

Tales from the Coast part 1: With rising sea level and overfishing, coastal communities in Tamilnadu switch to integrated fish farming

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Sharada Balasubramaniam (Host): I have been doing journalism for almost 15 years now and the last 10 years I have been focusing on environmental stories and development stories from across India.

This is Sharada Balasubramaniam, an award winning journalist from Tamil Nadu who will be hosting the mini series, Tales from the Coast and report us on Climate change and environmental issues from the South Indian Coastal state of Tamil Nadu.

Rakesh: Hi, I am Rakesh, host of this podcast Climate Emergency and production lead at Suno India. In the coming weeks we will have Sharada take over the podcast as a host as she will be reporting from the ground on various issues surrounding climate change adaptation case studies from Tamil Nadu. Just to give you an overview of the issues that will be covered in this mini series, I spoke to Sharada to understand why she chose to do the mini series and what she feels on the challenges and reporting.

S: So, I primarily write about climate change, water agriculture, conservation and wildlife. These are some of the topics that I cover and I have got training and many fellowships which has actually helped me to report in a better way and that is what I have been doing now for the last decade.

R: So, can you tell a little more about this short series?

S: As you may know that Tamil Nadu was one of the states that was affected by the Tsunami, so there are many places where even today people are actually trying to rebuild their lives and you know how they have coped with the Tsunami and after that what they have been doing. So this series actually looks at various adaptation strategies. It is more looking at you know, what people have been doing, what communities have been doing.

R: Specifically why Tamil Nadu is the focus of this series?

S: Tamil Nadu again if you look at it we have you know the Bay of Bengal, we have the Indian Ocean. I think we have like a huge coastal line that spans across the Eastern Coast. Recently there have been so many incidents of Cyclones and we have seen lots of natural disasters that have been happening and so many fishing communities are there like dependent on the sea for their survival. So I think it is very important that we look and address how these people are

going to, you know how they are living their lives, living next to the coast and what will their future be like you know in terms of their livelihood. So, I think this is one of the reasons and also we all talk about rising sea level and so many scientists talk about rising sea level and which is again very you know, very evident when I travel to the different parts of Tamil Nadu where most of the Nagapattinam District and also like you know water is a major issue right now and people living in coastal areas again they say with the rising sea level the ground water is getting salty and you know how their agriculture is getting affected. So climate change as such is impacting the livelihoods of so many people who are dependent on the coast for their livelihood right. So I think that is one of the main reasons why I chose this topic.

R: What challenges did you face so far and what do you envision as you are reporting now on other stories, what do you think will be the challenges that you will come across?

S: I think it is more challenging to find solutions and it is more challenging to find data that can actually support you know, the climate change issue. I think that is a huge challenge that is going to happen and that is already happening. It is becoming very unpredictable, so even when we talk about solutions we are looking at you know how some communities which are actually leaving or migrating due to climate change and you know that is again an issue that we look at. Challenge is to even identify the community and try to see what they are doing and you know trying to see, look at the success of it again I think in the long run we really cannot predict what is going to happen but at least we can find a good adaptation practice. I think finding such stories itself is a huge challenge because we just talk about climate changing data but not about adaptation. So I think finding such stories itself is a challenge.

R: What do you envision in this series? Like what are the things that you will be covering in broad, so that you know the listeners can have an idea about what they are looking at when they listen to this series?

S: So, in this series what I am looking at is like you know four different geographies in Tamil Nadu and all coastal areas and it is more like taking our listeners to the communities and taking them to the place and actually letting them know what is happening from the ground, on the ground what is happening like salinity is becoming a huge issue among farmers in coastal areas. So, again how that is being addressed, that is going to be one of the stories where I will be travelling to Cuddalore to look at how actually lot of farmers and fishermen are actually doing this thing called Vettiver farming which is like an aromatic plant and how that which has a huge demand in countries like Malaysia, also fishermen have this problem of fishing ban right during the fish breeding season. So they need alternative livelihood. I think all these stories look at how we have exploited the marine life and marine fisheries and marine resources. On the other hand we are also looking at how sea level rise is impacting the ground water. How it is impacting the livelihood of people and what are people actually doing about it because it takes

a whole, it is not just one person, it is not just one NGO or just one community or how a whole bunch of people are coming together to sort of resolve this. So that will be the larger focus of the story. It is more solution driven because we want to talk about what people are also doing to address these kinds of challenges. So we are looking at these kinds of stories that show alternative livelihoods. Also community involvement, involvement of scientists and local people and how the integrated effort of everyone is helping in addressing these challenges. I think that is the larger focus of the story.

It's a breezy Sunday evening in Poompuhar, a sleepy coastal town in Nagapattinam district of Tamilnadu. There were hardly a few shops in the town, and the road was a little deserted. On this idle road, I found my way to Tsunami Nagar, crossing through the homes built for fishermen after the tsunami.

Poompuhar, once a prosperous land, is ancient and dates back to the Chola kings, who ruled here. Tamil literature says that this port town flourished between 300BC-300 AD, and was a popular place for trading. History has recorded occurrence of tsunami here, and submergence of this land centuries ago. Even today, underwater excavations unearth remnants of a town that was swallowed up by tsunami in the past.

Hello, I am Sharada Balasubramanian, and I am here with the first in the podcast series on climate change and coastal communities for Suno India.

It was about 5pm when I walked out of tsunami nagar, to experience the town, and of course to also visit the beach. There were local tourists on the main road, flocking to a temple. On one end of the road, fishermen were busy weaving colourful fishing nets. The road bustled with hawkers selling peanuts, corn, fried fish, ice cream and hot piping tea. Many women were selling a variety of fish in the open. Youth trotted on the long bridge from where they could witness the Kaveri river merging into the Bay of Bengal. I must also tell you that this place was once called kaveripoompattinam as the river merges with the sea here. People relaxed on large boulders that were placed along the shoreline. The sea as such was calm.

As the sun began setting, the air got cooler. People started dispersing and the town came to a grinding halt. I headed back to tsunami nagar, watching fisher families sitting outside their homes, having a conversation in the dim lit street. A few of them even invited me for an evening meal of fish.

The history of Poompuhar is not just a history of time. It is also a history of shifting lands. Scientists and historians talked about the shifting land four times due to sea level rise and tsunami. And with that, the place where Kaveri river meets the sea, has also been shifting, scientists observe.

After the tsunami, new houses were built away from the coast, for fishermen's safety, razing down thick thorny patches of scrubland. From the locals, I heard stories of surviving tsunamis, and rebuilding their lives from scratch. This episode is a story of adaptation. Fishermen and farming communities in this district can no longer depend on one source of income for maintaining their lives, more so, with the unpredictable climate patterns. In this beautiful Nagapattinam district, teeming with greenery and breeze from coconut trees, I took off to the hinterlands, visiting fish farmers. Through various training programmes from MS Swaminathan Research Foundation, the communities have been learning to integrate horticulture, floriculture, apiculture, goat rearing, poultry, along with fishing and farming. I was here to see how people adapted to changes after the tsunami, and their livelihood now, in the phase of changing climate and natural calamities.

Velvizhi, a scientist from MSSRF, has been working closely with the communities, and she talks about the initiatives taken here after the tsunami.

So, Velvizhi, tell me, it has been over a decade that this centre was set up in Poompuhar. So what really happened during this time? What were the measures taken in the decade for the welfare of communities affected by the tsunami? How are they now climate resilient?

Though the Fish for all centre started in 2009, our activities started back in 2004, after the tsunami. There are two things we had looked at, first, what could we do for tsunami rehabilitation for communities from a livelihood component, second, how this livelihood can be suitable for climate change.

Velvizhi, please tell us about how climate change is actually impacting fish resources and livelihood of fishermen?

Today, fish catch is reducing in multiple ways. Climate change has a major impact, as it changes the weather pattern. Fishermen are not able to catch fishes they caught earlier. For example, oil sardine, which was found in Malabar coast is now found here. Sixty percent of the Indian Ocean has oil sardines. How did they come here, the question arises. Scientists say that due to temperature rise, it spreads. Similarly, in the squid fishery, we were not getting so many squids earlier, but now their population has increased.

If we look at mackerel fish, they are surface fishes. Fishermen carry surface gill nets to capture those fishes. Now, due to temperature variation these fishes have gone from surface water to mid water. If fishermen fish using a surface gill net, they cannot catch these fishes. They will come back saying there was no fish catch. The fishermen have been pushed to adapt and change their fishing technique.

Fishermen can predict the wind pattern and decide which net to carry for fishing, accordingly. Now, they are unable to predict the changing wind conditions. All this is affecting their livelihood. Fishermen, as a whole, get affected, but the most affected are poor fishermen.

Fishing has changed over the years, due to climatic conditions, and more people venturing into the sea for resources. Everyone talks about overfishing, and how that is fast depleting the marine resources. How does overfishing impact the livelihood of small fishermen? In such a scenario, isn't it a greater challenge to address the livelihood of fishermen?

When we look at livelihood, overexploitation of fish resources is also another issue. Industrial fishing is being promoted. And this impacts the livelihood of traditional fishermen. There is no fishing near the shore area. We can separate the waters into three categories- There are inland waters, territorial sea, EEZ (exclusive economic zone) area. Estuaries, ponds, will be inland waters, and usually fishermen don't go there. Just the fish farmers go there. Territorial sea is the fishermen area. This is 12 nautical miles from shore. EEZ is 200 nautical miles away. People fish within our country borders in EEZ. Earlier, fishermen went to territorial waters. Now, there are not many fishes in the territorial area, they are pushed to go beyond the territorial waters, and small fishermen do not have the facility to go there. There are multiple factors- coastal industries, pollution, plastic, all affect the marine environment. We need to look at how we can promote resilience, and for that we need to promote sustainable practices.

So, tell me, what was your approach to bringing in training for local communities? It must be challenging to change the way the fishermen practice fishing, or telling them to adapt to new changes? How do you promote new sustainable fishing practices within the community?

To promote sustainable fishing practices, they need continuous training programmes. It is not a one time thing. There is a need to change their behavioural attitudes, and it is not going to happen soon. For that to happen, we have to create efforts to bring in their trust. We give training, demos, and knowledge on deep sea technology. How can we catch tuna in deep sea, how to process it, what are the different mesh sizes, fish habitat, and even fish biology.

For instance, people think shark fish will have a lot of hatchlings, which is not true. There will not be many hatchlings. There are limited young ones. We tell them that there will be only five young ones. So, they will know they should not catch the young ones, else, these five will also vanish, and their species can go extinct, leaving nothing for them in future. We tell them not to throw the torn nets into the sea. We tell them not to catch young fishes, and even if they are caught and dead, we ask them to throw them back into the sea.

When we diversify the livelihood of people, there will be reduced pressure on the sea. We did an assessment and talked to them. Fishermen were only keen if it was marine related or fishery

related. They were not interested in farming or other things. So, we worked on how we can generate livelihood along these lines.

Like say Integrated fish culture, post harvesting, processing and marketing. They catch very little fish, so they should know how to process and market them. They were trained on making compost from fish waste, setting up unit establishments, conducting events, among others.

Farmers or fishermen could not just depend on one source, say, just fishing, or just paddy or vegetables for their livelihood. Integrated fish farming was a concept that looked at bringing various components like floriculture, apiculture, horticulture, fodder crops, poultry along with fish rearing. There are many underutilized ponds in the region. Such ponds were identified and rebuilt to raise fish. Velvizhi explains more on this concept.

Just like coastal fishermen, there are coastal farmers, who depend on coasts for their livelihood. They are fish farmers, and they have farm ponds and they use it for agricultural activities. We thought, why can't we use that for income generation? We introduced fish culture to the farm pond. Otherwise, if they did just fishing, they would wait for eight months to harvest. And they will lose interest. We looked at how they can get daily income from the farm pond. Agriculture, horticulture, floriculture could be done around the pond, and different components can be brought in. In lesser areas, there will be more benefit. The concept is how maximum output can be brought from minimum inputs.

It is not just integration. One component is linked to another. One waste becomes manure for another component. For example, poultry waste becomes fish feed. Farm pond water can be used for other purposes.

There can be 10 components in one farm. So far, 152 farm ponds have been converted into integrated fish farming successfully in Nagapattinam district. In a recent study, we found that integration for one crop in 8 months gave additional income of Rs 40000-60000. Other than this on a daily basis, they consume vegetables for their nutritional requirements.

A NABARD farmer's whatsapp group was formed. Velvizhi shared a post of a fisherman who got fish catch worth Rs. 3500 on the day of Pongal. The farmer shared details of the money he spent on input and the types of fishes he caught. He had just spent Rs. 750 for inputs.

There are many such underutilised ponds in coastal places. Conversion to farm ponds has proved to be a successful alternative livelihood option for fish farmers. One such farmer is Govindaraj. I walked into the backyard of his house. On the stretch of land from the backyard to the farm, there were tall fruiting trees like guavas and bananas. Beyond these trees, were creepers, from where Govindaraj happily took out a massive white pumpkin. There were many such pumpkins hidden beneath the creepers. He had left them all, to harvest later. He said that

this year, he profited from vegetable cultivation. On his farm, onion seedlings were just sprouting. There was also bitter gourd, bottle gourd, tomatoes, coriander, chillies, tomatoes, and many other vegetables in his farm. His land also has traditional paddy varieties. He also cut a farm pond, and rears fishes for his living. He talks about the change in his farm and the training he received.

I learned how to do organic farming through MSSRF. I took part in their meeting and learned how to rear fish, build farm ponds, practice apiculture. I also learnt about the diseases fishes get and how to treat that, and how to grow vegetables around the farm pond. They also gave us vegetable seed and fruiting plants. I have placed the fruiting plants around the farm pond. I know how to prepare organic manure like panchagavya. We will be also trained in poultry farming, they said.

The farmers I spoke to said one thing that was common. During the fishing ban time, fishes from the farm pond will give them high profits. Govindaraj talks more about his recent fish catch in the pond..

I raised fish during July-August. I gave proper food and manure for fishes. For the Pongal festival, I took some fish for consumption at home. I will now take them out during fishing ban season for selling.

Govindaraj also has cows, and gets 10 litres of milk every day. This is directly supplied to the milk company Aavin. He said that he did not even have to sit and milk the cow every day. People come and take it themselves. He talks about his profit from vegetable cultivation.

I got very good profit from vegetables- I sold yellow pumpkin for Rs 650, white pumpkin for Rs 800, Ladyfinger for Rs 1600, and cluster beans for Rs 1650. I also grew spinach. I used them at home, and also sold them outside.

In the last one year, MSSRF's activities focused on promoting the concept of community fish ponds. In the next year, from promotion, the fish farming will have to be popularised among communities. For this, fish farmers in their respective villages were identified to become master trainers. These master trainers would take the concept of fish farmers to other people in their villages.

Velvizhi, tell me, how do you identify these master trainers to expand integrated fish farming?

The concept of integrated farming has been brought in, but that needs to be popularised. We need the support of local people. Just NABARD and MSSRF are not enough. We selected 30 farmers as master trainers in this region. There were certain criteria for choosing them. They must have at least 1 acre farm pond, and it should not be integrated. This is because only when

they witness how integration happens, they learn how to do it. Also, they should be smallholding farmers who should be regularly involved in fish farming activities. We identified 30 farmers from 30 villages in Sirkazhi and Semmanarkovil blocks. We told them how to rejuvenate the farm, we gave input support for components. Some built farm ponds with their own money. Those who could not spend, there are government schemes, and we tied them to that. We brought fish nurseries and gave input and training for one year. Every month, for a year, we talked to them about how to integrate every component. For instance, how to integrate poultry, or vegetable, floriculture, azolla, apiculture. Now, farmers are doing it. Until March, this master training will happen. Next year, there will be popularisation. The master trainer will reach out and train farmers in his village. So, when each master trainer reaches 100 farmers, we will reach 3000 people.

I caught up with a master trainer from Thennampattinam village. Gunasekaran Vaidyalingam, a 67-year old farmer, has been working on the farm since the age of 5. He is a member in many farming and fishing groups, and works tirelessly from morning to evening, with no agricultural labourers supporting him in his farm. He cultivated peanut, small onions, sesame, millets, as it suits the soil conditions here. He talks more about his field knowledge now.

I get daily income from vegetables. We never bought vegetables for consumption at home. Experts say that fish is yearly income, vegetables is weekly income. They have trained us like this and it turned profitable. After training, I have put banana and fodder crops as well. We even learned bee keeping, and received certificates after each training programme.

Gunasekaran also reaps profit from fish ponds.

I have profit from fish as well. Now, I have half a kilo of fish, it will soon become one kilo, and then a tonne. In fish rearing I get more income because I don't spend on labourers. I do all the work myself. I spend only Rs 10 for buying the feed.

Fish farmers changed the way they practiced farming, and were also able to generate sustainable income with new initiatives like integrated fish farming. However, all that was possible with the effort of the community. Where one fish farmer dug out a farm pond, there were many others who witnessed this transformation and wanted to implement this in their own farms. Now, as master trainers embark on a new move to train other farmers in the village, it is expected that many unutilized farm ponds in villages would be converted into fish farms, giving communities good income opportunities in days to come.

In the next episode, I will take you to Vanagiri, a fishing village in the Nagapattinam district of Tamilnadu.. From the last decade, a fisherman, Kutti Andi, has been collecting eggs of Olive Ridley turtles and conserving them. He ensures that they are taken care of, until they hatch, and

are ready to be let into the sea. Looking at the dedication of this local fisherman, the forest department has now entrusted him with the responsibility of turtle conservation. Local communities, NGO, college youth, have all come together to protect these turtles. You will hear all about the night long walks to collect eggs, the state of the turtles in the changed modern fishing environment, mobilising communities to conserve these turtles, and how these species struggle for survival in this human-infested, overfished seascapes.