



# On the front line of climate change in India's Sundarbans

With the ocean swallowing up land in the world's largest mangrove forest, humans and tigers are being squeezed into an ever-shrinking space, with deadly consequences. Words by Johan Augustin; Images by Jonas Grätzer.

BY **JOHAN AUGUSTIN** ON 17 OCTOBER 2019

- *The sea level has risen by an average of 3 centimeters a year over the past two decades in the Sundarbans, the vast mangrove delta at the mouth of the Bay of Bengal, leading to one of the fastest rates of coastal erosion in the world.*
- *Residents of the dozens of islands in the Indian part of the Sundarbans have seen their homes swallowed up by the sea and their farmland poisoned by saltwater, forcing many to relocate.*
- *The fast-encroaching sea, driven by climate change, has also eaten away at the hunting grounds of the Sundarbans' famous Bengal tigers, pushing them to target the villagers' livestock — and, increasingly, the villagers themselves.*
- *At the same time, villagers unable to farm and experiencing dwindling fish catches are venturing deeper into tiger territory to look for crabs and collect honey, putting them at even greater risk of being attacked by the big cats.*

SAGAR ISLAND, India — Saktipada Bhuinya looks out over the ocean that surrounds Sagar Island. The Indian part of the Sundarbans, the vast mangrove forest in the Bay of Bengal, consists of 102 islands, about half of them inhabited.

That may not be the case for much longer. The villagers have raised a tall barrier of mud and rocks, and farther out to sea the West Bengal state government has erected a white concrete structure to prevent the vigorous erosion. But these measures haven't stopped the approaching water from carving away large chunks of land, year after year. Saktipada tells Mongabay that the sea level often rises above the barrier at high tide, the water rushing over his floors.

"I'll give the house another year," he says. After that, Saktipada and his family of six will have to move to a higher part of this mostly flat island, where they'll stay under tarpaulin tents with other climate refugees.

"We have no money to buy new land. We're poor people," Saktipada says.



*Saktipada Bhuinya says the sea level often rises above the barrier at high tide, and water comes rushing over his floor in the Indian Sundarbans. Image by Jonas Gratzner for Mongabay.*

He's not alone. Tens of thousands have already lost their homes in the Sundarbans. Each year it becomes harder for the 160,000 people living in Sagar Island's 43 villages to resist the rising water. Cyclones and storms, which regularly pass through the Bay of Bengal, have become more frequent.

Five years ago, the high tide broke through all the barriers on the island's eastern side, ruining thousands of houses and rendering farmland unusable through high salinity. Through centuries the tides have formed the Sundarbans; the islands vanish and reappear, in a natural rhythm. But over the last couple of decades the variations have become more extreme, and the pace of erosion here is considered to be the world's highest.

The locals have tried to adapt. Those who farm have begun cultivating salt-resistant strains of rice. For others, overfishing has made for leaner catches, and the shrinking coastline threatens the tradition of sun-drying fish on the beaches.



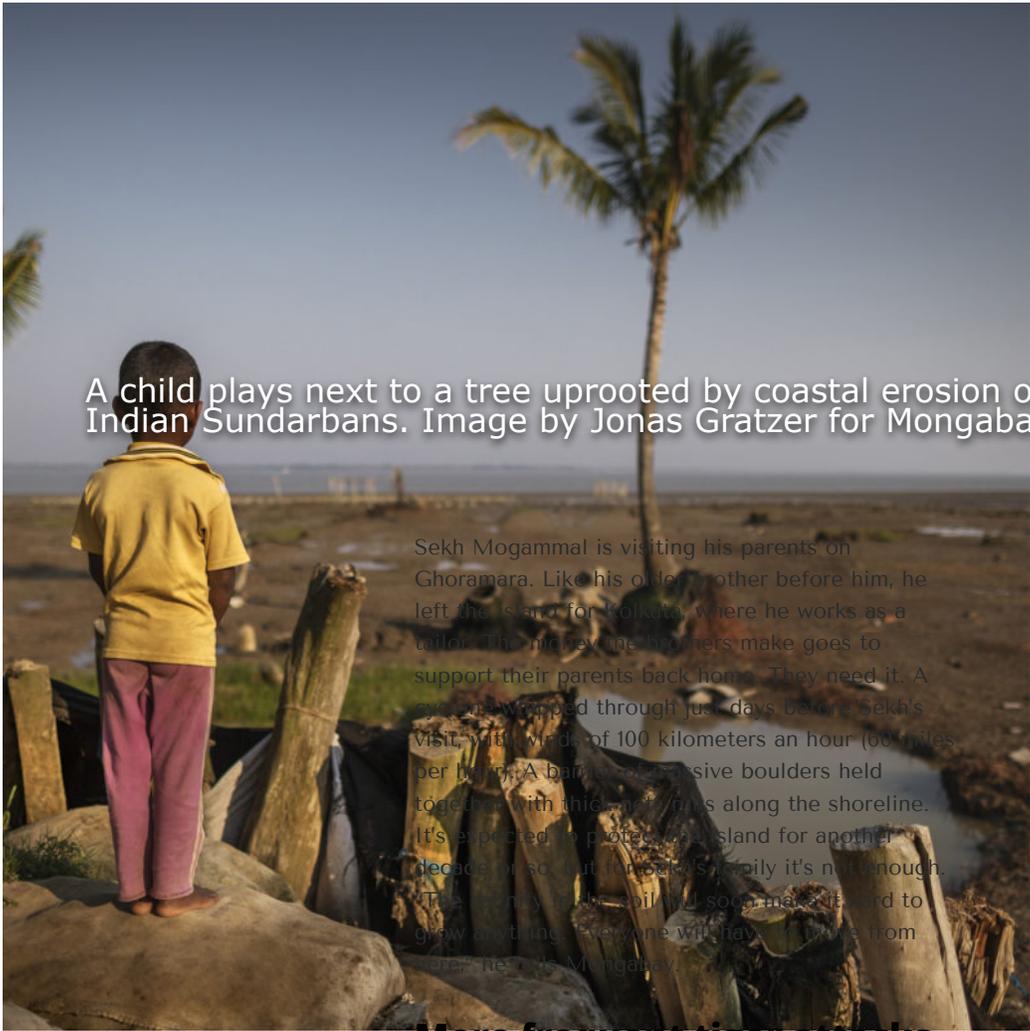
*Amina Bibi Gita fishes in the paddy fields on Dayapur Island in the Indian Sundarbans. Her work leaves her vulnerable to a tiger attack. Image by Jonas Gratzler for Mongabay.*

Saktipada has fished all his life, but his son won't carry on the tradition: like many young people from the Sundarbans, he's moved to Kolkata for work. "They don't want to stay here. There is no future in Sundarbans," Saktipada says.

The situation on nearby Ghoramara Island is worse. The island had one of the first settlements in the delta, but thousands have been forced to move since more than half of the island area was lost. At a glance, Ghoramara appears to be a pristine paradise: no traffic, congestion, no loads are piled up on village paths, next to ponds with diving ducks, lush forest all around, and goats and cows grazing. Yet all of this is at risk of disappearing due to climate change.

"The aggressive cyclones have an impact on the rice yield, and the salinity has increased by 50 percent on our fields," says Shankar Kayal, one of the fewer than 5,000 residents still remaining. "I have enough land to support my family. But what happens when the sea rises further?"

He adds that government assistance for relocation to other islands reaches few residents. "There are just too many villagers in need of financial support."



A child plays next to a tree uprooted by coastal erosion on Sagar Island in the Indian Sundarbans. Image by Jonas Gratzner for Mongabay.

Sekh Mogammal is visiting his parents on Ghoramara. Like his older brother before him, he left the island for Kolkata, where he works as a tailor. The money he earns makes go to support their parents back home. They need it. A cyclone whipped through just days before Sekh's visit, with winds of 100 kilometers an hour (60 miles per hour). A barrier of massive boulders held together with thick mud bricks along the shoreline. It's expected to protect the island for another decade or so, but for Sekh's family it's not enough. The salty water and soil has made it hard to grow anything. Everyone will have to move from here, he says. [Mongabay](#)

### **More frequent tiger attacks**

Farther east, toward the border with Bangladesh, the changing climate has exacerbated another deadly threat. In this easternmost part of the Indian Sundarbans, an unknown number of Bengal tigers still roam the mangroves. (A census is underway, with a few hundred of the big cats believed to live on either side of the border.)

The tigers' ancient hunting grounds have vanished with the advancing water, and the animals, which are excellent swimmers, have been reported crossing rivers and channels in higher numbers, drawn to human settlements by livestock. At the same time, villagers are forced deeper and deeper into the forest in search of a livelihood as the saltwater turns their farmland sterile. They look for honey and for crabs, and in doing so face an ever-increasing risk of encountering a tiger.



Villagers fish in a river by the Sundarbans tiger reserve. It's an increasingly dangerous activity as they are at risk of being attacked by tigers. Image by Jonas Gratzler for Mongabay.

Sunita Mondol lives in the village of Anpur. She's a living tale of what tiger conflicts mean in reality. Across the Gomti River from her home lies vast wilderness, stretching as far as the eye can see. The forest department has erected a fence several metres high along the mangroves and along the riverbank with nets. These are temporary solutions to prevent tigers from swimming across the river and into the village.

Three years ago, Sunita's husband, Paresa, ventured into the forest with two friends to fish for crabs. A tiger leaped into the low-lying boat and the men were fishing from being killed. Paresa. Since the incident, the couple's son, Aun, 26, has been the family's breadwinner, he pulls a rickshaw in the village.

The attack didn't just leave Sunita bereft of her husband. It also made her an outcast in a society where being a "tiger widow" carries its own stigma. It's said that a person attacked by a tiger has invoked the wrath of Bonobibi, the guardian spirit of the forest. The widows are sometimes called *swami-khego*: those who eat their own husbands. Sunita used to be popular in the village, where she would socialize with neighbors. Now she's lost her circle of friends, she tells Mongabay.

"When my husband was still alive, people would come for tea. Nobody comes anymore," she says. "I am completely empty inside."



Sunita Mondol and her son, Atin. Her husband, Paresh, was killed by a tiger during a fishing trip deep in the Sundarbans mangroves. Image by Jonas Gratzler for Mongabay.

It's estimated there are hundreds of tiger widows, or *gambas*, in the villages throughout the Sundarbans. Atin wants the family to move to Kolkata. Sunita says life in the swamps has become too harsh.

"The tiger attacks increase. They need more food and have lost all respect for humans," Atin says.

The relentlessly encroaching sea, also driven southward by cyclones, venomous snakes and even sharks closer to human settlements. Atin says his brother-in-law died and his sister was in a coma for several days after being bitten by a cobra.

## Living day by day

Life insurance coverage from the state is available for tiger widows, but it only applies within the regulated fishing areas in the buffer zones, and not in the core areas of the Sundarbans National Park and Tiger Reserve. And since fishing is more profitable in the more remote areas deep within the mangrove forest, most fishermen aren't covered. The West Bengal government prohibits fishing in the core areas of the park and reserve, and permits it in the buffer zones, but only with a license — something most fishermen lack because of the cost.

Tourism activities associated with the reserve have further restricted the area in which fishing is allowed. That's left the tiger widows, already socially ostracized, increasingly reliant on NGOs for financial support, or else forced to fish or gather honey deep in the mangroves — leaving them vulnerable to the same fate as their husbands.

Aparajita Mondol lives in the nearby village of Rajat Jubilee. She became a tiger widow a few months ago when her husband, Ravi, and two other fishermen set off for what was meant to be an eight-day fishing trip. Early on the second morning,

as Ravi prepared breakfast, a tiger jumped from a sandbank onto the boat. In the commotion, Ravi and the tiger fell into the river. The other fishermen splashed the water with their oars to scare off the tiger, but by then Ravi had sustained fatal wounds to his throat and the base of his head.

"I found out around 10 o'clock, and went down to the jetty and waited for his body to arrive," Aparajita tells Mongabay.



◀ Aparajita Mondol and her mother, Anmima Barkandaj. Aparajita lost her husband, Ravi, in a tiger attack when he went out fishing in the Indian Sundarbans. Image by Jonas Gratzler for Mongabay. ▶

Aparajita has two daughters, 16 and 18, both of whom are married and live with their husbands.

Aparajita has moved in with her parents, who support her both financially and mentally. Her gaze is empty as she stares at the clay floor of her parents' home.

"She has stopped talking," says her mother, Anima Barkandaj. "Traumatized."

Ravi was covered by insurance, so the family is entitled to about \$1,500. The money will sustain them for some time, but not for long.

"I've never fished in the river or in the forest, but now I may have to," Aparajita tells Mongabay. "I need to make money."

Anima shakes her head. "The tigers have become completely unafraid of people. They see people on boats and jump at them," she says.

But the family has neither savings nor fishing gear, and relies on a tiny patch of land to grow food.

"We live day by day. It's all about making sure that the family is getting by," Anima says.

## 'Humans are easy prey'

In an experiment to deter tigers from attacking people, fishermen and honey collectors have donned face masks on the back of their heads to

trick the cats, which often lunge at their prey from behind. Electric fencing has also been used against tigers entering villages. These measures worked initially, but not anymore, says Niranjan Raptan, a former poacher who now guides tour groups around the mangroves. He says the shortage of freshwater has forced the tigers to consume brackish water, whose salt is said to make the cats more aggressive.

"What we see is old tigers with worn-out teeth that become man-eaters," he tells Mongabay. "Humans are easy prey. We don't run or swim fast."



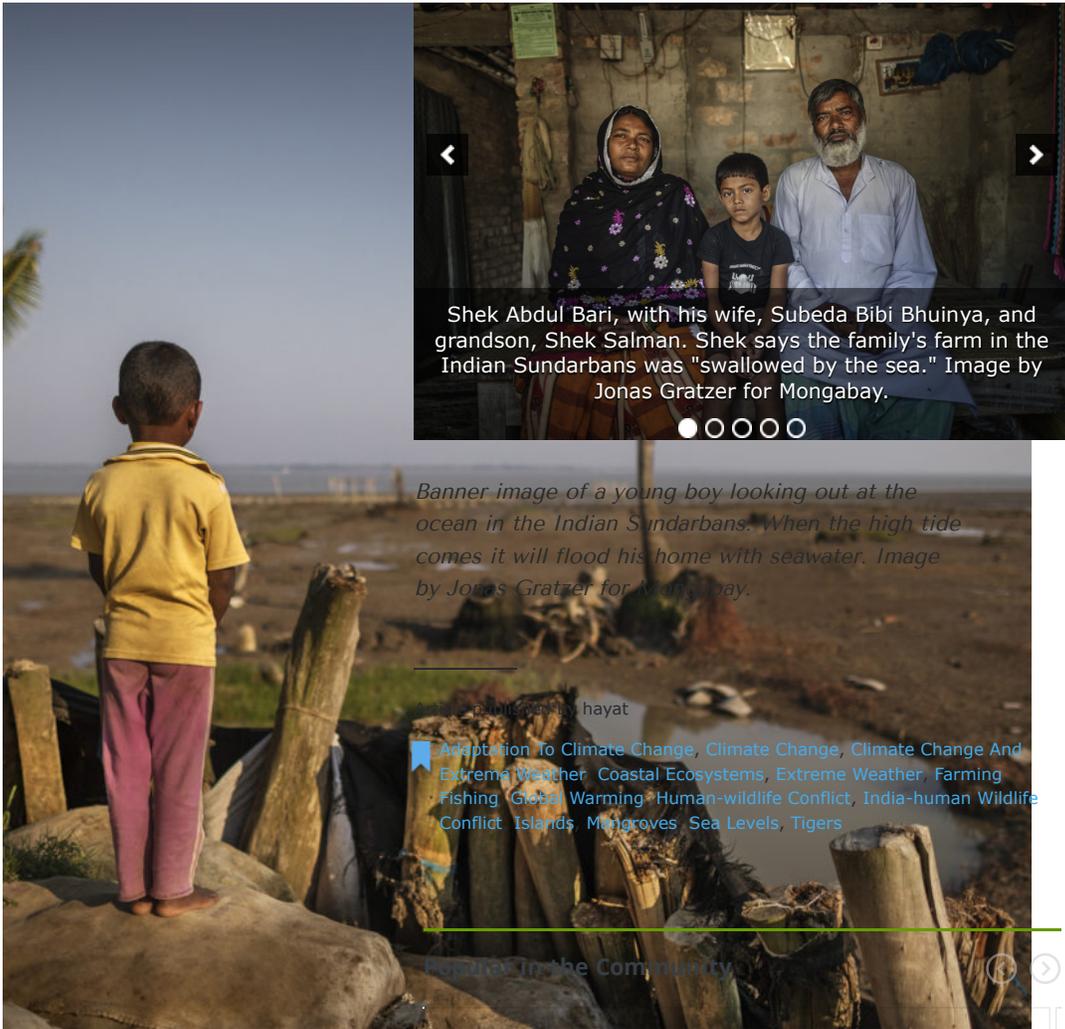
Hopeful and Dhruva Baranwal demonstrate wearing a mask on the back of the head to prevent an attack by tigers. With a mask, blind tigers prey if they are in Sundarbans. Image by James Graham for Mongabay

About 20 people a year are killed in tiger attacks in the Indian Sundarbans, according to government statistics. But Niranjan suggests the official figure is only for those killed outside the national park, and that just as many may be killed inside the UNESCO World Heritage Site.

Niranjan says one way the government can address the immediate conflict between humans and tigers is to prohibit crab fishing, but concedes that it's "very lucrative" for communities whose traditional livelihoods are fast disappearing.

That's only a stop-gap measure, though. Satellite pictures show that the sea level has risen by an average 3 centimeters (1.2 inches) a year over the past two decades in the Sundarbans, well above the global average. During that period, four islands have completely disappeared, and 6,000 families have become climate refugees.

In the world's largest mangrove forest, the tigers and snakes may pose the most immediate danger. But it's the inevitability of a changing climate that threatens the very state of the Sundarbans and its inhabitants, both human and wildlife.



Shek Abdul Bari, with his wife, Subeda Bibi Bhuinya, and grandson, Shek Salman. Shek says the family's farm in the Indian Sundarbans was "swallowed by the sea." Image by Jonas Gratzler for Mongabay.

Banner image of a young boy looking out at the ocean in the Indian Sundarbans. When the high tide comes it will flood his home with seawater. Image by Jonas Gratzler for Mongabay.

Adaptation To Climate Change, Climate Change, Climate Change And Extreme Weather, Coastal Ecosystems, Extreme Weather, Farming, Fishing, Global Warming, Human-wildlife Conflict, India-human Wildlife Conflict, Islands, Mangroves, Sea Levels, Tigers

Popular In the Community

- |  |   |  |
|--|---|--|
| <p><b>COOK ISLANDS MPA LEADER FIRED AFTER...</b></p> <p><b>Beer</b><br/>3d</p> <p>A 10 year moratorium would do more...</p>        | <p><b>'BRING IT ON,' EU MP SAYS OF TRADE FIGHT...</b></p> <p><b>Bone</b><br/>4d</p> <p>The next best thing is coming from India....</p> | <p><b>LEGAL AND ILLEGAL TRADE NEGATIVELY...</b></p> <p><b>Basketball</b><br/>11 Oct</p> <p>The mixing of conservation and...</p> |
| <p><b>SUSPICIONS OF MURDER IN DEATH OF...</b></p> <p><b>Paw</b><br/>11 Oct</p> <p>God bless that man and best wishes to all...</p> | <p><b>MISUSE OF WILDLIFE TRADE DATA...</b></p> <p><b>Kelgreen</b><br/>3d</p> <p>Databases are only as strong as the data. T...</p>      | <p><b>DEFORESTATION CONTINUES TO RISE IN...</b></p> <p><b>Tag</b><br/>6d</p> <p>The two key areas of focus right now need...</p> |

Conversation (1)

Sort by Best

Log In

Add a comment...



Pizza · 1d

The coal-fired Pampa power station which India may build in the Sundarbans - partly to avoid its own environmental regulations - will make matters worse and more widely. That power station (like other new coal, gas or biomass power stations) would of course also be a white elephant / stranded asset - given climate change.

Reply · Share · 5 · 4

Terms · Privacy

Add Spot.IM to your site



## Special series

### Endangered environmentalists

- 'Weird' police probe ruins Indonesian activist died in drink...
- Suspicion of murder in death of Indonesian environme...
- Oil palm, cattle and coca: a toll on Colombia's indig...

◀▶ [More articles](#)



### Indonesia's forest guardians

- In a Sumatran village in Indonesia, one task of gourmet...
- Restoring Sumatra's Leuser Ecosystem, one small step...
- Indigenous Iban community defends rainforests, but aw...

◀▶ [More articles](#)



### Conservation effectiveness

- Failure in conservation projects: Ecolony experiences it...
- Wilderness cuts the risk of extinction for species in half
- Changes in Sierra Leone alert to human-impacted habit...

◀▶ [More articles](#)



### Southeast asian infrastructure

- Audio: Traveling the Pan Borneo Highway with Mongaba...
- Notes from the road: 5 revelations from traveling the Pa...
- Pan Borneo Highway development endangers the Heart ...

◀▶ [More articles](#)



### Amazon infrastructure

- Yanomami Amazon reserve invaded by 20,000 miners; ...
- Amazon infrastructure puts 68% of indigenous lands / p...
- Amazon fish kill at Sinop spotlights risk from 80+ Tapaj...

◀▶ [More articles](#)



### Asian rhinos

- Malaysian attempt at Sumatran rhino IVF fails on low qu...
- At India's Assam Zoo, decades of experience lead to rhi...
- For India's flood-hit rhinos, refuge depends increasingly ...

◀▶ [More articles](#)



### Indonesian fisheries

- Bali mangrove bay is now a conservation zone, nixing re...
- Saving Aru: The epic battle to save the islands that insp...
- As wildfires roil Sumatra, some villages have abandoned...

◀▶ [More articles](#)



### Conservation in madagascar

- Madagascar calls for assistance as fires imperil its prote...
- Madagascar: Opaque foreign fisheries deals leave empty...
- CITES appeals to countries to watch out for trafficked M...



[↔ More articles](#)

#### About Mongabay

Mongabay is a U.S.-based non-profit conservation and environmental science news platform. Our EIN or tax ID is 45-3714703.

#### Information

[Mongabay.org](#)  
[Tropical Forest Network](#)  
[Wild Madagascar](#)  
[Selva Tropicales](#)  
[Mongabay Indonesia](#)  
[Mongabay India](#)  
[Tropical Conservation Science](#)

#### Social

[Facebook](#)  
[Twitter](#)  
[Instagram](#)  
[LinkedIn](#)  
[YouTube](#)

#### Information

[About Mongabay](#)  
[Copyright & Terms of Use](#)  
[Privacy Policy](#)  
[Advertising](#)  
[Contact Us](#)

© 2019 Copyright Conservation news