

CASE STUDY

Indonesia –

TIMBULSLOKO



GEOGRAPHICAL CONTEXT

Timbulsloko Village in Sayung District, Demak Regency, is one of many coastal villages in Indonesia. The village, located in northern Java, is one of Indonesia's "fastest-sinking areas".¹ Within the village, there is an area known as Timbulsloko Neighbourhood that has been entirely submerged by seawater. Around 107 households in Timbulsloko Village live in stilt houses and use wooden planks as walkways. Today, most of the residents are fisherfolk. Women are involved in collecting shellfish, such as clams, shrimp, *rajungan* (small crabs), and crabs. As climate change alters local ecosystems, villagers have been forced to shift their livelihoods from farming to fishing.

1

ECOLOGICAL AND TERRITORIAL DISRUPTION FROM CLIMATE CHANGE AND HUMAN ACTIVITY

The village of Timbulsloko has experienced significant changes to its ecosystem:

- **SEA-LEVEL RISE, EROSION, AND FLOODING:** Timbulsloko Village, once an agrarian community reliant on agriculture, has been severely affected by rising sea levels, tidal flooding, and coastal erosion. Seawater intrusion was first observed in 1990, marking the beginning of a long-term transformation of the village's landscape and livelihoods. By 1997, flooding had become more frequent, with residents reporting increased insecurity and discomfort—particularly during the months from September to April, when high waves often crash into their homes. Over time, the community has lost the ability to predict the timing of storm seasons, and the volume of water entering their homes has risen steadily each year, as tracked by local flood level markers.

¹ Rebecca Ann Hughes and AFP, "We Can't Do Anything": See the Village Where Homes Are Permanently Surrounded by Water," *Euronews*, July 25, 2023.

Among the 19 villages in the Sayung Subdistrict, Timbulsloko is currently the most affected by tidal flooding and land loss. Since 1995, residents have observed a continuous rise in sea levels, with an average increase of 18 cm per year between 2002 and 2016.² Combined with land subsidence, these changes have resulted in the submergence of some homes and the permanent inundation of large areas of land. The village has lost approximately 101 hectares of land and between 400 to 1,300 meters of coastline.³ Dozens of hectares that were once dry and cultivated have now been overtaken by seawater. Since 2017, tidal flooding has not only worsened in Timbulsloko but has also affected nearby villages like Bogorame, turning flooding into a near-permanent condition.

The inundation of Timbulsloko has been driven by both natural processes and human-induced factors, particularly large-scale development projects in the surrounding area. Completed infrastructure developments – such as the Marina Beach reclamation, the construction of Tanjung Mas Port, and industrial expansion in Semarang near the Demak border – have all contributed to accelerating seawater intrusion into the coastal zone.⁴ Another significant driver is the relocation of industrial zones from East Java to Central Java, following the environmental disaster caused by the Lapindo mudflow in Sidoarjo. That event led to the submergence of 10,426 homes and 77 religious buildings across 16 villages and three districts. In its aftermath, investors and manufacturers began seeking new areas to establish their operations – preferably locations with fewer environmental risks and lower labor costs. Demak, Central Java, met these conditions and was quickly developed as a new industrial hub. Since this shift, large factories have emerged along Demak’s main roads, bringing with them high levels of groundwater extraction for industrial use. This intensive extraction has contributed to land subsidence, worsening flooding and leaving the residents of Timbulsloko Village increasingly submerged.⁵

2 N. W. Suryanti and M. A. Marfai, “Analisis Multibahaya di Wilayah Pesisir Kabupaten Demak,” *Jurnal Bumi Indonesia* 5, no. 2 (2016).

3 A. Astra et al., *A Sustainable Solution for Massive Coastal Erosion in Central Java*, Discussion Paper (Delft, The Netherlands: Deltares, 2014), 1–45.

4 M. Karmilah, *Urip Dioyak-oyak Banyu: Perjumpaan Manusia, Abrasi, Rob, dan Infrastruktur di Sayung* (Yogyakarta: Matakata Inspirasi, 2023).

5 Lihat Munasikhah, Siti, and Putri Agus Wijayanti. (2021). “Dari Hutan Mangrove Menjadi Tambak: Krisis Ekologis Di Kawasan Sayung Kabupaten Demak 1990–1999.” *Journal of Indonesian History* 10(2):129–40.

RIGHT TO FOOD AND NUTRITION

The loss of productive land due to rising sea levels has forced most residents to shift their livelihoods.

In the 1960s, Timbulsloko's coastal area was dominated by rice fields. Before the 1990s, residents recall the village being densely covered with coconut and fruit trees, along with thriving vegetable farms and crops such as corn and legumes. Most households depended on rice farming, supplemented by other crops and vegetables grown behind their homes. This agricultural livelihood sustained the community until the early 2000s, when seawater intrusion – driven by erosion and land subsidence – began to take its toll. Between 2003 and 2010, 35.5 hectares of land had turned into sea.⁶ Rice fields were flooded and rendered unusable, trees died, and vegetables stopped growing. As the land became increasingly submerged, residents transitioned to shrimp and milkfish farming, managing yields of 2–3 quintals per hectare. Eventually, as more land became unsuitable for agriculture, the majority of villagers turned to fishing. They began fishing within 12 nautical miles, primarily in the waters surrounding Timbulsloko.

Damage to rice fields and fish farms has reduced sources of subsistence and decreased family income, including fewer employment opportunities for women. Previously, villages were able to earn an average of Rp 47,500 (close to Rp 50,000, equivalent to USD 3) per harvest or per day per one square km of fish pond. Meanwhile, for milkfish farmers, the estimated average losses are no less significant. On average, milkfish farmers suffer losses of around Rp 6,370,000 (ca. USD 40) per harvest, or every 5–6 months. This situation has also led to a shift in livelihoods toward informal economic activities, particularly as daily and contract workers in the manufacturing and construction sectors outside the Timbulsloko village under precarious work conditions.⁷ Loss of income has made it harder for villagers to feed themselves and their families.

Women who were previously involved in small-scale agriculture as farm workers and tenant farmers shifted to fish farming-raising milkfish and shrimp – as tidal flooding began to inundate rice fields and farmland. When the flooding fully submerged the agricultural land in Timbulsloko Village, many women who had been fish farmers also became fisherfolk, using the same former fish ponds and nearby waters as their fishing grounds. The fishing gear commonly used by women includes fish traps and dragon traps to catch fish, shrimp, and crabs. Additionally, residents engage in gogoh-hand-picking

⁶ Ari Wilis Setyati, Arya Rezagama, Tri Winarni Agustini, Yusup Hidayat, Narendra Prasidya Wishnu, and Dyah Ayu Wulandary, "Inovasi Penanganan Mitigasi Bencana Desa Bedono Kecamatan Sayung Demak Akibat Efek Abrasi," in *Proceeding SNK-PPM*, vol. 1 (Semarang, 2018), 198–200

⁷ Sukamdi, "Mobilitas Penduduk, Kemiskinan, dan Ketahanan Pangan di Daerah Bencana: Kasus Desa Timbulsloko, Kecamatan Sayung, Kabupaten Demak, Provinsi Jawa Tengah," *Populasi* 27, no. 1 (2019): 55–72.

shellfish from former fish farming areas that have merged with the sea and are no longer physically distinguishable.

RIGHT TO HOUSING

Ecological changes caused by the climate crisis and human activities have also impacted the livelihoods of residents in Timbulsloko Village. In terms of access and mobility, the flooding of most of the land has forced residents to adapt by building stilt houses and access roads made of wooden planks. The cost of constructing a stilt house is approximately Rp10 million (ca. USD 615). When their houses are increasingly submerged due to rising sea levels, residents must raise their houses, which costs much more than building a stilt house. Meanwhile, roads made of wooden planks also need to be continuously renovated as tidal flooding becomes higher and permanently inundates the Timbulsloko Village area.

Boats, or boat taxis, are the primary mode of transportation frequently used, especially during rising sea levels or floods. Boats are typically used to take residents to a special parking area where they park their private vehicles before continuing their journey to other locations. The use of this parking area is not free, with residents required to pay a fee of Rp 2,000 (USD 0,12)/ day to park their vehicles. Meanwhile, residents who do not own or cannot drive motorized vehicles, such as women and housewives, often ride with others heading to the same destination.

Today, around 300 villagers continue to reside in the village. They choose to stay because relocation does not guarantee safety or stability. In Demak, areas already affected by flooding have seen the government offer only temporary use of irrigation land – land that is not owned but merely lent to the displaced. This insecurity discourages relocation. Additionally, many community members have already adapted from farming to fishing due to environmental changes, and they fear having to change their livelihoods again if they move. The lack of clear and sustained government support further deepens their uncertainty. Ironically, the water that now covers parts of their village – and the fish it brings – has become a fragile but vital source of income, offering a reason to remain despite ongoing challenges.

For those who left the village, life continues to be difficult for them, due to the need to adapt and change means of livelihood. One fisherwoman who decided to move to Trengguli Village eventually returned to her original home in Timbulsloko Village because she could not find work in her new place. A similar phenomenon was also experienced by other residents of Timbulsloko Village. Some residents who moved out still rely on trapping fish and shrimp in Timbulsloko Village, as they have no alternative means of livelihood. Many residents still work as fisherfolk even though they have moved to a place far from Timbulsloko Village.

RIGHT TO EDUCATION

Since flooding began in Timbulsloko Village, children have faced increasingly difficult conditions to access education. To reach school, they must first cross the flooded area by boat and then walk for about half an hour, incurring additional transport costs just to get to the main road. These challenges worsen during the Rendeng season (high-wave season), from September to April, when strong winds, heavy rain, and rough tides make the journey even more dangerous.

Flooding also disrupts children's home environments. When water enters their houses at night, they are forced to help their parents move belongings to safety, leaving little or no time for rest, homework, or study. This constant uncertainty creates psychological stress – children live with the fear that their school supplies could be destroyed by sudden floods, which sometimes arrive like “thieves” in the night. Their emotional distress is compounded by the social stigma they face at school, where they are often teased for coming from a flooded village.

Beyond education, the floods have also taken away safe and accessible play areas. Once open spaces like soccer fields or playgrounds are now submerged. Children are left to play on narrow wooden paths, often flooded from below, increasing the risk of accidents. There have already been incidents of children, particularly girls, falling into the water while walking or playing. The only remaining space for recreation is a one-meter-wide wooden walkway – hardly a safe or adequate environment for play. The continued lack of proper infrastructure and access further isolates the children, making both education and daily life more difficult and precarious.

RIGHT TO WATER

The current situation has also made it difficult for villagers to access clean water, as many water sources had been affected by seawater intrusion. This includes the river that flows through the village. To meet their clean water needs, the residents of Timbulsloko Village rely on two wells obtained from the Community-Based Drinking Water and Sanitation Program (Pamsimas) from the Ministry of Public Works and Public Housing (PUPR), which are distributed to every resident's house. Each household pays a fee of Rp3,000 (USD 0,18) per cubic meter.

RIGHT TO HEALTH

The tidal flooding that inundates the residential area in Timbulsloko Village causes the community to suffer from skin diseases such as itching and digestive disorders such as diarrhea.⁸ In Timbulsloko Village, there are health workers who carry out their professions, namely midwives, posyandu cadres, and village midwives (traditional birth attendants). One midwife operates a Village Health Post (Poskesdes) in Dukuh Karanggeneng, where residents can check their health and receive treatment for mild to moderate illnesses. However, the location is only accessible via a rocky gravel road that is frequently flooded by tidal flooding. The limited access due to tidal flooding makes it difficult for pregnant women to access emergency care, such as when giving birth.

About two years ago, in the middle of the night, a child under the age of 5 experienced seizures due to high fever and had to be taken to the nearest hospital. At that time, Timbulsloko Village was flooded with tidal water up to an adult's waist. In such conditions, the child's parents had to carry their child through the tidal flood for 30 minutes to exit the village in order to reach the main road. Based on discussions with women in Timbulsloko Village, particularly those who are pregnant, over the past five years women have had to anticipate their expected delivery date and decide to stay at their relatives' homes outside of Timbulsloko Village. This effort is a form of risk prevention for maternal mortality during childbirth.

RIGHT TO CULTURE

The sense of safety and comfort, even the ability to envision a decent life, has grown increasingly distant from the imagination of Timbulsloko Village residents. In the past five years, the public cemetery has begun to flood. In 2024, the public cemetery flooded again and collapsed. This situation has caused immense sorrow for the predominantly Muslim community of Timbulsloko Village. For Muslims, graves are both the "new home" for the deceased and a memorial for those left behind. Over the past five years, residents have raised the grave area at least three times using funds they have collected or donations from networks.

For the people of Timbulsloko Village, what has been taken away is not just a home, but also their dignity as human beings, their history with their village and their social connections.

⁸ M. Masfiah, S. Sampurna, I. Yusuf, K. D. Utami, and S. Suparmi, "Efforts to Improve Health in Timbulsloko Village, Sayung District, Demak Regency through Health Checkups and Education," *Journal of Medical Community Service* 2, no. 3 (2023): 102–11.

Indonesia presents itself as a country with ambitious climate commitments, progressively updating its Nationally Determined Contributions (NDCs) since 2016 to reflect stronger emission reduction targets and broader adaptation goals. Sectoral targets, for example, in forestry, energy, agriculture, and more, are included in these targets with recent updates promising alignment with the 1.5°C global warming limit and the inclusion of new issues such as marine ecosystems and just transition. The legal framework supporting these efforts includes several national laws and regulations focused on environmental protection and climate governance.⁹ These policies, however, have been criticized for failing to address the real needs of affected communities, often prioritizing carbon trading and conservation schemes like Marine Protected Areas over grassroots solutions.

In addition, the Indonesian government's approach to addressing the climate crisis in coastal areas, particularly in Timbulsloko Village, has largely prioritized corporate interests over community needs. Legal reforms under the Job Creation Law (UUCK 2023) have streamlined spatial planning and licensing processes to facilitate industrial expansion, including in coastal and marine zones.¹⁰ In fact, as a result, Timbulsloko Village has been designated as both an industrial and reclamation zone under national and provincial spatial plans, pushing a shift from traditional livelihoods to cheap labor serving industrial labor demands that will be built. This is already a reality for many who have left the village in 2000. Meanwhile, government-led climate mitigation efforts, such as mangrove planting, have failed due to poor planning and lack of local capacity, becoming more symbolic than effective. These policies reflect a failure to support the real needs of villagers facing severe climate impacts.¹¹

Furthermore, the government efforts to support Timbulsloko residents, such as the “Tuku Lemah Oleh Omah” program and the provision of instant panel houses, are inaccessible to most villagers because they require land ownership outside the village—a condition difficult to meet given residents' struggles for livelihood. Those who stayed have been urging the government to support them with public facilitation such as health care, road or transportation for children to go to school. They also demand the government to take long-term actions. However, most assistance comes in the form of short-term relief, like food aid during crises or religious holidays. This assistance serves as a social safety net to ensure that the reproduction of labor remains intact, and while it may appear compassionate, it ultimately fails to address structural issues and instead helps sustain the ongoing crisis.¹²

9 These are, for example, Law (UU) No. 32 of 2009 concerning Environmental Protection and Management and Law No. 31 of 2009 concerning Meteorology, Climatology and Geophysics. In addition, there is also Presidential Regulation (Perpres) No. 98 of 2021 concerning Carbon Economic Value and Minister of Environment and Forestry Regulation (Permen LHK) No. 12 of 2024 concerning Greenhouse Gas (GHG) emission control. Indonesia has also ratified the Paris Agreement through Law No. 16 of 2016.

10 Saragih, F. et al., 2024. Saragih, F., Ahmad, R., Mas'ud, I., Suryana, E., & Azis, M. (2024). *Integrasi Tata Ruang Darat dan Laut Untuk Siapa?: Ocean Grabbing melalui Integrasi Kebijakan Tata Ruang dan Laut di Indonesia*. Jaringan Kerja Pemetaan Partisipatif dan Koalisi Rakyat untuk Keadilan Perikanan.

11 Tania Murray Li, *The Will to Improve: Governmentality, Development, and the Practice of Politics* (Durham: Duke University Press, 2007), 7, 23.

12 Nancy Fraser, *Fortunes of Feminism* (London: Verso, 2013), 219, 227. Fraser develops a neo-Marxist critique of capitalism through the concept of “social reproduction,” arguing that social safety nets, such as health care, education, social assistance, and welfare programs, are embedded in capitalist reproduction and cannot be separated from its exploitative logic.

The case of Timbulsloko illustrates how Indonesia's climate crisis policies consistently fail to address the realities faced by communities on the ground. This failure is mirrored in the government's stance at international climate conferences, where it prioritizes carbon trading schemes and the expansion of Marine Protected Areas under the guise of conservation. Rather than tackling the direct impacts of rising sea levels and land subsidence, Indonesia focuses on market-based mechanisms such as Blue Finance, Blue Bonds, Blue Food, Debt-for-Nature Swaps, and the 30x30 conservation target. A clear example is the Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security (CTI-CFF), which aligns with the Regional Plan of Action (RPOA) 2.0 and the 2030 Global Biodiversity Framework.¹³

In effect, the government's strategy centers on meeting NDC targets through carbon transactions, while leaving coastal communities like those in Timbulsloko to face the devastating consequences of climate change on their own.



RESISTANCE OF FISHERS AND SOLUTIONS TO CLIMATE CHANGE

The people of Timbulsloko Village have undergone a long process of adaptation from an agrarian society to aquaculture, and eventually to capture fisheries. In the process, many changed professions or took on additional work as factory workers to meet their daily needs.

The fisherwomen of Timbulsloko also engage in daily acts of resistance by utilizing available resources. They trap fish and gather shellfish in the land that has become ocean. They also form women's groups and establish independent savings accounts as a means of empowerment and mutual support. These groups advocate for the rights of fisherwomen, serve as forums for idea exchange, and connect with similar fisherwomen's groups to share strategies and experiences.

Meanwhile, fisherfolk and fisherwomen actively reject false solutions by the state – such as relocation schemes, or the construction of the Giant Sea Wall. The efforts of coastal communities in facing the impacts of the climate crisis illustrate the holistic relationship of humans to marine space, coastal ecosystems and their identity as fisherfolk and fisherwomen.

¹³ Coral Triangle Initiative – Coastal and Marine Resources Management Project (CTI-CFF), *CRMP Final Assessment Report* (2013), https://www.crc.uri.edu/download/CRMP_Assessment_Final.pdf. The CTI-CFF, a regional initiative balancing economic and environmental goals through market-based approaches, has influenced coastal management strategies in Indonesia. In Timbulsloko Village, this model is reflected in the Mangrove Capital and Building with Nature projects, which aim to address climate impacts by combining mangrove restoration with engineered coastal defenses. Led by the Indonesian government and Wetlands International, these projects also promote carbon accounting and community-based economic activities linked to ecosystem rehabilitation.

**AUTHORS:**

Abdul Manan, Adib Saifin Nu'man and Susan Herawati, KIARA, Indonesia.
KIARA is a support organization of WFFP.

COPY-EDITING:

Michelle Brown Ochaíta, NAFSO/McGill University

ILLUSTRATION AND DESIGN:

Ewelina Ulita

PUBLISHED BY:

World Forum of Fisher Peoples

AUGUST 2025

With the financial support of Grassroots International (USA)



**Grassroots
International**