Insecure Lives Under Extreme Climate Conditions: Insights from a Fishing Hamlet in Tamil Nadu, India

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Series: Climate Change and Social Change

In recent years, climate change–induced weather events have exacerbated poverty and insecurity in small fishing villages on the southeastern coastline of India. Author Devendraraj Madhanagopal documents the difficult choices that vulnerable fishermen must make between safety and livelihood, and urges action.

> Rainwater and seawater surrounded the whole village, and we were disconnected from the external world for a few days.
>
> [15 March 2016, Chinnamedu village; translated from Tamil]

Mr Manikumar, the fisheries cooperative society[1] leader of Chinnamedu village, a small fishing hamlet of the Nagapattinam district, Tamil Nadu, narrates a disturbing incident that occurred in November and December 2015. His hamlet has been listed among the fishing villages[2] most vulnerable to coastal disasters by the district administration. Indeed, the notorious 2004 Indian Ocean tsunami had already devastated this portion of the Indian Coast. More recent studies have emphasized that the low-lying district is highly vulnerable to projected impacts of sea-level rise and shore erosion. The climate risks affecting the district include heavy rainfalls and floods (Byravan *et al.* 2010; Arivudai Nambi and Bahinipati 2013; Ramachandran *et al.* 2017).

Chinnamedu

Chinnamedu (11.10°N, 79.85°E) is located on India's southeastern coast, in Sembanarkoil *panchayat*[3] union, Nagapattinam district. It is a homogeneous, single-caste fishing village. The inhabitants belong to the traditional marine fishing caste, Pattinavar, a centuries-old caste of the

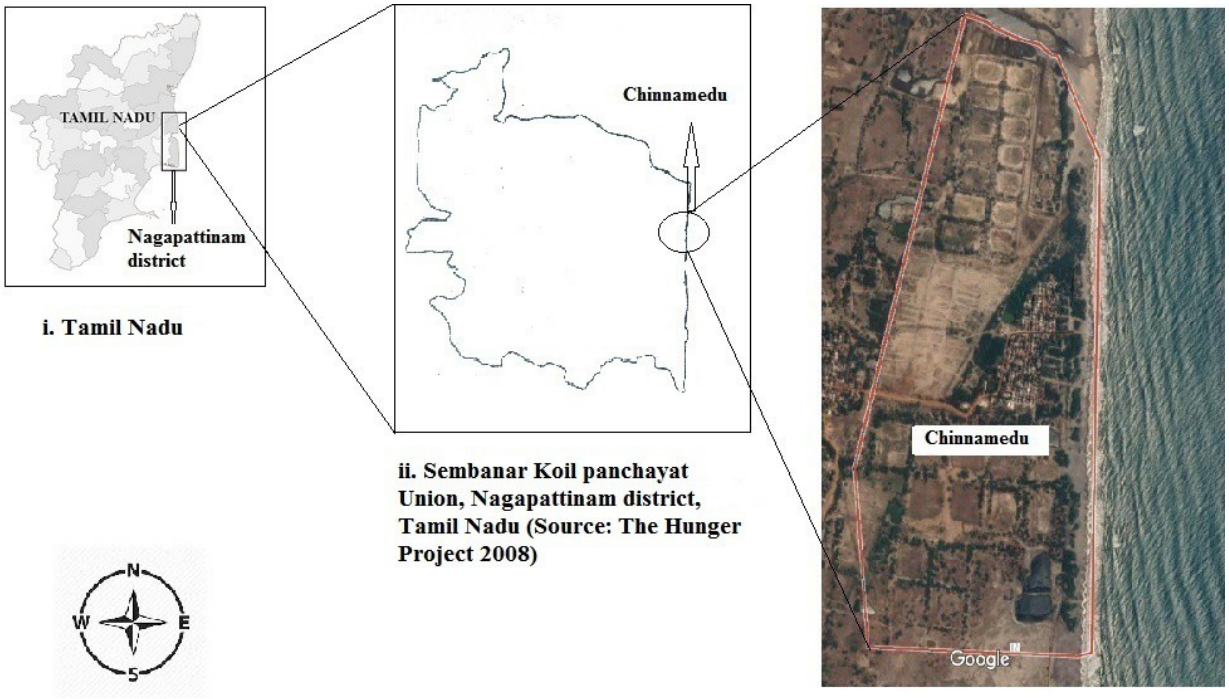
[1] In India, fisheries cooperative societies are registered bodies of the central and state governments. In Tamil Nadu, the state government governs fisheries cooperative societies, which operate at the state, district and village levels. These societies play crucial roles in organizing fishermen and fisherwomen and executing various state-government welfare schemes. For more details about fisheries cooperative societies in Tamil Nadu, see: www.fisheries.tn.gov.in/co-operative-main.html.

[2] My ongoing PhD research focuses on selected fishing hamlets (including Chinnamedu) in the Nagapattinam district and their vulnerability to climate-change impacts.

[3] In India, *panchayat* means an institution of self-government, constituted under article 243B of the Indian Constitution (see: www.aaptaxlaw.com/constitution-of-india/article-243-243a-243b-constitution-panchayat-definitionsd-gram-sabha-constitution-of-panchayats-article-243-243a-243b-of-constitution-of-india-1949.html), for rural areas. For more details on *panchayats* and *panchayat raj* system in India, see: www.panchayat.gov.in/home.

Coromandel Coast of Tamil Nadu. Pattinavars' historical isolation from the agrarian mainland and involvement in fishing have garnered them a substantial measure of informal institutional infrastructure and extended social networks within their community (Bavinck 2008).

Figure 1. Maps showing the study location



i. Tamil Nadu

ii. Sembanar Koil panchayat Union, Nagapattinam district, Tamil Nadu (Source: The Hunger Project 2008)

iii. Chinnamedu village (Source: Google Earth)

Around 250 fishing households reside in Chinnamedu, and the total population of the village is less than 1,000. The primary income of the fishing families mostly depends on the male heads of household. Their small-scale fishing shields them from dependence on modern technology. Their activities are mostly limited to those areas where they can see the seashore, but they can travel long distances along the shore (about 50 to 70 km, or 30 to 45 miles) at the onset of the southwest monsoon to catch *kola meen*[4] ("flying fish" in Tamil). Village houses are built about 300 meters (1,000 feet) away from the coast, making them highly vulnerable to natural hazards, including climate extremes. According to villagers, seawater intrusion has been pervasive during the fall monsoon "rough season"[5]. Around 40% of the fishing households[6] of Chinnamedu do not own fishing vessels and gear. Their livelihoods entirely depend on fishing or on seasonal migration. Around 50 of Chinnamedu's fishing households have at least one family member who works[7] in a foreign country and sends remittances to the family. During field visits, I noted that a significant number of fishermen in Chinnamedu had worked in foreign countries for a few years and returned. They are now re-engaged in fishing. Abroad, these fishermen worked as manual laborers and in a few cases in the Gulf countries as fish workers. In most cases, the families of migrants are financially better off than the others. The level of poverty among fishing families of Chinnamedu is not, therefore, equally distributed: it is mitigated by factors such as ownership of a fishing vessel and fishing gear, and seasonal migration.

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[4] Around six species of flying fish (Exocoetidae) are found on the Coromandel Coast of Tamil Nadu. It can be caught by small motorized boats, but not mechanized boats and trawlers. A recent analysis of marine fish landings (Sathianandan *et al.* 2011) pointed out that "flying fish" in Indian coastal waters are in "depleted" condition.

[5] Fishers from the coastal districts of Tamil Nadu consider October to November the "rough season". The Northeast monsoon, which starts in October and ends in November, brings 60% of the state's total annual rainfall. In the Nagapattinam district, the northeast monsoon produces cyclonic storms, flooding, and massive rains at least once every three or four years. For more details, see Nagapattinam district official website: www.nagapattinam.tn.nic.in/monsoon.html.

Figure 2. Tsunami memorial stone in Chinnamedu village

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Exposed to the elements

Chinnamedu fishers were victims of the 2004 Indian Ocean tsunami and the 2011 Thane cyclone. In November and December 2015, massive, widespread and incessant rains lashed across Tamil Nadu state (India Meteorological Department 2015). Nagapattinam district experienced heavy rainfall on November 9, 2015, following the formation of a low-pressure weather system[8]. Rain returned to the district in December 2015[9]. From October 1, 2015, to December 9, 2015, the Nagapattinam district received 1,339 mm (52.7 inches) of rainfall (Bhatt and Mishra 2016), a 10-year high. The infrastructure and assets of the marine fishers of Nagapattinam and Cuddalore districts were significantly affected; sand dunes and coastal land were substantially eroded.

In 2011, Around 150 fishing families benefited from free "tsunami houses" provided by international donor agencies, and still reside in these dwellings. Fishers (especially the poorest ones) complain about the conditions of the houses. They have become old and no longer provide enough protection during the rough seasons. Poverty also reduces coastal communities' ability to cope with extreme climate conditions (Clark *et al.* 1998). The continuous decline of fish catches and the resulting insufficient income over the past two decades have added to the effects of the

[6] The details that are mentioned in this report come from the author's field survey. These may vary from the CMFRI census (CMFRI 2012). However, it should be noted that there are no recent, accurate data available regarding ownership details of fishing vessels and gear, and or details of migrants in the small fishing villages of the Coromandel Coast in Tamil Nadu.

[7] Seasonal migration of small-scale fishermen from along the Coromandel Coast to foreign countries has become the prevalent phenomenon over the past three decades. Primarily, fishermen out-migrate because of insufficient income, declining catches, and other economic reasons.

[8] For more details, see *The Hindu*, November 15, 2015: www.thehindu.com/news/national/tamil-nadu/rain-pounds-tamil-nadu-as-depression-looms-large/article7880501.ece.

[9] For more details, see *The Hindu*, December 9, 2015: www.thehindubusinessline.com/economy/agri-business/weather-muted-in-north-tamil-nadu-as-heavy-rain-lashes-south/article7966690.ece.

tsunami and created a situation of perpetual poverty that leaves the fishers feeling unable to cope with danger. They do not have the means to renovate their houses in order to withstand rough climate conditions. As a consequence, they have to knowingly risk their lives.

Figure 3. Fishing vessels on the Chinnamedu coast

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Inconsistent compensation and relief measures

The state government of Tamil Nadu has put together various welfare schemes to support the lives and livelihoods of marine fishers. A fisheries policy note (2017/2018)[10] mentions that the fishermen's welfare board of Tamil Nadu usually provides a total sum of 100,000 rupees (about $1,500) to the families of missing or deceased fishermen during the fishing season (Government of Tamil Nadu 2018). However, in practice, the compensation amounts vary according to the types of events and sociopolitical conditions. For example, Tamil Nadu state government provided 2 million rupees ($30,500) to the families of the fishermen who went missing or died during the 2017 Ockhi cyclone.

After the massive 2015 rainfalls, many news outlets reported that significant efforts were made by the state administration to drain stagnant waters and assess the damage of marine fishers' assets. However, a senior fisherman from Chinnamedu criticized the aid provided by the state administration:

> It is a common story. Elected representatives and bureaucrats visit our villages to evaluate damaged assets if any storm, flood or heavy rainfall materializes. But as far as I am aware, we've never received timely and fair 'compensation' from the state administration. It was exactly the same story for the Thane cyclone. The sole exception was the tsunami disaster. [Recovery] went very well because a lot of NGOs came and provided rehabilitation measures.
>
> [25 March 2016, Chinnamedu village; translated from Tamil]

[10] The fisheries department of the state government of Tamil Nadu releases a fisheries policy note every year. In this note, the fisheries department details the state budgetary allocations for both the marine and inland fisheries sectors. It also provides information about significant events, achievements, welfare schemes, subsidies, and relief schemes aimed at the fisheries sector.

This perspective aligns with other fishermen's accounts. Fishermen try to safeguard their assets from possible loss during climate events, because they know that they cannot rely on the state's compensation. Widespread feelings of fear and insecurity have led them to avoid emergency evacuation plans. During climate extremes, they choose to risk their lives in order to protect their homes, fishing vessels, and fishing gear.

As stated earlier, poverty among the fishers of Chinnamedu is not equally distributed. Fishing households who do not have any source of income other than fishing are forced to safeguard their assets despite the risks, whereas households who receive remittances from family members abroad are able to withstand losses resulting from extreme climate conditions. A senior fisherman explained how the remittances sent by his son helped his family to cope with the losses due to 2015's massive rainfalls:

> My fishing gear was destroyed due to the continuous massive rains. I could have saved the gear if I had visited the coast amid heavy rains. But that was extremely risky as both rain and seawater surrounded the village on that day. I did not take that risk, and I left my gear on the coast. I knew it was going to be hard to get the compensation from the state administration. But the remittances sent by my son from abroad helped me make that decision.
>
> [8 April 2016, Chinnamedu village; translated from Tamil]

A few fishermen who own outboard motorboats share this perspective. Their financial conditions are more stable than those of fishermen who only have catamaran boats and risk their lives in extreme climate conditions to ensure the safety of their fishing assets.

Disaster preparedness

I recently discussed the first three phases of disaster preparedness—mitigation, preparedness, and response—with the community leaders of the hamlet. They noted that the district administration visited their village and provided basic pre-disaster management training to around 20 young fishermen for a few months at the end of 2017. But this training has had no visible impact on the state of disaster preparedness. Leaders were unaware of the proper escape routes and emergency shelters. The life jackets and the emergency equipment given by the state administration and donor agencies were no longer in usable condition. Although a small channel was set up to drain rainwater from residential areas to the sea, it had already proven insufficient to manage the massive rainfalls of November and December 2015.

Mr Anjappar, the fishermen's council leader in Chinnamedu, summed up how marine fishers face climate extremes and natural hazards:

> Every year, during the rough season, seawater enters the village and damages our fishing vessels and houses located near the coast. We usually don't use the nearby cyclone shelter. Also, this particular shelter is not big enough to accommodate the whole village population. It is therefore not at all sufficient to deal with an emergency situation.
>
> [25 April 2017, Chinnamedu village; translated from Tamil]

Mr Rajkumar, a middle-aged fisherman from the village, pointed out why fishers are not ready to evacuate to safer places during heavy rains and cyclone periods:

> Our coastal spaces have been shrinking by and large for the last three decades as a result of the effects of coastal erosion. During climate events, my main priority is always safeguarding my fishing vessels. In order to safeguard the boat and household items, we (including our families) never think about evacuating to the cyclone shelters.
>
> [25 April 2017, Chinnamedu village; translated from Tamil]

In Tamil Nadu, there has been a significant improvement in early-warning systems and disaster-recovery efforts compared to earlier decades. Many senior fishers pointed out that the district's early-warning systems have become more efficient since the 2004 Indian Ocean tsunami. New mobile devices inform the marine fishers of cyclone and flood alerts. Villagers share these alerts with fellow fishers through their extended social networks of family and friends. However, government-sponsored disaster-management planning at the village level has been weak. A 2008 plan conducted by The Hunger Project, an NGO focused on women's leadership, is available at the *panchayat* office, but community leaders are not aware of its accessibility.

Improving the future of disaster relief

My field visits revealed that fishers' awareness about the need for disaster preparedness has been low irrespective of their educational backgrounds. Insufficient income, unstable finances, and a lack of proper disaster education exacerbate the vulnerabilities of fishers to extreme climate conditions. Fishers in stable financial condition are more prepared and more capable of responding to the effects of climate events. But the apathy of the state administration, and fishers' unawareness of the *panchayat*-level contingency plans for natural disasters, have impeded cohesive localized disaster management efforts. In sum, there is a lack of concern among state administrators about the plight of coastal fishing communities. Considering the sociopolitical aspects of the community (Amaratunga and Smith Fowler 2007), distributing fair disaster compensation to the victims—especially the poor fishers—and decentralizing disaster response efforts are all necessary steps to ensure effective disaster relief and rehabilitation.

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