Kerala Climate Change News Articles

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Kerala: 'Modernizing small-scale fisheries sector crucial'

https://timesofindia.indiatimes.com/city/kochi/modernizing-small-scale-fisheries-sector-crucial/articleshow/97998266.cms

"KOCHI: A panel discussion on future proofing of small-scale fisheries was held here on Thursday as part of the ongoing international symposium on innovations in fishing technology, organized by the Bay of Bengal programme (BoBP) and other organizations. Experts suggested that blending technological innovations with indigenous traditional knowledge in respective regions could help improve the livelihood of fishermen. "Relevant innovations are crucial to meet a set of targets such as sustaining production in coastal waters, mitigating climate change, developing mariculture, reducing conflict among multiple users of coastal zones, tackling trade barriers and developing value chain," fishery industry officer Food and Agriculture Organisation of John Lansley.

BoBP director P Krishnan said modernizing the small-scale fisheries sector was the need of the hour, to deal with concerns such as low productivity, low price realization and labour issues. The panel discussion proposed ensuring financial covers such as credit and insurance to small-scale fishers. It also suggested taking urgent actions for innovations concerning craft and gear improvisation, hygienic fish handling, economical post-harvest, safety of fishers and easy access to advanced communication and information technologies."

Kerala: Call to blend innovations with indigenous knowledge to help small-scale fishers

https://www.thehindu.com/news/cities/Kochi/call-to-blend-innovations-with-indigenous-knowledge-to-help-small-scale-fishers/article66516972.ece

"Marine scientists and experts from across the globe called for blending technological innovations with indigenous traditional knowledge in respective regions to improve the livelihood of fishermen. They were participating in a panel discussion on future proofing of small-scale fisheries on the sidelines of the ongoing international symposium on innovations in fishing technology in Kochi on Thursday.

On the major challenges in small-scale fisheries, John Lansley, Fishery Industry Officer of the Food and Agriculture Organisation of the United Nations, said culturally appropriate technologies significant to respective regions needed to be developed to enhance the contribution of fishing to food security.

"Relevant innovations are crucial to meet a set of targets such as sustaining production in coastal waters, mitigating climate change, developing mariculture, reducing conflict among multiple

users of coastal zones, tackling trade barriers, and developing value chain," he said. In addition to scientific and technological innovations, effective utilisation of age-old indigenous traditional knowledge existing in different localities as much as possible is important to develop small-scale fisheries and improve the livelihood of traditional fishers, he added.

A press release citing P. Krishnan, Director of the Bay of Bengal Programme - Inter Governmental Organisation (BOBP-IGO) said modernising the small-scale fisheries sector was necessary to deal with concerns such as low productivity, low price realisation, and labour issues. The modern small-scale fisheries sector will take decisions based on traditional knowledge and scientific evidence, helping maximise the value of the catch, he said.

Flagging concern over growing issues such as climate change impacts, overfishing, and scattered input and output market structure, the panel proposed ensuring financial covers such as credit and insurance for small-scale fishers. It also suggested innovations for craft and gear improvisation, hygienic fish handling, economic post-harvest, safety of fishers, and easy access to advanced communication and information technologies, the release said. The meet also demanded that small fishing vessels be fitted with on-board freezing and sorting facilities, a long-pending issue, to boost post-harvest value creation. It is high time small fishing vessels were equipped in a way that helps them venture into the deep sea.

Daniel Stepputtis, scientist of Thunen Institute, Germany, said environmental impacts should be minimised for a sustainable and healthy existence of the sector. Attended by around 250 participants from 30 countries, the symposium is being organised by BOBP-IGO, National Fisheries Development Board, and the Indian Council of Agricultural Research."

Kerala: ₹2,450-cr scheme to rehabilitate fishermen

https://www.thehindu.com/news/national/kerala/2450-cr-scheme-to-rehabilitate-fishermen-in-kerala/article66490599.ece

"The Kerala government has drawn up a comprehensive scheme of ₹2,450 crore for the rehabilitation of fishermen across the State. The government has already rehabilitated as many as 2,321 families from coastal areas hit by severe coastal erosion triggered by global warming and climate change through the Punargeham scheme.

A total of 21,220 families living within 50 m of the high tide line will be rehabilitated to safer locations. Out of this, 8,675 families have informed their willingness to relocate to safer locations, said Fisheries Minister Saji Cherian. As part of the Punargeham scheme, 390 flats and 1,931 individual houses have been constructed, while 1,184 flats and 1,373 houses are under

various stages of construction.

Further, steps have been taken to rehabilitate 400 families at Muttathara in Thiruvananthapuram by constructing a complex of 50 buildings after acquiring 8 acres of land owned by the Dairy Development department. The government plans to hand it over to the beneficiaries in one-and-a-half years after completing the project under the supervision of the Harbour Engineering department.

Each housing unit will have an area of 635 sq ft, including a common utility, two bedrooms, a hall, a kitchen, and toilet facilities. The Uralungal Labour Contract Cooperative Society (ULCCS) is entrusted with the task of construction. Further, those who have informed of their willingness to move to safer locations can either buy land up to 2-3 cents on their own to build a house or buy land and house together or even identify land in groups and build a flat for which a maximum financial assistance of ₹10 lakh per family will be given, said the Minister.

Besides, flats are being built on government land and private land under the supervision of the Fisheries department, for which a transparent system has been set up with the District Collector as chairman and people's representatives as members to select the beneficiaries, added Mr. Cherian."

Kerala: Low coastal catch is forcing small fisherfolk to go into the deeper, riskier waters of Arabian Sea

https://scroll.in/article/1042053/low-coastal-catch-is-forcing-small-fisherfolk-to-go-into-the-deeper-riskier-waters-of-arabian-sea

"Davidson Anthony Adima started fishing as a 12-year-old, in the coastal waters of southwestern India, on a traditional log raft called kattumaram, propelled by sails and oars. Three decades later, outboard motors take his small fibreglass boat to deeper waters, but he finds fishing as uncertain as the state of the sea, sky and seasons. His trips are becoming longer, costlier and often riskier than before.

Davidson and colleagues from his Fathimapuram village launch and land about 50 small boats (under 34 feet in length) from the sandy shores of the Arabian Sea at the adjoining St Andrew's village in Thiruvananthapuram, Kerala. A few local boats and shore seine units of fishers from villages further away, where the coast has eroded, find space on this rare scenic beach, along with joggers and walkers.

They fish within 35 km from the shore but sometimes go further to deeper waters, about 100 km

from the shore, where bigger mechanised boats operate. Davidson's three outboard engines of 40, 15 and 8 horsepower can handle the distance, the big motor kept in reserve to cut across big waves and escape from foul weather quickly. He navigates with a Global Positioning System, and some colleagues use radio sets and fish-finders (a device to locate fish in water). Fishers are often forced to invest in technology, even with high-interest private loans, to ensure safety and viability in a changed environment and climate.

Still, unexpected changes in the local climate, increasing fleet size, small catch, increasing fuel prices, uncertainties and market dynamics add up to make the whole operation uncertain and risk-prone.

"Earlier the sea would be calm like a cradle at this time. It would softly caress you," Davidson said, describing the state of the from November to February. Following the southwestern monsoon season of June to September marked by high wind and waves, the thelivu nalukal (clear days in Malayalam) come as a relief to fishers. "Sometimes, when the sea is very clear, we can see deep down, as far as it is visible, but then we don't get fish close to the shore during the day," he said. Fishers chase fish that swim with the currents to faraway seas, he added.

The shallow waters adjoining the 78 km coast of Thiruvananthapuram is known for rocky or sandy reefs and shipwrecks forming rich fish habitats. "Fish used to stay in these places for days like buses in a bus stand," Davidson said. "The regular 'customers' were kalava (grouper), chemeen (snapper), motha (black king fish), oolappu (barracuda) and other fish, but they have just vanished from these places now. Some fish such as thedu (catfish) and panjukadiyan (Indian halibut) have disappeared altogether."

A 2021 study on the loss of marine fish stock in south west India, noted the disappearance of once popular local fish like navara (mullet), chennavara (red mullet), soles, numb fish, and torpedo ray. Scientists have also noticed fluctuations in abundance of oil sardine due to overfishing, variations in its habitat ecology and ocean warming. Additionally, they have noted an abundance of jellyfish that eat fish larvae in the warm waters.

Pollution is also an increasing issue. Plastic debris and ghost nets abandoned by fishers entangle and choke fish and damage reefs when pulled by strong currents, noted conservationists involved in cleaning up of the coastal waters here. "Discarded nets cover many reefs, and fish avoid these places, scared," Davidson said. A recent clean-up drive on the tourist beach of Veli near Thiruvananthapuram city yielded 2500 plastic pieces, 90 kg sandals, 319 glass bottles, 32 kg thermocol, 2 kg paper and 10 kg other waste, reports environmental non-governmental organisation Thanal. "Ocean trash is a serious pollution problem that affects the health of the

people, marine wildlife and local economies," a Thanal spokesperson noted.

Fishers also complain that trawling boats from neighbouring districts fish very close to the shore, often on Saturdays when most local fishers are on holiday. Then there is the prevalent practice of fishing juvenile fish.

"Global climate change has brought about changes on the coast of Kerala," said A Bijukumar, professor and head of the department at the Department of Aquatic Biology and Fisheries, University of Kerala, Thiruvananthapuram. "Because of increasing temperature in the sea, there have been changes in ocean resources as well as natural hazards, significantly impacting fishers' lives and livelihoods."

But climate is not the sole reason for local changes. For instance, there have been changes in the availability of many surface-water fish that are usually abundant in the sea here. "Reduction of oxygen in the Indian ocean and excessive catch involving small fish have been pointed out as reasons behind these changes," Bijukumar said. Eutrophication caused by nutrients from the coast is yet another problem, he pointed out. Decreasing concentrations of dissolved oxygen makes parts of the Arabian sea near Kerala an oxygen minimum zone. Poorly planned coastal structures such as ports and harbours can kill fish habitats and make fishing riskier, studies show.

The most severe threat to the fishers comes from changing storm patterns of the Arabian Sea, historically considered safer than the Bay of Bengal on the eastern side of India. The warming of the Arabian Sea contributes to the formation of highly intense tropical cyclones. A 2021 study on tropical cyclones over the north Indian ocean has shown a significant rise in the intensity, frequency, and duration of cyclonic storms (wind over 62 kmph) and very severe cyclonic storms (winds over 112 kmph). In 2017, for instance, Cyclone Ockhi, formed in the southwestern Bay of Bengal, traversed 2500 km and rapidly intensified into a very severe cyclonic storm near the coast of South India, killing 365 fishers caught in the sea. Climate change is expected to increase the risk of cyclones here.

Engaged in one of the most dangerous jobs in the world, fishermen face frequent accidents, mostly related to weather, but also due to hits with other vessels and dangerous harbour structures. In the past five years, 345 fishermen have died in the sea off the shores of Kerala, including 145 in Thiruvananthapuram, according to a media report. This list does not include 91 fishers who went missing during Ockhi.

At least 643 accidents involving fishing boats were recorded in Kollam, Thiruvananthapuram and Kanyakumari districts during 2011-2016, and 75% of them involved small, motorised boats.

The accident causes included high waves while launching and landing, capsizing, getting thrown overboard and damage to gear when hit by another vessel. An international study shows that in developing countries, fishing accidents occur due to lack of enforceable regulation, small, unseaworthy and dangerous vessels, lack of visibility of small boats, lack of weather information, and the compulsion to fish regardless of weather conditions. Unscientific coastal structures further add to the risk of fishing, experts note.

The harbours that the fishers use instead of local sandy beaches during high shore waves are also turning out to be dangerous spots. In September, four people died when their boat capsized close to a harbour, 10 km north of St Andrews, a spot of several accidents. The coastal waters near Vizhinjam harbour, 27 km to the south, is another risk-prone zone. Two boats engaged in seine fishing were caught in unusual high waves also in September. Sahayaraju Susa Michael in his early 50s, one of the 11 fishermen who survived the accident, said they were caught in unexpected high wind and waves. “Suddenly the wind became ferocious,” he said. The boat in which he was fishing capsized and the five crew members were thrown overboard. “We swam, thinking that if we can live, we will live, or we will die. We swam and swam and we hollered loud.” They were joined by three men from the other boat. “The eight of us swam for an hour and a half. A boat heard our call and rescued us…they had to lift us as our hands and legs were frozen.”

Sahayaraju stopped solo raft fishing close to the shore about three years ago as it was not remunerative enough, and he was getting older. His son, Kumar Sahayaraju, a marine biologist and indigenous scientist, said several reef fish species were declining over the past five to ten years, so it is hard for small craft fishers. “There is no fish close to the shore, and the competition is more. It is like the survival of the fittest now. Rafts don’t stand a chance in this competition,” he said.

Diversification to offshore fishing is a solution, according to a 2020 study led by Indian Council of Agricultural Research-Central Marine Fisheries Research Institute. KK Baiju, a co-author based at the Advanced Centre for Atmospheric Radar Research, Cochin University of Science and Technology, said artisanal fishers need to embrace new technologies, use bigger vessels and venture into deeper waters. “They need adequate training and safety measures and ensure that the fishing is both sustainable and economically viable,” he said. Safety gadgets and reliable weather communication systems are essential, he added. There are takers for this view, and there is a Kerala government move to train and equip groups of fishermen for deep sea fishing.

Coastal fishers gamble in deep sea fishing for the rare bumper catch, Kumar Sahayaraju said. However, a safer and more sustainable alternative for small craft fishers could be mariculture

(cultivation of fish and other sea life) and restoration of coastal ecosystems. Local fishers are not experienced in these options, and there is no comprehensive data on local biodiversity, he points out. As he noted in the International Journal of Fisheries and Aquatic Studies paper he co-authored: “Accurate studies and conservation measures (Marine Biodiversity register and auditing, marine-protected areas,…marine spatial planning) are needed.” This definitely needs a bottom-up ecosystem planning approach, he commented."

Kerala: Why activism is a way of life for fishing communities

https://lifestyle.livemint.com/news/opinion/why-activism-is-a-way-of-life-for-kerala-s-fishing-communities-111672283951499.html

"Kerala’s coastline is a narrow one with more than 2,000 people crammed into every square kilometre of its shore. Most of those living along this beautiful coast are the fisherfolk whose livelihoods are linked to the sea. Exactly a month ago, members of the fishing community clashed with police after their three-month protest against the construction of an international port at Vizhinjam, near Thiruvananthapuram. Work has now resumed at the port, but the incident is another in a long line of activism undertaken by Kerala’s fishing community to protect their domain against changes that have adversely impacted their lives and changed the nature of their work. Traditional fishing communities have a deep knowledge of the sea and its creatures, understanding that overfishing and coastal erosion will irrevocably change their world.

In the late 1970s, when trawlers began emptying the seas of fish, the community realised they had to organize and assert themselves to protect their domain. Backing them, was the Latin Catholic church to which nearly 40% of the fisherfolk of south Kerala belong. The church had been their rallying point since the Portuguese missionaries began working among them in the 16th century. Now, a new wave of young priests and nuns emerged, whose religious training course had exposed them to ideas like Liberation Theology, or the interpretation of religion as a social and political movement to liberate the oppressed. Alongside, non-profit organisations such as Project for Community Organization (PCO) began working within the fishing community. Among PCO’s project was an effort to get them out of the grip of money lenders by converting funds collected for a new church building into a community savings scheme.

In the early 1980s, when the agitation against trawler fishing was at its peak, I spoke several times to Father Thomas Kochery, the leader of a group of Liberation Theologists and a man who would go on to lead the demands for the rights of traditional fishing communities for three decades. To the Liberation Theologists, the western idea of religion as charity did not appeal as much as the concept of joining hands with the poor to fight for their rights. Father Kochery, who had been dubbed Naxal Achan or naxal priest, sat in a tiny office belonging to PCO in

Thiruvananthapuram. Was he a Marxist, I asked during one of our conversations as the then Congress government kept calling him that. He laughed and said if standing up for the poor and disempowered made him Marxist then he was one. When the Communists were in power they called him a CIA agent, he laughed.

I spent hours and days meeting the clergy, the social workers and the fisherfolk. I went at dawn to the coast to watch the fish being brought in and the auctioning process. I heard their stories of how they had empowered themselves and visited their villages. They were all inspiring stories which showed again and again that empowerment had to come from within. They needed leaders like Father Kochery to help them in their fight for survival. Over the next ten years they expanded their scope. It was no longer just about fishing rights but also about preserving marine ecology. Father Kochery passed away about eight years ago, but now, nearly forty years later, I see some of those young social workers and activists still alongside the fisherfolk. The recent protest at Vizhinjam proves that seeds of this awareness of their rights to defend their territory were sown more than forty years ago.

One of their major demands is to halt construction of the deep-water port and container transhipment terminal at Vizhinjam. The project which is estimated to cost Rs. 7,525 crore is already more than half complete. The government has agreed to most of their demands, including rehabilitation of families who lost their homes to sea erosion and financial assistance and compensation to families who lost their kin in accidents or weather-related calamities, but it has refused to budge on halting construction. The fisherfolk say they want to protect their coastline. A recent report from the National Centre for Coastal Research (NCCR) found that about 41% of Kerala's coastline of Kerala has been subjected to varying degrees of erosion between 1990 and 2018. Apart from climate change and rising sea water levels, human intervention in the form of development projects have also contributed to this erosion.

Last month, the protests turned violent and several protestors including some church leaders were arrested. The Latin Catholic Church to which most of the fishermen belong then decided to call a halt to the protests with immediate effect. A.J. Vijayan, chairperson of the Western Ghats and Coastal Protection Forum has said that all "the burning issues raised by the fishing community remain unaddressed", while adding that he will continue to protest. The fight of the fishing communities against the interests of the rich and politically powerful seems unlikely to end soon."

Kerala: Climate change could disrupt govt's plans for MSME sector

https://www.newindianexpress.com/states/kerala/2022/dec/19/climate-change-could-disrupt-kerala-govts-plans-for-msme-sector-2529499.html

"The recent report of the Kerala state action plan on climate change put nine districts — Wayanad, Kozhikode, Kasaragod, Palakkad, Alappuzha, Idukki, Kannur, Malappuram, and Kollam — in the "highly vulnerable" category. And with rapid industrialisation being identified as a leading driver of the climate crisis, how the categorisation will impact leading destinations for micro, small and medium enterprises (MSMEs) in the state is a question for all stakeholders to tackle.

Kollam district added about 11,000 MSME units in the first three quarters of this fiscal year. This generated more than 20,000 jobs and more than Rs 500 crore in investment in the sector. Vincent Vijayan, head of the economics department at SN College, says the climate change scenario will harm the MSME sector, particularly in Kollam district, where traditional industries such as cashew, coir, handloom, etc, have always dominated.

"The climate-change scenario will adversely impact traditional industries and the fishing sector. The cashew industry is already on the verge of collapse due to competition from Vietnam and other states like Tamil Nadu and Andhra Pradesh. The production of raw cashews will now be impacted by the scenario of a changing environment. Furthermore, the output of raw cashew will suffer," Vijayan said.

According to Godwin S K, professor at Thiruvananthapuram's University College, dealing with the climate change scenario would be relatively easy for companies with higher market cap, because big firms have financial backing and can adopt cutting-edge technologies to deal with climate change. However, MSMEs lack the financial resources and technological capabilities to adapt to the changing climate scenario. As a result, MSME industries will be completely wiped out in the long run.

"Climate change is never a big issue for big corporations." Because they have all the resources, they can easily adapt to changing scenarios. However, MSMEs will bear the brunt of climate change. The sector is already collapsing after demonetization and post GST." They will now be extinct due to climate change. "As a result, the government must subsidise MSMEs to help them adapt to climate change," he said.

Additionally, the MSME sector has faced significant challenges in obtaining loans from the formal banking system, which may impede the development of new products or services in response to market demands under climate change, said Kiran Kumar Kakarlapudi, assistant professor at the Gulati Institute of Finance and Taxation.

"MSMEs cannot compete in climate-change scenarios unless they receive financial assistance.

Furthermore, the sector's vulnerability to climate change is exacerbated by the fact that many operate outside of the formal sector. These sectors have limited access to the public safety net, formal finance channels, and post climatic disaster insurance, making it difficult for them to recover quickly," Kiran explained."

Kerala: fishing communities unfurl their COP27 message – "United For Climate Justice"

https://www.greenpeace.org/india/en/press/14778/kerala-fishing-communities-unfurl-their-cop27-message-unitedforclimatejustice/

"COP27 is set to be held from 6th to 18th November in Egypt as countries come together to discuss their collective climate goals. As a response to COP27 and the unfolding climate crisis, on November 8th, Greenpeace India along with Kerala fishing communities unfurled a 27 ft-by-60 ft banner on the open waters of the Chellanam Harbour, one of the worst erosion-impacted coastlines, which read "UNITED FOR CLIMATE JUSTICE". The aim is to highlight the increasing impacts of climate change and to demand climate justice at COP27. Through this photo-op, impacted fishing communities demanded action from those in power to match the efforts of vulnerable communities and climate justice movements in fighting climate change.

The public action was part of three events organised at Fort Kochi and Chellanam, Kerala, from 5th to 8th of November 2022. The events witnessed critical stakeholders from vulnerable communities across India coming together to express solidarity and challenge the inaction on climate change by country leaders and world leaders. This is a crucial step in the fight for climate justice, as historically marginalised communities, though having the least contributions towards causing the climate crisis, are the most affected by extreme global warming-induced weather events.

"We have put out this message because it is high time the world sees the real-time impact of climate change. We are losing our homes and livelihoods to erratic weather events. Fishing is our only source of income, and it is becoming increasingly challenging to go out into the sea, make a living and feed our families. Political leaders across the world have wasted enough time. Now, there should be quick, real solutions to our problems. The world needs to know our story." said Anthony Thayil, KSMTF Erakulum District President.

The key objective of these events was to create momentum and public conversations towards demanding a scientific and community knowledge-driven Climate Adaptation Plan across India. The community members sent the message that they are facing the brunt of climate change already and, at the same time, are stepping up to create spaces for solidarity, hope and resilience. They demanded that their actions should be backed up by the state and society members as they

continue to work on radical hope.

Avinash Chanchal, Campaign Manager at Greenpeace India, commented, “The latest IPCC reports highlight the widespread losses and damages to nature and people being caused by the climate crisis. Our climate adaptation policies must align with climate justice and acknowledge that this crisis disproportionately affects marginalised and underprivileged populations and, therefore, ensure that their lives and livelihoods are protected. Furthermore, we will require immediate changes at a systemic level to rapidly decarbonise our economies. Ambitious declarations without any impactful implementation is essentially hollow talk, and must be called out as such.”

The programme’s participants included farmers from Maharashtra who faced drought and excess unseasonal rainfall, fishworkers and coastal dwellers from Chellanam, inland fish workers and residents of the Sundarbans, youth from fishing communities of Kerala and Tamil Nadu, and the survivors of the 2018 floods in Kerala who were rescued by the Chellanam fishing community.

Two other events that took place were the following:
Parallel to (and in response to) COP 27, Greenpeace India conducted a Roundtable Conference at Fort Kochi on 8th November. The conference hosted eminent speakers from various stakeholder groups with a special emphasis on impacted communities. The participants discussed critical issues around climate change such as vulnerability, climate adaptation, the relevance of community action and citizen’s movements, loss and damage, and climate justice.

The speakers included Jackson Pollayil, State President, Kerala Independent Fish workers Federation; Hibi Eden, MP, Ernakulam; Lalit Babar, Ambedkar Sheti Vikas Sansodhan Sanstha; Sankar Haldar, Director, MUKTI (Sundarbans) and impacted community members from the Sunderbans. The main demand from the event was climate justice for the most vulnerable, linked to responsibility and accountability. Ernakulam MP Shri Hibi Eden offered space to raise questions in the winter parliament session, which added strength and hope to the gathering.

Jackson Pollayil, State President, Kerala Independent Fish workers Federation said, “It is important to have these conversations around community resilience and adaptation to extreme weather events and climate change. Fishermen from Chellanam have been experiencing increasing frequency and intensity of cyclones and rising sea levels. And I can see there are several other communities here who are experiencing varying degrees of the climate crisis. These disasters should not be looked at as individual freak incidents anymore, and instead should become part of the global discourse on Loss and Damage and climate adaptation.”

Between 5th to 7th November, Greenpeace India conducted a storytelling workshop in Kerala for youth community members who have been at the forefront of climate change resilience in Kerala.

As first-line respondents in many situations, the participants were encouraged to document and retell climate stories in realtime to bring out community-based climate resilience stories. Through sessions held by various resource persons, the participants were enabled to respond to climate change and related events through photography, videography and content creation for social media and digital platforms.

Greenpeace India is pushing to work with communities that are the first witnesses of climate change to collectivise their voices — and sees it as imperative that their stories are documented and told by the communities members themselves. The workshop paved the way towards active engagement of the youth and members of the stakeholder communities in Kerala and India.

“We should act if we want to save ourselves. Nature knows how to pay back for the atrocities we commit against her. We are not indispensable, it’s the other way round. Let us realise that, the sooner the better.” says Dr Shahina Rafeeq, writer and workshop participant, With these events, Greenpeace India aims to create urgency and build solidarity among impacted communities and climate justice movements. This will help to amplify the voices of those most affected by climate change and send an affirmative call-to-action on the need for fast-tracking climate adaptation for vulnerable communities."

Kerala fishing communities unfurl their COP27 message – #UnitedForClimateJustice

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Countries come together to discuss their collective climate goals. As a response to COP27 and the unfolding climate crisis, on November 8th, Greenpeace India, along with the fishing communities of the state of Kerala, unfurled a 27 ft-by-60 ft banner on the open waters of the Chellanam Harbour, one of the worst erosion-impacted coastlines, which read “UNITED FOR CLIMATE JUSTICE”. The aim is to highlight the increasing impacts of climate change and to demand climate justice at COP27. Through this photo-op, impacted fishing communities demanded action from those in power to match the efforts of vulnerable communities and climate justice movements in fighting climate change.

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climate change by country leaders and world leaders. This is a crucial step in the fight for climate justice, as historically marginalised communities, though having the least contributions towards causing the climate crisis, are the most affected by extreme global warming-induced weather events.

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Avinash Chanchal, Campaign Manager at Greenpeace India, commented, "The latest IPCC reports highlight the widespread losses and damages to nature and people being caused by the climate crisis. Our climate adaptation policies must align with climate justice and acknowledge that this crisis disproportionately affects marginalised and underprivileged populations and, therefore, ensure that their lives and livelihoods are protected. Furthermore, we will require immediate changes at a systemic level to rapidly decarbonise our economies. Ambitious declarations without any impactful implementation is essentially hollow talk, and must be called out as such."

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Kerala: Climate vagaries to blame for coastal erosion

https://www.thehindu.com/news/national/kerala/climate-vagaries-to-blame-for-coastal-erosion-studies-vizhinjam-port-kerala/article65810849.ece

"Most studies held prior to the port works and after point to climate change induced cyclonic systems and unscientific structures built to check sea erosion as the major reasons for the aggravated sea erosion. But fishermen, citing the works for the worsening situation, has

called for a scientific study after stopping construction to assess the damage The protest against the Vizhinjam international seaport in Thiruvananthapuram by fishermen and their families has reached a feverish pitch with the agitating fishers trying to lay siege to the under-construction port at sea and on land.

The round-the-clock protest led by the Latin Catholic Archdiocese, Thiruvananthapuram, does not seem to be ending soon what with the protesters insisting that any compromise other than halting the multi-crore port work, the first phase of which is about to be commissioned next year, cannot be agreed upon. Their main demand is that the port construction should be stopped straightaway to take stock of the damage caused by the construction along the coast of Thiruvananthapuram.

The coastline of Kerala has been witnessing constant erosion in varying degrees due to seasonal changes in waves triggered by monsoons. This gets aggravated if there are cyclonic weather systems over the Arabian Sea and the Indian Ocean. The cyclonic systems will normally leave a long-term impact on the overall beach morphology. If there are any hard structures such as groynes, seawalls, or breakwaters constructed unscientifically, the morphological impact on its adjacent coastal region will be more severe.

Shaji E., Associate Professor and Head of the Department of Geology, University of Kerala, who headed a study on coastal erosion, coastal accretion, and shoreline changes (from 2006 to 2020) along the 58-km coastal stretch between Pozhiyoor and Anchuthengu in Thiruvananthapuram, says an increase in the number of cyclones over the Arabian Sea is one of the main reasons for the rise in shoreline changes along the southern coast.

However, the striking fishermen are not ready to buy the argument. “It is a known fact that the coast of Thiruvananthapuram is highly eroding even before the port construction. Normally, port activities are prohibited on eroding coast as any structure will only aggravate sea erosion. Disregarding these facts, the authorities went head with the work. Further, many scientific studies have earlier proved that coastal erosion is man-made.

Even as everyone accepts the fact that coastal erosion has intensified along the coast of capital in recent years, the authorities are not ready to hold a scientific study stopping the port construction. It is against this backdrop the fishermen decided to stall the port construction until their legitimate demands are met,” says Joseph Vijayan, spokesperson of Coastal Watch, an outfit which works for the causes of fishermen, Thiruvananthapuram.

The social worker and local activist has fought a case in the National Green Tribunal (NGT)

against the port project

When environmental clearance (EC) for the project was challenged in the NGT, it appointed an expert committee and a cell to monitor the shoreline changes in the project area — within 10 km on either side. These committees have been monitoring shoreline changes along a 20-km stretch (Instead of the mandatory 10 km) on either side of the port every six months and filing reports. Contrary to the argument of the fishermen and the Latin Archdiocese, none of these reports endorses any form of coastal erosion due to port construction.

Coastal erosion in Kerala is not limited to Thiruvananthapuram alone. Valiyathura and Shangumugham beaches are the most erosion-hit areas about 13-15 km north of the port site. However, there is no major accretion or erosion in Adimalathura, Pulluvila, and Poovar regions on the south side. Port development is likely to cause minor accretion for about 2.6 km to the south of the port, the maximum rate being 21.6 m per year which will reduce to 0.6 m per year by the tenth year and will stabilise thereafter, according to studies carried out by L&T-Ramboll Consulting Engineers Limited in connection with the Environmental Impact Assessment.

A reference manual on Climate Change Adaptation Guidelines for Coastal Protection and Management in India prepared by the Asian Development Bank for the Ministry of Water Resources, and published in 2019, notes that the Valiathura is typical of a tropical coast which has waves as the predominant hydrodynamic force controlling the coastal processes.

The data available with the National Institute of Ocean Technology say that during the Ockhi cyclone, the maximum wave height along the coast had touched 7.29 metre. The highest maximum wave height was recorded during the time of cyclone Tauktae in 2020 at 9.44 metre.

There is a constant longshore sediment transport along the coast of Kerala that indicates the transport, or drift, of beach material caused principally by the action of waves and tidal currents. When there is high wave activity induced by cyclones, depression or low pressure during monsoon, a large portion of the beach will be gnawed away by the waves. This has become a regular feature on the Kerala coast.

The proposed Vizhinjam port is being constructed inside a ‘sediment cell,’ which is a pocket-like area in which interruptions to the movement of sand along the coast do not significantly affect the adjacent length of coastline. Further, it has been found that shoreline changes are negligible to the north of the proposed port even after the complete phase of development, according to the L&T study.

In addition, around five-km north of the port site are rocky headlands and pocket beaches where the rate of sediment movement along the coast is significantly low , says the study. Several other studies had reported the high erosion zones along the coast of Thiruvananthapuram. The Department of Ocean Engineering, IIT, Madras, in a report to the government in 2007, stated that Beemapally and Shangumugam stretches were under constant threat during high wave seasons.

Applications Centre in 2014 has also found Valiyathura and Poonthura coastal areas vulnerable to high-intensity erosion. This is mainly due to the unscientific construction of seawalls and groynes in the south of Valiyathura to check erosion, says the ADB report. There has been no proper impact assessment preceding the construction of coastal structures at many places, says a senior officer at Vizhinjam International Seaport Limited (VISL). The unscientific construction of a breakwater at Muthalapozhi is an example where scores of fishermen have lost their lives, where sand bypassing is urgently required to mitigate the problem, he says.

“Coastal erosion is a reality and the rate of erosion has increased recently, especially after Ockhi. It is not right to club erosion with port construction as there are permanent mechanisms to monitor the shoreline changes due to construction. Perhaps this is the only port project in India that began after completing all comprehensive studies to address all impact with a high level of stakeholder participation,” says VISL CEO Jayakumar."

Kerala: On India’s Arabian Sea coast, villages pay brutal price of ‘stolen’ shoreline

https://www.arabnews.com/node/2125251/world

"When the sea destroyed her home, Mary Joseph had to move to a warehouse, a shelter that she and her children now share with more than 20 other families displaced by coastal erosion in Valiyathura, a former port area of Trivandrum, the capital of Kerala state. The rising sea levels in the state that spans almost 600 kilometers on the southwestern coast of the Indian subcontinent is one of the reasons that people are losing their houses and livelihoods, but climate change is not the only culprit.

In Trivandrum, more than 20 percent of the city’s Arabian Sea coastline is affected by erosion, much of it caused by artificial seawalls and riprap revetments protecting infrastructure projects, according to local government data. Hundreds of fishing families from Valiyathura and about a dozen other neighboring villages have been forced to abandon their houses in the past few years. “It’s terrible living here where you don’t have any privacy,” Joseph, who has two teenage children, told Arab News.

“Life in the warehouse has not only dehumanized us, but has also brought health problems, with many of us suffering from respiratory problems because this building used to store cement earlier.” Since May, the displaced villagers and civil society groups have been protesting a multibillion-dollar seaport project built in nearby Vizhinjam, which they say has deprived local communities of homes by increasing sea levels at a pace much faster than climate change.

The Adani Vizhinjam port and container transshipment facility, developed in a public-private partnership since 2016, has already affected about 200,000 people and the number is increasing, according to Trivandrum-based environmentalist A. J. Vijayan.

“We have seen that every year at least 100 houses are getting lost after the port project started,” Vijayan told Arab News. He estimates that more than 650 families have since moved to temporary shelters in nearby schools and warehouses. Vijayan is one of the organizers of the protest to stop the development and compensate the fishermen who have lost their lands.

“For land and housing, they should be adequately compensated,” he said, adding that protesters also want the local government to restore the eroded coastline that provided livelihoods to those dependent on it. “Stolen Shorelines,” a documentary film by K. A. Shaji, a journalist from Kerala, shows how development projects in Trivandrum are pushing coastal communities into homelessness and poverty.

“The coastal region of Kerala is facing massive sea erosion. Massive sea erosion is visible in Trivandrum and the surrounding areas for the last four and five years, and now it has escalated to alarming levels,” Shaji told Arab News. “At one level climate change is a villain. On the other level there are many contributing factors that are aggravating the crisis created by climate change.” The local government has policies to rehabilitate displaced communities.

“We are giving 10 lakhs rupees ($12,600) of which six lakhs is for buying land and four lakhs for building houses,” Sheeja Mary, deputy director of the Kerala Department of Fisheries, told Arab News. “These projects are for those who live within 50 meters of the high tide line and those affected by sea erosion.”

She said that under the program, the government has so far helped 3,000 people and plans to rehabilitate a further 15,000. But the assistance covers all those displaced along the hundreds of kilometers-long Kerala coast, which means that only a fraction of the people affected will receive funding. And if they do, it may be too little to rebuild their households and livelihoods.

Reni Dixon, another resident of the Valiyathura warehouse, said that with the government

assistance she would fail to buy land in any port city of Kerala, where her family could rely for sustenance on what they know best — fishing. “If we shift to the rural areas then our livelihood is lost,” she added. “We have lost not only our houses, but also our livelihoods, and the government is not willing to accept that this is a problem.”"

Kerala: Sharp decline of oil sardine

https://theprint.in/india/sharp-decline-of-oil-sardine-in-kerala-says-cmfri/1026182/

"Catch of oil sardine, a tasty and favourite variety of marine fish integral to Kerala cuisine, has drastically decreased to a meagre 3,297 tonnes in the southern state last year, according to the Central Marine Fisheries Research Institute (CMFRI).

Compared to the previous year, 2021 experienced a drop of 75 per cent in the sardine catch across the Kerala coast. This was the lowest catch of the fish after 1994 in the state. Again, this was 98 percent lower than the annual average of sardine availability during 1995-2020 which is 1.66 lakh tonne,” the central institute said in the finding presented at a workshop held at its headquarter here. However, Kerala recorded 5.55 lakh tonne of total marine catch in 2021 registering an increase of 54 per cent compared to the COVID-hit 2020 in which it was 3.6 lakh tonne, CMFRI said in the workshop participated by the representatives of various fishers’ organisations

Lesser sardine (65,326 tonne) topped the list of the most landed resources in the state in 2021, followed by Indian mackerel (56,029 tonne) and scad (53,525 tonne). Even as oil sardine, silver bellies and black pomfret decreased, penaeid prawns, squid and threadfin breams increased significantly during the year, said Dr T M Najmudeen while presenting the findings.

Small-scale fishers bear the brunt of dwindling catch of sardine. Kerala’s marine fisheries sector suffered a severe loss owing to the steep decline in the catch of oil sardine, showed another CMFRI study that was presented at the workshop. The annual value of the sardine in the landing centres dropped to Rs 30 crore from that of Rs 608 crore in 2014, incurring a loss of Rs 578 crore to the sector, said Dr N Aswathy, Principal Scientist of CMFRI, who led the study.

The small-scale fishermen who venture into the sea on outboard ring seins bore the brunt of the dwindling catch of the sardine as they primarily depended upon this fish for livelihood. Even as many other fish resources showed an increase in the landings, the annual income of this group of fishers was reduced to Rs 90,262 in 2021 from that of Rs 3.35 lakh, she said.

Meanwhile, the workshop has called for strict measures to curb juvenile fishing as it causes severe loss to the marine fisheries sector. Speaking at the meet, fishery experts warned that

juvenile fishing practices would result in economic loss and resource depletion as well. Citing CMFRI's study, Najmudeen pointed out that 31 per cent of threadfin breams (Kilimeen) caught from the Kerala coast last year were juveniles.

"This alone has incurred a loss of Rs 74 crore to the sector," he said, adding that implementation of the Minimum Legal Size (MLS) had a significant impact in the sector. President of Matsyathozhilali Aikya Vedi Charles George, who presided over the function, said fishermen across the state were in deep crisis owing to steep hikes in fuel prices and dwindling catch of commercially important fishes, especially the Indian oil sardine.

"In order to support the fishermen families, special famine packages or subsidies should be provided to them," he said. Fishermen should stay away from juvenile fishing as it would only add to deepen their crisis in a way that the practice might badly affect the sustainability of the resources, George added. The workshop also called for uniform implementation of the MLS regulations across the coastal states of the country. The marine fisheries sector is also plagued by climate change, pollution and plastic litter among other reasons, the workshop observed.

Kerala: Shattered lives of fishermen left high and dry

https://www.newindianexpress.com/cities/thiruvananthapuram/2022/jun/08/shattered-lives-of-fishermen-left-high-and-dry-2462943.html

"Erratic weather conditions due to climate change, threat of cyclonic storms round the year and advancing sea the fishermen community in Thiruvananthapuram is fighting many odds each day. With their livelihood hampered, these fishers are struggling to support their families. Due to weather disruptions, they rarely get to fish these days. These families are in constant danger of displacement and starvation. Ever since Ockhi hit the shores, cyclonic storms have become a regular affair in the state but Kerala is still not prepared to handle them. In the past three to four years, the coastal areas have been eaten away by sea erosion. The state departments lack the experience to prevent such natural disasters.

The intermittent hike in kerosene price has also crippled the fishing community. Jackson Pollayil of the Kerala Swathanthra Matsya Thozhilali Federation said "Even if the fishers go out in the sea, they are unable to make any profit as they are spending more on the fuel now. The number of days they can fish has also reduced largely," said Jackson. In 2021, the fishers in Kerala lost around 76 working days. "The state government should compensate the fishermen for the days they lost. Precautions being taken as part of disaster management is stifling their livelihood. The government agencies should write off all the loans given to fishermen who are struggling for survival. The agencies like Mathsyafed are offering loans to fishers at 12.5 percent interest with

an additional service charge," said Jackson.

Valiyathura, a coastal hamlet in the capital, is the worst hit. Over the last four years, around 1,200 homes were destroyed and swallowed by the sea in Valiyathura alone. The situation is similar at Cheriyathura, Bheemapally, Kochuthoppu, Valiyathopp, Kannanthura and Vettucaud. Xavier Andrews, a traditional fisherman, and his family from Valiyathura are constantly living in the fear of displacement. "Around four rows of houses along the Valiyathura coast have been washed away by the advancing sea. My house, which belonged to my mother, where I have been living for the past 45 years, will be gone this monsoon. The government should take steps to protect us and our property. Every year, hundreds of houses are getting washed away. I have been asked to move to the relief camp," said Xavier.

Lack of profit has plunged Xavier's family into a deep financial crisis. "There is no shore for fishing. We have to go to Vizhinjam to venture into the sea. Local fishermen there often create friction. But this is the only job I know to do," he added. Former Valiyathura ward councillor Tony Oliver said 50 out of the 140 constituencies in Kerala are coastal areas and the changing governments have failed the fishermen community. "They have no clean drinking water or sewage lines. Apart from announcements, no projects were launched to protect the coast from the advancing sea. They just want our votes. There is no opposition to help raise our demands either," said Tony.

The destruction of the shoreline has adversely affected the livelihood of around 4,500 kambavala (gill nets) fishermen. There are around 87 kambavala units in Poonthura. "Fishing equipment worth lakhs have been damaged and I am in a deep financial crisis. We have to dole out more money for fishing and it's not profitable anymore," said Antony Stancilas, a traditional kambavala fisherman.

"The state randomly issues warnings on days and restricts us from venturing into the sea, even when the weather is normal. This should stop. Weather warnings should be more accurate as our livelihood depends on this. Unscientific fishing activities by industrial units have become rampant. Many countries and other states are curbing trawling activities to improve marine resources. Traditional fishermen are returning empty handed because of all this," said Anto Elias, vice chairman of the Mathsyathozhili Karshaka Samyukta Samara Samiti.

Kerala: Vembanad Lake fish count indicates decline in backwater salinity

https://www.newindianexpress.com/states/kerala/2022/may/29/vembanad-lake-fish-count-indicates-decline-in-backwater-salinity-study-2459406.html

"The lives of people inhabiting the banks of Vembanad Lake are deeply connected with the brackish water system. Fishing and black clam collection are the only source of livelihood for a predominant number of people here. Fishermen pushing country-made boats through backwaters and tourists arriving to enjoy the beauty of backwaters seen enjoying fish delicacies of the region are common sights for the people of Kottayam and Alappuzha districts.

However, unseasonal rains and climate change appear to have cast a shadow on the brackish ecosystem of the Vembanad backwaters. As per the findings of the Vembanad Fish Count-2022, organised under the aegis of the Ashoka Trust for Research in Ecology and Environment (ATREE), the nature of the lake water has changed with a sharp decline in its salinity.

While the two-day-long fish count has spotted 43 fin fishes and five shellfishes in Vembanad Lake, a vast majority of them belonged to the freshwater category.

According to ATREE officials, it was a surprise finding which made this year's fish count different from the previous 14 years. ""This is for the first time that the presence of 'Chela Fasciata', a purely freshwater fish has been reported from Vembanad Lake. This indicates the freshwater nature of the lake,"" they said.

Meanwhile, Jojo T D, project coordinator at ATREE Community Environment Resource Centre (CERC), said though a delay in opening the Thanneermukkam Bund (Saline water barrier) and torrential rains might be the reasons for a change in the nature of lake water, a detailed study is needed to ascertain such assumptions. According to him, a change in the nature of water would badly affect the fish and black clam (Villorita cyprinoides) deposit in the backwater. ""Usually, salinity level is up to 16 ppt during the time of fish count being conducted in the month of May every year. However, this time it is zero, which is a surprising finding,"" he said.

He added that the decline in salinity would affect the breeding of black clams and the arrival of migratory fishes from sea. ""The black clams usually have two breeding seasons that fall in December-January and April-May. With Thanneermukkam saline water barrier being closed during the December-January season, the breeding of black clams happens in April and May. Moreover, 10 to 12 ppt of salinity is needed for the breeding of clams. If the lake water loses its salinity, it would affect the population of clams and their reproduction is likely to decrease in the following season,"" Jojo said.

Jojo added that the presence of migratory fish from the sea could not be found in the survey. ""Usually, lake water is more brackish during the summer season and migratory fish are common here during the fish count,"" he said.

The survey was conducted by collecting samples from 15 points dividing the entire lake into West, East and Riverine sections. The survey was conducted in association with Kerala University of Fisheries and Ocean Studies, Department of Fisheries and Aquatic Biology, Kerala University and Vembanad Kayal Samrakshana Samithy. The survey also spotted babies of 'Oreochromis niloticus', a fish variety that has been included in the Global Invasive Species Database. Following this, the organisers suggested a detailed study into the presence of invasive fishes which may affect the deposit of natural fishes."

Kerala: Freshwater fish dominate market as sea fish remains scarce

https://english.mathrubhumi.com/news/kerala/freshwater-fish-dominate-market-as-sea-fish-remain-scarce-fish-market-1.7540973

"Freshwater fish seems to dominate the market when the sea fish population has been found depleting due to climate change. As there is a high demand for the farm fish and other fishes caught from rivers and backwaters in the state, the cost also remains high.

Along with the decline in fish population due to climate change, the unexpected rains and subsequent restrictions issued for fishing in the sea added on to the scarcity of fish. Sea fish are currently brought from sea mainly to Tamil Nadu, Andhra Pradesh, Goa and Maharashtra. Hence, the fish would turn almost rotten by the time it reaches Kerala. This also led to a surging demand for freshwater fish.

The farmers who invested in aquaculture could earn a better profit by this. The fisheries department has begun a programme for raising fish in the abandoned water bodies of the state. Last year, the department had invested 22 lakh of fish in this manner."

Kerala: Warmed up by 1.67 deg Celsius since 1901, says India's first state-level climate report

https://indianexpress.com/article/cities/pune/kerala-warmed-up-by-1-67-deg-celsius-since-1901-says-indias-first-state-level-climate-report-7881053/

"Kerala warmed up by 1.67 degrees Celsius during the past century and this warming trend over the southern state is expected to continue in the coming years, according to a new report, the State of Climate for Kerala – 2021. The climate report, prepared by the Institute for Climate Change Studies (ICCS) under the Kerala State Council for Science, Technology and Environment, was released by Chief Minister Pinarayi Vijayan at Thiruvananthapuram on Thursday. This is the first-of-its-kind state-level climate statement prepared for any Indian state.

According to the Kerala climate report, the annual maximum temperatures recorded across all the 14 districts here showed an increasing trend between 1901 and 2021, which collectively led to the 1.67 degree Celsius jump over the century.

"This is a statistically significant figure," Dr D Sivananda Pai, senior meteorologist and director, ICCS, told The Indian Express. The annual minimum temperatures in Kerala have also increased since 1901. "The average minimum temperature saw a relatively lower increasing trend, which was 0.42 degrees Celsius/100 years," the report stated. However, the minimum temperatures over Kollam and Thiruvananthapuram districts showed an exceptional cooling trend between 1901 and 2021.

The India Meteorological Department, since 2016, has been releasing the annual Climate of India report every January. "But that report's findings may not be applicable and actionable at regional or state levels. That is where the need for having state or even district-level climate reports arise, for effective planning, performing sector-wise assessments and undertaking future climate studies," said Pai.

Set up in 2014, the ICCS aims to publish state-level annual climate reports every January, which will act as a ready scientific reference for policy makers, local administrations and climate researchers. The institute, in the coming months, also plans to conduct climate and weather awareness sessions and organise local climate fora in Malayalam.

Since 2018, Kerala has faced repeated extreme heavy rainfall events that have caused massive destruction to hillside properties and establishments. "This may have prompted the state government to take climate studies more seriously," said an expert. Incidentally, 2021 was Kerala's eighth warmest year in 121 years, with the annual mean land surface temperature recorded last year being 0.4 degree Celsius above the average. Eight of the 10 warmest ever years, since 1901, over Kerala were recorded between 2011 and 2020, also making it the warmest decade ever.

Kerala is a high rainfall recording state and receives rain during two seasons — the Southwest Monsoon between June and September and the Northeast Monsoon between October and December. Kerala records an average of 2049mm and 450mm of rain, during June to September and October to December seasons, respectively.

But of late, Kerala has been receiving below normal rainfall, as per observations noted since 1901. The average seasonal rainfall (both seasons) over Kerala reduced by 10 per cent of the Long Period Average (LPA) over the last century. The Southwest Monsoon 2021 had ended

with minus 10.4 per cent of the LPA.
Climate scientists said the state's Southwest Monsoon rainfall was lower than average for 26 out of the total 122 years since 1901. The state's worst June to September rainfall performance was recorded in 1981, when the seasonal deficiency was about 57 per cent. The state's best monsoon season since 1901 was nearly a 100 years ago, in 1924, when the seasonal average was 79.9 per cent of the LPA. During October to December 2021, Kerala recorded its wettest Northeast Monsoon season, touching a seasonal average of 401 per cent above normal.

On the district-wise rainfall trends, scientists said that 13 districts showed a downward trend, with Alappuzha, Kottayam and Pathanamthitta districts recording significant decline in the rainfall recorded during the crucial June to September months. These districts are known for cultivation of paddy and spices along with extensive fishing and tourism activities. Notably, Idukki was the lone district where rainfall during summer monsoon showed an increasing trend from 1901 to 2021.

Kerala: Pokkali farmers demand withdrawal of government order

https://www.thehindu.com/news/cities/Kochi/pokkali-farmers-demand-withdrawal-of-government-order/article65317774.ece

"Pokkali Samrakshana Samiti, a forum engaged in conserving pokkali rice cultivation, has demanded that the government withdraw its order permitting aquaculture in pokkali fields till April 30, as it will upset the crop cycle of 'one-rice and one fish'.

The government order said that the time period for fish culture in pokkali fields was extended in 2020 considering the pandemic situation, and that climate change factors had also prompted extension of the time period for fish farming up to April 30 in 2021.

The crop calendar stipulates that rice cultivation is to be carried out between April 15 and November 14 every year. The rest of the year is utilised for brackish water aquaculture, said Francis Kalathunkal, general convenor of the Samiti."

Kerala: Frequent hike in kerosene prices irks traditional fishers

https://www.thehindubusinessline.com/economy/agri-business/frequent-hike-in-kerosene-prices-irks-keralas-traditional-fishers/article65252401.ece

"The intermittent hike in kerosene prices has put Kerala's traditional fisherfolk in a crisis. According to them, the hike in fuel prices which are ruling at ₹123 per litre from the ₹96 per litre in January, has forced them to dole out more for their daily fishing activities. Charles George,

President of the Kerala Matsya Thozhilali Aikya Vedi (TUCI), said the unavailability of fish in the coastal waters due to sea drought, especially during between January to May has prompted traditional fishermen to venture into deep seas for their catch and it requires more fuel for their daily operations.

The subsidy for kerosene through PDS and the State government agency Matsyafed has so far helped them to a certain extent from the ill effects of steep hike of kerosene prices. But the government has stopped paying subsidies for kerosene in the last one and a half month, he said. At present, fishing boats with 9 HP are getting 129 litres of kerosene on a monthly basis, while 20 HP boats with 179 litres. This is insufficient and will not last for a day's operations, he said, adding that the frequent rise in kerosene prices and its non-availability coupled with fish scarcity reportedly due to climate change issues has put the fishing community in a mess.

Qouta for fishing sector

The association has sought urgent intervention of the government to retain the kerosene subsidy and ensure its uninterrupted availability by fixing a quota for the fishing sector.Matsyafed should be entrusted as the wholesale dealer to supply kerosene to the fishing sector. He said the Kerala Government in the last year's budget had allocated ₹60 crore to provide kerosene to the fishing community at ₹25 per litre. However, the latest budget has not considered the allocation made last year. The association has threatened to go on an indefinite agitation across coastal areas until their demands are met."

Kerala: Woman's award-winning fish farm helps her earn Rs 5 Lakh/Year

https://www.thebetterindia.com/273566/kerala-farmer-earns-lakhs-with-cage-fishing/

"Around 40 metres from the banks of Periyar River, near Moothakunnam in Ernakulam, you can see numerous cages in which many varieties of fishes are grown. Tending to and guarding them is 38-year-old Smija M B, who regularly feeds and harvests the fish. In 2018, the Department of Fishers came up with its cage fishing project, as part of the Blue Revolution. With global fish production on the decline due to climate change, the project aims to encourage more farmers to enter the field, especially women and members of scheduled castes/tribes. Around 500 cages were supplied to Kerala as part of this. The project began in Kannur, and later reached Ernakulam, where Smija, who also works as a workshop instructor at SNM INT Engineering College, decided to take up the cause.

Cage fishing, or cage culture, involves growing fishes in existing water resources like rivers, ponds, lakes or sea. This allows the fish to remain in free flowing water, while being enclosed in a net cage made of a floating frame, net materials and mooring system. Cage farms are

positioned in such a way so as to utilise natural currents, which provide the fish with oxygen and other appropriate natural conditions. ‘Women-friendly cage fishing’ “I grew up in a family of fishing labourers, which helped me develop a genuine interest in the field. My husband, too, adores aquaculture and fish breeding.

Earlier, we used to do this on a small scale. We took up cage fishing mainly because neither of us had a permanent job,” Smija tells The Better India. Many women from Smija’s locality became part of the project with technical guidance from the Central Marine Fisheries Research Institute (CMFRI), she says. In order to farm in the river area, a no objection certificate has to be acquired from the panchayat, by which the farmer gets hold of a fisheries licence. It has to be refurbished every year by paying an amount based on the area used. Apart from the subsidy provided by the CMFRI, Smija, her husband Unnikrishnan, and three other shareholders, invested around Rs 10 lakh in this farm.

They started off by installing three cages with four types of fishes — sea bass, bluefin trevally, green chromide and mangrove red snapper. “The 2018 floods adversely affected us, but luckily not many fishes were lost. The market became dull and the price of fish went down. We pitched in whatever profit we had gained and expanded farming. Four more cages were installed and we made a small house near the farm area to keep a watch on them 24/7,” Smija explains. In addition to the back-to-back floods, COVID-19 has also posed a challenge to the farmer, mainly due to lack of access to adequate feed.

“As both of us are working, farming is now a side business. Despite that, we are able to earn double our annual investment. For instance, last year, we invested around Rs 2 lakh and were able to earn Rs 4-5 lakh,” Smija explains. “If enough feed is available and thorough care is given, this can be a more successful and income-generating business idea capable of meeting the requirements of a whole family.” she adds. The harvesting period of each fish is different, Smija notes, ranging from six months to two years. She sells them wholesale to nearby markets and retail to individuals.

During holidays, the couple gives special offers publicised through social media and banners, which make faster sales, they say. Smija was honoured by CMFRI on Women’s Day 2021. This national level award made her popular among aquaculture farmers in and out of the state, she says. She adds that many women in her neighbourhood have taken up cage fishing after seeing her success. “At least 10 local women organisations approached us for details. Also, research students of aquaculture visit the farm to take notes of the methods I implement here. Before the pandemic, at least 20 used to drop by every month,” says the farmer. “I also help women get in touch with required authorities to start cage fishing.”

Kerala: Focus on vulnerability mapping and bio-shields for coastal protection

https://www.thehindu.com/news/cities/Kochi/focus-on-vulnerability-mapping-and-bio-shields-for-coastal-protection/article38283093.ece

"A study of the coastal protection requirements of vulnerable segments like Chellanam by the Kerala University of Fisheries and Ocean Studies (KUFOS) has said that an issue-based management plan must be developed rather than a resource-based plan. The study on coastal protection and social perspectives also emphasised protection of morphology while adopting coastal protection measures. Among the suggestions that evolved during a meeting of stakeholders on social and environmental issues was the need for mapping of land use, land form, assets and people's requirements.

The suggestions will be submitted to the government. Conservation and vulnerability mapping must be carried out to develop a comprehensive coastal protection strategy in view of the conditions caused by the effects of climate change even as monitoring of the existing system should be done to suggest sustainable development protocols. The study also said a coast-specific management approach was needed in most of the segments while seawall alternative could be developed in the Chellanam area using mangrove planting. Developing a bio-shield of a 30-metre-wide mangrove line along the coast could help Chellanam. Stakeholder and community participation at the base level should be ensured for the sustainability of such measures, the study said. Chellanam is among the most vulnerable coastal segments in the State and the government has announced a series of measures to protect the coast. Chellanam's sea erosion problems, though in the news for long, came into prominence after Cyclone Ockhi hit the coast in December 2017.

Periodic sea water incursion and flooding of homes have made lives of the coastal population difficult, prompting the government to announce rehabilitation programmes such as 'Punargeham'. Meanwhile, KUFOS is expected to submit its final report for turning Chellanam into a model fishing village soon after a final round of studies. The government had announced a ?344-crore programme to strengthen seawalls, erect geotextile tube barriers and build breakwaters to protect the coast.

Kerala: Kufos seeks strategies to develop a sustainable fisheries model

https://www.thehindu.com/news/cities/Kochi/kufos-seeks-strategies-to-develop-a-sustainable-fisheries-model-for-kerala/article38111941.ece

"The Kerala University of Fisheries and Ocean Studies (Kufos) and the Fisheries department will join hands to develop a sustainable fisheries culture for the State and reorient aquaculture strategies. Fisheries think-tank from across the country comprising scientists, industrialists, and farmers will gather at the university on January 6 and 7 for a national seminar

on reorienting strategies towards sustainable aquaculture and fisheries. Vice Chancellor of the university K. Riji John said around 300 scientists, industrialists, farmers and fisheries department officials will participate in the conference. Fisheries Minister and Pro-Chancellor of Kufos Saji Cherian will inaugurate the national conference.

Former Fisheries Minister K. Babu, MLA, will preside at the inaugural. R. Ramkumar, State Planning Board member, will deliver the keynote address. “Kufos is the first fisheries and ocean studies university in the country and has enormous responsibility to play a key role in reorienting Indian aquaculture scenario to meet the new challenges by setting up a better State-level model, which can multiply the income of the farming community in a sustainable way,” said Dr. John. “The conference is being organised against this backdrop envisaging to provide an ideal platform for researchers, academicians, farmers, industrialists and policy makers to take forward the concept of sustainability,” he added.

While the aquaculture sector is growing fast, there are concerns about the environmental implications of the industry, which pose a question over sustainability. These are also related to diseases, stock loss, climate change and environmental degradation, among others. A sustainable aquaculture strategy needs to ensure farmers earned a fair reward from farming while causing no or minimum damage to the surrounding ecosystem, Dr. John said.

Kerala: 45 percent of coastline facing erosion

https://keralakaumudi.com/en/news/news.php?id=702640&u=

"A study conducted by the National Center for Coastal Research (NCCR) has found that 45 per cent of the coastline of Kerala is subject to varying degrees of erosion for over two and a half decades. The shocking fact was mentioned in the National Shore Line Change Assessment Mapping for Indian Coastal Report by the NCCR. According to the report, unscientific construction of structures such as fishing harbours, ports, groins and seawalls, sand mining, climate change, monsoon fluctuations, and rising sea levels due to global warming have largely contributed to the erosion of the coastline.

The coastline of Kerala is 592.96 km long. The coastal area is up to seven and a half meters above sea level. This area, which covers only 10.25% (3979 sq km) of land area, is very densely populated. The population density of Kerala is 810 per sq km. However, in coastal areas, the population density is as high as 2168. Hot spots and threats 1. Thiruvananthapuram: Construction of harbour at Thengapattanam and dredging at the port 2. Kollam: Sand mining activities in Alappad 3. Alappuzha: Unscientific construction of harbour from Purakkad to Chellanam 4. Ponnani-Kasargod: Unscientific construction activities Rising sea level 1. During

the period 1993-2015, the sea level in the country rose by 3.3 mm 2. Increase of 1.75 mm in sea level per year along Kochi coast 3. An area of 169 sq km in Kochi is at risk of floods.

Kerala: Clam collectors a worried lot

https://www.thehindu.com/news/national/kerala/clam-collectors-a-worried-lot/article37790648.ece

"With the stock hitting an all-time low, clam collectors of Ashtamudi were a worried lot in 2019. The year 2020 offered no solace, but by then they could identify some visible changes in the estuarine ecosystem. And today, their worst fears have come true as the fluctuations in hydrographic parameters have affected the spawning season of yellow clams (Paphia malabarica). Normally, the annual three-month ban on harvest begins in December, but inconsistent salinity and surface temperature has forced the Fisheries Department to push it to January. “In earlier times we could spot huge numbers of pea-sized bivalves during November-December. But this year we stopped collecting clams some two months ago as there was hardly any stock left.

The clam collectors and women engaged in allied activities have been in total distress after the floods of 2018. Everything including the depth and current has changed over the years due to unscientific interventions and climate change. At present we have hit the rock bottom,” says Prasannan, clam collector. The decision to move the ban has been taken by the Clam Governing Council that manages the Marine Stewardship Council-certified fishery. “For the last three years we are experiencing a change in the intensity and pattern of rain. Usually the waterbody will achieve the salinity level required for spawning by November, but this year the situation is different. It's for the first time we are changing the ban period,” says K.Suhair, Deputy Director, Fisheries Department.

As part of efforts to replenish the stock and protect the livelihood of clam collectors, the Fisheries Department had set up sanctuaries in Ashtamudi and at present there is no seed to carry out relaying or collect the broodstock. “Whether the ban should be pushed permanently to January or February will be decided after further studies by various expert bodies including the Central Marine Fisheries Research Institute (CMFRI),” Mr. Suhair says. Apart from erratic rain and freshwater influx, sedimentation is also posing a huge challenge to the larval settlement. “Right now our clam beds are nearly empty. After the ban ends in April, the stocks may get replenished due to the long six-month window. The Fisheries Department has also promised to procure seeds from Vizhinjam hatchery and relay them in Ashtamudi. At present we are pinning our hopes on that,” adds Prasannan.

Kerala: Experts recommended fishermen at Vypeen should adopt novel methods where they can increase fish harvest and thereby increase their income

https://timesofindia.indiatimes.com/city/kochi/call-for-novel-fishing-methods-at-vypeen/articleshow/87724018.cms

"Experts recommended fishermen at Vypeen should adopt novel methods where they can increase fish harvest and thereby increase their income. The recommendations were put forward on the second day of the workshop on 'Vypeen island protection and sustainable development' on Monday. "The availability of quality fish is coming down in the state. Hence, prospects for aquaculture methods like cage fish farming and biofloc is high at Vypeen which is a favourable place for fish production. "Farmers can cultivate and harvest Vannamei shrimp (whiteleg shrimp) on the compounds of their houses itself. It has high export opportunities," said Kerala University of Fisheries and Ocean Studies (Kufos) registrar B Manoj Kumar. "Shrimp can be cultivated in biofloc method and harvested in seven months. By expanding pokkali farming, cage farming can be done along with prawn farming at pokkali fields.

Aquaponics method also can increase job opportunities," he said. Other than creating job opportunities associated with fish farming, export of marine and value-added products also will create employment. The workshop also discussed the prospects of inland tourism in the area by giving thrust to the tradition of the island, culture, history, pokkali farming and water resources. "Since the population density is high at Vypeen, possibilities of setting up small-scale industries in electronics, organic vegetable farming and waste management can be explored," Kumar said. The workshop is held in the backdrop of climate change induced incidents at Vypeen.

The area witnesses recurring episodes of sea erosion and high tide. It has been envisaged to formulate a master plan for the island by consolidating the expert views and traditional knowledge emerged at the workshop. The workshop will conclude on Tuesday and water resources minister Roshy Augustine will inaugurate the valedictory function.

"Kerala: Extreme weather events in Kerala linked to climate crisis: Experts

https://www.hindustantimes.com/india-news/extreme-weather-events-in-kerala-linked-to-climate-crisis-experts-101634668375094.html

"The havoc wrought by heavy rain in Kerala last week in which 39 people were killed has a clear imprint of climate change, say weather scientists. In the last three years, the state has seen at least four flash floods of which the 2018 floods were the worst. Scientists link the fast-changing weather pattern to the rise in surface temperature of the Arabian Sea in the last two decades, leading to higher cyclonic circulations. According to the India Meteorology

Department, there was a 52% increase in cyclonic movement over the Arabian Sea between 2001 and 2019, and an 8% decrease in the Bay of Bengal during the same period.

IMD statistics showed that nine cyclonic or major depressions had formed in 2020, of which four were over the Arabian Sea. Roxy Mathew, a planet scientist with the Indian Institute of Tropical Meteorology, Pune, said the temperature over the Arabian Sea has increased by 1.2 to 1.4 degrees Celsius in the last two decades. "Usually, the temperature in the Arabian Sea is 1.5 degrees lower than the Bay of Bengal and this is one of the reasons for less cyclonic circulations and low pressure in the Arabian Sea. But of late, the situation is changing. What is disturbing is that warming is seen not only in the top layers of the sea but also in the deeper layers of the ocean," Mathew said. He added, "We all know that more than 90% of the heat on earth is absorbed by oceans. Usually, temperatures in the Indian Ocean and Bay of Bengal are above 28 degrees Celsius and in the Arabian Sea, it is between 26 and 28 degrees Celsius. But the Arabian Sea is warming up fast.

It has been quite visible in the last decade or so." Dr Dr V S Vijayan, a member of the Madhav Gadgil committee on Western Ghats and founding director of Salim Ali Centre for Ornithology, said the state was yet to learn its lessons from the 2018 tragedy in which close to 400 people died. "It is sad that in Kerala, discussions start only after a tragedy, but everyone forgets about it soon. Cloud bursts, flash floods and landslips are here to stay. The state will have to pay a heavy price if it goes ahead ignoring the climate change signals," said Dr M G Manoj of the Advanced Centre for Atmospheric Radar Research with the Cochin University of Science and Technology. Vijayan said Kerala can take the lead in implementing the UN General Assembly resolution of 2017 on sustainable development.

"Our overdependence on natural resources will be reduced and we can think of a better tomorrow. Whether you take Uttarakhand, Kerala or the Northeast, calamities are leaving untold miseries. But for this, we need a committed political leadership," he said. The UNGA resolution is a set of suggestions to achieve a better and more sustainable future for all by 2030. Noted ecological scientist Madhav Gadgil, who headed an expert group to study the degradation of the Western Ghats, said people will have to take more proactive roles to protect their place of living, surroundings, and environment.

"I agree that lopsided developmental activities have aggravated the intensity of natural disasters. But I still have hope from Kerala — it is the first to take up decentralised planning. Let people take up their bread-and-butter issues along with sustenance," Gadgil said, adding that states like Maharashtra and Goa also experience similar tragedies year after year but Kerala gets wider publicity and reach. Mathew said a big shift in the rain pattern in Kerala is visible. "Though monsoon rainfall may decrease, the number of heavy rainfalls will increase, leading to more flash floods and landslides," Mathew said, adding that Kerala should have been very careful in

land use because the state, endowed with many hills and rivers, has a slanting geographical landscape.

Apart from global warming, scientists have also found that the dumping of plastic waste in the sea has also led to a rise in surface temperature. According to a study conducted by the Central Marine Fisheries Institute of India in 2018, major oceans will have more plastic than fish by 2050. By then, over 850 metric tonnes of plastic will be found in the sea whereas fish will be 821 metric tonnes. Another study conducted in 2017 by a world body, Alfred Wegener Institute, says the seas near Mumbai, Kerala and Andaman and Nicobar Islands are among the most polluted in the world.

Kerala: Rains, Climate Change

https://english.mathrubhumi.com/news/columns/i-mean-what-i-say/rains-climate-change-and-kerala-shashi-tharoor-column-1.6094654

"As I write these words, heavy rains are again lashing Kerala, as they did in 2018 and 2019, causing colossal damage and loss of life. Though vivid footage of swirling floodwaters is once again dominating our television screens and mobile phones, one hopes the damage will not be as severe as on the previous two occasions. Still, it is time we confronted an inescapable reality: the Indian Ocean region, which hosts two-thirds of the world's population, is particularly vulnerable to the effects of climate change and extreme weather conditions. Kerala – and many other parts of peninsular India – may have to live with much more flooding in the years immediately ahead. While rising sea levels and coastal inundations have increased in magnitude, frequency and intensity, increased rains – in quantities the earth is unable to absorb -- are another well-known reflection of the climate crisis.

It is no consolation that what is happening in the Indian Ocean is also responsible for severe events in other parts of the world. For instance, recent flooding and landslides in East Africa and bushfires in Australia have been linked to higher-than-usual temperature differences between the two sides of the Indian Ocean – a phenomenon called the Indian Ocean Dipole. Dipoles are likely to get worse with increased greenhouse gas emissions. In a 2014 study published in the prestigious scientific journal Nature, scientists in Australia, India, China and Japan modelled the effects of CO2 on extreme Indian Ocean dipoles, such as those in 1961, 1994 and 1997, and found that if emissions were to go up further, the frequency of extreme dipole events would increase from one in 17.3 years to one in 6.3 years.

The Kerala floods of 2018 were described as the worst in a century; but floods almost as bad occurred the very next year, and a new round seems to have begun two years later. Is this going to be an annually recurring tragedy? If it is, it threatens a region of colossal importance to the

rest of the world. The Indian Ocean itself comprises 20% of the world's oceans but also accounts for 40% of the global coastline, amounting to 66,526 kilometres, connecting 36 countries and a full two-thirds of the world's population. It is absolutely key to the global energy trade, being responsible for 40% of the energy supply between the Gulf, Europe, and Asia.

According to the Journal of the Indian Ocean Region, more than 80% of the world's seaborne trade in oil transits through Indian Ocean chokepoints, with 40% passing through the Strait of Hormuz, 35% through the Strait of Malacca, and 8% through the Bab el-Mandab Strait. For India, 70% of its oil is imported through the Indian Ocean Region to its various ports and in China's case, 84% of its energy imports pass through the Indian Ocean. Over 32.2 million barrels of crude oil is transported through the ocean daily and nearly 70% of offshore oil deposits are located in this region.

Things are even graver from India's national perspective. The Indian Ocean accounts for over 95% of India's trade by volume and 68% of its trade by value. India is the fourth-largest importer of LNG, of which 45% comes through the Indian Ocean. India's fisheries and aquaculture are also significantly dependent on the Indian Ocean. Our maritime exports have grown 55 times (in volume) between 1962 and 2012 and fisheries exports are valued at over US$ 2.5 billion. It is clearly no exaggeration to say that the Indian Ocean is absolutely crucial for the Indian economy, and this has only become clearer with time.

Regional integration has also become increasingly important. There has been steady growth in intra- Indian Ocean exports (in other words, exports from one country in the region to another) -- from US$ 391,098 million in 2005, to US$ 1 billion in 2014, accounting for 30% of the region's total exports to the world. The United Arab Emirates, the biggest trader in the region in 2014, directed almost 50% of its exports to other Indian Ocean countries, followed by Singapore, India, Malaysia and Saudi Arabia. Despite this, the World Bank has called the Indian Ocean Region one of the worlds' least integrated regions. Integration boosts trade and the movement of people, and is crucial to the promotion of economic prosperity.

The devastation of climate change will undermine regional integration as well, threatening the well-being of Indians and others for decades to come. At the turn of the twentieth century, a casual observer of any one of the myriad trading ports of the Western Indian Ocean could have said these were the "green shoots" of increasing integration and growing inter-connected prosperity. However, with the arrival of the "Oil Age," capitalism, and new nation-state institutions in the last century, Indian Ocean trading communities have seen a complete transformation in the ways in which they engage with each other. Their once vibrant communal interaction across the seas has been replaced by displacement and even the loss of historic connections.

Today, as global capitalism and reactionary nationalist impulses engage in a war to win the hearts and minds of nation-consumers, what does this mean for trans-national communities (especially those that predate the nation-states in which they live)? Where do they fit in? And will climate change undermine even what currently exists, forcing countries and communities to retreat into self-protection and focus principally on their own survival? Just as globalisation today appears to be in a crisis driven by the increasing divide between the haves and have-nots, those who profited from the benefits of globalisation and those who have been left behind, historically cultural exchanges in the Indian Ocean region also suffered when conquest and the expansion of colonial empires, in an attempt to establish a hegemony over trade routes, replaced the previous – and largely peaceful – method of commercial and cultural interactions. Today, new threats affect the Indian Ocean region and communities within this area in two main ways: first, through geopolitical competition for sea lanes, resources, and maritime dominance in the region; second, through the increasingly visible effects of climate change, which contribute to freak events, natural calamities with increased frequency and magnitude.

For hundreds of years the Indian Ocean has been the site of naval battles, movements of migration, and commercial trade, a place of great cultural interaction and military conflict as well as of the moving syncretism of the exchanges of culture and belief. As the rains flood the hills, plains and rivers of Kerala today, it is vital to realise there is something even bigger at stake. The vast expanse of ocean within which we are located must be safeguarded – not just from military aggression but even more from environmental degradation that threatens us all.

Kerala: Sardine becomes as expensive as seer fish; price touches Rs 200-300

https://english.mathrubhumi.com/news/kerala/sardine-becomes-as-expensive-as-seer-fish-price-touches-rs-200-300-fish-price-sardines-scarce-and-high-priced-kerala-1.6048854

"Though it is the time of a good catch, Keralites' favourite fish sardines are nowhere to be seen. Due to the rise in demand, the price of sardines has skyrocketed. As seer fish is available aplenty, its price dropped and now the cost of both the fish is almost the same. The sardines that are sold in Kasaragod are mainly brought from Tamil Nadu and Karnataka. The fisherfolk said that it has been around two years since they caught sardines near the Kerala coast. Sardines now fetch between Rs 200 and Rs 300 per kilogram while the large seer fish are sold for Rs 380 - Rs 400. The cost of small mackerels have dropped considerably and touched Rs 250 - Rs 300, which is almost the same price of sardines. Despite being the season of a good catch, it is not a good time for the fishermen. Neeleshwaram native Suresh Babu, a fisherman, claimed that the fish population has depleted drastically.

The pearl spot (Karimeen) and prawns once abundantly caught have also decreased now, said Suresh. What happened to sardines? Dr A Bijukumar, head of the Department of Aquatic

Biology and Fisheries in Kerala University, pointed out three reasons for the absence of sardines near the Kerala coast and the most important among them is climate change. As the sardines swim near the water surface, they migrate to cooler places when the temperature exceeds a certain limit. Now the sardine population is moving to the northern region including the coasts of Gujarat and Goa. When the temperature rises in the Indian ocean, the oxygen level in the water decreases and it also dwindles the reproduction rate of them.

Kerala: Keeping alive a mangrove conservationist's legacy to protect

https://india.mongabay.com/2021/09/keeping-alive-a-mangrove-conservationists-legacy-to-protect-kerala-coast/

"Born into a marginalised family in 1937 in Kerala, his umbilical cord looked almost like a bloated seed of a common mangrove tree. So, his parents who worked as farm labourers named him Pokkudan, which in the local language, refers to infants with such umbilical cords. The man, who was unable to complete elementary school education due to poverty and caste-based discrimination, died on September 27, 2015, leaving behind a rich legacy of protecting 22 species of mangroves from local extinction. Better known as Kallen Pokkudan, the Dalit from Kannur district became a celebrated guardian angel of Kerala's mangrove forests through dedicated interventions over the years. Pokkudan travelled across Kerala's coast telling the local communities, especially fish workers, that only mangroves could protect coastal assets during hazards such as cyclones.

On his travels, he collected seeds of 22 species of mangroves. There were only a few takers in those years for his argument that mangroves are one of the vital long-term solutions to sea erosion and storms, which turn coastal communities into climate refugees. To prove his point, Pokkudan had created mangrove walls at Choodat beach in Kannur and Arattupuzha in Alappuzha and prevented sea erosion-related issues that concerned the respective local fishing communities. Now, climate change and rapid, unscientific development of mega infrastructure projects have crippled everyday life on the 590-km long Kerala coastline; sea-erosion and sea accretion are worsening the situation.

Experts have warned that coastal areas in the state will witness an increasing number of sea surges in the coming years, primarily due to rising sea surface temperatures. Experts advocating for nature-based solutions involving the active participation of coastal communities are looking to answers such as those spotlighted by Pokkudan, who consistently argued that erecting granite seawalls would turn counter-productive. Restoring coastal vegetation, mainly mangrove forestation, is the need of the hour, they say. "It was 1989; my father started planting mangroves seedlings along mud-bunds which protect the traditional shrimp fields in the brackish water wetlands of Kannur where wet paddy and fish are cultivated. He was 52 then.

Soon he started mounting public opinion against land reclamation, garbage dumps and deforestation that threatened coastal forest ecosystems. Then based on the traditional knowledge he gained and practical expertise from the local fisher community, he concluded that mangroves are the best available deterrent against sea erosion," said Anandan Paithalen, elder son of Pokkudan, a schoolteacher by profession. Anandan is now on a unique mission with his five siblings. They revived the defunct Kallen Pokkudan Mangrove Trust in recent months, formed by their father in 2013 to impart mangrove conservation literacy to society.

With the help of Kerala government's social forestry and education departments and environmentalists, the trust has started preparing mangrove nurseries in schools, youth clubs, and voluntary organisations in ten coastal districts to generate enough seedlings to plant in areas that witness sea erosion. The Kerala coast would get a mangrove protection wall in another six years as per the ongoing project. "My father had incurred financial debt by devoting himself to promote the mangroves. After his death, the immediate priority of the family was to clear the debts. Now we are reviving the trust using our resources and his legacy through conservation activities," said Anandan Paithalen's sister Pushapalatha.

"They can buffer erosion, enhance bio-biodiversity, prevent high tide incursion, and even reduce the impact of future tsunamis. So, we have high hopes for the initiative started by Pokkudan's family. The appreciative aspect is that they collect the seeds and make them available free of cost at the respective nurseries to local communities. The government departments and environmentalists can only meet expenses of the upbringing at the nursery," said Jaffer Palott, noted environmentalist. According to P Sujanapal, a scientist with Kerala Forest Research Institute, Kerala's mangrove cover has severely disintegrated in the last four decades with their spread declining from 700 sq km to 24 sq km in that period. Of the remaining wetlands, Kannur has 45 percent of the total mangroves, largely thanks to Pokkudan. Now the effort is to increase the mangrove cover manifolds mainly in the coastal region.

Like Pokkudan, his children also live in close contact with the wetlands of Kannur and collect, preserve, and plant the seeds, primarily of the "mad mangrove" tree – the long-fruited, stilted mangrove known as Rhizophora mucronata. They are also promoting some other rare species of mangroves. In total, 22 varieties of mangrove trees welcome you to Pokkudan's village Pazhyanagadi in Kannur district, including Clerodendrum inerme, Premna serratifolia, Acanthus ilicifolius and Derris scandens. The surroundings of Pokkudan's ancestral home have now turned into a massive mangrove nursery. Interestingly, what had led to Pokkudan's passion for mangroves was political disillusionment.

Pokkudan had spent a significant share of his life organising and strengthening the labourers' union of the Communist Party of India (Marxist). He started noticing how monsoon storms were drenching little school-going children while they walked to the school through narrow mud paths

in his hometown. During heavy monsoon days, the lashing winds would take their umbrellas away. The high-energy storm waves would destroy embankments around the paddy cultivating areas. Over the years, the mangrove wetlands in his hometown had turned into garbage dumps for neighbouring towns. Such a situation had severely affected the ecological functions of the wetlands; it had impacted their nutrient cycling, flood control function, groundwater recharging, salt dissipation, absorption and dilution of pollutants, and the creation of microclimatic niches that support different forms of life. The mangroves always remained a rich medicine, food, and fuel source for the marginalised community (Pulayan) Pokkudan belonged to. “The fish, the birds, and the people all depend on the mangroves,” says Anandan.

He said his father called the trees “the security guards of the earth” and was convinced that floods in coastal regions would not kill so many if there were mangroves. According to Pokkudan’s younger son Sreejith, collecting the seeds of the mangrove trees is strenuous work. Besides, the swamps where mangroves grow often remain choked with waste. “Our father aimed to construct a mangrove wall in the coast, and we will fulfill it,” said Pushpalatha, one of Pokkudan’s children. “In the past, our father had led a one-person movement for mangroves. Now, his family is in the process of evolving it as a mass movement with the involvement of students, fish workers, and farmers,” she added. “So far, the government has dumped granite boulders mined from the Western Ghats on the coast.

The construction of granite boulder walls that began in the 1960s turned into a wasteful process with huge expenditure from the public exchequer. The ideal option is creating a green belt comprising the finest varieties of mangroves in the coastal region. It must be a unique wall that can grow organically and ensure a sustainable livelihood option for coastal communities,” says Anandan. “Numerous mangrove restoration projects were initiated after the 2004 tsunami. Mangroves can rapidly diminish the height of wind and the swell of waves. Even during relatively large storm surges, the leaves and branches of the forest canopy will help reduce wave energy providing the trees are tall enough,” points out coastal zone expert Max Martin. According to aquatic biologist A. Bijukumar, restoring the coastal mangrove ecosystem is a challenging and gradual process that needs to be scientifically robust.

“The effort is to plant mangroves in areas where they were not in existence for long, especially the mudflats. In such areas, saplings that can withstand soil erosion and wave action must be preferred. Low oxygen availability due to constant moisture is an issue in mudflats, and that may cause high seedling mortality and stunted growth. So the choice of local good quality seed is important,” he said. “Some mangrove species tolerate greater saltwater flooding than others. They must be preferred. To create a multi-species community we need to combine species that complement one another. Involving the local communities, especially fish workers, in the process is supreme. Local communities know much about successful mangrove management,

and their involvement is key to long-term success in restoration, management, and benefit flows," he said.

Inspired by Pokkudan, 55-year-old fish worker T P Murukesan of Vypeen in Kochi started his mangrove nursery and plantation initiative ten years ago to prevent sea erosion and flooding on the coast. In collaboration with Pokkudan's family, Murukesan is engaged in plantation drives in coastal villages of Cherai, Njarackal, North Mulavukad, Nayarambalam, Vallarpadam, Mangalavanam, and Chellanam with the forest department. The mangroves he planted grow lush, providing animals and birds with a safe environment. As per the initial plan, seedlings prepared in the nurseries would be taken to the coast for planting by October end coinciding with the opening of educational institutions in Kerala after COVID-19 lockdown. The trust feels that the involvement of school and college students is critical in promoting mangroves. The same kind of activities would be undertaken by the trust every year. "We are also determined about the involvement of the fisher community," says Anandan.

Kerala: In Kuttanad, climate change is forcing residents to abandon their homes

https://scroll.in/article/1003721/in-keralas-kuttanad-climate-change-is-forcing-residents-to-abandon-their-homes

"Kuttanad in Kerala is a picture-perfect location with vast waters surrounding its palm-fringed emerald islets. This region of the Alappuzha district in Kerala lies more than two metres below sea level and has the lowest altitude in India. It is serviced by the state's significant rivers Pampa, Meenachil, Achan Kovil and Manimala in addition to Vembanad-Kol wetland, India's second-largest wetland ecosystem. Luxury houseboats occupy the lake and several canals link it with the rivers, while numerous cottages and eateries dot the islands. Kuttanad is a waterlogged region that spreads over about 1,10,000 hectares. Of it, more than 50,000 hectares remain submerged in water for most of the year.

Widely known as the rice bowl of Kerala, it is one of the few places in the world, and the only one in India, where farming activities are being held below sea level. The region has more than 18 lakh residents, and most of them are agricultural workers who do not own the rice fields where they work. According to KG Padmakumar, special officer and director of Kuttanad-based International Research and Training Centre for Below Sea Level Farming, the once abundant paddy cultivation has given the region its name. It is a massive area of reclaimed land which remains supported by fragile dikes from vast amounts of water.

But the region that once attracted settler farmers from outside is now seeing an exodus as many local people, unable to withstand the effects of climate change and human factors, are abandoning the region. Everybody who can, is leaving now and Kuttanad is turning into a cluster

of ghost villages surrounded by water, said Santhosh Eruthiyel, who recently left Kuttamangalam Island in Kainakary panchayat to go to Cherthala. On the other hand, Cherthala region, 30-km away, faces no issues of waterlogging and food.

As per the state government's estimate, over 6,000 families of Kuttanad have abandoned their houses and properties in the last two years. Climate refugees The waters in the rivers and the Vembanad Lake ecosystem, which were an icon of prosperity are now turning into a threat to the lives and livelihood of the people. Eruthiyel, who lived in Kainakary all his life, is now nostalgic about his abandoned house, which once had beauty and tranquillity. "It was after the massive Kerala floods of 2018 that my family decided to leave," he said. "We have been facing at least half a dozen floods a year for over a decade and things got aggravated after the 2018 floods. Now, everything remains submerged for a long time.

How can you cook and eat in a kitchen filled with water? Nights are fearful as water can enter anytime without warning. Whenever there is rain, the outer bounds of the paddy fields suffer breach, risking numerous lives." A professional electrician, Eruthiyel, bought a piece of land at Poojaveli in Cherthala and built a house and now sleeps without fear of the waters threatening to disrupt nights. But for Vinodini Raju, her husband and two school-going daughters who live in the waterlogged Kanakaseri Island in Kainakary panchayat, there is no means to abandon the house built using bank loans and find another outside the region.

Most parts of their house, including the kitchen and toilet, remain inundated for over seven months of a year, said her daughters Pooja and Anamika, who study at the higher secondary level. The same is the case of Shyja and her husband Jyothish of Meenappulli, whose house is almost entirely inundated. A cook with a houseboat, Jyothish was laid off and unemployed after the Covid-19 lockdowns put a halt on domestic and foreign tourists coming to the region. For sixty-two-year old widow V Sasiamma, some government aid turned out to be a bit of luck just ahead of the southwest monsoon. She left her home in Kainakary, which had recurring floods, to buy a plot of land in Muhamma near Cherthala town. When contacted by Mongabay-India, Kuttanad taluk officer TI Vijayasenan confirmed that there is a trend among families, who can afford it, to buy land outside Kuttanad and build houses there.

People are migrating to nearby Cherthala, Alappuzha and Changanassery. "The poor have nowhere to go, and they are becoming victims of frequent flooding. The government is now evolving strategies to prevent flooding in Kuttanad, but those may take time," he said. "We have become climate refugees," said PB Vijimon, who recently bought land in Kalavoor in Alappuzha and started constructing a new house there. "We are losing our land. In addition to climate change, unscientific construction of large-scale tourism resorts, roads, bridges and other infrastructure facilities have contributed to the present grim situation. Lack of river management and backwater region protection facilities are making the situation worse. P Prasad, a Cherthala-

based real estate broker, said he has been receiving numerous inquiries from people of Kuttanad who have no option other than relocation.

“For us, life is not the same since the devastating deluge of 2018,” said MD Salim, a rice farmer of Kanakassery. “We are forced to either flee and rent or buy a house in less flood-prone nearby areas or continue to live here fearing floods of different magnitudes whenever it rains.” Floods changed everything The wetland agriculture system of Kuttanad is a unique one that facilitates paddy cultivation below sea level on small patches of land created by draining delta swamps in brackish waters. “The whole Kuttanad has over 500 years of history of draining delta swamps manually by poor Dalit workers who remained slaves of powerful landlords. The whole region is artificial and is made of reclamation using traditional means,’’ said Padmakumar of International Research and Training Centre for Below Sea Level Farming. Here the agricultural system is divided into three segments: wetlands are used for paddy activities and catching fish while the garden lands are used for coconut, tuber and food crops plantation. In addition, water areas are being used for inland fishing and shells.

“The rice and fish cultivation had ensured livelihood to most people here while houseboat tourism has evolved in recent years as a new form of livelihood,” explained Padmakumar. Most people in Kuttanad agree that flooding was a part of their life for centuries. They knew how to live with water all around them, even during heavy monsoons. To them, water proximity was always a regular thing. But since the floods of 2018, the character and after-effects of rains and floods have started changing. Since 2018, Kuttanad has been witnessing frequent floods with high devastation capability. Even when other parts of Kerala are not experiencing any kind of waterlogging, flooding is happening in Kuttanad. “After 2018, I could not sleep on rainy days,” said B Asokan, who now lives in Muhamma.

“Instead, I would sit guard checking whether the water level is rising more than normal. During one such night, the water level increased suddenly in 2020, and my wife and I fled, carrying our eight-year-old grandson. We could not take anything when we fled. Now, my house of decades is destroyed, and there is not even a stone left from it.” Now, the heavy rains and resultant floods are impacting livelihoods as well. Last year, farmers here did not earn anything from paddy farming due to the significant scale collapse of bunds and the pandemic-induced lockdown. However, those who leased paddy lands had to pay the landowners. Farmers and experts say that the land areas in Kuttanad are fast sinking, and even ripples caused by moving boats cause water to enter the compounds.

Kuttanad people are living on land and houses they inherited from their ancestors through generations. As no one from outside wants to buy their property because of the frequent floods, selling and moving out has turned impossible. Around a decade ago, the state government had plans of implementing a package worth Rs 1,840 crore, that was developed by experts, led by

internationally known scientist MS Swamminathan. However, nothing concrete has taken place so far. Because of floods and inundation, people who can afford it are building new houses on large pillars and keeping their rooms far above the expected rising water level. Now the demand is that the government must construct such houses for the poor. “Until a decade ago, we had a proper drainage system that could minimise the duration of flooding,” said KV Dayal, a local environmentalist.

“Unscientific developmental projects like big bunds, massive roads and bridges have disrupted the existing systems. Flood management systems are required now, and they must consider the region’s fragile ecosystem too.” Sixty-one-year-old P Sisupalan, a resident of Kuttanad, attempted rebuilding his home after he turned homeless in the 2018 floods. However, the 2019 floods washed away the new house’s foundation, and then he completely abandoned the idea. Local people say more families would be forced to migrate in the coming months as the government has done nothing so far to restore the ecology of Kuttanad and make it flood-free. “Climate change is now getting aggravated along with after-effects of wrong notions of development,” said VN Jayachandran, president of the district unit of Kerala Sastra Sahitya Parishad, the state’s popular science movement.

“We do not know how long the place will remain habitable with hardly any measures to protect the low-lying areas. Those people who have no other place to go are forced to live here.” Scarce drinking water Though it is surrounded by water, Kuttanad is known for drinking water scarcity. In almost all parts, piped water is available only twice a week, that too for an hour, often at night. So people are buying drinking water by travelling to other locations using their country boats. In many parts of Kuttanad, sewage is being released into the same canals from which people are drawing water for drinking and cooking needs. In many households, there are toilets built with direct outlets into the canals and streams of the backwater system.

Water in the rice fields is polluted by pesticides. Solid waste from medical college hospitals at Alappuzha and Kottayam, sewage of municipal towns of Kottayam, Cherthala, Thiruvalla, Changanassery and Alappuzha, the oil and faecal wastes from about 300 houseboats which are being operated between Alappuzha and Kumarakom, all find a dumping place in the Vembanad lake. During the famous Sabarimala pilgrimage season, the river Pampa turns into a sewage drain. As per surveys conducted by the Centre for Water Resources Development and Management in Kozhikode, almost 80% of the people in Kuttanad rely on the contaminated canal water for their daily water requirements.

Infrastructure development has not only destroyed Kuttanadu’s fragile ecosystem but also made the climate change situation worse. The famous Thanneermukkam bund was constructed across the Vembanad Lake in 1975 to prevent saline water intrusion into rice fields, especially during dry seasons, thus enhancing rice farming. “The natural flushing through tidal movements which

existed in the entire Lower Kuttanad for several centuries has ceased since its construction," according to Madhusoodana Kurup, a fisheries scientist who conducted a water balance study in the region in 1988-'90. "Kuttanad is a victim of misplaced and impractical developmental schemes. The backwaters themselves are vanishing due to climate change and human interventions. The government must evolve strategies that can involve the spirit of human coexistence with water and low-lying areas," said the International Research and Training Centre for Below Sea Level Farming's Padmakumar.

Kerala: How climate change is taking a toll on livelihoods of small-scale fishers

https://india.mongabay.com/2021/08/how-climate-change-is-taking-a-toll-on-livelihoods-of-small-scale-fishers-in-kerala/

"Until recently, Kerala's coastal population had every reason to rejoice the arrival of the monsoon in the state. Apart from numerous good fishing hauls, the important celebratory moments like weddings came about during the monsoon season which spans from June to August, as they generally attained economic stability during the period. However, over the last few years, climate change and the ensuing shifts in the marine environment have disrupted the rhythm of their lives. Long gone are the days of big catches and the subsequent rise in seasonal income for the small-scale fishers.

"Our age-old custom of planning and celebrating big events during the monsoon season has come to a halt as this period no longer offers us a stable income for the past few years. Lately, the monsoon is quite erratic in its patterns resulting in a reduction in the number of fishing days, and thus becoming the worst-hit season of the year," says 55-year old Ponnan K., a traditional fisherman from Alappuzha. - Erratic monsoon patterns and other disruptions by climate change are reducing number of fishing days as well as fishing stock in the waters of coastal Kerala. - There has been a steady decrease, over the past five years, in the availability of oil sardine and this is hitting the economic stability of coastal communities. - The income of small-scale fishers in Kerala, who depend on fishing for daily needs, has drastically reduced in recent years. People are quitting fishing and looking for other livelihood options to support their families.

In addition, the unavailability of commercially important fishes also adds to their woes. "These days we return with empty boats. Going out fishing only adds to our debts," says Unnikrishnan T.B., another fisherman from Vypin in Ernakulam district. Like Ponnan and Unnikrishnan, as many as 1,37,248 active fishermen in Kerala are passing through a difficult phase in their life, as the impacts of climate change are taking a toll on the livelihoods of the small-scale fishermen who go for fishing primarily to feed their families on daily basis. A series of environmental phenomena such as rapid warming of the Indian Ocean, sea-level rise, frequent occurrences of cyclones and associated impacts such as the vulnerability of many fish stocks and disruption of

fish food like planktons are attributed to climate change by marine scientists. Loss of working days coupled with the depletion of resources has spelled doom for the livelihood of resource-poor fishers in Kerala.

A drastic drop in the availability of the Indian oil sardine has further deepened their trouble. Loss of fishing days In a recent research article Changing Status of Tropical Cyclones Over the North Indian Ocean published in the journal Climate Dynamics, a group of scientists observes that the frequency, intensity and duration of cyclonic storms have increased in the Indian Ocean. According to them, the frequency of cyclones has increased by 52% in the Arabian Sea (during 2001-2019) and that of very severe cyclones has risen by 150%. While the intensity of the cyclones increased in the region by about 20% to 40%, the duration of very severe cyclones is up by 260% in the Arabian Sea, says this study. “The sea surface temperature (SST) has increased by 1.2 degrees to 1.4 degrees for the past century.

The surface temperature in the Arabian Sea sometimes rose to 31?C-32? C which is 28?C-29?C normally,” says Roxy Mathew Koll, Climate Scientist with Indian Institute of Tropical Meteorology, Pune and one of the authors of this study. Rapid warming of the sea and associated impacts, including cyclonic storms, adversely affect the fishing calendar days. With a substantial increase in alerts on cyclones or extreme weather conditions followed by Cyclone Ockhi in 2017, the number of fishing days has drastically come down, impacting the livelihood of fishermen. Annual marine fish landing estimates of the ICAR-Central Marine Fisheries Research Institute (CMFRI), Kochi shows Kerala experienced a fall of 46% in the number of fishing days in 2017 compared to the previous year due to Cyclone Ockhi. Some scientists call the phenomena ‘weather shocks’ which according to them have adverse effects on marine environment.

“Change in ocean ecosystem following a series of climatic issues directly affect the small pelagic resources such as oil sardine,” says Grinson George, marine scientist and Senior Programme Specialist of the SAARC Agriculture Centre, Dhaka, Bangladesh. According to George, who works on climate-related aspects in fisheries and aquaculture in South Asian region, weather shocks and associated developments in the waters influence the distribution pattern, life cycle, behavioural changes, migration pattern and reproduction of the fish stocks. Vulnerability of fish to climate change Another study by Koll signals the reduction of primary productivity such as phytoplankton in the waters owing to rapid warming over the tropical Indian Ocean. The study, published in the Geophysical Research Letter, finds that “enhanced ocean stratification due to the rapid warming of the waters suppresses nutrient mixing from subsurface layers”, which affects fish resources.

Rapid warming of the Indian Ocean may potentially turn this biologically productive region into an ecological desert, the study warns. ICAR-CMFRI’s vulnerability assessment of Indian marine

fishes to climate change also shows that ocean temperature, current speed, direction and chlorophyll have an influence on the biology of fishes. According to this study, 30% of fish species are vulnerable to climate change along the south-west coast (Kerala, Karnataka and Goa). “Large magnitude of changes in ocean temperature is expected by 2055 affecting the highly vulnerable species. These would influence changes in distribution and species composition. Our study finds that fishes which lead complex lifecycle, high exploitation and low adaptive capacity are prone to climate change,” remarks P. U. Zacharia, Principal Investigator of this study. Drop in sardine catch deepens trouble The very familiar common name “kudumbam pularthi” (family provider or family caretaker) of oil sardine among the fishing community, implies the economic significance of the species in Kerala.

The decrease in the availability of oil sardine is hitting the economic stability of coastal communities. In a recent study, the ICAR-CMFRI points out that oil sardine resource in Kerala waters is severely affected by climate change related disruptions. After a record harvest of nearly 4 lakh (400,000) tonnes in 2012, catch of oil sardine is on a declining trend in Kerala every year. For the last five years, there has been a sharp decline of oil sardine along the coast of the state. The fish registered a slight increase in 2017, but continued to slide during the following years. In 2019, the catch of sardine was just 44,320 tonnes and the yield again dropped to one-third the following year. E. M. Abdussamad, Principal Scientist at CMFRI who works on oil sardine says, “The unfavourable conditions in the ocean ecosystem following El Nino seriously influence the growth and reproduction of oil sardine resources in Kerala.” The fish landing data throws light on the disquieting condition of Kerala’s active fishermen, out of which 68% fall under BPL (Below Poverty Line) category, according to the latest census report. Normally, sardine harvest fetches good income to the traditional fishers during the monsoon period and a decline of this reousrce alone can trouble their economic safety. Substantiating this view, another CMFRI study reveal that following the reduction in oil sardine landings, the average net returns of Kerala’s outboard fishermen using ring seine experienced a sharp decline from Rs. 12,000 per fishing trip to Rs. 2500 during the period from 2014 to 2018.

The period saw a drop of the sardine catch from 2.5 lakh (250,000) tonnes to 77,000 tonnes. Fishermen in this category lost 50% of fishing efforts due to lesser availability of sardine, according to the study. Social and economic catastrophe Charles George, an activist and the president of the Malsyathozhilali Aikya Vedi (Fishermen Unity Forum) calls the situation a “social and economic catastrophe,” adding that the traditional fishing community in Kerala that is already marginalised socially and economically, is reeling under the impact of the climate-induced crisis. “Income of fishermen in the state, who depend on fishing for their daily needs, has drastically reduced over the past three years.

People are forced to flee from fishing and find some other livelihood options to support their families," he says. He further demands that a fish famine package be allowed to compensate their economic loss due to climate change and "fish drought". Responding to a query on awareness of climate change, Basheer T.K. a fisherman from Tanur in Kerala's Malappuram district says that climate change is a reality. "We are aware of this through our continuous interaction with the sea. According to our indigenous traditional knowledge we can see the sea has changed a lot. We could feel warming of the waters upon our venture into the sea. There have been drastic changes in ocean current and we could sense changes in the fish habitats," he says.

We used to venture into the sea by picking up certain signs from the sea, wind, clouds, etc. But climate change has disrupted this way of fishing too, he adds. Coastal lives in peril Storm surge, high waves, sea erosion and extreme weather conditions have put the lives of Kerala's coastal people in danger. Many coastal villages like Chellanam in Ernakulam district, Vizhinjam and Poonthura in Thiruvananthapuram district are increasingly becoming vulnerable to sea erosion which leaves many fisher families homeless more often. In May this year, hundreds of people residing in the coastal village of Chellanam were impacted when Cyclone Tauktae struck. Houses collapsed and a vast area along the coast, which extends to about 15 km, was flooded following storm waves.

According to Sebastian D.S., a fisherman residing at Chellanam, the sea is encroaching into their land each year. "This year the sea erosion is severe after the Cyclone Tauktae", he says. Livelihood issues apart, such incidents are posing threat to their life and coastal assets, putting their lives at peril. At the same time, marine experts are of the view that storm surge will occur more frequently in the coming years. According to them, alarming winds by the cyclones help form storm surge in the waters which results in high waves, sea erosion and flooding in the coastal hamlet. Safety issues Another lurking issue faced by the fishers is the lack of proper 'social safety nets' such as insurance coverage in the sector. A 2017 study carried out by Shinoj Parappurathu, Senior Scientist at CMFRI, Kochi shows that though accident risks of fishermen are covered, other risks such as vessel loss or damage and loss of other coastal assets due to natural disasters are covered only at a limited scale in India.

"If suitable insurance schemes were available, the lives of the coastal people would not have become this pathetic. Their only livelihood option is at stake owing to climate change and related fallouts", says Parappurathu. He further states that the fishermen need to be equipped with on-board safety equipment to ensure disaster-proofing. Lack of advance warning system and means for two-way communication exacerbate the risk involved. Fishermen are pushed to bear the brunt of the natural calamity in the light that only 4.25% of fisher families have GPS and 0.67% use wireless communication.

“ICAR-CMFRI is working for assessing the vulnerability of the marine fisheries sector in the future,” says A. Gopalakrishnan, Director of ICAR-CMFRI. “The institute has come up with a slew of adaptation strategies that include adoption of climate-friendly technologies or green practices, assurance of capacity building to make fishers climate-smart, development of knowledge base for climate change and marine fisheries and promotion of coastal aquaculture or cage fish farming. This is an outcome of a recent research project Impacts, Vulnerabilities and Adaptation Strategies for Marine Fisheries in India with the support of the Ministry of Environment, Forest and Climate Change. The predicted scenarios in different radiative changes will help the policy planners to go ahead with suitable plans to tide over the uncertainties,” he remarks.

Kerala: Fishing community in sea of despair

https://www.newindianexpress.com/states/kerala/2021/aug/09/fishing-community-in-sea-of-despair-2342118.html

"A week after fishing activities resumed in the state after the 52-day-long monsoon trawl ban, the festive cheer in harbours is missing and the fishing community continues to struggle in the sea of despair. Low catch due to dwindling marine resources, high operations cost, disruption of market due to Covid situation and tumbling prices have added to the woes of the fishing community. Though mechanised fishing activities resumed in the state on July 31 midnight, around 50 per cent of fishing boats are yet to venture into the sea as the owners are unable to complete the repair work of the vessels due to financial distress.

Only a few vessels that resumed fishing activities have returned with good catch. But the prices started stumbling after the initial days due to low demand. “The boats are getting threadfin bream, small shrimp and anchovy. But the size of the species is very small. The auction price of small shrimp started at Rs 80 per kg and has plunged to Rs 25. Threadfin bream gets Rs 85 per kg. Surprisingly, cuttlefish and sardines have disappeared. The deep sea fishing vessels will be returning only next week and we hope they get some good catch,” said All Kerala Fishing Boat Operators Association vice-president Paul Rajan.

Though the fishing activities have resumed, most of the shrimp peeling units are yet to open due to lockdown restrictions. Meanwhile, many workers who were previously employed in the sector have joined employment guarantee scheme as the peeling units remained shut for more than a year which affected their livelihood. Most of the processing units have been holding stock for the past few months due to lack of demand in the export sector. The ban imposed by China on 37 export firms alleging Covid contamination of packing material has added to the woes of the exporters. All these factors have a cascading effect on the fishing sector. Another issue is exploitation by middlemen.

The traders have been charging 13 per cent brokerage for sale of fish and recently hiked the share to 16 per cent. As the boat owners refused to pay the increased amount, the traders refused to procure the fish for two days. The boat owners had to sell the catch at a cheaper rate to fishmeal factories in Mangaluru. Later the traders deferred the decision for two weeks. The fishing boat operators association has submitted a memorandum to the Chief Minister seeking to end the exploitation by traders. “The traders purchase the shrimp for Rs 25 from us and sell it in the market for Rs 140. The people who toil fighting the elements are not getting a fair price.

The government should intervene and end this exploitation. The price of diesel has gone up by Rs 30 in a year and the expense of a day-long fishing expedition has crossed Rs 1 lakh. The operational cost is rising and rarely do we get some profit,” said association general secretary Joseph Xavier Kalappurakal. Meanwhile fishermen said that many species have migrated from Kerala coast due to climate change. While the volume of catch in Kerala has dropped drastically, there is an increase in landing in Tamil Nadu. A study by the Central Marine Fisheries Research Institute (CMFRI) last year had found migration of oil sardine species to Tamil Nadu coast. “There has been a decrease in the size of various fish species in Kerala coast during recent years. This could be an adverse effect of climate change. There is a need for a study on the impact of climate change on fish species in the west coast,” said scientist and CMFRI demersal fisheries division head P U Zacharia.

Kerala: Vizhinjam port turning into an eco disaster

https://www.newindianexpress.com/cities/thiruvananthapuram/2021/jul/28/vizhinjam-port-turning-into-an-eco-disaster-2336336.html

"The construction of the Vizhinjam International Deepwater Multipurpose Seaport is fast progressing. With that, the tragedy awaiting the coastline is also fast approaching, say researchers. The continuous dredging activities in Vizhinjam region has led to environmental problems and the rocky reefs which are a habitat for hundreds of marine creatures have been covered with sand and are completely destroyed.

This has also led to the loss of livelihood of the fishermen community, especially traditional mussel collectors. Dredging for the sea lane began in 2015 after Vizhinjam International Seaport Limited (VISL) signed a contract with Adani Vizhinjam Port Private Limited for the Rs 7,525-crore project. Due to the nature of the land and rock groups, it is said the area is landslide proof and that negates the need for permanent dredging, thereby making Vizhinjam an ideal location for the construction of a port.

However, the experts who have been researching the marine ecology in the area point out that the port construction is not only causing permanent damage to the sea ecosystem but also

affecting the marine life and the livelihoods of fishermen. Several studies carried out by volunteers of the city-based Friends of Marine Life (FML) led by chief coordinator Robert Panippilla have found that several of the rocky reefs have already been destroyed due to the dredging activities and other remaining ones are on the verge of destruction. Experts say that as the oceans absorb the gases that cause global warming, they become more acidic, leading to the loss of marine biodiversity such as the destruction of marine habitats and liquefaction of the coral reefs. Kumar Sahayaraju, a marine biologist involved in documentation of the reefs, says, "Rocky reefs such as 'Kozhippara Paru', 'Madan Paru', 'Panavilakode Kallu', 'Parayan Kallu', 'Neruv Kallu', 'Kulathukal Paru' and 'Charupara Kallu' have already been destroyed due to dredging and more than 147 species including mussels and corals have been lost.

A 2017 study by the Thiruvananthapuram-based Friends of Marine Life found that such coral reefs are also beginning to be destroyed in the seas off the Inayam region of Kanyakumari." Kumar says, "Climate change is generally said not to affect the deep sea. However, deep-sea biodiversity largely adapts to stable temperature conditions. Therefore, when the temperature changes due to climate change, the deep-sea biodiversity will no longer be able to adapt to it. The monsoon season is crucial for fishermen and the sea. This is also the time of fish breeding. The currents in the ocean in monsoon contribute to the phenomenon of 'Karaneerilakkam or upwelling which contributes to marine biodiversity. However, the fishermen say there was no strong monsoon or Karaneerilakkam after Cyclone Ockhi."

The ocean expert, who works closely with the fishermen community, said the traditional fishermen have tabulated that a few types of fishes such as Chennavara (Red mullets), Numb fish and Torpedo Ray found in the rocky reefs of the coastal regions of the district have completely disappeared. Kumar says, "I recently documented 32 traditional fishing reefs on the south Thiruvananthapuram coast from the shipping channel and entrance of the proposed Vizhinjam port. These are under threat. I noticed that the sessile corals which provide a habitat for the fishes are getting bleached and degraded, resulting in depletion of fishes."

A Biju Kumar, head of Department of Aquatic Biology and Fisheries, University of Kerala, said, "The region had a good mussel bed before the dredging works began. However, after the dredging began, we noticed that most of it was covered by sand. If this continues, it will lead to the total destruction of the mussel habitat." The fishermen also blame the port project for destroying the mussel habitat and their livelihood. Sam Kutty, a member of the Fish Workers Forum, Kovalam unit, says, "The marine biodiversity has been completely destroyed due to the Vizhinjam port dredging.

The mussel habitat is destroyed and due to less mussel catch, the mussel collectors are forced to take up other jobs to survive. If dredging continues, the sea ecosystem will be completely destroyed in a few years." The dark side of development Kumar Sahayaraju, a marine biologist

involved in documentation of the reefs, says many rocky reefs such have already been destroyed due to dredging and more than 147 species including mussels and corals have been lost.

Kerala: KSSP concerned over appointment of members of panel looking into fishers' issues

https://www.thehindu.com/news/cities/Kochi/kssp-concerned-over-appointment-of-members-of-panel-looking-into-fishers-issues/article35525944.ece

"The Kerala Sasthra Sahithya Parishad (KSSP) has welcomed the State government's move to appoint a three-member committee to look into issues that may crop up on account of the draft Coastal Zone Management Plan under the Coastal Regulation Zone notification of 2019. The Parishad, however, expressed concern over the members of the committee that had been constituted, among others, to look into livelihood and safety issues of fishers, said a press release here. It said that the government had appointed the committee through an order dated July 1 to study the draft prepared by the National Centre for Earth Science Studies (NCESS).

The Parishad's reservation is that one of the members of the committee is a Delhi-based consultant on environmental impact of various projects. The member is also a consultant to real estate developers, builders of resorts, and quarry owners. It is not appropriate to make such a person a member of the committee, the release said. Another member is a legal advocate of violators of coastal zone regulations, the Parishad alleged. The release claimed that the two would not be able to represent the views and interests of the fishing community, as they were in no way related to the sector. A democratic government should ensure that the interests of the fishing community, now reeling under climate change and other adverse conditions, are protected, said O.M. Shankaran, president, and P. Gopakumar, general secretary of the Parishad, in a statement on Sunday.

Kerala: Fisherfolk are still at sea over their livelihoods

https://www.thehindubusinessline.com/economy/fisherfolk-in-kerala-are-still-at-sea-over-their-livelihoods/article35419540.ece

"Mumbai, July 20 James Kalathil*, a fisherman from Thuravoor, has pondered over leaving this profession many a time in the past few months. During the last lockdown, he was compelled to go to work by taking a secretive route to avoid the police checkpoints, which helped to bring in some money during an otherwise dry period. He managed to go for 'neetu

pani' - individuals or groups of two or three people venture into the sea on a 'ponthu' - amid the lockdown. Few others were not so 'fortunate' enough to go for such clandestine work, like Sebastian Maliekal, who has remained at home for the past one and a half months with no means to earn an income.

The fisher communities of Chellanam and Thuravoor gram panchayats of Ernakulam and Alappuzha districts, respectively, are an aggrieved lot. With just over 40 working days in the past year, compared to 200 days of work in a normal year, the fisheries sector is staring at an estimated loss of Rs.1,371 crore, as per an assessment by the Kerala State Planning Board. The sector was plagued by multiple problems like cyclones and floods, which significantly brought down the number of days of work, even before the onset of the pandemic. While the fisher families were slowly limping back to make both ends meet, the second wave of Covid-19 struck. It has been almost 25 years since Maliekal began his fishing work. He rues not having learnt any other skill, because of which he is still anchored to this field.

"Free ration kits worth Rs.300- Rs.500 does not change the desperate circumstances of our lives. We are forced to borrow money or pawn valuables in order to survive each day." According to the Department of Fisheries website, under the Saving-Cum-Relief scheme (SRS), Rs.600 is collected from fishermen and an amount of Rs.1,800 is released to them during lean season every year, which is April to June in the marine sector and June to August in inland sector. But, as per latest update, fishermen now have to pay Rs.1,500 in order to receive Rs.4,500 in return, under SRS. According to information received from the Chief Minister's office in September 2020, as a response to the petition filed by former Union Minister K V Thomas, an amount of Rs.31.16 crore was sanctioned from the State Disaster Relief Fund and Rs.5 crore from the Chief Minister's Disaster Relief Fund to support fishermen who lost their jobs during the Covid-19 lockdown.

The families of fishermen engaged in fishing activities were to be given an amount of Rs.2,000, while registered fishermen Rs.1,000, in addition to SRS. According to a report by The New Indian Express, as many as 1,78,365 fishermen, included under the SRS, were sanctioned an amount of Rs.3,000 amid the shutdown. Kalathil, a member of Matsya Thozhilali Kshemanidhi Board or Kerala Fishermen's Welfare Fund Board (KFWFB), which provides for the constitution of welfare of fishermen in the State, said although he had heard of these aids, he has not received either of the sanctioned amounts nor does he want to run behind it. Complaints to the fisheries office and collectorate have fallen on deaf ears.

The traditional fishers who mainly depend on the trawling period (June 9 to July 31 this year), to earn some big bucks, (people earn from 50k to Rs.1 lakh or more over the 2 months. In comparison, Kalathil has got Rs.5,000 since last week. By this time, he should have earned around 40k normally. The fishing boats, which usually take around 20 fishermen, are carrying

larger groups of 35 people or more now .Such large numbers are gathering this year because people from other professions like carpenters, daily labourers, etc who were also rendered jobless due to covid and lockdown, are taking up fishing to make ends meet.

This, in turn, reduces the individual profit share from about Rs.3,000 to Rs.1,000. “We can't no to these people because we understand the struggle to somehow make ends meet,” says Kalathil. Xavier Sajeev has taken up jobs as a painter and a fisherman. But his income has reduced by at least 50 per cent in comparison to previous years. “I got Rs.2,000 and Rs.1,000 as separate deposits from the government as financial aid amid the lockdown last year, but not this year. Rs.200 each for 6 days of work lost due to Tauktae cyclone was also credited. But, there are many discrepancies in the distribution of these amounts to people,” he says. On top of these Covid induced difficulties, the destructive trail left by cyclone Ockhi in November 2017 has aggravated the problems.

“Any hint of a low pressure area developing is a reason for the government to stop us from going into the sea. It almost seems like we are bearing the brunt for the State’s mistake of dismissing the warnings issued prior to Ockhi,” said Sajeev. Traditional fishers feel that they can easily reach back to safety by gauging the wind and waves, since they don’t go as far as trawlers. Dr. Saly N Thomas, Principal Scientist at Central Institute of Fisheries Technology (CIFT), said the government’s warnings cannot be completely ruled out as of late, the western coast is becoming vulnerable to inclement weather conditions due to climate changes. According to Dr. M. V. Baiju, senior scientist at CIFT, the small fishing boats with a speed of 10 km/h - 15 km/h cannot match the strong winds which blow at 40 km/h - 55 km/h.

Most of the vessels here are not scientifically designed adhering to the specifications for stability. “The mandatory life saving equipment and communication systems are also rarely followed by the fisherfolk,” he added. Sajeev, a fisherman at Chellanam harbour, feels that Rs.200, under the financial assistance announced by the fisheries department for Tauktae cyclone affected fishermen, is an unfair compensation for a day’s loss of work, but it is better than nothing. On the other hand, Maliekal who works at the Kochi harbour, is unaware of the ?200 compensation and did not know anyone who received it. “Do you think Rs.1,000 is enough for a family of four to survive for a month? The government should make provision to provide at least Rs.3,000,” said Maliekal. Emails to the Chief Minister’s officer and fisheries department elicited no response.

Kerala: Expert panels scrutinising draft Coastal Zone Management Plan

https://www.thehindu.com/news/cities/Kochi/expert-panels-scrutinising-draft-coastal-zone-management-plan/article35288246.ece

"As the Coastal Zone Management Plan (CZMP) for Kerala, which will define development activities along the coastal belt, is being finalised, various stakeholder agencies are assessing the impact of the draft plan. While the Fisheries Department has constituted an expert committee to assess the impact of the proposal on the sector, the Tourism Department has engaged a consultant to list its concerns. The draft CZMP, which covers nine coastal districts and Kottayam, is being circulated to elicit views from stakeholder agencies. The Fisheries Department too has constituted an expert committee by including 10 members. The department, while noting that fisherfolk and fish farmers are the major stakeholders in the coastal regulation zone area, feels that inputs for housing and development activities for the sustainable development of coastal areas need to be incorporated in the CZMP. It also plans to come out with an Integrated Fisheries Development Plan, which can be incorporated into the CZMP.

The 10-member committee is headed by K.V. Thomas, former head of the Coastal Processes Division of the National Centre for Earth Science Studies (NCESS). The Environment Department, on its part, has constituted a three-member committee consisting of the Additional Chief Secretary, environmental consultant P.Z. Thomas, and lawyer P. B. Sahasranamam to study the draft plan. Meanwhile, a section of fishermen has opposed the nomination of members to the committee. Matsya Thozhilali Aikya Vedi (TUCI) State secretary Charles George complained that the committee had been constituted to sabotage the implementation of the CZMP. The organisation demanded that the committee be scrapped.

The suggestions put forward by various agencies will be discussed at the Kerala Coastal Zone Management Authority meeting and forwarded to the NCESS for its consideration. The public will get an opportunity to comment on the draft proposal and suggest modifications during public hearings. The State will be able to avail the benefits of the 2019 CRZ notification only if the CZMP is approved and notified by the Ministry of Environment, Forest and Climate Change.

Kerala: Sea surge on Kerala coast: Why experts are calling for nature-based solutions

https://www.downtoearth.org.in/news/climate-change/sea-surge-on-kerala-coast-why-experts-are-calling-for-nature-based-solutions-77431

"Kerala's 590-kilometre-long coastline — one of the most densely populated in India and exposed to rogue waves — has for long been susceptible to large-scale sea erosion. The Pinarayi Vijayan-led Left Democratic Front (LDF) government has adopted traditional measures such as seawalls and breakwaters to brace against the perceptible impacts of climate change. But there are reasons to believe they may not save the state from the rising seas. A recent study has flagged the possibility of coastal areas in the state witnessing an increasing trend of sea surge in the coming years, mainly due to the rise in sea surface temperature.

The scientists have advocated for nature-based solutions, in such a case, involving active participation of residents of the coastal communities. Seawalls are walls or embankments erected to prevent the sea encroaching on or eroding an area of land. The scientists involved in the study termed the present practice of erecting granite seawalls as counter-productive. They emphasised that mineral sand mining — rampant in coastal areas of Kollam, Alappuzha, and Ernakulam districts — be confined to public sector with strict monitoring amid numerous complaints of illegal extraction of mineral sand by private agencies. They urged the state government to focus on protecting and promoting mudflats, coastal wetlands, mangroves and sandy beaches to prevent further escalation of sea erosion, which has gained alarming proportions even before the onset of south-west monsoon.

The study flagged the need for participatory seashore management and a coastal erosion map. The joint study was conducted by: - A Biju Kumar (Professor and head of department, Aquatic Biology and Fisheries, University of Kerala) - KV Thomas (retired chief scientist and head of National Centre for Earth Sciences, Thiruvananthapuram) - Ajayakumar Varma (retired chief scientist and head of Natural Resources and Environmental Management wing of National Centre for Earth Sciences, Thiruvananthapuram) - E Shaji (associate professor and head, Department of Geology, University of Kerala) - TV Sajeev (senior principal scientist, Kerala Forest Research Institute, Peechi) Restore mangrove forests The increasing calamities faced by the coastal community has elicited the need to restore coastal vegetation, including mangrove forestation, which could act as a bio-shield to the coastal belt, Sanjeev told Down to Earth.

K V Thomas said: “More than 0.6 million people of Kerala are directly dependent on the sea for their livelihood. There is a vast segment that indirectly relies on the sea by way of fisheries, tourism, transport of goods and people, aquaculture, energy, materials for biotechnology, minerals, and metals. The sea and the seashore are the most threatened areas during the Anthropocene. The current and predicted climate change impacts threaten the very existence of seashore communities.” He added that the most impacted communities in Kerala — bordered by the Western Ghats on the east and the Lakshadweep Sea on the west — live at the ecotone of land and the sea. This calls for urgent intervention of the state government.

Seashore erosion has worsened coastal ecological balance and we need to evolve better solutions based on nature and in tune with the integrated development of Kerala, he added. The coastline has also been subjected to environmental dynamics of the past several thousand years that eventually led to the formation of a wide range of geomorphological features such as backwaters, bays, lagoons, salt marshes, sand dunes and sandy shores, said Thomas. The study noted: “Among the 44 rivers originating from Kerala in the Western Ghats, 41 empty into the Lakshadweep sea. The average distance between the seas and the Western Ghats is 55-56 km. The backwaters, formed when the seawater pushes back the river as it reaches from the plains

into shallow areas, is a unique characteristic of Kerala. The vagaries of the sea level and beach barrier formed perpendicular to the shore that led to the formation of the backwaters like Vembanad, India's largest backwater ecosystem.

The nutrient richness of the shallow seas in Kerala is due to the nutrients and organic matter brought by the rivers through the estuaries…" The ocean currents — in tune with the winds that bring cold, nutrient-rich water, which upwells in the Kerala coast — make the seashore productive, thereby ensuring good fish biomass. Residents thrive by extracting resources from nature around them and are tied to the ecosystems they live in. Any damage to the ecosystem will be at the cost of their livelihood, the study warned. The seashore degradation started in Kerala in the 1950s, primarily due to unscientific constructions in the seashore, said Biju Kumar.

"The constructions comprising mostly harbour breakwaters ignored the ecotone landscape's dynamic nature. The beach nourishment systems adopted the world over during the construction of harbours was not implemented." Hard armouring structures such as the seawall have been presented as the only solution to degradation; but they have only aggravated the issue. The degradation of rivers — that brought sand and sediments to maintain the seashore — also worsened the situation. "The life of the lowland people became a rope walk between the sea and the land, and many lost their homes and livelihood, said Kumar. He warned that the tourism industry has shifted to inland backwaters and the Western Ghats from the shoreless seashore. The increasing number of hurricanes in the Arabian sea and the rising sea level may aggravate the situation. The seashore is maintained by the continuous process of accretion and erosion, according to the researchers.

According to them: The 'room for seashore' must be taken up as an immediate slogan, they said. The decision to leave 50 meters distance from the shoreline for the sea to ensure the stability of beaches must be strictly enforced. The study suggested preparing a list of hotspots based on available studies on seashore erosion and field verification reports reported by local self-governments. Based on the intensity of erosion, the seashore should be classified as: - Severely eroded seashore (where the erosion is intense and no management method is possible) - Highly eroded seashore (where erosion is intense but management is possible) - Moderately eroded seashore - Slightly eroded seashore - Seashore prone to erosion - Erosion-free seashore.

The way ahead According to Sajeev, the current breakwater and seawall constructions have worsened the sea erosion scenario. Better structural features are needed for seashore maintenance after careful study of the current status. Beach nourishment methods and sand bypassing should be considered wherever possible, after site-specific studies, considering coastal geomorphology and dynamics. "India is envisaging an integrated coastal zone management project. Local-level participatory coastal zone management projects should be implemented as part of this. The district-level management committees should lead these projects," observed E Shaji. Among

other suggestions were: - A coordination committee headed by the chief minister to complete the projects in a time-bound manner. - Institutions like KILA (Kerala Institute of Local Administration) should conduct training for local self-government representatives using the expertise available at NCESS, KFRI, CWRDM, Universities, and Geology, Marine Sciences, Ecology, etc. - The green army, civil society organizations, and citizen scientists should also be used to prepare local-specific coastal zone management plans. - A coastal zone monitoring network should link civil society groups, environmental activists and link all local self-government in the coastal zone to monitor violations of the coastal zone management Act. –

Ecosystem services of the coastal zone should be assessed and sustainable management plans should be developed and implemented through integrative research. - The researchers said mining of the strategically important mineral sand should be regulated strictly and should be done only by the public sector. Mudflats, coastal wetlands, mangroves, and sandy beaches should be declared as Ecologically Sensitive Zone 1. Dredging will be necessary at ports. It has to be made sure that the mud and soil excavated are not used to reclamation coastal wetlands. Sand mining should be prohibited at the hotspots. There should be a reliable enforcement mechanism for this. Shores, where the Olive Ridley turtles lay eggs, should be protected. "Studies based on predictive models should be started to develop better coastal zone management.

Nature-based solutions should be used to prepare green belts at the coastal buffer zone, and the activities should be linked to Rural Employment Guarantee programs and programs schemes," said Thomas. Meanwhile, a webinar organized by the Central Marine Fisheries Research Institute (CMFRI) in Kochi also suggested similar steps. The webinar highlighted that the entire Kerala coast recently witnessed a 'storm surge' during the two cyclones — Tauktae and Yaas. "Kerala's coastal region could be protected from the wrath of the sea to a great extent through the restoration of mangroves and other biodiversity in the region," said CMFRI Director A Gopalakrishnan when contacted by Down to Earth.

Kerala: Infrastructure Projects amplified Cyclone Tauktae's impact

https://science.thewire.in/environment/in-kerala-infrastructure-projects-amplified-cyclone-tauktaes-impact/

"An eerie silence is still prevailing over Chellanam, a coastal village panchayat located between Ernakulam and Alappuzha in Kerala, where cyclone Tauktae barrelled dangerously into the tiny houses of COVID-battered fish workers a few days ago. Over 500 houses of the village were inundated in the worst-ever sea attack since Cyclone Ockhi of 2017. The primary health centre at Kandakkadavu in the middle of the panchayat was seen fully submerged in waist-high water due to Tauktae. With the help of fire and rescue workers, health department officials were

able to retrieve medicines and equipment stored there, especially those required for COVID-19 treatment. According to panchayat president K.D. Prasad, Chellanam witnessed a spike in COVID-19 cases when the cyclone Tauktae wreaked havoc in all 21 wards.

There were 601 active COVID-19 cases in the panchayat area, and even the facilities where the patients got accommodated were destroyed in surging waves. He said high waves continue to hit the coastal settlements despite cyclone moving away. A local resident Louis Abraham said that seawater intrusion into houses is continuing and most houses are under knee-deep water. "As COVID-related lockdown was strict in our area, rescue and rehabilitation work faced enormous hurdles. We had even to organise online protests to attract relief works and government intervention," said Louis. The situation is almost similar in the Thiruvananthapuram district's fish worker settlements such as Beemapalli, Vizhinjam, Anchuthengu, Muthalapozhi, Paruthiyur, and Kochuthoppu.

The road linking Thiruvananthapuram city with the domestic terminal of the local airport via the famous Shanghumukham beach was washed off. Though the cyclone killed only two people in Kerala, its intensity across the coastal region was heavy. The worst affected districts include Ernakulam, Kollam, Alappuzha, Kozhikode and Kasargod. "The nature and severity of cyclone Tauktae indicate that the Arabian Sea will witness more such severe storms in the coming days, especially during late monsoon season, due to climate change. Until 2014 when Cyclone Nilofar occurred, there were no cyclones in the entire Arabian seacoasts. Global warming, climate variability, and weather changes are increasing the risk. As far as the Kerala coast is concerned, many human interventions make the cyclones severe.

They include land reclamation, port developments, shrimp farming, river diversion, dredging, and sand mining," points out S. Abhilash, a scientist with the Department of Atmospheric Sciences at Cochin University of Science and Technology (CUSAT). "Places like Chellanam have witnessed severe destruction because of the human activities which turned supporting factors for the natural forces. The cyclones have intensified the ongoing coastal erosion," he observed. Abhilash stated that the cyclone frequency over the Bay of Bengal is on the decrease in the recent years, but they are increasing over the Arabian Sea around the onset phase of the monsoon. He noted that cyclone Tauktae is the fourth cyclone in recent years to have developed in the Arabian Sea and in the pre-monsoon period of April to June. All these cyclones since 2018 have been categorised as either 'severe cyclone' or above.

After Cyclone Mekanu, which struck Oman in 2018, the Arabian sea witnessed Cyclone Vayu in 2019, and it struck Gujarat. Cyclone Nisarga followed it in 2020 and struck Maharashtra. "All tropical cyclones require large amounts of energy to remain alive. Normally, this energy is obtained from the warm water and humid air over the tropical seas. At present, seawater up to depths of 50 metres is hot in the Arabian Sea, and so the possibilities of more cyclones are in the

cards," he observed. While Thushar Nirmal Saradhi, a social activist who works with the climate change victims of Chellanam, emphasised that "for people outside Chellanam, sea erosion may be a new phenomenon propelled by the climate change-induced cyclones but for us, it has been happening for over six decades."

"It all began when a shipping route was dredged to Cochin shipyard through the sea close to our villages. The construction of the coastal highway connecting Kochi with Aapuzha has further intensified sea erosion. Now, the cyclones have turned into a regular phenomenon posing a severe threat to our people. In the previous years, the authorities have promised to construct sea walls using geosynthetic tubes. Still, synthetic geo constructions that began last year were washed away in the cyclone," said Saradhi. Impact of infrastructure projects The unscientific and rapid development of big infrastructural projects is being pointed out as one of the reasons for the intense impact of the cyclone.

Max Martin, a researcher working with coastal communities in Southern Kerala, said: "The impact of the cyclone (Tauktae) was heavy on the northern parts of all major constructions in the sea in Kerala, mainly ports and breakwaters. Rampant coastal zone violations and destruction of adjoining wetlands have contributed immensely to the destruction. The coastal region of Kerala is now under high risk, and it is high time that ways are found to minimise the impacts of climate change." A similar concern is being highlighted by those working with fishermen. "Every year, the sea is drawing closer to us. The wide beaches are getting smaller. Cyclone Tauktae is not an isolated phenomenon. It is an extension of the disasters happening in the coastal region for a long time. The human factors related to sea erosion are often ignored conveniently," said Joseph Jude, a rights activist working with Kerala fish workers.

Albert Thomas, a fish worker of Arthunkal in Alappuzha observed that climate change has been affecting the character of the Arabian sea for a long time. "The sea started turning turbulent ever since the Tsunami of 2004. Ockhi further worsened the situation. Now we rarely see the sea calm. The height and force of the waves have increased in recent years. They are times, not just during the monsoon months of June to September but all through the year. It's difficult to predict how the sea will behave," said Thomas. Fish workers also alleged that there is an alarming depletion in fish wealth in the Arabian Sea in the last three years. They state that because of the loss of beaches, they find it difficult to dry their nets and small fish under the sun. In Vizhinjam-Shanghumukham regions, fish workers accuse the Vizhinjam International Seaport, which is under construction, of inciting natural disasters.

A news report said that Cyclone Tauktae severely damaged the breakwater of the under-construction seaport, and washed away vast amounts of stones and concrete pillars. "The seaport has played a significant role in destroying houses in Valiyathura, Beemapalli, and Shanghumukham areas. Because of the constructions in the sea, the waves have become rougher.

The breakwater has prompted the waves to hit the shores harder," observes Joseph Vijayan, an expert on coastal communities in Thiruvananthapuram. Do seawalls work? In 2017, the international journal Natural Hazards published a paper 'Impact of sea-level rise and coastal slope on shoreline change along the Indian coast,' which said that the highest level of coastal erosion was occurring in West Bengal and identified Kerala as a close second.

Other studies have also observed that the western coast of India was primarily stable except for Kerala's coastline of 590 km. They estimate that about 63 percent of the state's coastal region faces sea erosion. Earlier this month, the Kerala Coastal Zone Management Authority (KCZMA) distributed a draft coastal zone management plan among concerned local bodies in all coastal districts for discussion. In Kerala, nine districts are affected by sea erosion. During each incident of sea turbulence, coastal communities seek solutions, and the government soon starts the construction of seawalls. As per data available from the KCZMA, seawalls have been erected in almost 60% of the Kerala coast, spread in 310 km.

"Seawalls are not a solution to sea erosion. Fortifications of this kind are increasing the flow of the currents around the shore. That results in the intensification of waves to the north of the breakwater and subsequent further erosion of that shoreline. But the local people insist that fortifications are the only way they can save their homes," observed Abhilash of the CUSAT. Joyce Mary, a 52-year-old resident of Kannamaly, said seawalls were a big failure in preventing the raging sea from entering households. Even huge stones and concrete pillars used for the walls have been washed away. Losing home, Joyce moved to a relative's house where 15 people of three families now live.

According to Joseph Vijayan, seawalls and breakwaters are interruptions of sediments across the coast preventing the coastal areas from getting replenished. While Max Martin said: "We need to plant trees and plants in the coastal areas that protect our beaches. Only natural remedies can solve the issue, not human-made constructions. Coastal vegetation, as well as mangrove plantations, can hold the sand in the shore." Activists want the state government to formulate a policy in this regard. "A state like Kerala with its long shoreline needed to have a clear policy outlook to protect coastal areas," said Charles George, a leader of the Kerala fish workers forum.

Kerala: How infrastructure projects intensified cyclone Tauktae's impacts

https://www.moneycontrol.com/news/environment/how-infrastructure-projects-intensified-cyclone-tauktaes-impacts-in-kerala-6933501.html

"An eerie silence is still prevailing over Chellanam, a coastal village panchayat located between Ernakulam and Alappuzha in Kerala, where cyclone Tauktae barrelled dangerously into the tiny houses of covid- battered fish workers a few days ago. Over 500 houses of the village were

inundated in the worst-ever sea attack since Cyclone Ockhi of 2017. The primary health centre at Kandakkadavu in the middle of the panchayat was seen fully submerged in waist-high water due to Tauktae. With the help of fire and rescue workers, health department officials were able to retrieve medicines and equipment stored there, especially those required for Covid-19 treatment.

According to panchayat president K.D. Prasad, Chellanam witnessed a spike in Covid-19 cases when the cyclone Tauktae wreaked havoc in all 21 wards. There were 601 active Covid cases in the panchayat area, and even the facilities where the patients got accommodated were destroyed in surging waves. He said high waves continue to hit the coastal settlements despite cyclone moving away. A local resident Louis Abraham said that seawater intrusion into houses is continuing and most houses are under knee-deep water. “As covid related lockdown was strict in our area, rescue and rehabilitation work faced enormous hurdles. We had even to organise online protests to attract relief works and government intervention,” said Louis.

The situation is almost similar in the Thiruvananthapuram district’s fish worker settlements such as Beemapalli, Vizhinjam, Anchuthengu, Muthalapozhi, Paruthiyur, and Kochuthoppu. The road linking Thiruvananthapuram city with the domestic terminal of the local airport via the famous Shanghumukham beach was washed off. Though the cyclone killed only two people in Kerala, its intensity across the coastal region was heavy. The worst affected districts include Ernakulam, Kollam, Alappuzha, Kozhikode, and Kasargod. “The nature and severity of cyclone Tauktae indicate that the Arabian Sea will witness more such severe storms in the coming days, especially during late monsoon season, due to climate change.

Until 2014 when Cyclone Nilofar occurred, there were no cyclones in the entire Arabian seacoasts. Global warming, climate variability, and weather changes are increasing the risk. As far as the Kerala coast is concerned, many human interventions make the cyclones severe. They include land reclamation, port developments, shrimp farming, river diversion, dredging, and sand mining,” points out S. Abhilash, a scientist with the Department of Atmospheric Sciences at Cochin University of Science and Technology (CUSAT). “Places like Chellanam have witnessed severe destruction because of the human activities which turned supporting factors for the natural forces. The cyclones have intensified the ongoing coastal erosion,” he observed.

Abhilash stated that the cyclone frequency over the Bay of Bengal is on the decrease in the recent years, but they are increasing over the Arabian Sea around the onset phase of the monsoon. He noted that cyclone Tauktae is the fourth cyclone in recent years to have developed in the Arabian Sea and in the pre-monsoon period of April to June. All these cyclones since 2018 have been categorised as either ‘severe cyclone’ or above. After Cyclone Mekanu, which struck Oman in 2018, the Arabian sea witnessed Cyclone Vayu in 2019, and it struck Gujarat. Cyclone Nisarga followed it in 2020 and struck Maharashtra. “All tropical cyclones require large amounts of energy to remain alive.

Normally, this energy is obtained from the warm water and humid air over the tropical seas. At present, seawater up to depths of 50 metres is hot in the Arabian Sea, and so the possibilities of more cyclones are in the cards," he observed. While Thushar Nirmal Saradhi, a social activist who works with the climate change victims of Chellanam, emphasised that "for people outside Chellanam, sea erosion may be a new phenomenon propelled by the climate change-induced cyclones but for us, it has been happening for over six decades." "It all began when a shipping route was dredged to Cochin shipyard through the sea close to our villages. The construction of the coastal highway connecting Kochi with Aapuzha has further intensified sea erosion.

Now, the cyclones have turned into a regular phenomenon posing a severe threat to our people. In the previous years, the authorities have promised to construct sea walls using geosynthetic tubes. Still, synthetic geo constructions that began last year were washed away in the cyclone," said Saradhi. Impact of infrastructure projects on Kerala's coastline The unscientific and rapid development of big infrastructural projects is being pointed out as one of the reasons for the intense impact of the cyclone. Max Martin, a researcher working with coastal communities in Southern Kerala, said: "The impact of the cyclone (Tauktae) was heavy on the northern parts of all major constructions in the sea in Kerala, mainly ports and breakwaters.

Rampant coastal zone violations and destruction of adjoining wetlands have contributed immensely to the destruction. The coastal region of Kerala is now under high risk, and it is high time that ways are found to minimise the impacts of climate change." A similar concern is being highlighted by those working with fishermen. "Every year, the sea is drawing closer to us. The wide beaches are getting smaller. Cyclone Tauktae is not an isolated phenomenon. It is an extension of the disasters happening in the coastal region for a long time. The human factors related to sea erosion are often ignored conveniently," said Joseph Jude, a rights activist working with Kerala fish workers.

Albert Thomas, a fish worker of Arthunkal in Alappuzha observed that climate change has been affecting the character of the Arabian sea for a long time. "The sea started turning turbulent ever since the Tsunami of 2004. Ockhi further worsened the situation. Now we rarely see the sea calm. The height and force of the waves have increased in recent years. They are times, not just during the monsoon months of June to September but all through the year. It's difficult to predict how the sea will behave," said Thomas. Fish workers also alleged that there is an alarming depletion in fish wealth in the Arabian Sea in the last three years. They state that because of the loss of beaches, they find it difficult to dry their nets and small fish under the sun. In Vizhinjam-Shanghumukham regions, fish workers accuse the Vizhinjam International Seaport, which is under construction, of inciting natural disasters.

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away. “The seaport has played a significant role in destroying houses in Valiyathura, Beemapalli, and Shanghumukham areas. Because of the constructions in the sea, the waves have become rougher. The breakwater has prompted the waves to hit the shores harder,” observes Joseph Vijayan, an expert on coastal communities in Thiruvananthapuram. Are seawalls successful in tackling sea erosion? In 2017, the international journal Natural Hazards published a paper ‘Impact of sea-level rise and coastal slope on shoreline change along the Indian coast,’ which said that the highest level of coastal erosion was occurring in West Bengal and identified Kerala as a close second.

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Kerala: Idling boats, fishers anxious on the coast

https://www.thehindu.com/news/national/kerala/idling-boats-fishers-anxious-on-the-coast/article34433857.ece

"Hit hard by an unprecedented dip in catch, majority of the fishing boats in Kerala are lying idle for the last few days generating anxiety in the sector. While 80% of the trawlers have stopped venturing into the sea, traditional fishers say there has been an alarming decline in the availability of pelagic fish species such as mackerel and sardine. Though the annual lean season is not over, the fishers say they are facing a fish famine for the first time in several decades. They also feel that this drastic depletion may hint at a change in marine environment and its capacity to replenish fishery stocks.

“Along with the low availability of fish, the hike in fuel price has left us in a difficult spot. The diesel price was around Rs.62 last year, but now it has touched Rs.86 which makes a huge difference in total expenditure. If we can’t return with a reasonably good catch, the result will be mounting debts and we have decided to stay off waters due to this,” says Peter Mathias, president, All Kerala Fishing Boat Operators Association. Fishers say the situation has proved all the normal forecasts wrong and point out many reasons for the famine, including pollution and overfishing. “Only small units are venturing into the sea at present and they are able to survive as the prices have skyrocketed due to the shortage. We agree that this is a lean season, but we have never experienced such scarcity before,” says Jackson Pollayil, president, Kerala Swatantra Matsyathozhilali Federation.

Since climate change and rising sea temperatures can affect the migratory pattern and stock size of pelagic fish, they also fear that some species might have moved away from the shallow coastal waters. “In the month of April and May we usually harvest mackerel and sardine in huge volumes, but right now both have become rare. Traditional fishers mainly depend on the pelagic stock and now it remains nearly empty.” Mr.Pollayil adds that unscientific fishing methods, including pair trawling, too have contributed to the situation. “They use Chinese engines and multiple gears to sieve all three levels of the sea. They net a lot of juveniles and that part of the catch goes straight to the fish meal fish oil (FMFO) industry.

In a sense the ban and regulation on fishing during the early pandemic days helped us as the landings were really good in post-lockdown days,” he says. Mr.Mathias says overexploitation can be one main reason as an enormous number of crafts are currently fishing in our sea. “We have boats and crafts three times beyond the capacity of our sea and the government keeps giving permission. At present 80% of boats in the mechanised sector are staying off waters, which is something totally unheard of under normal circumstances. If this continues it will be difficult for the sector to stay afloat,” he adds.

Kerala: Allow fishing boats to venture into deep sea, plead operators

https://www.thehindubusinessline.com/economy/agri-business/allow-kerala-fishing-boats-to-venture-into-deep-sea-plead-operators/article34261581.ece

"Mechanised fishing boat operators in Kerala are insisting that they be allowed to carry out fishing in deep sea waters like their counterparts in other States and countries. The operators, who are curbed by the State Government not permitting them to venture out into the deep sea, have pleaded their case with the Union Government. While fishing boats in the State are not allowed, trawlers, particularly from China, are allowed to venture into deep sea. All-weather employment Joseph Xavier Kalapurackal, general secretary of All Kerala Mechanised Fishing Boat Operators Association, said fishermen in the State are capable of fishing in deep waters, and to any extent, if permitted.

If permission is granted to them, the presence of Chinese fishing trawlers could be deterred, he said, adding that there are about 800 Chinese fishing boats currently engaged in fishing in the Arabian Sea. In a memorandum submitted to the visiting Union Fisheries Minister Giriraj Singh, the Association requested that fishing should be made an all-weather employment with many expatriates migrating to fishing as a vocation after having lost their jobs. The association also sought the Minister's intervention to urge the State Government to not impose a fee on fishing boats that operate beyond 12 nautical miles.

Other State governments are not levying any such fee. The sea and its resources beyond 12 nautical miles from shore fall within the jurisdiction of the Union Government, Kalapurackal argued. Subsidised fuel Fishing has become a high-cost venture, in view of the rising price of diesel. The association urged the government to provide fuel to fishing boats at a reduced or subsidised rate to help the industry. Of late, the fishing sector. including its subsidiaries, is passing through a critical phase on account of a host of issues that include shortage of fish in the seas due to climate change, Covid-related restrictions, etc. This has impacted more than three lakh fish workers and their families.

Kerala: As jellyfish blooms increase in North, fishers put a pause on work

https://india.mongabay.com/2021/02/as-jellyfish-blooms-increase-in-north-kerala-fishers-put-a-pause-on-work/

"In the early hours of the day, when the sky is clear and blue, swarms of jellyfish wade through the waters surrounding Kavvayi islands, some four kilometres from the nearest town, Payyanur, in Kannur district of Kerala. "It is a beautiful sight indeed. When you watch them slowly propel themselves through the water, they don't even seem that dangerous," says Satheeshan T.V. a fisher worker from the island. Aesthetics aside, jellyfish blooms sighted in estuaries in and around Kavvayi as well as Madakkal, Nileshwaram, Padanna, Valiyaparamba and neighbouring regions in Kasargod district have become a cause for concern for the fisher workers here. Sighted from November to March, jellyfish blooms are almost an annual phenomenon in these coastal regions of North Malabar.

However, their scale has increased at an unprecedented rate, observe fisher workers from the region. “Normally, we wouldn’t mind. We have been sighting them every year, so you expect them to bloom at this time. We try to avoid trapping them in our nets as much as we can. But now, it appears that their numbers are increasing at a steady rate, so much so that some of us have to stop going for work for days,” says Madhu, a long-time fisherman, who stays near Madakkal. Jellyfish is a collective term for any umbrella-shaped gelatinous animal in marine waters and is considered the oldest animal found on earth, having overcome 500 million years through natural selection. Over 90 percent of a jellyfish’s body is composed of water. Experts estimate that India is home to around 50 jellyfish species, out of which at least 20 species have been identified in Kerala.

Around six species of these have reported regular blooms in the state. A 2016 article by A. Biju Kumar and Riyas A., published by Society for Environmental Education Kerala (SEEK), has elucidated that jellyfish blooms have been notably increasing in Kollam district’s Paravur, Elathur and Korappuzha in Kozhikode, as well as Nileshwaram and Padanna in Kasargod. While venomous stinger jellyfish species have been reported across the globe, regional scientists say that most of the species found in Kerala’s coasts are not fatal and can, at the most, induce itching and swelling, upon contact.

Jellyfish woes for fisher workers, aquaculture The discomfort caused by certain jellyfish is such that the indigenous species has been named after it. The local name for jellyfish is ‘kadal chori’, which literally translates to ‘sea-itch’. In Kavvayi and neighbouring regions in Kannur and Kasargod, they are also called ‘kanjaampothu’. However, the fisherfolk also mention that not all jellyfish are harmful. “There is a white jellyfish (Acromitus flagellatus) with black patches on its umbrella, which is mostly innocuous and commonly seen here, especially near the mangroves. There is another yellow jellyfish (Chrysaora caliparea), and it’s more dangerous. If you touch it, it stings for a second and then you start itching. There’s nothing you can do but wait for it to pass,” says Sandeep CK, who works as a tourist guide and fisher worker in Kavvayi.

Apart from the severe itching, fishers are troubled by jellyfish that clog their nets; it is often an arduous task to shake them off. With the ongoing prawns and shrimps season, the presence of jellyfish makes it difficult to efficiently catch other types of fish, say the workers. “During the prawns season, we throw our nets hoping for a good catch, but what do we get instead? Hundreds of jellyfish. If their liquid splashes on our face or eyes by accident while we shake them off our nets, our eyes begin to swell. We’ll have to stay away from work if that happens,’ says Satheeshan.

These free-swimming animals are known to reduce the marine resources available for catch, and reduce the number of fishing days for fishermen. For instance, a study published by the Central Marine Fisheries Research Institute (CMFRI) in 2015 found that jellyfish are also known to feast

on sardine larva in substantial quantities. This has the potential to disrupt the marine food chain as well, the study suggests. T. Purushothaman, a shrimp farmer from Payyanur and president of Aquaculture Development Cooperative Society (ADCOS), further observes that these jellyfish were found preying on post-larva shrimps, which affects their breeding.

“During the time of high tide, we’ve seen jellyfishes swim along with post larva shrimps, and feed on them. This ultimately has an impact on the recruitment of shrimps,” said the aqua-farmer, who is also the recipient of the Jagjivan Ram Innovative Farmer award instituted by the Indian Council of Agricultural Research (ICAR). Coastal aquaculture is one of the fastest-growing industries in India, with a total of 1.53 lakh (153,000) hectare area in nine maritime states under shrimp culture producing 6.8 lakh (680,000) metric tonnes of product, data sourced from Marine Products Export Development Authority (MPEDA) shows.

Such “rapidly increasing aquaculture/mariculture/cage culture practices can act as a catalyst for jellyfish swarming,” a study on jellyfish aggregations, published in 2020, found. Other industries such as tourism, power generation, desalination, and shipping have also reported considerable economic losses due to jellyfish blooms. “Jellyfish are known to sting swimmers and tourists in Kerala’s beaches. Sometimes, dead jellyfish collectively deposit on the shores of the beach, which impacts the aesthetics of the region,” observes Savitha Mohanan K.M., a research scholar from Kannur University, who has also worked as a project assistant in the Fisheries Department in Kanhangad. Causes for jellyfish surge While there is no scientific consensus on whether jellyfish are exponentially increasing at a quantifiable rate across the globe, it is safe to argue that the jellyfish blooms have been increasing, rather than decreasing, in most places where they have been studied.

A 2012 study (by Brotz et al.) showed a 62 percent increase in jellyfish blooms out of the 45 Large Marine Ecosystems (LME) studied across the world, wherein the Arabian Sea also noted an increasing trend. Jellyfish blooms have been sighted in Thiruvananthapuram, beaches in Goa, Mumbai, Visakhapatnam, Odisha among other coastal regions. In India’s west coast, “majority of blooms occur towards the end of the southwest monsoon (June-September); blooms of Crambionella orsini start towards the end of monsoon and last still post-monsoon (October-January), while Acromitus flagellatus blooms occur in backwaters during November-May,” a study by Riyas A. and Biju Kumar, Department of Aquatic Biology and Fisheries under University of Kerala, noted. What are the possible reasons for this increase in the number of jellyfish blooms along the coast of Kerala?

As per regional scientists and marine biologists, this surge is attributed to several factors, both natural and man-made ones. A variety of natural factors, including winds, changing tidal movements, surface currents, water temperature, salinity, dissolved oxygen, as well as man-made factors- such as water quality deterioration, eutrophication, overfishing, translocation, habitat

modification have a significant role to play here. "The complex life cycle of this Cnidarian species is a major contributing factor for its unique existence, which is often impervious to rising temperatures and lack of oxygen in the water. They can survive in such conditions, as opposed to other marine beings.

Therefore, a rise in sea temperature and global warming can facilitate these blooms," says Riyas A., research scholar. But researchers also mention that it would be wrong to say that climate change is the only reason for this global phenomenon. "Kerala's coastal infrastructure can be another factor. Two-thirds of the state's seawalls are made of granite, providing a hard surface for jellyfish larva to settle and multiple," notes A. Biju Kumar. Increasing marine activities, which lead to rising nutrient levels in the sea (particularly phosphates, leading to eutrophication) can increase the productivity of planktons, which jellyfish mostly feed on. "When the number of planktons increases, jellyfish also increase.

Its natural predators like sea turtles and swordfish are supposed to prey on jellyfish and maintain the balance of the marine food chain, but when there are fewer predators, it is only natural that jellyfish populations surge," added the professor. The way forward Scientists are united in their opinion that not only are there no quick-fixes to this issue, but also that such an approach would be detrimental to the study of the species. "We are yet to efficiently and economically utilise the jellyfish found in Kerala's coasts, as opposed to states like Andhra Pradesh, which started engaging in jellyfish processing, trade and export to Southeast-Asian countries four to five years ago," observes Dinesh Kaippilly, Head of the Department, Aquaculture, Kerala University of Fisheries and Ocean Studies (KUFOS).

Export earnings from jelly fish in the state are negligible: In the last 20 years, exports have remained at a meagre 1,092 tonnes in the state. It was only in 2000, when large numbers of jellyfish blocked the cooling system of the Madras Atomic Power Station (MAPS) in Kalpakkam, Tamil Nadu, that discussions on jellyfish blooms and their consequences gained spotlight in India. "Lack of adequate background and historical data pertinent to the region is a major deterrent for jellyfish studies. This is because the species had no economic value earlier, and it is only now that some research is being done on its export and trade value. Its impact on aquaculture also needs to be scientifically studied, because this definitely has ramifications on the marine economy of the state," says Biju Kumar.

The species' taxonomic diversity and complex life cycle make it further challenging for researchers to properly categorise and mark their surge in population because the rate of jellyfish blooms are often variable and irregular. It is in this hope that the University of Kerala plans to host the Seventh International Jellyfish Bloom Symposium at Thiruvananthapuram in 2022, in an attempt to address the gap in the region's jellyfish studies. The scientists, therefore, call for a holistic understanding of the surge of jellyfish blooms. While this seems to be linked to human

activities, their mechanisms need to be thoroughly researched, due to the significant impact it has on marine ecosystems and human beings. Fisher workers, meanwhile, are on the look-out for other options, like new devices, to tackle the jellyfish influx.

Kerala: Is it too late to save marine livelihoods in Kerala from climate change?

https://www.youthkiawaaz.com/2020/12/climate-change-in-kerala-and-marine-livelihoods/

"The state of Kerala is situated along the south-west coast of India. It stretches along the Arabian Sea and is separated from the rest of the sub-continent by the steep Western Ghats. Kerala has a 580-kilometre-long coastal line and these coasts cover around 10-15% of its total area. Almost 222 fishing villages depend on this marine coast in terms of livelihood. Oceans have had an influence on the history of the state and people's way of life in Kerala since ancient times. Trade, through sea, was seen even in earlier centuries of the first millennium BC. Kerala has had frequent maritime interactions with the regions around Red Sea and the Persian Gulf.

Agriculture is considered the main source of livelihood in the state. However, marine fisheries and trade has also been a major sector of livelihood and economy since ancient times. In short, one may say that the economy of Kerala is based primarily on agriculture and marine products. Kerala has a unique development track and been ranked first in the UNDP's ranking of states, the Inequality-adjusted Human Development Index for India's States, UNDP, 2019. Fisheries have a major role in the unparalleled development trajectory of Kerala. The UNDP Human Development Report, 2007-08, shows that developing nations near the equator are much more vulnerable to a rise in the sea level.

This means that coastal areas in India are more vulnerable to a sea-level rise. The role of climate change is more clear in this scenario and if it is left unchecked, it will severely affect those who are living near the sea and depending on the sea. Climate Change In Kerala Climate change in Kerala has caused a variety of impacts on agriculture, human health, biodiversity, coastal areas and water crisis, and vary from region to region. Kerala's ecosystem is a closed and fragile one. The emission rate of CO2 and other greenhouse gases in the state is comparatively low. However, the shifting pattern of monsoon over the last decade is enough to prove the role of climate change in Kerala.

The Arabian Sea on the western border of Kerala is getting severely affected by climate change and global warming. From 1904 to 1994, an increase in temperature by 0.5°C was observed on the surface of the Arabian Sea. Since 1995, the increase has been unprecedented. There is ample evidence to show that the increase in surface-level temperature of the Arabian sea is due to the influence of carbon-related global warming and climatic change. A study conducted by ITM (Institute of Tropical Meteorology), Pune, on the increase in temperature between 1901 and 2007

in the north of Kerala (Calicut region) and the south of Kerala (Thiruvananthapuram region) asserts that there has been an increase in the annual average temperature of these regions in the last 100 years. The average annual temperature in the north has increased by 1.02°C and in the south, it is 1°C.

The increase in temperature during the last three decades is almost 0.4°C. Statistics by the Indian Meteorological Department indicates that there has been an increase in temperatures by 0.64°C over the last five decades across seven centres in Kerala. The increase in global temperature in the last five decades has been 0.7°C. This shows that the increase in the temperature level in Kerala has a similar pattern as that of the global increase in temperature. In the case of rainfall pattern, there was a decline in rainfall from 1901 to 2007. The changes in rainfall along the western coast of Kerala has increased by 6-8% in the past five decades. The flood that occurred in 2018 in Kerala was an outcome of this increase in rainfall. By 2030, an increase of 8% can be expected in the months of June, July and August, and 19% the decrease in rainfall is expected in the months of November, December and January.

Climate Change And The Vanishing Coast The change in physical ocean parameters, such as seawater temperature and current flows affect the number of marine fishes and the distribution of marine fish stocks. The Intergovernmental Panel on Climate Change (IPCC) says that as sea temperature changes, the quantity of fish will change and the fish will move to different areas some species would go extinct in particular areas, while some predators and prey in the food chain would move to different areas. This would lead to a disruption in food chains. Wetlands and other low lying habitats where fish reproduce will be drowned by the rising sea and the inconstant weather may stop fishers from going to the sea altogether (Adger et al., 2003). The shifting pattern of EL Nino, due to climate change and the degradation of mangrove forest along the coastline, is a major threat to the marine environment of Kerala.

The western side of the Arabian Sea is most vulnerable to cyclones. However, climate change, in the recent decades, has made the eastern part of Arabian sea vulnerable to cyclones as well. The Ockhi cyclone, which happened in 2017 on the southern districts of Kerala and Tamil Nadu, bears witness. Migration of fish species, the degradation of many marine ecosystems and the disappearance of the Ridley Turtle's breeding sands were the aftermath of this cyclone. In Kerala, most of the fishing communities use the direction of wind, waves and the sight of flock birds for fishing. They observe nature and this traditional and local knowledge has given a strong foundation for the sustainability of their livelihoods.

They are familiar with paru (rocky reefs) under the sea and the ecosystem present there. A change in climate can shift the pattern of wind and waves and the route of migratory birds. Nowadays, unpredicted climate can lead to the cyclones that gobble up coasts, houses and numerous species of fish, disrupting the existing ecosystems by newly migrated species. These

unpredictable events have made a severe impact on marine ecosystems, nature and commercial fisheries. In Kerala, most of the artisanal fishers are extremely poor, and socially as well as politically marginalised communities. Their capacity to adapt is poor and the small-scale (often migrant) fishers are highly vulnerable to climate impacts. This leads to a situation where fisher communities are suffering in terms of their income and social standards.

Due to climate change, vulnerability has emerged in the community. Vulnerability, as defined by IPCC, is a condition where the internal ability to cope, recover and adapt to climate stress lacks. According to the IPCC 2001, "vulnerability is the extent to which climate change may damage or harm a system it depends not only a system's sensitivity but also its ability to adapt to new climatic conditions. The major impacts of climate change in marine fisheries are the changes in habitat brought about by the rise in sea-level, the frequency of extreme events such as cyclones, erratic catch and erratic revenue. Marine livelihoods are always the most affected by climate change.

The strategies used to 'combat' climate change are technology gimmicks they're costly and do not take into account the vulnerabilities of the fishing community in Kerala. These methods create uncertainties in the ecology as well as livelihoods, and cast doubts on oft-proven data. This doesn't pave recovery channels for these fishing communities. This keeps them locked in their contexts of vulnerability. The long term impacts of climate change on marine livelihoods have not been realised yet, to the horrifying extents they can be. Improvement in the primary stakeholder's awareness by involving them in disaster-preparedness, management and mitigation planning can resolve these problems to an extent.

Kerala: A hydropower project has got both environmentalists and Adivasi communities worried

https://scroll.in/article/978363/in-kerala-a-hydropower-project-has-got-both-environmentalists-and-adivasi-communities-worried

"While Kerala's contentious Athirapilly dam may be temporarily on hold due to peoples' resistance, a smaller 7.5-megawatt hydropower project in the vicinity has got both environmentalists and Adivasi communities worried. The Anakkayam Small Hydro Electric Project, which will require the diversion of eight hectares of forests in Thrissur district and is just a stone's throw from the proposed Athirapilly dam site, is all set to become a reality. An order from the Kerala State Electricity Board Limited dated September 3 has sanctioned the felling of hardwood trees in the forest land allocated to the Anakkayam Small Hydro Electric Project. Operations are expected to commence soon and 1,897 trees will be axed. Adivasi communities living in the area and local activists are opposing the hydropower project, and their concerns are many.

“This hydropower project will involve the loss of rich forests, said SP Ravi, secretary of the Chalakkudy River Protection Forum, a non-governmental organisation that has resisted the Athirapilly hydel project for more than a decade. “It violates not only the Forest [Conservation] Act but the Forest Rights Act and the State Disaster Management Act as well. A long history The Anakkayam Small Hydro Electric Project is a tailrace development project that aims to harness electricity from the water flowing out of the existing Sholayar hydro project. The project received environment clearance in 1990 itself, and the state government sanctioned eight hectares of forest land under the Vazhachal Forest Division for the project. However, the project was stalled for several reasons. The transfer of forest land was delayed by more than 20 years, causing its environmental clearance to stand cancelled.

But in 2013-14, the project obtained both Stage-I and Stage-II environmental clearances. Interestingly, as per the project details listed on the Kerala State Electricity Board Limited website, the project is being implemented as a Clean Development Mechanism under the United Nations Framework Convention on Climate Change. A Clean Development Mechanism, as per Article 12 of the Kyoto Protocol (which India is a signatory to), can earn a country certified emission reduction credits in recognition of the clean, green energy it produces or utilises. But while the project may be clean (hydroelectric power is categorised as “clean because it is renewable and does not pollute unlike fossil fuels), the hydropower project may be anything but green.

Malabar pied hornbills also use the evergreen forests in the Vazhachal Forest Division. Impact on local biodiversity The forest land where the project is planned – which will involve razing down an unquantified number of small trees as well as 1,897 large trees including giants with a girth (or circumference) of more than 500 centimetres, according to Ravi – is home to tropical wet evergreen and semi-evergreen forests which support a diversity of wildlife. Fifteen acres of the eight hectares being diverted for the project under the Vazhachal forest division is part of the Parambikulam Tiger Reserve's buffer zone, Ravi told Mongabay-India. Surveys have recorded between 120 and 139 bird species in the Vazhachal Forest Division alone. These include species such as the uncommon Malabar pied hornbill Anthracoceros coronatus. A recent survey that assessed the impact of the 2018 floods recorded 196 bird species in the division; the area could be a “stronghold of hornbills in the Western Ghats, the report found. Birdwatcher and naturalist Susanth C, whose birdwatching group Warblers and Waders has been conducting surveys almost every year at Anakkayam and Vachumaram since 1995, has observed the state bird – the great hornbill – breeding in the area.

The Vazhachal Forest Division is also the only known home of the Athirapilly night frog, which was described in 2017. Frog biologist Sandeep Das (Kerala Forest Research Institute) has also encountered several individuals of the Cochin forest cane turtle (classified as “Endangered as per

the International Union for Conservation of Nature Red List) here. The region is home to 131 butterfly and 51 odonate (dragon and damselfly) species, including endangered species such as the Malabar tree nymph, as well as 1,164 flowering plants, of which 103 are endemic to the Western Ghats. More than 60 species of mammals, including the Asian elephant, use the Division. In fact, the area between Anakkayam and Vachumaram (which is part of the area where the Small Hydro Electric Project will come up) is used by at least three herds of elephants, said biologist Sreedhar Vijayakrishnan who studied and followed elephants here for both his masters and doctoral studies.

“A few solitary males too used that area, he added. “There's one herd, probably with an extremely small home range, in the Vachumaram range that uses the area round the year. Small hydropower projects in such areas are not devoid of impacts. A study in 2017 found that in Karnataka, there was a strong correlation between the construction of four Small Hydro Electric Projects along the Netravati river and the onset of human-elephant conflict in the area. Neglecting forest rights and consent Such forest loss can impact the Kadar community in other ways too. The location of the proposed Anakkayam Small Hydro Electric Project – where the blasting for an approximately 5-kilometre-long tunnel will occur – is located within the 400 square kilometres of forest land that has been allocated in 2014 as community forest resources to the Kadar community here, under the Forest Rights Act (2006), say locals and activists.

The Kadar rely on these forests for a range of non-timber forest produce, harvesting which is their only means of sustenance and livelihood. They also extract medicinal plants from the area, said Geetha VK, chieftain of the Vazhachal settlement. The excavation and construction for the project will occur very close to the Anakkayam settlement and the tunnel will go through the Sholayar settlement, she said. The proposed site of the SHEP is also close to a local sacred site that people in the Sholayar and Anakkayam settlements worship at and where they conduct annual festivals, she added. The stream in the vicinity is also used for fishing. Geetha and her community worry that their access to these natural and cultural resources will be affected by the implementation of the Anakayyam hydropower project.

The large landslide that occurred right next to the Anakkayam tribal colony during the floods of 2018. It is in such a disaster-prone area that the Anakayyam Small Hydro Electric Project is to be constructed. Photo credit: Chalakkudy River Protection Forum. And their fears are not without reason. A study in 2017 on the social and ecological impacts of small hydro projects found that the construction of four Small Hydro Electric Projects in the Gundia river basin of the Netravati river in Karnataka severely restricted locals' access to the river which they used to rely on for sustenance fishing because entry to the area from the reservoir to the tailrace canal was restricted. They also found that employment of locals in such projects – which is often listed among the benefits that such projects can accrue to local communities – was mostly temporary.

“Without the consent of the respective grama sabhas, this project [Anakkayam] cannot be taken up. And the Kerala State Electricity Board Limited never applied for their consent, said Ravi. The Cochin forest cane turtle in the Vazhachal Forest Division. The species is listed as 'endangered' by the IUCN Red List. An already sensitive area Moreover, the Anakkayam settlement – near where the excavation for the Anakkayam project is proposed – is the same area that witnessed a fairly large landslide during the floods that the state saw in 2018. Any excavations here can enhance disaster risks, said Ravi. “And this is against the Disaster Management Act 2005. The costs that the project will incur is also far higher than the benefits it can accrue, he added.

As of 2018, the Anakkayam project was budgeted at approximately Rs 139 crore. Board orders uploaded on the KSEB website detail this, and that an amount of Rs 61 lakh has been allocated as compensatory afforestation for the trees being logged. However, there can be no replacement for the loss of ecosystem services that these forests provide, said Ravi. While he will have to refer to the specifics of the project to answer whether a site for compensatory afforestation has been identified, the Kerala State Electricity Board Limited has not done anything unlawful by initiating the Anakkayam project, said Chairman and Managing Director NS Pillai. “The project has obtained both Stage I and Stage II clearances from the Ministry, he said.

Local resistance In light of all these concerns, the Chalakkudy River Protection Forum will be launching a campaign against the project, clarified Ravi. Their demands are simple. “We want the order to fell trees in the area to be withdrawn immediately, and the Anakkayam project cancelled, he said. Eight of the nine Kadar settlements in the vicinity have convened ooru sabhas or meetings and passed resolutions against the project, said Geetha. “These have already been submitted to the Thrissur District Collector and officials in the Forest Department, she said. “To us, every single tree is our god. We will resist the Anakkayam project just as we did the Athirapilly dam. Divisional Forest Officer Vinod SV confirmed that he had received the resolutions from the settlements and sent it to the Thrissur District Collector.

Since the environmental clearance for the hydropower project was afforded before the community forest rights were granted, the legality of which order will hold will need to be ascertained, he added. Meanwhile, local activists are planning to voice their angst against the Anakkayam Anakkayam Small Hydro Electric Project on November 18 by conducting protests across different locations in the state.

Fish workers’ organisations in Kerala have demanded government to provide immediate financial assistance to fishermen

http://timesofindia.indiatimes.com/articleshow/74165966.cms?

"Fish workers' organisations have demanded the state government to provide immediate financial assistance to fishermen “as they were struggling to make ends meet due to poor catch in the sector. “Various factors, including climate change, unscientific trawling near to the shore and pair trawling, have led to the reduction of our fish production. Fishermen are now in a state of poverty, said a joint statement issued by Kerala Swathanthra Matsya Thozhilali Federation (KSMTF) state president Jackson Pollayil and National Fish Workers' Forum general secretary T Peter, here on Friday.

They said fishing with powerful LED lights, making use of power generators, was also affecting the marine wealth. The government, it demanded, should take immediate measures to confiscate vessels involved in juvenile fishing and vehicles transporting the catch to factories, and to cancel their permits. “If the government fails to keep vigil on the matter, fish will vanish from our dining tables and the fishing community will plunge into extreme poverty, the statement said.

The eroding shorelines of Thiruvananthapuram, Kerala

https://www.thehindubusinessline.com/blink/cover/coastline-erosion-in-keralas-capital/article30818347.ece

"Thiruvananthapuram's Shanghumugham Beach is shrinking by the day, as the sea is continually pressed inland by a combination of climate-related and man-made causes. On weekends, there is hardly any elbow room on Shanghumugham Beach in Kerala's capital, Thiruvananthapuram. The smell of roasted corn hangs in the air, vendors mill around the walkway that leads to the beach, families lounge around a 35m-long sculpture of a reclining naked woman ‘Jalakanyaka' by Kanaayi Kunhiraman that seems to strain against Kerala's conservative ethos yet has come to be one of the most recognised landmarks in the city.

It is a familiar beach scene. The only problem is there isn't much beach left. “Every year, I feel the sea is drawing closer, says Indu, a 44-year-old Thiruvananthapuram resident who has been coming to Shanghumugham since her childhood. “The beach is so much smaller than it used to be. We would come here to get away from the congestion in the city, and now look how congested the beach has become. She points to a row of fishing boats lined up along a part of the shore usually reserved for people. The boats were moved after vast tracts of the Shangumugham shoreline were eroded following Cyclone Ockhi, which hit the Kerala coast in December 2017.

A nearby road, which runs parallel to the beach, bears testimony to Ockhi's fury rope and traffic cones cordon off the traffic from long sections of the road that were washed away by the waves. Even now, the waves are visibly rough but they do not deter visitors. Beach-goers play a game of racing back to the shore before the water reaches their ankles, laughing aloud when the wave beats them to it. Others try to venture into the water, holding hands with their friends but lose

balance when the wave pulls back into the sea. The whistles of coastguards pierce the air, instructing the crowds to move away from the water. Families with toddlers are turned away from the water.

Standing under a wide umbrella, Shishupal, a coast guard, watches his colleague admonish youngsters taking selfies with their backs to the waves. “Earlier, we would merely look on as people played and swam since the sea is quieter at this time of the year, but now we must strictly prevent them from going into the water, he says. “We can't trust the waves anymore. After the [2004] tsunami and Ockhi, we rarely see the sea calm. Shishupal has been working as a coast guard since the early '90s and remembers how he would have to walk for about a kilometre to reach the sea in Shanghumugham. Since then, he notes that both the height and force of the waves have increased, not just during the monsoon months of June to September, when the sea is usually rough, but all through the year.

“It's getting harder to predict how the sea will behave, he says. Part of the notion of Kerala being ‘god's own country' is drawn from the abundance of its water resources. Bordered by the Arabian Sea on the west, Kerala has 44 rivers, 34 lakes, scenic lagoons, mangroves and estuarine wetlands, and also receives heavy rain during the monsoons. But having been battered by severe floods in 2018 and 2019, the state's relationship with water is fast changing. An article titled ‘Impact of sea level rise and coastal slope on shoreline change along the Indian coast', published in 2017 in the international journal Natural Hazards, noted that the highest level of coastal erosion was observed in West Bengal.

Kerala was a close second. Other studies have observed that the western coast of India was mostly stable, except for Kerala's coastline. Of Kerala's 590-km coastline, 63 per cent faces sea erosion. The enforcement of the Coastal Regulation Zone Notification is lax. Among nine districts observed to be affected by sea erosion in Kerala, the maximum (23 per cent) has been reported in Thiruvananthapuram. The state capital has a 35-km coastline, and is one of the densest districts in terms of population factors that exacerbate the vulnerability of its people at the time of a natural disaster. Cyclone Ockhi, for instance, threw into sharp relief the dangers faced by populous settlements along the coast.

Houses and other buildings were washed away in areas such as Valiyathura and Shanghumugham, and families identified as vulnerable were offered ?10 lakh by the state to relocate to safer areas. But many are loath to leave the coast. “What kind of land will you get these days with ?10 lakh in this city? Will it cover the cost of building a house? Who will pay for my transport back and forth from the shore? asks Gilbert (59), a grizzled fisherman who lives further up the coast in Shanghumugham. His house faces the sea, separated from the beach by a narrow road. “Why are you coming now, when the sea is safe? Come in June and see what we

have to live with. His neighbour comes out of her house on hearing Gilbert's raised voice. She squints and points to a boat in the distance.

“That's where the sea would begin, she says. “You'd have to walk that far to get to the sea. Gilbert also remembers the beach being a vaster expanse. “During the '80s, there would be swathes of anchovies, sardines and other small fish drying under the sun. We would have dinner and lie down to sleep on the shore, he recalls. “Now there are hardly any fish to catch, let alone to dry. And the sea is knocking at our doors. He attributes the recent disturbances in the sea to the Vizhinjam International Seaport, which is currently under construction. The port is located about 18km further south from Shanghumugham beach. “Ever since the harbour came up, the waves have become rougher. Because of the breakwater in the harbour, the waves have nowhere to go and are hitting us harder.

A nearly 310km stretch (close to 60 per cent) of Kerala's coastline has been protected by seawalls, groynes and offshore breakwaters. Experts have long maintained that fortifications of this kind affect the flow of the currents around the shore, resulting in the intensification of waves to the north of the breakwater and subsequent erosion of that shoreline. But the residents insist that fortifications are the only way they can save their homes. Gilbert points to a mark on the wall of his house, about a metre from the ground. “Last monsoon, the waters rose and came into my house till here.

We told the government to put in seawalls but they said they didn't have money. Sacks of absorbent clay are lined up along the road in front of his house. “We have to make do with this instead of a seawall, but the only thing protecting us are our prayers. On the Observatory Hills opposite the Kanakakunnu Palace, where the office of the Kerala State Disaster Management Authority is located, Sekhar L Kuriakose, member secretary, clarifies that what is happening in Shanghumugham is not representative of what is occurring elsewhere along Kerala's coastline which is beset by issues of rampant coastal regulation violations, destruction of adjoining wetlands and sea surges.

“The erosion and accretion process is a cyclical one. Shanghumugham's shore will erode as well as build up eventually. I wouldn't call it a classic example of climatic variation, he says. “Shanghumugham is an interplay between whatever is happening in terms of changes in the Arabian Sea, in terms of temperature regimes, wind patterns and the different anthropogenic factors such as the Vizhinjam harbour, increased built-up area along the coastline, and so on, he notes. The average temperature in the Arabian Sea seems to be rising, he adds. Recent studies have attributed the rise in temperature to the rapid warming of the Indian Ocean, among other climate change signals, but the root cause of the rapid warming remains unclear.

“If the temperature is increasing, it means the air will have more moisture and the sea will have more wind, and this manifests as rough waves, he says. Recent studies also note an increase in wind velocity and wind-related disasters across the coast. “Our construction practices are not wind-resilient, so we've been getting a lot of cases of rooftops being blown away and electric poles and trees falling on houses, he says. He also adds that fish stocks have been dropping because of overfishing, degradation of marine environment, ocean warming and so on.

As a result, fishermen are forced to go into deeper seas, adding another layer of vulnerability to a population at risk. Even during Cyclone Ockhi, what began as a depression in the Arabian Sea quickly changed course and became a cyclonic storm, hitting the Kerala coast without warning. Fishermen who had already set out for the sea couldn't be notified in advance. Even now, families in Valiyathura wait for news from their kin who went missing at sea back then. Other experts have pointed out that seawalls and breakwaters interrupt the accretion of sediments along the coast, thereby preventing the coast from being replenished. Moreover, the intensive quarrying for rocks needed for such structures contributed to the denudation of hillsides in the Western Ghats, leading to an unprecedented number of landslides in Kerala's hilly districts such as Wayanad and Idukki during the floods of 2018. Furthermore, the dams in Kerala's rivers that drain into the Arabian Sea have been faulted with preventing the flow of sediments to the coast.

The picture that emerges of Kerala's many-layered vulnerabilities is dire. Studies suggest that the sea level may rise by 15-38cm in Kerala by mid-21st century. “From a disaster manager's perspective, it's more like a cautionary note on a cigarette packet, Kuriakose reflects. “We're aware of the dangers. And we now know yet another cause for the danger. Back on the shore, Gilbert leans against a sack of clay and shrugs. “This beach is my home. The sea is my livelihood, he says. “I'm not going anywhere.

Kerala: Meet to discuss fisheries laws, climate change

https://www.thehindu.com/news/national/kerala/meet-to-discuss-fisheries-laws-climate-change/article30428331.ece

"Fisheries resource depletion, climate change, and new laws governing marine and inland fisheries will figure prominently in a two-day seminar being organised here at the end of January by the unions under the Kerala Fisheries Coordination Committee. Chief Minister Pinarayi Vijayan and Fisheries Minister J. Mercykutty Amma will address the seminar, being organised with experts' and scientists' help at the Central Marine Fisheries Research Institute here. There has been serious depletion in both pelagic and demersal fish resources, a constant cause for worry among all group of fishermen, said Charles George of the Matsya Thozhilali Aikya Vedhi, which has taken the lead in organising the discussions.

New regulations on inland fisheries will also be discussed in detail. The proceedings have been divided into six sessions, which will consider important issues facing the fisheries sector in the State.