

Coastal vulnerability to climate change: A pilot study in Cuddalore district of Tamil Nadu

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The impact of natural disasters like floods, cyclones and rising sea levels are evident in many coastal pockets of Tamil Nadu. A preliminary survey of the coastal districts in the state revealed that Cuddalore district has been the worst affected of all districts in the recent past, with the impact of tsunami in 2004, cyclone Thane in 2011 and cyclone Neelam in 2012, creating a detrimental impact on coastal communities and their activities, particularly fishing. This has in turn affected their livelihood to a great extent. In this context, a group of ten villages (Thazhanguda, Sonankuppam,

Sothikuppam, Rasapettai, Chithiraipettai, Thammanampettai, Pettodai, Reddiarpettai, Samiyarpettai, Chinnur Pudupettai) based on climate change impact vulnerability indices, were selected (Fig. 1) and 100 households from each village were randomly interviewed under Integrated District Level and Sustainable Management (IDLAM) programme under the project on National Initiative on Climate Resilient Agriculture (NICRA).

Based on the response, it was observed that the direct impact relates to loss of employment due to destruction and damages of livelihood assets,

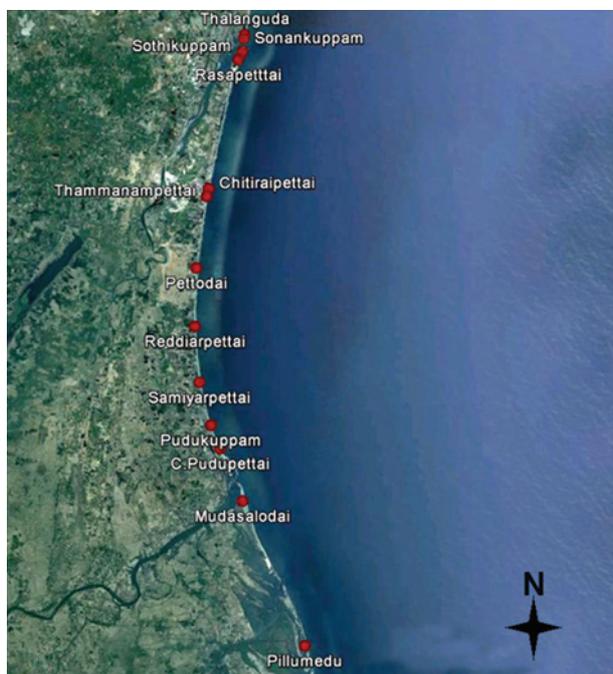


Fig. 1. Village map of Cuddalore district, Tamil Nadu

equipment and infrastructure. The indirect impact relates to employment loss due to disruption of supply of raw materials, goods, services and markets. Most active fishermen at sea and fishermen engaged in net mending, auctioning and marketing activities on the seashore, have suffered loss of life, health or property at some time or the other due to tidal waves. Maximum damage to fishing boats has been recorded in the case of catamaran, wooden and FRP boats, in that order. Widespread damage

caused by recurrent cyclones has upset the economy of the fishing communities anchored in these villages. The loss and damages to boats, nets and fishing craft have made fishing impossible without rehabilitation for several fishing families. Households participating in fishing and related activities like fish processing and fish marketing have been severely affected. The workers in fishing industry were the worst hit as they belong to the below poverty line (BPL) categories. All the fishermen interviewed opined that cyclones have been the major causal factor for damage, while 68% ranked habitat destruction and 63% ranked sea level rise as the causal factors for immediate concern, next to cyclones. Pollution, ranked by 58% and high surface water temperature, ranked by 42% succeeded in the list of damage causal factors (Table 1 and Fig. 2).

Vulnerability Indices developed based on indicators and sub-indicators of climate change following the method given by Patnaik and Narayan (2005) revealed that Pettodai village was most vulnerable, followed by Reddiarpettai, Sothikuppam and Thammanampettai. The results tallied well with our observations during the pilot study. The extent of sea erosion and consequent loss of shallow fishing areas adjoining the coast (within a distance of 2 km) is very high in these villages (Plate 1), particularly Pettodai, where the fishermen do not have docking space for their country craft.

Table 1. Fishermen perception on climate change (Intensity ranking) causal factors

Climate change causal factors	Fishermen perception on climate change (Intensity ranking)				
	Negligible (0)	Low (1)	Medium (2)	High (3)	Very high (4)
Industrialization	33	0	0	30	37
Farming systems	54	30	16	0	0
Habitat destruction	0	14	18	68	0
Urbanization	33	14	32	21	0
Transportation	33	14	33	19	0
Pollution	0	0	2	58	40
Wind	33	0	14	37	16
Ocean currents	0	0	21	54	25
Land slides	2	23	16	19	40
Temperature	33	0	0	25	42
Sea level rise	0	0	0	37	63
Cyclone	0	0	0	0	100



Thazhanguda



Sonankuppam



Thammanampettai



Pettodai

Plate 1. Glimpses of sea erosion and weather conditions in coastal villages in Cuddalore district of Tamil Nadu