bandar understands a little of what has been happening to his island, he is as helpless as the unenlightened.



unable to survive through  
**farming**

I had to turn to  
**fishing**  
to feed my family



## HAMID BANDER

### SUNDARBANS, INDIA

Poverty and vulnerability come alive as one hears the story of 58-year old Hamid Bander of Mousuni Island located in the Indian Sundarbans. Lack of financial resources in his early years compelled him to quit studying after his secondary schooling, though he still managed to use that basic education to work in the metro city of Kolkata for five years. However, family responsibilities dragged him back home at the age of 22 when Hamid had to learn to make a living off the land.

Hamid's father had six hectares of agricultural land to begin with but over a period of time, five hectares got washed away by the sea, leaving the family of 11 brothers and sisters with only one hectare to till. Hamid has spent the bulk of his life tilling a piece of land which belonged to his older brothers. Unable to survive off its produce, he turned to fishing in coastal waters.

Looking back at his childhood, Hamid Bander recalls the year 1960 when his house, two kilometres away from the coast used to be surrounded by a thick vegetative cover. Once the vegetation disappeared, his house became more vulnerable to the violent tides which finally did strike one unfortunate day.

After losing three houses to such devastation, Hamid looks helplessly at the new

embankment which is 7.62 metres high. He wonders how long it will be before it meets a similar fate.

**The coast has become symbolic of angry tides, cyclones, storms and breached embankments.**

Hamid's family is growing but the land that they occupy is receding. His homestead now is a measly 0.06 hectares which he had bought from his brother. He feeds his family by fishing in the deep sea for four months in a year and working as a daily wage farmer for the remaining eight. His poverty prevents him from availing of the frugal solar power supplied on the island.

Staring out at the sea in complete despair, Hamid says that the only way he can survive is by fighting the natural elements everyday.




 my village has lost

more than

64 acres

of land and

35 houses

## PANCHANAN GAYEN

### SUNDARBANS, INDIA

Born and brought up in Beguakhali Village on Sagar Island, 60-year old Panchanan Gayen holds a Bachelor of Arts degree, for which he travelled to the mainland since there were no colleges on his island back in 1973. He now supports his family of five by cultivating three *bighas* (0.48 ha) of land out of the five he owns. Apart from agriculture, he has tried his hand at being a fish wholesaler, a wood merchant and a supplier of medicine. He is also involved in the local political system on the island.

Beguakhali was once a big and beautiful village. Located in the south eastern parts of Sagar Island, it has now fallen prey to the hungry tides. The village is fast eroding, having already lost 64 acres of land in the last three decades! The river has also washed away 35 houses in the recent past. Gayen tells of his house which used to be about a kilometre away from the river, but now the river flows through it. The families affected by this disaster were relocated and resettled on the northern part of Sagar.

Gayen tells that he has witnessed great changes over the last three decades in his part of the island. He remembers with fondness the huge stretches of sandy beaches and dense mangrove jungles along the coast abound with wildlife, and how they began to lose all of this from 1980 onwards. After this,

Gayen has seen coastal erosion accelerate to alarming levels. The settlements situated near the point of confluence of the river and the Bay of Bengal, have been badly affected by this.

He has not experienced a real monsoon, winter or summer season since he was a boy. Gayen has also observed that the course of the river is constantly changing and the water level has risen, by almost a metre. In fact, he is already searching for an alternate location to resettle as he is wary that the next time it happens he might lose his house completely.

Furthermore, agricultural practices, as well as, cropping patterns have experienced a transition. Chemical fertilisers and pesticides are being used limitlessly to increase agricultural production. These changes in livelihood patterns and socio-economic dynamics are all connected to climate change, Gayen firmly believes.

He looks grave as he talks of the embankments which are damaged and breached by tidal action every year. The Irrigation Department of the state government either repairs the embankments or re-builds them afresh. The soil used for building them is excavated from the vicinity, which defeats the purpose since this weakens the base of the new embankment, leading to another collapse. Gayen looks a little exasperated.

Feeling indignant at the department, he describes how they pay no heed to suggestions made by the local community who is the primary stakeholder. Sometimes they even bring boulders from outside to strengthen these embankments but that is also not working. Presently, they have advised them to put up a super boulder of about 30.48 m in length and breadth which may help in silt deposition and reduce coastal erosion significantly. Gayen feels the urgent need for a well planned mechanism for silt deposition.

Gayen's indignation doesn't stop there. He is bothered by the young people in his village who he thinks are irresponsible and

**My house shakes violently every time the tide strikes the coast.**

unconcerned about community well being. They don't seem to understand that the embankment is their last line of defense and theirs to protect. He finds them stealing bricks from embankments to construct their houses and bathrooms.

Gayen knows that his generation will not live for long and the time to hand over the reins and problems to the next generation is approaching faster than the roaring tide.





## The Climate is Changing

The manifestations of a changing climate are clearly visible around us, in the form of increased incidences of severe droughts, hurricanes, floods and diseases all over the world. These changes are damaging critical and fragile ecosystems. It is believed that the Earth is fast approaching the tipping point, a point in the temperature graph beyond which entire ecosystems will propel into a different state from which there is no turning back.

India, in particular is vulnerable to climate change impacts because of its unique geography, high population density and acute poverty. The adverse effects of climate change, like rising sea levels, melting glaciers, erratic precipitation patterns, and increased occurrence of natural calamities are affecting the poor the most because they count on the climate for livelihoods like agriculture and fishing.

## WWF-India Stepping In

In order to observe and study the impacts of climate change and to introduce adaptation strategies to combat its adverse effects, WWF-India has identified pilot sites in Ladakh and the Sundarbans. In both regions, initiatives are being undertaken to:

- Assess the vulnerability of local communities arising from variability in climate and communicating it to decision makers and civil society to influence the development of climate-aware policies.
- Improve the resilience of local communities by raising awareness and engaging in advocacy.
- Provide alternative sources of livelihood
- In Sundarbans, a Climate Adaptation Centre has been set up, that provides early warning systems, disaster response teams, relief equipment and seed banks. In addition, an indigenous salt tolerant variety of paddy for agriculture, and breeding of sea bass and scat as alternative livelihood options have been introduced.
- In Ladakh, renewable energy technologies are being encouraged, especially solar energy.
- Conserve and manage the natural ecosystems to improve the resilience of local communities.

## When disaster strikes, it spares nobody

Photographs of Cyclone Aila, Sundarbans, 2009  
and Leh Cloudburst, Ladakh, 2010



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Dorjay Angdus kaya







There are people out there who have been directly impacted by changes in their natural environment because their lives and livelihoods directly depend upon the ecosystem that provides them sustenance. Any alteration in it touches their lives as well. These individuals have experienced changes first-hand and can speak about them with the confidence of an eyewitness.

This book is a collection of real life accounts from the local people of Ladakh and Sundarbans who have observed, perceived, lost, grieved, and learnt to fear and cope with an environment which they can recognise or predict no more.

The documentation of these, it is hoped will help let their voices be heard and aid WWF in its work to coordinate a shift from a reactionary response from relevant government agencies to a more strategic one.

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