

Shifting Sands

The COVID-19 pandemic poses an additional challenge for the social-ecological resilience of the fisheries of Pulicat, India's second largest lagoon

Pulicat, India's second largest lagoon, which straddles the states of Andhra Pradesh and Tamil Nadu on the Coromandel Coast of south India, covers a maximum area of 750 sq km and has an average depth of 1 m. The depth at the mouth (opening into the Bay of Bengal) is almost 10 m. When full, the lagoon spans up to 60 km in length and 18 km in width. About one-third of the lagoon lies in the Thiruvallur district of Tamil Nadu and the rest in the Nellore district of Andhra Pradesh.

The lagoon harbours three islands—Venadu and Irukkam, almost in the middle of the lagoon, and Sriharikota acting as the barrier island between the Bay of Bengal and Pulicat. In addition to other smaller streams, the lagoon derives its freshwater source from three major rivers: the Arani, the Swarnamukhi and the Kalangi. Seawater enters the lagoon through the northern end near Sriharikota Island (Tupilipalem) and flows back into the Bay of Bengal through the southern end (Pulicat). This interaction of fresh- and sea-water in the lagoon acts as a breeding ground for many species of fish and prawn, including commercially important white prawn (*Penaeus indicus*) and tiger prawn (*Penaeus monodon*), which supports the lives and livelihoods of fishing communities residing in and around the villages.

The outbreak of the COVID-19 pandemic has had an unprecedented adverse effect on public health, as well as on livelihoods, around the world, leading to precautionary and preventive measures such as nationwide lockdowns, social distancing and temporary closures of industries. The resultant economic downturn and job losses as a result of these measures have only worsened the situation. The pandemic control measures have also

threatened—or have the potential to threaten—the social-ecological resilience of the fishing communities situated within the Pulicat Lagoon.

Based on the experiences of one fishing village located on an island in Pulicat, we explore how (a) resource-governance institutions function on the island; (b) social-ecological resilience was impacted during the first wave of the pandemic; and (c) a larger set of environmental, social, and political factors that impact the day-to-day life of the islanders. Of the three islands, our study focused on the people of Irukkam, particularly fishing communities, and their relationship with the lagoon. This

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walnut-shaped island, located south of Venadu, spans over 2,636 ha and has a total population of 1,820 individuals and 513 households.

Focus-group discussions

With the consent of the fishing community, we conducted the study in Irukkam from January to March 2020, employing detailed, semi-structured interviews with 25 households in the village. Two focus-group discussions were also conducted, including one with women who commute to the mainland to work in factories for processing fish, and manufacturing shoes and pharmaceuticals. During the COVID-19 pandemic, four telephonic interviews were conducted with participants in July and August 2020, to understand the impacts of the lockdown and other restrictions on their daily life.

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The island of Irukkam has two settlements, Irukkam and Kuppam, which are geographically separated by grasslands and sand dunes, and are situated in the north and south of the island, respectively. Human settlements on Irukkam are segregated on the basis of caste. The people of Irukkam, who constitute the non-fishing, agriculture community, are considered higher in the caste hierarchy, whereas the people of Kuppam, belonging to the fishing community (Pattinavar) are considered lower in the hierarchy.

There is a third category of 100-150 households of Irula people (a Scheduled Tribe) who work as labour on the agricultural lands owned by the upper castes in Irukkam. Most inhabitants are Hindu, though there are also a few Christian households. Although the island falls within Andhra Pradesh, most inhabitants speak Tamil with the exception of a few bilingual Tamil-Telugu speakers.

The only means of transportation between Irukkam and the mainland is by boat. Boat services operate twice a day, with separate jetties and boat operators for the two dominant castes

of Irukkam and Kuppam. Fishers, students and workers commute daily to the mainland, to industrial centres such as Tada, Sri City, Sullurpeta and Chennai, which are also important fish-marketing and processing hubs.

The people of Kuppam have institutions of their own to govern the social, economic and environmental interactions in their lives. One such institution is the Jamaat, a traditional, self-organized village committee whose members (usually males) represent their respective households. It has the power to take decisions in all socioeconomic, environmental and political affairs in Kuppam, and is led by the village head (elected by the members of the Jamaat).

Economic activity

All economic activity has to go through the committee, be it the management of the lagoon fisheries, the allocation of boat contracts or the sale of goods from the mainland. The committee also controls social organization, imposing rules on marriage, the resolution of conflicts and the celebration of festivals. Transgressions are usually punished

through a cash penalty: For instance, inter-caste marriages are strictly forbidden and are fined INR20,000 (USD266). Anyone who wishes to leave the village and relocate to the mainland has to pay the committee a sum of INR40,000 (USD532). These sums are significant, relative to the average income in the area, and serve as strong disincentives against certain forms of behaviour.

Most households depend on the lagoon for their livelihood; many own their own fishing craft, usually purchased with the help of a loan. The Jamaat allocates fishing grounds—most of which are located near Sriharikota to the north—on a rotational basis to individual households. Fishers depart for their fishing grounds at night, setting their stake nets near the shores of Sriharikota. They collect their catch in the morning. The major portion of the Kuppam fishers' income comes from prawn, most of which is sold for INR300-400 (USD4-5) per kg to processing factories in Sullurpeta, Sri City and Arambakkam.

Most women are engaged in repairing nets and selling fish, in addition to household work. In Kuppam, traditional gender roles usually have women engaged in fisheries pre- and post-harvest activities and in household work, while the men go fishing. However, with the perceived reduction in the productivity of the lagoon in the past two years, women have begun working in other sectors on the mainland. Most men, on the other hand, continue with their precarious fishing livelihood.

The money that the Jamaat collects from the leasing of economic activities and other sources is used to conduct festivals, construct village-owned infrastructure and for the welfare of the community. The Jamaat is also the guardian of the coastal and marine common-property resources, and has traditionally played a greater role in fisheries management than the State. The committee regulates the allocation of fishing grounds and decides on days when fishing is banned (locally called 'thalavu'). The practice of thalavu is a community-evolved mechanism for sustainably managing fish stocks in

the lagoon during the breeding season (mid-April to mid-June). Additionally, the Jamaat declares one day every month when fishing is banned. All members of the fishing community are answerable to the Jamaat and there were no instances of people operating outside its influence. Therefore, any changes in the practice of thalavu can affect the resilience of the ecosystem as a whole.

Social resilience in this context is seen as the ability of groups or communities to cope with external stresses and disturbances as a result of social, political and environmental change. In the case of fisheries, social and ecological resilience are linked because the lives and livelihoods in the community directly depend on common-property resources managed by traditional institutions such as the Jamaat. Disturbances or changes could threaten the resilience of the whole social-ecological system. As the example of Irukkam shows, COVID-19 is one such major disturbance that can have ramifications at the level of both the individual and the system in small-scale fisheries.

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The catch from Irukkam is either sold locally, or sold directly to wholesalers on contract. Fishermen from the island usually sell most of their catch at the nearest market town of Arambakkam (8 km away) or to factories located along the national highway nearby. However, almost throughout the first wave of the pandemic (March-May 2020), Arambakkam was declared a 'Red Zone,' in which very few activities were permitted. No vehicular movement of any kind was allowed.

Devastating effect

This total lockdown during the first wave of the pandemic had a devastating effect on Irukkam's fishery. The men were unable to return to their fishing grounds even after

the fishing ban period. Despite the community's demands to the Jamaat, the thalavu remained in force. The Jamaat themselves were powerless due to pressure from the police and administration, and for all practical purposes, the thalavu had been extended due to the pandemic control measures.

Individual households were thus presented with a dilemma—whether to disobey the thalavu or to comply with the community rules, thereby increasing their economic hardships. The Jamaat generates its revenue by levying duties and fines on households, whose incomes are mostly from the fisheries. Naturally, the resources flowing to the Jamaat have greatly reduced or stagnated. In these circumstances, there are chances that this pandemic could test the strengths of the traditional thalavu system and the Jamaat, which, in turn, can considerably affect the management of the lagoon fisheries. The resilience of the community, its institutions and the ecosystem are thus inextricably linked.

While the COVID-19 pandemic poses several challenges to the community and to the lagoon, there are also other factors that destabilise their resilience. These factors have played out over larger temporal and spatial scales than the pandemic. As discussed earlier, three rivers drain into Pulicat: Arani, Swarnamukhi and Kalangi. During the monsoon, Arani and Kalangi bring in sewage, agricultural chemicals and industrial effluents into the lagoon. In recent times, the flow and balance of freshwater in the lagoon has been impeded by siltation. The average depth has reduced over time and its mouth is almost entirely closed by a sand bar. This has affected both the productivity of the fisheries and the ability of fishing vessels to enter the sea. (Several fishers from Pulicat also fish in the sea.) Proposed solutions by scientific institutions, such as building training walls on either side of the bar mouth, could themselves have long-term ecological consequences and have been kept in abeyance for the time being. In addition to these threats, the lagoon is also impacted by industrial activity in and around nearby Chennai,

such as a petrochemical factory, a thermal power plant and a port project. Together, these developments have severely polluted local rivers, cleared thousands of acres of land and encroached on coastal commons.

The impacts of these interconnected factors make it imperative to be aware of the complex historical, social and environmental factors that underpin the relationship of the community and the lagoon. The future of the Jamaat in Irukkam rests on governing the fish and prawn fishery in Pulicat. Eventually, the sustainability of the livelihoods from the fishery, the effective enforcement of the thalavu system and the maintenance of equitable trade with the mainland all rest on the ecology of the lagoon.

Vital questions

With the productivity of the fishery under threat due to siltation and the pollution in the region, the Jamaat is stuck between a rock and an even harder place. These local and regional stressors have coalesced with the impacts of the COVID-19 pandemic, such as market disruption, reduced access to fishing grounds and the out-migration of people from Irukkam, thus raising vital questions about the importance of maintaining social-ecological resilience. 3

For more

Study of territorial use rights in small-scale fisheries: Traditional systems of fisheries management in Pulicat lake, Tamil Nadu, India.

<https://indianfisheries.icsf.net/images/Indian%20Fisheries%20Site/Resources%20others/Study%20of%20territorial%20use%20rights%20in%20small-scale%20fisheries.pdf>

The Chilika Lagoon Social-Ecological System: An Historical Analysis

<https://www.ecologyandsociety.org/vol19/iss1/art1/>

Reaffirming Rights

https://www.icsf.net/images/samudra/pdf/english/issue_75/4246_art_Sam75_e_art07.pdf