



NTFP-EP

# Leaf Litter

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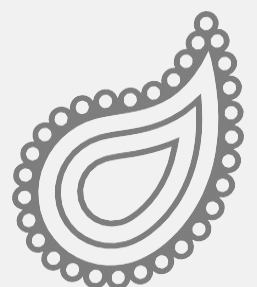
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## Glass houses!

More than anything else, the present war between the Israel-USA combine, and Iran, is about energy and energy control. The Strait of Hormuz, which is now in Iran's control, is a crucial passage through which 80% of all oil and LNG goes to Asia, the top consumers being China, India, Japan and South Korea. India imports approximately half its crude oil and almost all its LNG through this route. Breaking this down, for LNG, India depends on Qatar, UAE and the USA, as well as Oman, Angola and Nigeria, in that order. For crude oil, India depends on Russia, Iraq, Saudi Arabia, UAE and the USA. For LPG, it is Qatar, Saudi Arabia and the UAE. And from Malaysia, India imports over a billion USD of mineral fuels, and at present bears a trade deficit of about 4 billion \$ USD.

In the initial days of the war, when some countries sided quickly with either Iran or the US-Israel combine, our Prime Minister Modi was criticised for keeping silent. Earlier on, there were tensions between India and the US when Trump announced tariffs on Indian goods, and Modi was expected to speak up and take a stand against the US. But it cannot be easy for Modi to walk this tightrope. Being dependent on so many countries for energy, for trade (our first and second largest partners are US and China), and security (Russia provides 36% of India's arms, followed by France (28%) and the US). Israel and the US provide India technical equipment, like anti-tank missiles, armed drones, with Israel also helping in a joint defence system. In such a scenario, it is impossible to expect Modi to unilaterally back any one country, or shun another. There will be no pointing fingers at the gulf states for their often reported human rights violations, especially of women and other migrant workers. We will not speak about the environmental concerns in the Persian Gulf due to oil spills or oil extraction, and the loss of fragile marine ecosystems. It also means that a country like Russia can continue with human rights violations, especially the systemic use of torture by its security forces, and its violations against journalists, pointed out by international organisations, and yet be welcomed in other countries. Putin received red-carpet welcomes in Alaska (August 2025), China (August 2025) and India (December 2025), by Trump, Xi Jinping and Modi respectively. The opposition parties in India criticized Modi's studied silence following the death of the Supreme Leader Khamenei, as he attempted to maintain ties with both Iran and the US, that defined a new and unprecedented order of diplomacy.

Globalization signifies interdependence between countries, integrating economies and societies, and reducing trade barriers. It is a result of better transportation infrastructure and technologies that drive communication and information. All true, but we miss a crucial ingredient that the Russia-Ukraine war, the still ongoing genocide in Gaza, and the present conflict between Iran and the Israel-US combine brings to the fore. It is that globalization implies that countries prepare for, and accept, a moral compromise, that they will look the other way when their neighbour breaks or violates a human code, if the neighbour is able to provide something they badly need. Seen in this way, globalization prevents us from speaking and acting freely, and responsibly as a world citizen. In fact, it has made us parochial, confining us and our leaders 'to the narrow domestic walls' that Tagore strived to break out of. What is worse is that when conflicts arise in the world, and they certainly will with increasing regularity, there will be no mediator who can stand morally tall, and whose word is respected by those involved in the conflict. What we will have are bullies with more bombs and destructive power, without a moral code to restrain them. We all live in glass houses.

MR

# Union Budget 2026: the negation of ecological security

*Pandurang Hegde*

The 9<sup>th</sup> consecutive Union Budget presented by Finance Minister, Nirmala Seetharaman, made experts debate whether it will boost the economy. Will the higher allocation of budgets to certain sectors have positive impact on the GDP?

The sector which gets the least attention is the allocation for environment. Will this budget address the increased air pollution across urban and rural areas, or the crisis of drinking water, or the mountains of solid waste? Is there any allocation to address the negative impacts of climate change, experienced through the recurring phenomena of floods and unprecedented heat waves?

The Swachh Bharat Mission (SBM) is a flagship programme, aimed to address sanitation. The present budget has cut the allocation from Rs 7192 crores to Rs 2500 crores. Instead of increasing the budget, it has been cut to less than half, assuring a negative impact on our large population, especially those who are indisposed. The recent incident in Indore, where people died due to drinking contaminated water, is a stark indicator of the reduced budget allocation under SBM.

While most cities are on the verge of collapse due to the failure of basic civic amenities, like waste management, the present Union Budget indicates that the decisions of the Finance Ministry is not grounded on reality.

Air pollution in Delhi is threatening our lives. Logically, the allocation for this sector should have increased over previous year. Instead, it was reduced from Rs 1300 crores to Rs 1091 crores. Ironically, in 2024-25, of the proposed budget of Rs 858 crores, only Rs 16 crores were spent on pollution control. The present budget is not only a policy failure but a criminal negligence, and a lack of political and bureaucratic will to act and utilize funds. If this is the situation in the national capital, how can we expect a better situation in other cities?

Air, soil and water pollution are not only impacting lives but have a drastic impact on economy. It is estimated to cost the state between 8-9% of the GDP. Ironically, there is no provision in the budget to address this issue. The Central Pollution Control Board, the apex body that manages pollution, is allocated Rs 123 crores which is not only inadequate, it is quite impossible to monitor the pollution challenges across the states.

The Union Budget is riddled with contradictions, with a 640 % increase in allocation for the coal sector, simultaneously talking about becoming a global leader in renewable energy production. Though there is a 32 % hike in solar power

generation, they favor the corporate sector, who install capital intensive solar parks that have a negative impact on rural communities and ecosystems

Successful decentralized energy systems like KUSUM, ( Kisan Urja Suraksha Evam Utthaan Mahabiyam) already exist and provide possibilities for rural economic rejuvenation. These provide solar energy to operate pump sets for farmers, providing energy and water security. Additionally, they can sell the surplus energy back to the grid. Strangely, these low hanging fruits of solar technology are ignored in favor of large projects.

In order to address carbon emissions the solution offered in the budget is to establish Carbon Capture Utilization and Storage (CCSU) units, with an allocation of Rs 20000 crores. Once again, there is financial support for capital intensive technology favouring large corporate companies, while neglecting the everyday pollution faced by ordinary citizens.

Tax holidays and numerous financial incentives offered in the budget for setting up large data centers and for mining, and processing of rare earth minerals, is hailed as a major policy shift in support of developing a digital ecosystem. Unfortunately, both these have severe implications for ecosystems. They are not only capital intensive but also require huge amounts of clean water and energy, and leave a trail of environmental destruction. Even in the USA there is a strong opposition to the data centers. Against this background we need to tread carefully to utilize our natural resources, especially water, whose availability is limited.

Measures that prevent and reduce impact of climate change, like biodiversity and forest conservation, and reforestation, have received meagre budget allocation. There has been a reduction towards projects that promote forest and wildlife conservation. The budget is instead geared towards centralized capital intensive corporate and industrial growth, that leads to an increased impact on climate change; there is no attempt at decentralized growth, that would have led to rural rejuvenation. The Ministry of Home Affairs and Internal Security get the largest allocation of Rs 25,52,34 crores, with the Ministry of Environment and Forests and Climate Change, that is responsible for the well-being of 1.4 billion people, gets just Rs 3759 crores!

Obviously, the priority of the government is towards an extractive model, and the neglect of the green economy.

*Pandurang Hegde* is with Prakruthi based in Uttara Kannada, Karnataka

## **The Hidden Costs of Renewable Energy: notes from offshore wind farm sites in Tamil Nadu**

Madhu Ramnath

*You see the sea from outside, as an object to be viewed for entertainment, to pass your time, or to relieve you from stress. For us it is the god who feeds us, our livelihood, if we lose our focus even for a day we will perish. We are a people who from such a place catch some fish worth ten rupees and make a living. Each day the sea air mixes with our blood, and nobody understands this. They just see the sea as something big, with nothing happening in it. Which is why so many developmental projects are brought to the coast.*

A person from Periyathazhai community

### **India's Renewable Energy Goals**

The move from fossil fuels to renewable energy systems is welcome, and India is making great strides to achieve the goals it has promised in the various Conference of Parties meetings, since 2015 in Paris. Steadily progressing towards this goal, India, in November 2022, a conceptual plan was made between the Danish Energy Agency (DEA) and the Indian Ministry of New and Renewable Energy (MNRE). This plan involved 15 locations, for offshore wind in the India. 14 of these sites were in the southern state of Tamil Nadu, and one in Gujarat.

These are all offshore wind farms, occupying many hundreds of acres in the sea, stretching from Kanyakumari to the Gulf of Mannar and the Palk Bay regions, along the Kanyakumari, Thoothukodi and Ramanathapuram districts. Studies to achieve this goal have been developed under the Centre for Excellence for Offshore Wind and Renewable Energy, a joint initiative by the DEA and the MNRE. This is based on Denmark's approach to maritime planning for offshore wind, which provides substantial inputs to the present stakeholder dialogue on the recently released draft tender document from the MNRE. It may be noted that Denmark has 24 other government to government cooperations with countries that, together, emit 70% of the world's CO<sub>2</sub>; there are also some short-term country cooperations.

India's goal of installing 500 GW of non-fossil fuel based energy by 2030 is progressing well; the target for the Tamil Nadu project is 30 GW in this period. As of end March 2024, the country's renewable energy power capacity is about 43% of its total installed capacity, which is 190.57 GW. The cumulative installed capacity is now up to 441.97 GW, up from the 275.90 GW in 2014-15, in the pre-Modi years. According to the MNRE,<sup>1</sup> from 2015 to 2024 solar energy overtook wind energy in India – from 9.97% to 81.81% - and among the categories of solar energy, ground-mounted solar is the most prominent.

In October 2015, an Offshore Wind Energy Policy was published by the MNRE, followed by a strategy paper in 2022 for 'The establishment of wind energy projects', outlining 3 models for development (models A, B and C), each depending on the studies/surveys conducted or to be

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1 [www.mnre.gov.in](http://www.mnre.gov.in)

conducted, the sites and the areas of operation, and whether financial assistance will be available from the government or not. The National Institute for Wind Energy (NIWE) has identified a test facility for testing wind turbines in Dhanushkodi, the southern tip of Pamban island, in Ramanathapuram district of Tamil Nadu.<sup>2</sup> The test facility at Pamban island is over 75 acres; the intended installation is of 4 turbines to generate 50 MW, apparently for studies and data at a cost of Rs 350 Cr; about 70% of the cost is towards the pile foundation. The mast in OW construction is a least 100 m, with 50 m under the seabed. The EIA states that excavation for the foundations will lead to the removal of plankton and benthic animals; the resulting turbidity can affect shellfish and lead to the clogging of gills of several species of fish.



Dhanushkodi spit – Proposed Demonstration wind farm location

Source: from the Project EIA. The site is a wetland and falls in different CRZ areas

The turbine testing facility was subjected to a rapid marine EIA; the EIA study was conceptualized by the NIWE and the MNRE, and then conducted by Indomer Coastal Hydraulics (P) Ltd., Chennai, and ‘tasked’ under the ASPIRE programme of the Foreign Commonwealth and Development Office (FCDO) of the UK. More details about ASPIRE are available in a publication by the FCDO.<sup>3</sup>

### The human angle

Despite the pre-feasibility and feasibility studies conducted by various agencies the human element is missing, or mentioned only in passing. The opinion and views of the coastal people and fishers in whose waters these projects are planned is often absent, also because they have not been informed or consulted about the projects. This “report” attempts to set a small part of that record straight. Most of the people spoken to belong to the fishing communities and requested anonymity: where possible the names of the villages are given.

All along the Tamil Nadu coast a number of projects have been implemented, and more planned. These include a heavy water plant, a nuclear plant, zirconium mining, deep sea mining, sea sand

<sup>2</sup> EIA report published by NIWE and Indomer Hydraulics (P) Ltd.

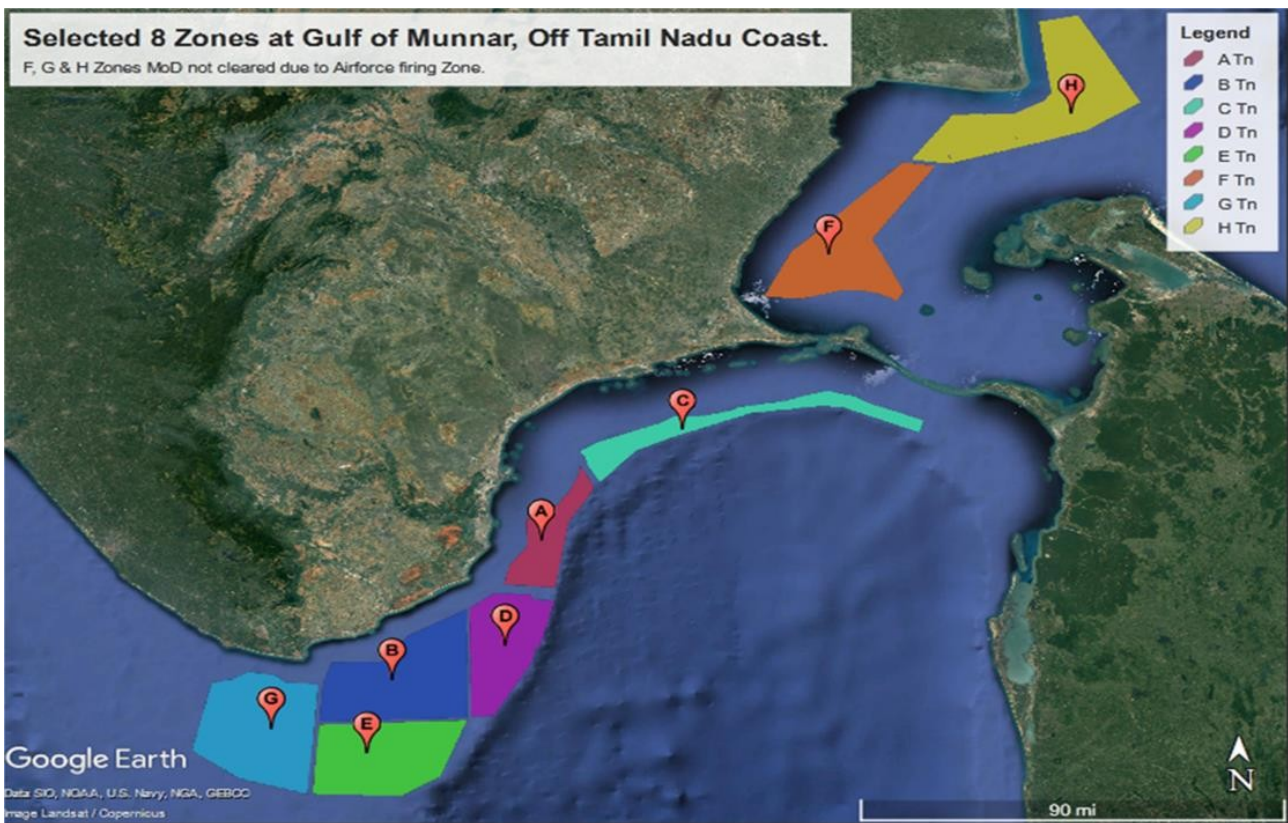
<sup>3</sup> <https://powerline.net.in/2025/02/12/india-and-uk-partner-to-launch-second-phase-of-bilateral-aspire-programme/>

mining, thermal plants, a rocket launch pad, captive ports, harbours and jettys, and the newly proposed offshore wind farms. Interspersed with the descriptions of the most recent of these projects – the Offshore Wind initiative with the pilot turbines in Dhanushkodi – are the testimonies of the local people. These are the people who will be most affected but whose views and opinions have not found any space in the public domain.



Map showing proposed and existing projects along the Tamil Nadu coast

Source: Coastal Peoples Federation, Nagercoil



Map showing the area of interest for the Offshore Wind Energy project

### Voices and observations from Periyathazhai<sup>4</sup>

- Since the Kudankulam nuclear power plant protests almost no project has been preceded with public hearings.

*They want to end coal, find something to replace coal. They go to solar energy, and wind energy, and more energy. But without talking about reducing our energy needs, or balancing our needs, or about distributing energy equally, and only wanting to produce more and more energy. Coal has destroyed the land, and now we want to create energy in the sea, forgetting that this will impact negatively the people who depend on the sea.*

*If we look at the southern districts, from Rameshwaram to KK, it's about 500 km, about half the entire Tamil coastline, the most densely populated fishing community belt of the state. And here we have a developmental project every 5 km. Why is this happening, for whom? It is to satisfy the unsatiable hunger of the corporate sector of the world, and that for this the sea and the forsaken people are being wiped out.*

*- The sea is not just the water, it includes the sand, the land at the edge, the living beings there. Take the turtle, for instance. It needs land to nest, and it returns to the same spot to lay eggs every year. What a wonder of nature! But with tourism the same land won't be there, as it's destroyed or changed. People don't even believe that sand has life. That life originated in the sea is now being studied. Which means that the sea and the coast are living.*

<sup>4</sup> Name literally means "big thazhai", which refers to a large *Pandanus odoratus* tree, a common coastal species that is getting threatened due to indiscriminate clearing.

## Voices from Manapadu

- They (the government) are say that the earth is heating up so we need to do this. That it won't be like coal, there won't be any flyash; what they will say if we oppose this is that it is necessary for development. It's good, but we will accept it if there are no bad impacts. This project will be very negative for us. For the fishing, as it will be within 3-4 nautical miles. Something happening in Chengalpet will affect the sea upto Chennai. For instance, even the anchors lost many years ago by small boats still damage our nets. This project will completely destroy our livelihood.

For instance, if there are cables for a kilometre from the shore into the sea, they will restrict fishing there, it will be a private area. Even if they do not restrict us the conditions that will be created will restrict us, that will be the situation. Not just this, any scheme within the sea will affect fishing. There is no scheme that can happen in the sea that won't negatively impact fishing and fishermen.



The Manapadu estuary, one of the 8 prime locations for port investments under Tamil Nadu's 'Blue Economy' initiative. The primary purpose is to develop infrastructure for coal and LNG jetties, to support coal-based thermal plants. The local fishing communities have opposed the project.

Source: Madhu Ramnath

- If they bring in a scheme which impacts 20% of the fishermen, can they create a project that takes care of these 20%? they don't even have such an intention. For instance, can the government indicate that because a certain project came in an area the people of that area are doing better? An example of such an instance, that a people are satisfied because of a project, that a hundred people are educated in our village and they got jobs, and the village is now well, such a thing cannot be said about any scheme they implement. The government can point to any four villages where they have implemented some scheme and ask two of the villages to speak about the benefits they have

*had, that they have been satisfied, that they have had better water, etc. There is nothing like that, only that they have been impacted negatively, that promises have not been fulfilled. There is nothing like employment for us. Even here, only the people who come from the north are given employment.*

*- Many of our nets get damaged in the jetty, a bridge-like structure. They (government) said then that if we have a loss of Rs 10,000/- we will get that back, even Rs 1 lakh will be compensated. But nobody even comes to see the damage, let alone pay for it. Actually, we have to see the damage, make a complaint and take it to the officer concerned, which is then processed, etc. As far as I know only one complaint has made the full way, but even that has not been paid. They said there was no fund for that. Even for such a large project there was no fund kept aside for this. They never seem to do anything right, or completely.*

### **From Idinthakarai<sup>5</sup>**

*- The government tells us that projects will bring in more jobs. But does one livelihood have to be wiped out for another?*

*- There used to be an abundance of lobsters in our coast, now that has declined. Nor is there much seaweed. The ribbon fish, also known as cavalai meen,<sup>6</sup> is hardly to be found now.*

*- There is much erosion of the seashore; the groynes meant to prevent the damage create new sand formations on one side, which is a cause of conflicts among fishermen as they want the space to land their boats.*

According to a shoreline assessment report by the National Centre for Coastal Research (NCCR) Tamil Nadu lost 1,802 hectares to sea waves at 22 locations, identified as ‘erosion hotspots’. The NCCR is a branch of the Ministry of Earth Sciences.<sup>7</sup> Several southern and delta districts are mentioned in the report, including Thoothukodi and Ramanathapuram; the latter has lost 413 ha of shoreline, the highest in the state.

*- My personal understanding of an agitation came with the Kudankulam Nuclear Power Plant. Leaders don't emerge nowadays, and there is no peoples support for a cause. Opposition parties support an agitation until the elections are over, then they leave.*

### **In Periyathazhai**

I asked whether anyone is making the local communities aware about the issues here. The TN government? The central government? What are these development projects? Why are they here? Any discussions? And the responses were:

*- Nothing of that sort. They are afraid to meet the people. The Kudankulam protest took place for many years and after that they (the government) work only through dadas (goons). In fact, any project before commencing requires a public hearing. But for the last 5-6 years there have been no such hearings. Earlier, any scheme that was proposed would be discussed at the collectorate, and*

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5 Coastal village about 25 kms from Kanyakumari which has been the scene of protests against the Kudankulam Nuclear Power Plant in Tirunelveli district; “idindhakarai” means broken shore, referring to the damaged coastline in that region

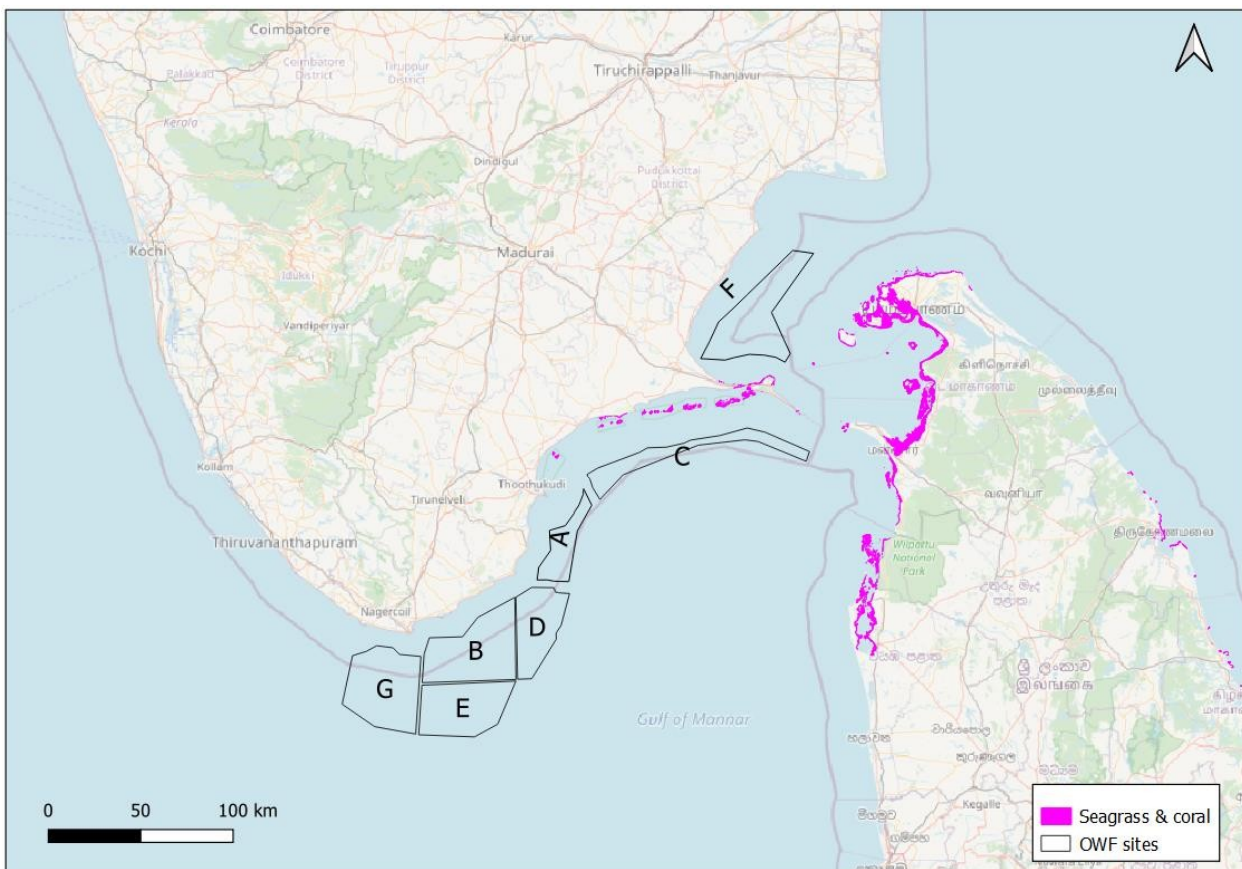
6 *Lepturacanthus savala*

7 <https://www.newindianexpress.com/states/tamil-nadu/2023/Jan/19/waves-take-away-big-slice-of-tamil-nadu-coastline-report-2539245.html#:~:text=Scientists%20say%20the%20estimated%20land%20loss%20due,of%20beach%20area%2C%20highest%20in%20the%20state.>

the concerned departments would come together and talk about it. They would then meet the people and explain the matter to them.

For example, we have an ISRO<sup>8</sup> project here. For this there have been no public hearings. They announced it some time earlier but began work on it about a year ago. This project was always on the cards but the last public hearing was held for Kudankulam; we had opposed that too but they did not listen to us.

- On the way here you must have seen a thermal plant, when you crossed Kallamuli, called Udangudi Thermal Plant, but it is not in Udangudi, it's not even in the Udangudi Panchayat. That project in Kulasekarapatnam is not in Kulasekaram at all, it's in Madhavankuruchi Panchayat. None of these projects have asked for the peoples opinion or consent.



Seagrass and coral sites; dugongs feed almost exclusively on seagrass forming a symbiotic relationship

Source: Centre of Excellence for Offshore Wind and Renewable Energy, (2022): Maritime Spatial Planning for offshore wind farms in Tamil Nadu.

- See the sand on the shore. There are thousands of life forms in it. But that is being destroyed due to tourists and tourism, and the filth they leave behind. Go to Marina beach, get some sand. Then go to a village near Dhanushkodi and get some sand. One will be dead sand, one will have some life in it; they have begun to destroy Dhanushkodi, also in the name of spiritual tourism. The sand at the shore is the food for mosses, for the turtles; not only that, where the sea and sand meet there is oxygen. There are many elements in these sands, and it is only when these sands mix with the water that the sea water gets its required density.

8 Indian Space Research Organisation

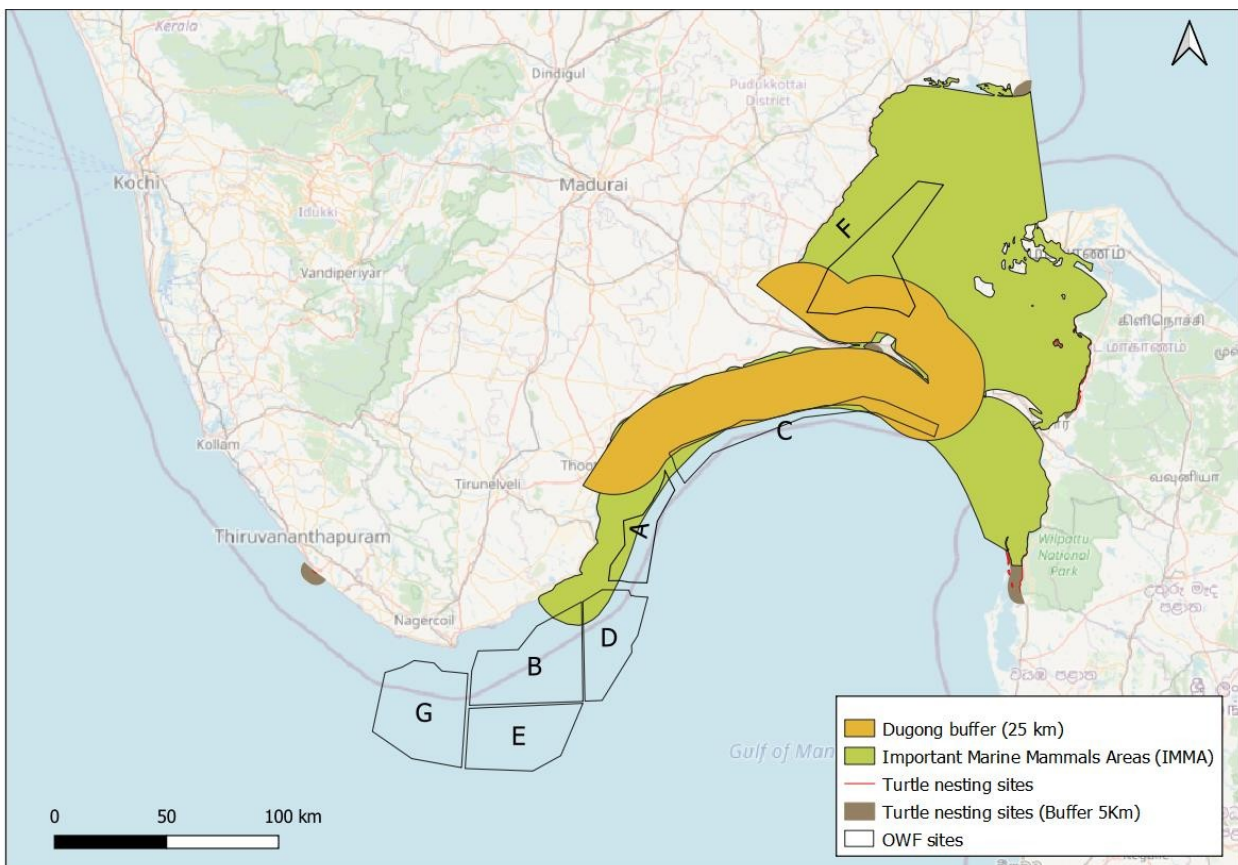
## Voices from Nagercoil

- The existing windmills are more than sufficient for the energy we need. If we still need more why not use some lands in Ramnad for the solar farms? The economics of OWE is incorrect, more inputs than outputs. You need to count the impacts as inputs. The windmills are planned in the fishing grounds of the people and will impact their livelihoods.

- Government records show that temperatures are rising and there is erosion of the shore, leading to a decline in fish – in Kanyakumari the sea has advanced 26-27 m over the last decade.

OWE will make ocean currents and wind directions change which will affect the small boats of the fishermen, especially their ability to steer.

There will be problems when drilling – noise and earth shaking – which will affect the migration of fish. There will be pollution that will affect the food chain and biodiversity. There will be problems when the equipment wears out and needs repair or replacement.



Map showing areas sensitive for dugongs, turtles and marine mammals

Source: Centre of Excellence for Offshore Wind and Renewable Energy, (2022): Maritime Spatial Planning for offshore wind farms in Tamil Nadu.

## The ecology of the marine region of the proposed project area

There are many species in the Gulf of Mannar and Palk Bay region that are vulnerable (27) and critically endangered (8). The government website on Ramsar reports that, “4 of the 7 sea turtle species found worldwide are reported here- Olive Ridley (*Lepidochelys olivacea*), Green Turtle (*Chelonia mydas*), Hawksbill Turtle (*Eretmochelys imbricata*) & Leatherback Turtle (*Dermochelys coriacea*). All 4 species are protected under Schedule-I of the Indian Wildlife Protection Act (1972), and also listed in Appendix-I of Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES)”<sup>9</sup>. It is quite obvious that the locations for the offshore wind energy projects like close to, or within, the Gulf of Mannar and Palk Bay regions that host a multitude of vulnerable, endangered and threatened marine and other species. In addition, the coastal length used for fisheries in Tamil Nadu runs parallel to the project sites.

The gulf region consists of estuaries, mudflats, beaches and forests in the near-shore environment and includes algal communities, sea grasses, coral reefs, salt marshes and mangroves. There are 21 islands in the area, where fishermen land during their expeditions, using the islands as their landing space. The Gulf of Mannar Biosphere Reserve hosts 3600 species, the globally endangered dugong, and 6 species of mangroves that are endemic to India. There are 117 species of corals,<sup>10</sup> divided into 14 families and 40 genera<sup>11</sup> (of the 89 genera found in India). It is to be noted that under the Indian Wildlife Protection Act (1972) all coral species are protected. There are about 100 species of echinoderms<sup>12</sup> in the GoM, that live among the corals and have been observed about 5 km from the project area. 321 species of sponges, of 129 genera have been recorded; of these 63 genera (and 257 species) are endemic to the area. In addition 67% of the sponges in India are found in GoM and Palk Bay regions.

The Dugong is a flagship species in the GoM and Palk Bay region, with a symbiotic relationship with seagrass, and very endangered in the world<sup>13</sup>; it is now recognised that both dugongs and seagrasses are endangered due to several factors, chiefly habitat destruction and climate change.

As recently as June 2025, the Tamil Nadu issued a Government Order (GO) declaring the 524.78 ha of Ramanathapuram district as part of the Gulf of Mannar Biosphere Reserve.<sup>14</sup> It recognised that the area is extremely important for both resident and migratory birds and served as a key stopover along the Central Asian Flyway with essential feeding and resting grounds. 128 species of both migratory and resident birds have been recorded in the area and in the 2023-24 census a total of 10,761 birds were recorded there. The Dhanuskodi village and surroundings in the Ramanathapuram district is to be declared a Greater Flamingo Sanctuary for purposes of conservation of this ecology and in particular these bird species. Tamil Nadu has five bird sanctuaries, two national parks, one wildlife sanctuary and one biosphere reserve. In addition, there are ecologically important coastal areas like the Pulicat Lake (with lagoons), the Gulf of Mannar (sensitive for coral reefs), and Pichavaram, Vedaranyam and Muthupet (sensitive for mangroves).<sup>15</sup>

9 ibid

10 Live coral observed within a 10 km radius of the project area; dead coral in a 12 km radius

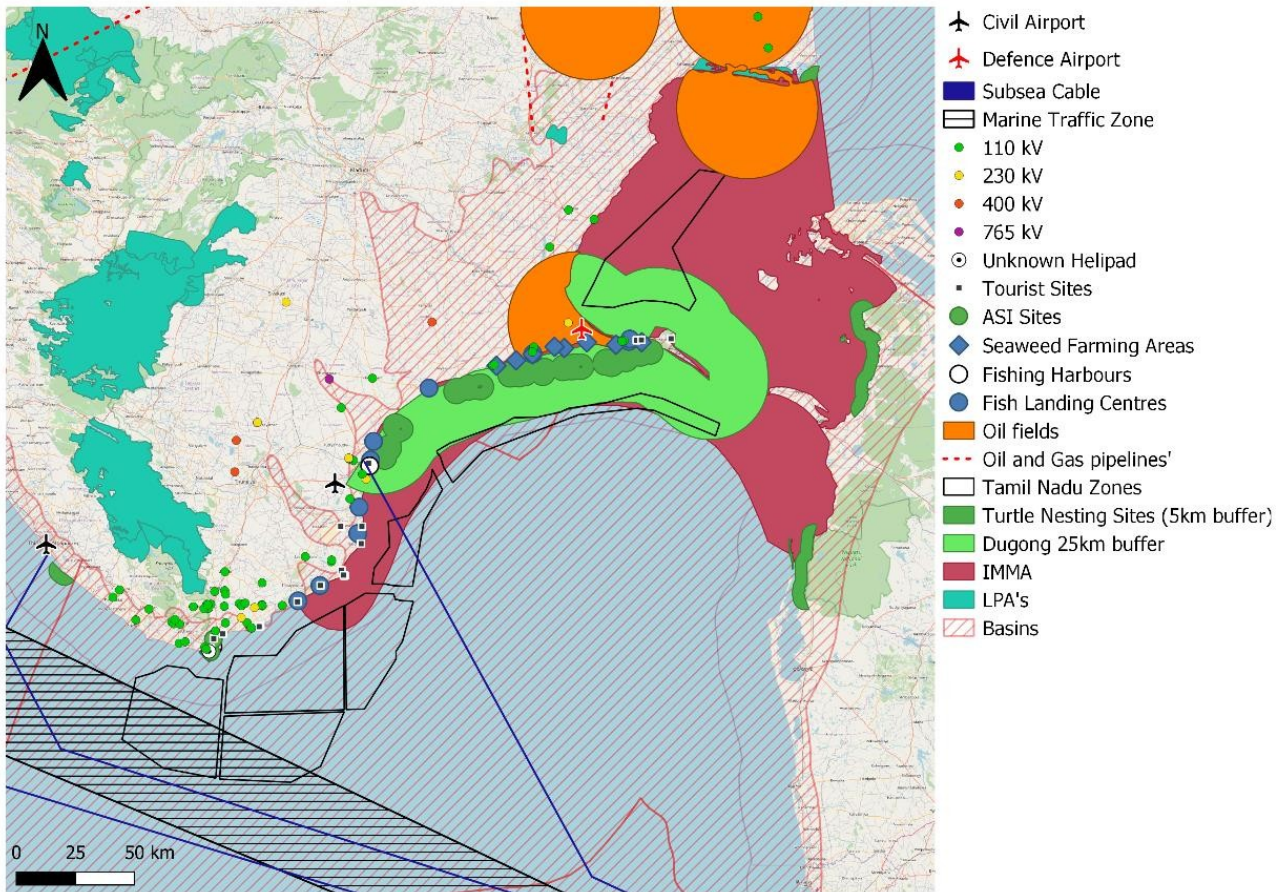
11 <https://tnswa.tn.gov.in/ramsar-site-information.php?token=Gulf-of-Mannar-Marine-Biosphere-Reserve>

12 Sea stars, sea urchins, sand dollars, etc.

13 <https://www.cms.int/news/global-dugong-report-reveals-urgent-conservation-gaps-and-calls-strengthened-regional-action>

14 2025\_GO Bird Sanctuary Danuskodi.pdf

15 <https://www.cecp-eu.in/resource-center/post/fowind-website/home>



Map showing various ecological sensitive zones as well as other fishing related sites along the proposed project areas.

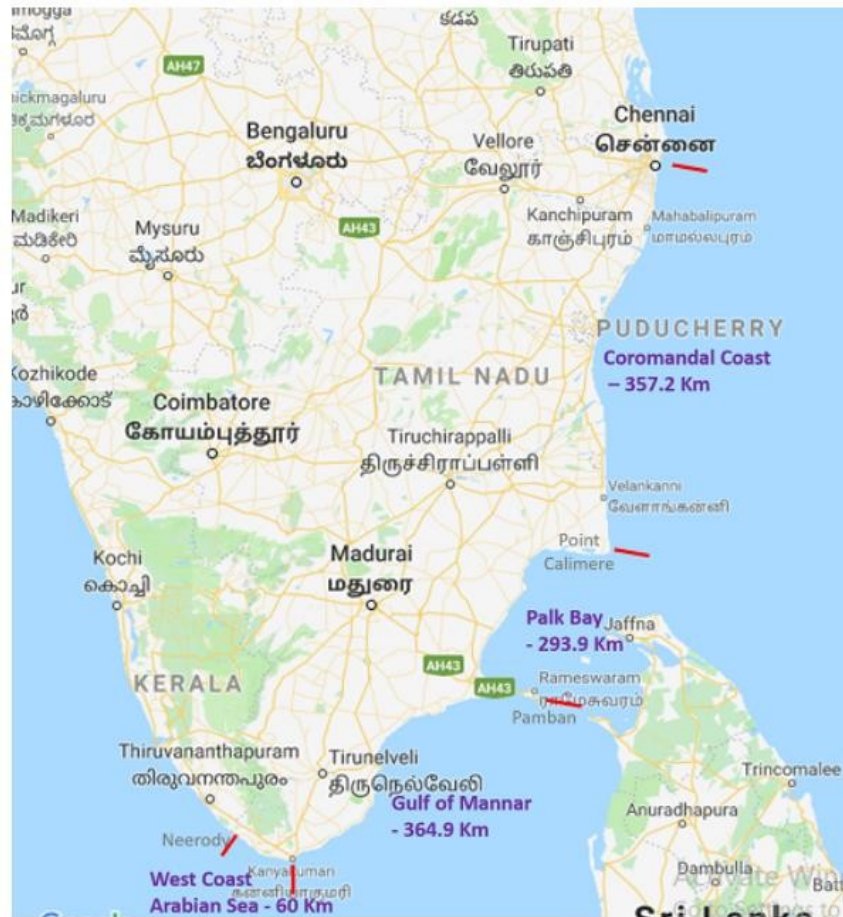
Source: Centre of Excellence for Offshore Wind and Renewable Energy, (2022): *Maritime Spatial Planning for offshore wind farms in Tamil Nadu.*

### Cautionary Note

An EIA was conducted as per norms approved by the Ministry of Environment and Forests and Climate Change (MoEFCC) with 'discussions' with NIWE. The report was submitted to the CRZ Board.<sup>16</sup> The Gulf of Mannar Marine National Park (GMMP) has a core area of 560 km<sup>2</sup> (from Rameshwaram to Tuticorin) within the Gulf of Mannar Biosphere Reserve, an area of about 10,500 km<sup>2</sup> in the southeastern coast of India. It is the first Marine Biosphere Reserve in Southeast Asia, established in 1989 and recognised by the UNESCO,<sup>17</sup> was meant to conserve and protect the dugong and the whale shark among thousands of other species: it is the world's richest region in terms of marine biodiversity. It may be mentioned that some marine species have a range of 15 kms (dugongs) but others (turtles) may have ranges of many thousands of kilometres; the said buffer and core zones of the biosphere reserve would be impacted by the establishment of the project as well as various aspects of its implementation.

<sup>16</sup> The report is not in the public domain but was available through one of the board members.

<sup>17</sup> It is also a Ramsar site, recorded as No. 2472



Coastal Length of Tamil Nadu used for fisheries

The Life Cycle Assessment (LCA) of the materials<sup>18</sup> used in the construction of the turbines are detrimental to the environment. Most of the material used in OWE impact human and environment health negatively.<sup>19</sup> These materials include metals, concrete, laminar compounds, fiber-glass, plastics, epoxy resins, rubber, oil derivatives (lubricants), rare earth, and oil (fuel). The metals are essentially Aluminium (Al), Iron (Fe), Zinc (Zn), Copper (Cu), and Steel, all of which demand land and freshwater during their extraction and generate industrial wastewater discharges when the turbine parts are fabricated. A number of conflicts in the world can be traced back to the extraction or control over some of the critical minerals (cobalt, lithium, nickel, molybdenum) which are concentrated in a few countries, as in the DRC and the Sibuyan Islands in the Philippines.

The noise level due to the construction, especially by pile driving, will be very high. Studies say that the levels will be as high as 208 dB, peaking as high as 244 dB re 1  $\mu$  Pa<sup>20</sup> at 1 metre; the EIA however only mentions a noise level of 120 dB at 3 m (which translates as 129.5 dB at 1 m) which is misleading. Pile driving will remove the biota at the foot of the wind mast in a marine geological formation consisting of calcerous reef; these negative effects will be repeated in the construction of the jetty.

18 The LCA calculates the total environmental impacts generated by a system, process, or activity over an ecosystem or persons throughout its lifespan (<https://www.sciencedirect.com/topics/earth-and-planetary-sciences/life-cycle-assessment>)

19 <https://www.sciencedirect.com/topics/earth-and-planetary-sciences/life-cycle-assessment>

20 Unit of 1 micro Pascal

According to a report by FOWIND,<sup>21</sup> a partnership between the EU and India on Clean Energy and Climate, many of the important parameters require more scrutiny with regard to the offshore wind projects in Tamil Nadu. These parameters include :

- wind resource, as there is high uncertainty of the wind resource assessment;
- metocean climate (water), where there is high uncertainty and limited availability for wave and current data;
- geotechnical conditions, due to limited information available about the seabed geology
- and, finally, an uncertainty of grid connection.

The report adds that as yet “*there is no regulation in place stipulating ESIA for the wind sector in India.*” Impacts of the developments in offshore wind projects depend on the site and scale of the project, making it essential to have a pre-construction analysis. At present, though India has a framework (the 2015 National Offshore Wind Energy Policy) that mandates EIA studies, there is no detailed and unified national EIA law for offshore wind projects. What we have instead – and on the basis of which work on the ground is continuing – are rapid EIAs and specific guidelines, which try to balance development and environment of sensitive zones. In the feasibility study report FOWIND<sup>22</sup> has placed almost all the parameters in either ‘medium risk’ or ‘high risk’, and none at ‘low risk’. Apart from the parameters mentioned above there are also a few others such as bathymetry, soil conditions and jack-up vessels, ports and logistics, ESIA, etc. FOWIND has made elaborate recommendations to mitigate these risks.

In addition to all the technical and ecological drawbacks stressed by India’s legal framework to protect and conserve its marine biodiversity, there is the human angle. This has hardly been addressed, as is evident from the testimonies quoted above. There has been little attempt at public hearings, or in taking the peoples’ opinions, their cultural and livelihood concerns into account while designing the demonstration facility, or the larger project that is envisioned.



21 <https://www.cecp-eu.in/resource-center/post/fowind-website/home>

22 <https://cdnbbsr.s3waas.gov.in/s3716e1b8c6cd17b771da77391355749f3/uploads/2022/12/2022121964.pdf>



Fishermen in Thoothukodi say that the flyash dumped from the thermal plants have made fish catch decline (below); the plants at night (above)

*Source: Madhu Ramnath*

Though renewables now make up about 50% of the installed power capacity thermal power continues to be the source of much of the country's round the clock electricity demand; there is little chance that India will be able to deal with the climate commitments before 2047, without compromising its economic ambitions.<sup>23</sup> The key issue in energy, as renewables expand in the power sector, is energy storage. Other aspects include better distribution, including better metering and better technology. Before going ahead with the planned installation of offshore wind farms it is implicit that the existing thermal plants are made more efficient. Alongside, the obvious and important considerations of marine ecology and seascapes, the impacts on human lives and livelihoods, all need to be taken into account before taking this path.

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<sup>23</sup><https://energy.economictimes.indiatimes.com/news/power/indias-energy-transition-the-role-of-renewables-and-the-need-for-storage-solutions/126131651>

# Sacred Trees Movement: reclaiming sacred landscapes for ecological renewal

Murali Sivanarayanan

Across the temple towns and villages of Tamil Nadu, where spirituality and daily life are deeply intertwined, a quiet ecological revival is taking root. The Sacred Trees Movement, initiated by the Palni Hills Conservation Council (PHCC), seeks to transform underutilized temple lands into vibrant “Sacred Green Zones” living landscapes where biodiversity, culture, and community responsibility flourish together.



*Lord Indiran Temple, Periyakulam*

## Roots of the Initiative

In the districts of Dindigul and Theni, many temples possess sizable landholdings. Over time, portions of these lands have remained barren or underused. Local communities expressed a desire to restore them with useful, culturally significant and deity-specific trees ‘reviving an ancient Indian tradition that reveres nature as sacred.’

One pressing ecological concern has been the decline of *Caryota urens* (Kundapanai). Its flowering stalk is frequently harvested for temple festival decorations, leading to severe depletion on the Palani slopes. Recognizing this imbalance, the PHCC envisioned a conservation movement rooted in faith, ecology and community participation.

Thus was born the Temple Trees Project, an initiative that blends ecological restoration with spiritual revival.



*Planting site*

### **Sacred Green Zones: The Vision**

The project is grounded in the traditional belief linking sacred trees with the 27 *Nakshatras* (lunar constellations). Each constellation corresponds to a tree believed to carry spiritual and medicinal significance.

By reintroducing such trees into temple landscapes, PHCC aims to:

- Restore threatened and native plant species
- Promote medicinal plant knowledge
- Improve biodiversity and pollinator habitats
- Enhance temple environments for pilgrims
- Encourage eco-conscious spiritual tourism

Each temple site becomes not merely a religious centre, but a “living sanctuary” a space where shade, birdsong, medicinal knowledge, and spiritual reflection coexist harmoniously.

### **Launch of the Movement – Diwali 2025**

The Temple Trees Project was ceremoniously launched on 22 October 2025, on the auspicious occasion of Diwali. The celebration symbolized the union of cultural tradition and environmental stewardship.



*Perumal Temple, about 10 km from Ghat Road*

Prior to the launch, the PHCC conducted extensive surveys in Batlagundu, Periyakulam, and Devadanapatti, identifying temple sites based on:

- Availability of land
- Soil and environmental suitability
- Cultural relevance
- Willingness of temple authorities and communities



*Idamalayan Temple, Kattakamanpatti*



*Planting site in Kattakamanpatti Temple*

### **First Phase Implementation**

Twenty-five species of indigenous, sacred, and medicinal plants were planted at four major temples:

- Chendraya Perumal Temple – Old Batlagundu

- Siva Murugan Temple – Pushparani Nagar
- Muniyandi Temple – Vadugapatti near Jayamangalam
- Edamalayan Temple – Kattakamanpatti

These temples offered 5–10 acres of land for cultivation and sapling propagation. Today, these sites serve as demonstration landscapes for ecological awareness and community involvement.



*Chendraya perumal Temple*

### **Second-Phase Expansion and Consolidation – 2026**

Encouraged by the strong response from temple authorities and devotees, the PHCC expanded the initiative in 2026. The Second Phase was formally launched on 25 February 2026, marking the consolidation of the Sacred Trees Movement.

#### **Expansion Highlights**

- Plantation planned in nine new temple sites
- Second-phase planting in three previously covered temples
- Over 5,000 saplings targeted across 20–25 acres
- 40 medicinal plant species already raised
- An additional 100 medicinal plant species under cultivation in PHCC nurseries

Community consultations involved poosaris (temple priests), trustees, village elders, and devotees. Many communities expressed strong interest in medicinal plants, reinforcing the movement's ecological and health-oriented focus.

## **Newly Selected Temple Sites**

The expansion includes several culturally significant temples:

- Maduraiveeran Kovil – Veriappanaicken Patti
- Kottai Karuppu Kovil – Viralipatti
- Paramasivan Kovil – Rajdhani Kottai
- Kannimar Kovil – Valayapatti
- Muniyandi Kovil – Sem Mettupatti
- Manjalar Mariamman Kovil – Near Manjalar Dam
- Karuppasamy Kovil – Kamakkapatti
- Gopalsamy Perumal Kovil – Thumbalapatti
- Siddha Mahalingam Kovil – Anaipatti

Additionally, the second-phase plantation is underway at:

- Chendraya Perumal Temple – Old Batlagundu
- Siva Murugan Temple – Pushparani Nagar
- Muniyandi Temple – Vadugapatti

Some temples requested up to 1,500 saplings in the first phase itself, indicating a strong reflection of community ownership and commitment.

## **Beyond Plantation: Knowledge & Participation**

The Sacred Trees Movement extends beyond planting. The PHCC has:

- Established a dedicated nursery for sacred and medicinal plants
- Initiated a medicinal plant garden with 100+ species
- Invited traditional healers (vaidyars) to document plant uses
- Promoted plastic-free temple premises
- Encouraged restoration of temple water bodies

Regular monitoring visits ensure sapling survival and gradually transfer stewardship to local communities.

## **Ecological and Social Impact**

The movement aims to achieve measurable and lasting outcomes:

- Enhanced biodiversity and improved microclimate
- Better air quality
- Increased pollinator presence

- Conservation awareness across 7–10 villages
- Revival of traditional ecological knowledge
- Creation of serene green spaces for pilgrims

By linking ecological restoration with spiritual devotion, the PHCC reinforces a timeless truth: “planting a tree is one of the most sacred offerings one can make.”

### **A Movement for the Future**

The Sacred Trees Movement demonstrates that conservation does not stand apart from culture, it grows from within it. By reclaiming temple lands as Sacred Green Zones, PHCC is nurturing not only saplings, but also a renewed sense of collective responsibility.

In a world facing ecological uncertainty, these temple landscapes stand as symbols of hope, where faith inspires action and action restores the earth.

The Sacred Trees Movement continues; One Temple, One Village and One Tree at a time.

*Murali Sivanarayanan* is with the Palni Hills Conservation Council based in Tamil Nadu



## Vellagavi: A hamlet in the sky island

Satheesh Muthu Gopal

Just after the spells of the Northeast monsoon season ended, I went on a trek from Kodaikanal to Kumbakarai via Vellagavi village, located on the southern slope of the Palani Hills. Fortunately, the sky was clear on that day. I went with the Solaikuruvi team, who work tirelessly to remove plastic waste from the Palani Hills, carelessly discarded by tourists and locals. We started the trek from Vattakanal after breakfast. The path descended to Dolphin's Nose, a tourist attraction, with a good view of the valley on the southern slopes. The huge boulders and massive roots of the surrounding trees have formed steps, making it easier to walk down. The eucalyptus trees stand tall on both sides of the path. The absence of bird song was evidence of the lack of native trees.



*Southern slopes of Palani hills*

I stood on the protruding rock called Dolphin's Nose. The valley below and the cliffs across, which cut across the hills, appeared astonishing. The Perumal Peak, the third highest in the hills, was unobscured by the clouds and clearly visible in the background. Since we planned to finish this 18-km trek in a single day, we had little time to linger. For most the initial four kilometers of the trek, I couldn't spot any birds. Then I heard a screeching sound I had never heard before and, after a brief pause to

analyze, we found a broken branch of an eucalyptus tree swaying in the wind. What else could we expect in stand of eucalyptus trees? Beyond the woods, the grasslands of Agamalai were clearly visible from that place. The grasslands on that hill looked like a green velvet mat covering the hill. Unfortunately, there are very few places in the Palani hills left with the grasslands.



*Lesser Yellownape Woodpecker*

After a while, the lantana shrubs brought some sign of life. Some small birds, such as the Crimson-backed Sunbird and Red-whiskered Bulbul, foraged in the bushes for nectar and berries. A pair of Indian White-eye fed on the Showy Aromatic Lobelia. Slowly, the landscape changed as native trees appeared, and tree birds too. As the path was full of loose stones, I couldn't concentrate much on the surroundings. I often had to stop as I had to watch my step. However, I stumbled several times during the trip. We continued walking along the ridge for a few more kilometers and reached the shola before Vellagavi village. A pair of beautiful Lesser Yellownape were pecking at a bole of a tree. The yellow hindcrest grabbed my attention under the dark canopy.

We had walked almost 8 kilometers to reach Vellagavi. This village had no road access to connect it to anywhere in the world. With no more than 50 families, this historical village is surrounded by forests and farms and sits at the top of a hill on the southern slopes. A village with zero air pollution, as there are no vehicles, but it has a primary school to educate the kids, and the government provides morning meals too.

Just at the entrance to the village, the Palni Hills Conservation Council had planted a magnolia sapling<sup>1</sup> last year, and it is nice to see it thriving. We removed our shoes and started walking barefoot along the street, as the people of this village consider this place sacred. It is common among people from this village to walk 8 kilometers uphill to Kodaikanal, or 10 kilometers downhill to Kumbakarai, to meet their needs. I have observed sparrows in most villages in the Palni Hills, but have never seen them in the forest. During this trek as well, I did not come across a single sparrow until I reached Vellagavi.



*White-eye*

As sparrows are habituated to human settlements for eons, it is no wonder to see them in Vellagavi. Though the village is isolated from other villages and towns, sparrows have found their home in this sky island. Like migratory birds which fly thousands of kilometers for food, and are able to reach the same place every year, sparrows, too, find their home in human settlements, even if they are remotely located.

After lunch, we started from Vellagavi. The breathtaking view of the surrounding valley was astonishing. But it was not easy as I already felt tired. However, as we

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<sup>1</sup> Sir Vere Henry Levinge, the Collector of Madurai in the 1860s, created the lake in Kodaikanal. The plant is named in his honour

had decided to finish the trek on the same day I continued. A spectacular, glistening Common Green Forest Lizard (*Calotes calotes*) grabbed our attention and enticed me to continue the trek. The path was getting harder and harder, and I had to take more breaks than in the first half. An Indian coral tree in bloom grew on the side of the path, the red flowers just at our eye level. A party of Vernal Hanging Parakeets feasted on the tree. I wondered why there were no elephant movements on the southern slope of the Palani Hills. On inquiry, I learned that no one had seen an elephant in this region.

We had only a couple of hours to leave the forest. So we continued our walk and did not wait to see the surroundings. While walking through the deciduous forest, I heard the song of a Tickell's Blue Flycatcher and the call of a Greater Coucal. But light was fading and as we left the forest we saw fireflies swarming around.

*Satheesh Muthu Gopal* is an independent writer and environmentalist based in Tamil Nadu and Singapore

# Van mela in Udaipur, Rajasthan: a glimpse

Kamlendra Singh Rathore

The First **Van Mela 2026** was organized by the Rajasthan Forest Department to promote biodiversity conservation and strengthen forest-based livelihoods. Aligned with the National "**Vocal for Local**" campaign and the "**Panch Gaurav**" initiative, the fair served as a bridge between tribal producers and urban consumers. The event was organised on the 17<sup>th</sup> and 18<sup>th</sup> January 2026, in the Sajjangarh Biological Park, Udaipur.

**Samarthak Samiti** played a pivotal role in the event, showcasing the economic potential of Non-Timber Forest Products (NTFPs) and tree-based livelihoods.

## "Where there are forest dwellers, the forest is also safe"

Addressing the program, Rajya Sabha MP Chunnilal Garasia stated that various value-added products can be prepared from the produce available in forest areas, with Mahua and honey being the most prominent. Emphasizing the need for widespread publicity of such events, he said that it would benefit a maximum number of people in the region. He remarked, "Where there are forest dwellers, the forest is also safe." He further noted that the Forest Department's role in protecting the Aravallis is extremely vital, and current issues regarding the Aravallis are concerning and require serious consideration.



Lok Sabha MP Dr. Mannalal Rawat said that our rural communities understand the importance of forests very well. He stressed the need to adopt best practices from other countries and mentioned that bamboo can also become a powerful medium for rural livelihood, which needs more focus.

On this occasion, Divisional Chief Conservator of Forests (Territorial) Sunil Chhidri explained that this fair is being organized to promote forest products and enhance rural livelihoods. More than 50 diverse stalls have been set up at the fair. He informed that forest produce worth approximately ₹25 crore is sold annually in the Udaipur region, the direct benefit of which goes to the local tribal community. Additionally, efforts are being made to develop similar markets in nearby districts. The program was attended by CCF Wildlife S.R. Yadav, Deputy Conservators of Forests Mukesh Saini and Ajay Chittora, Deputy Conservator of Forests (Wildlife) Yadavendra Singh Chundawat, along with other officials and employees of the Forest Department.



### An overview

The fair featured over 50 stalls representing all districts of the Udaipur division. Key focus areas included:

- Exhibits: Organic medicinal plants, forest honey, herbal products, and bamboo handicrafts.
- Conservation: Educational materials on wildlife protection and sustainable forest management.
- Entrepreneurship: Promotion of new tribal entrepreneurs and self-help groups (SHGs).
- Collaborations: Participation from 15+ NGOs including Samarthak Samiti, Sewa Mandir, Alert Sanstha, and Jagran.

### Samarthak Samiti's participation

Educational Outreach & NTFP Promotion

The Samarthak stall featured a comprehensive gallery of 32 detailed posters. These visual guides educated visitors on the lifecycle, harvesting, and benefits of various forest produces such as Jamun, Amla, Sitafal, Kikoda, Ratanjot, Aloe Vera, Palash, Puhad, and Mahuwa.

### Value Addition & Processing Display

The organization demonstrated its expertise in the Tree-Based Livelihood model by showcasing the complete value chain:

- Post-Harvest Management: Sorting and grading techniques.
- Value Addition: Processing and professional packaging of forest produce.
- Branding: Promotion of the "Desert Greens" brand as a high-quality, ethical market alternative.

## Commercial Success

The flagship product, **Desert Greens Natural Forest Honey**, received an overwhelming response. A total of **35 kg of premium honey** was sold over two days, with customers specifically noting the purity and the ethical sourcing from tribal honey-collecting families as primary reasons for their purchase.

## Dignitary visits and recognition

The Samarthak stall served as a primary hub for policy-makers and administrators. The following dignitaries visited the stall and commended the organization's work in tribal empowerment:

- Shri Babu Lal Kharadi, Hon'ble Minister of Tribal Development, Govt. of Rajasthan.
- Shri Chunni Lal Garasiya, Hon'ble Member of Parliament (Rajya Sabha).
- Shri Manna Lal Rawat, Hon'ble Member of Parliament (Udaipur).
- Smt. Pragya Kevalramani, Tribal Commissioner, Rajasthan.
- Shri Namit Mehta, District Collector, Udaipur.
- Senior Forest Officials from Jaipur and Udaipur divisions.

The leadership appreciated the organization's focus on transforming raw forest produce into high-value retail products, thereby ensuring a sustainable and brighter future for thousands of tribal families. The Van Mela 2026 was a resounding success for Samarthak Samiti. It provided a vital platform to demonstrate that forest conservation and tribal livelihoods are mutually beneficial. The visit of high-ranking officials and the strong retail performance of **Desert Greens** have solidified the organization's role as a key leader in the regional "Vocal for Local" movement.

A State-Level Van Mela, Jaipur (Feb 8–9, 2026) was organised in follow-up of the Van-Mela Udaipur . The Forest Department of Rajasthan organized a two-day State-Level Van Mela at Secretariat Nursery, Jaipur, from February 9–10, 2026 (preceded by district events like Van Mela Udaipur in January). The event was inaugurated by the Honorable Minister for Forest, Environment, and Climate Change, Shri Sanjay Sharma.

## Samarthak Contribution

- Educational Stall: Samarthak successfully set up a dedicated stall featuring Education Posters focused on Non-Timber Forest Products (NTFP). These materials highlighted the importance of sustainable forest resource management and biodiversity conservation.

- Sustainable Honey Promotion: A core highlight was the promotion of Improved Honey Collection techniques that ensure the safety of beehives.
- Product Sales: The stall facilitated the sale of Desert Greens Honey, a pure forest product that supports local tribal livelihoods and aligns with the "Vocal for Local" campaign.

Samarthak stall served as a platform to interact with forest officials, students, and nature enthusiasts, raising awareness about how scientific harvesting of honey can protect bee populations while providing economic benefits to forest-dwelling communities.



*Kamlendra Singh Rathore* is the Secretary, Samarthak Samiti and based in Udaipur, Rajasthan

# An Ode to Microscopy

Henry Harrison

*“The real voyage of discovery consists not in seeking new landscapes, but in having new eyes.”*

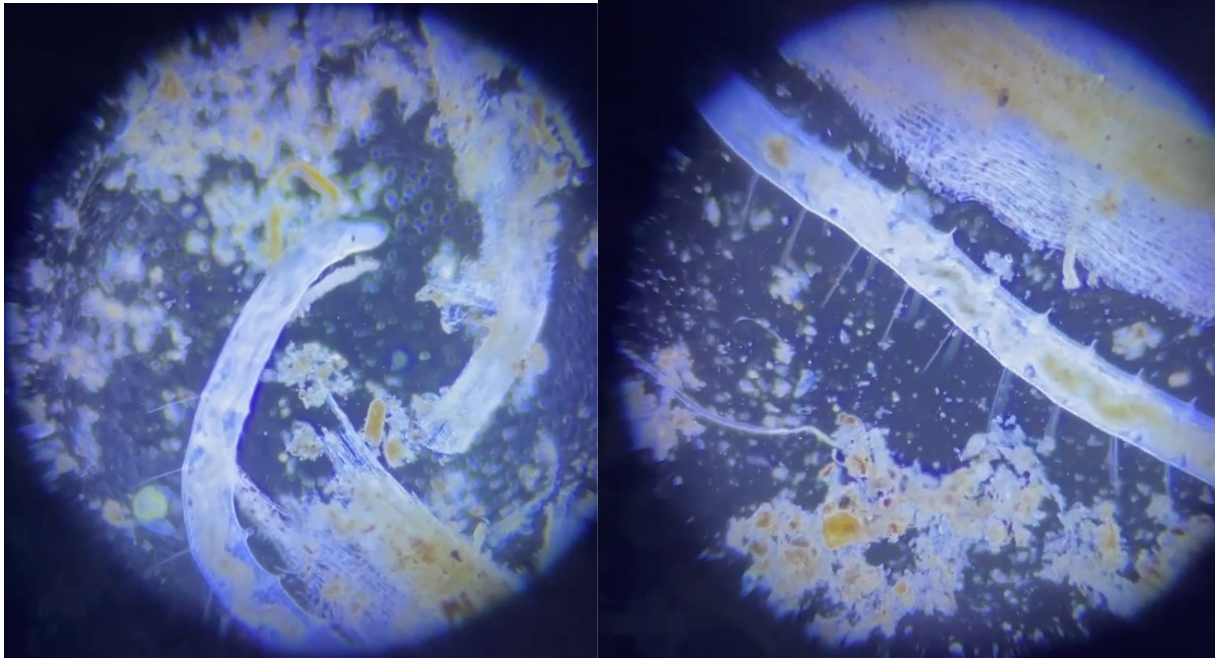
Marcel Proust

For most of human history, a world existed beneath the threshold of human experience. Moving, feeding, dividing, hunting, dying, an entire existence; silent, transient, flourishing.

Yet, this world is never resting.

A few months ago I stored a selection of Amsterdam pond water in a tupperware, recently opening it up expecting to get a fitting photo for this article... little did I know ironically enough this large hairy nematode had spent the last months gobbling everything in sight. Therefore to attach to this articles is a microscopic view of a free-living detritus-associated nematode moving through organic debris. These transparent, unsegmented roundworms are common inhabitants of freshwater sediments, wet soil, decaying plant material, and microbial biofilms. Rather than consuming large debris particles directly, many such nematodes feed on bacteria, fungi, and other microorganisms colonizing decomposing matter. Their slender cylindrical body, tapered ends, and characteristic serpentine thrashing reflect a hydrostatic body plan driven by longitudinal musculature. As abundant members of the

microscopic detrital community, they play an important ecological role in decomposition, microbial regulation, and nutrient cycling. [see photographs below]



*Amscope 120-R 100x, darkfield blue filter, still's from video recorded on Iphone 14*

A drop of pond water, a scoop of soil, a scraping of bark, life gathers in astonishing abundance. Fantastical designs unfold, relentlessly refined by opportunity, driven by the invisible gears of the punishing challenge of life on a microscopic scale. Nothing down there is sentimental, every choice and direction is driven by function, honed by time, defined by pressure and chance.

What is revealed is not simplicity but abundance.

Abundance of flow.

Abundance of motion.

Abundance of ingenuity.

Cells behave like societies and colonies thrive in perfect chaos. Predators stalk prey in areas smaller than sand grains. Parasites exploit hosts with strategy cunning and cruel.

Even decay is exploited on an industrial scale – matter dismantled molecule by molecule marching to the silent rhythm of death that becomes life again.

Peering into this world, there is awe and humility that overwhelms you. Our human life so often framed as central, solipsism drives the natural world to be seen as merely adjacent. These forgotten worlds gain attention only when they show their brutal relentless forces in sickness, yet every day we exist thanks only to the tiring work of our own bacterial colonies. The revelation is not that life is fragile, but that it is relentless, stubbornly indifferent to our concerns, and brutal in its persistence.

Beauty, too, is redefined.

It is no longer refined to the symmetry of shapes or the combination of colours we recognise as preferential. Beauty appears in the radical perfection of a diatom engineered more perfectly than any human creation. This emerges in creatures that are so alien that they feel utterly inconceivable. Chaotic tumbling and collisions of ciliates drive a constant cycle of entropy to organisation, to entropy again.

Looking through the scope, we are confronted with the realisation of the absurdity of scale. Microorganisms have spent billions of years operating in entire enormously complex ecosystems that may exist in a space smaller than a bottle cap. In our lives, similarly, we stress, worry, want, curse, love, laugh and die, all in the comparative bottle cap in the universe, and perhaps the universe is a bottle cap in a larger system still unknown.

Human nature often presents the question of meaning. Meaning of suffering, meaning of love, meaning of life. What is meaning on the microscopic scale for an Amoeba or a Paramecium? Life confronts us with a desire to assign purpose, intention, celestial intentions, but the microscope answers these questions with another, “how can there be any meaning at all”. Life exists, and it just *is*.

Life is far richer than our senses can suggest.

Life is perfectly absurd and beautiful.

An ode then, not to an instrument, but to the universe it unveils. To the silent, tireless lives that remind us, the universe is not only vastly expansive but awesomely small. An ode then, to the humbling realisations given by new eyes.

*Henry Harrison* is a medical student based in Amsterdam, The Netherlands

# Nature Notes

Four common trees of central India, associates of sal, *Shorea robusta*, in these regions. The local names, merdengi, nammi, tumri and sarangi are in the endangered Durwa language.



**Tumri: *Diospyros melanoxylon***



**Sarangi: *Shorea robusta***



**Nammi: *Anogeissus latifolia***



**Merdengi: *Terminalia tomentosa***



# NON-TIMBER FOREST PRODUCTS EXCHANGE PROGRAM NETWORKING FORUM, INDIA

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