



‘Seas’ the day: Against all odds, a Kerala entrepreneur wants to revolutionise marine transport

Synopsis

NavAlt aspires for an efficient water transport system that can amount to tremendous savings in energy and fuel. But the challenges of working capital and discriminatory policies are playing spoilsport.

Naysayers, they say, help to take things up a notch. Ask Sandith Thandasherry, Founder & CEO of Kochi-based **NavAlt Solar** and **Electric Boats**, who encountered many such voices when he wanted to navigate uncharted territories. While planning India’s first solar-powered ferry, Aditya, in 2017, skepticism came aplenty — from those who thought it fell short from a technical perspective to those strongly resisting such changes in the industry.

That was then. Last year, perhaps as a befitting response to the skeptics, Aditya bagged an international honour for his innovation when he clinched the **Gustave Trouvé** Award for Excellence in Electric Boats and Boating. Instituted in the memory of Gustave Trouvé — a French electrical engineer and pioneer in electric vehicles and boats — the low-cost passenger ferry became the winner after competing with five finalists from Europe.

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“NavAlt aims to indigenise the core technologies that enable advanced solar-electric ferries. For Aditya-type ferries, it has achieved over 65% (indigenisation),” Thandasherry had said in a statement after receiving the award. “The unavailability of lithium cells currently limits it in India. For advanced hybrid technologies, this figure is closer to 50%. If some of the policies of discrimination against indigenisation are removed, this process can be faster.”

For a solar ferry, the annual energy cost for Aditya was in 2016 estimated to be Rs 62,235 a year at 7,969 units. This energy cost is likely to increase at the rate of 5% every year. A diesel ferry of similar dimensions that consumes around 100 litres a day was in 2016 estimated to cost Rs 21,02,429, the company claims.

“We could establish not only the environmental impact but also clear economic savings and return on investment, which normally electric vehicles struggle with. We managed to get this going with no government subsidies,” says the 44-year-old entrepreneur.

How it all started

Thandasherry, who got a degree in naval architecture from IIT-Madras and an MBA from **INSEAD**, started his entrepreneurial journey with a marine consulting entity, Navgathi, in 2008. His aim was to save fuel by designing more efficient boats. “That was our primary purpose. We never knew about ferries or solar boats,” he recalls.

Before finding a niche in the public transport category, the company experimented with solar-powered leisure boats in 2010-11 to prove these can be as fast as a conventional one. “Usually at that time, people used to take a boat and put solar panels and electric motors on them, which made these boats slower. We wanted to change this. And we managed to do so in a small boat with a capacity of 10 passengers. This got us into the Limca Book of Records for the fastest solar boat in India,” says Thandasherry.



The company had experimented with solar-powered leisure boats in 2010-11 to prove these can be as fast as a conventional one.

This success prompted him to try a similar experiment on fishing boats in 2013. However, he figured out that while these were great technology demonstrators, the boats did not necessarily translate to great economics. The next option was

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public transport, which had the advantage of heavy asset utilisation as ferry boats run for 10-12 hours a day at moderate speeds. Around the same time, the Kerala State Water Transport Department (KSWTD) was trying to find solutions to stem the losses being incurred daily on account of escalating fuel costs. While its daily revenue collection was Rs 5,000-6,000, **KSWTD's** fuel bill alone was Rs 7,000-8,000 a day. "It was not just the environmental issue or better ride that was a problem. This had more to do with the department's sustenance as a transport company. That's when we thought we should try to put forth our proposal of solar boats, and we got that opportunity," he says.

Work on the project started in 2014 and it took almost three years to build a suitable ferry. In 2017, the venture was formally christened as NavAlt — a joint venture between Navigathi Marine Design & Construction and French companies AltEn and **EVE Systems**. "We had some investments and technology cooperation from a few friends and companies that had certain expertise, which I believed we didn't have as much at that time. So, we tried to bridge the gaps in our knowledge and tried to get the best solutions in the world, something that can be replicated across the world. That was the idea," he says.

Challenges and opportunities

It wasn't an easy victory. Thandasherry vividly remembers how the challenge in 2016-17 was to convince a certain group of people that such a thing was even possible. "Technically, ferries with 75-100 passengers need about 50-75-horsepower engines. We were telling them that it can be done with 25- or 20-horsepower engines. In their mind, this was a thought no less fancy that the power would be reduced by one third," he adds.

Some of them said such a boat was a sheer waste of public resources. "There were also those with vested interests, such as some lobby groups and a few other players who didn't want such a change in the industry. These groups were very vocal about it and even went to vigilance officers and the high court to stop the project," Thandasherry says.

All NavAlt needed to tide over this crisis was an opportunity to demonstrate that such a boat was possible. Luckily, they got it. On January 12, 2017, the solar-powered ferry started regular operations from morning to evening between Vaikkom and Thavanakkadavu, a 3-km trip across Lake Vembanad. This proved to the critics that solar boats could well be the norm rather than an exception in the industry.

Despite such breakthroughs, Thandasherry says getting working capital for such projects can be an impediment. Large ferries, he adds, could cost Rs 3-4 crore, and it takes six to nine months to operationalise them, depending on the approvals needed. "I am sure almost all MSMEs struggle because the finance cost is very high in India."

The competition doesn't make it any easier. The finance cost for foreign players is nearly zero. "When we compete against foreign players, the cost of finance is a big

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deal because we end up with a finance cost of 12-15%. We have an instant disadvantage," he says ruefully.



Sandith Thandasherry, Founder & CEO of NavAlt Solar and Electric Boats.

There is a clear discriminatory policy between an Indian company and a foreign company, says Thandasherry, unhesitating to mince words about an experience he had with the shipbuilding and maintenance facility Cochin Shipyard. There is an acute lack of confidence in something being made in the country. "When the government of India orders any product from outside India, they are invariably okay with paying money upfront or in multiple stages. But when they order the same from an Indian firm, the money is received only after delivery. This is okay if you are supplying small-value items of Rs 1-5 lakh. But for Rs 3-5-crore value items, it gets difficult for the enterprise to survive. It hampers our growth," says the entrepreneur.

This is a result of the "colonial hangover," that continues to exist. "It is the mindset that whatever comes from outside is great and what is done in India is not great. Many of the decision makers, mostly in government, still have that hangover. So, they invariably end up framing tenders that suit a foreign player, disincentivising any purchase from India with a sweeping generalisation," he states.

Future wise

Despite the challenges, Thandasherry's confidence in his venture has never faded. NavAlt's solar boats can save a lot on operating and maintenance costs even if these are 20-30% more expensive than diesel boats, he says. For instance, a typical diesel ferry for 75-100 passengers would cost around Rs 2.5 crore, whereas a solar ferry costs Rs 3-3.5 crore. "However, a solar ferry will help you save around Rs 25 lakh in fuel-plus-maintenance in a year. This means that in four years, you will save almost half of the boat's cost," he says. This is without considering the

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revenue generated by selling tickets.

NavAlt could keep its business steady during the pandemic, except during the initial two months. Its design and engineering team worked from home. In fact, work has picked up for the firm and NavAlt launched leisure boats for tourism in 2021. These are smaller boats, for 6-30 passengers, and cost Rs 20-50 lakh depending on size. A conventional boat of similar size would start from Rs 30 lakh.

The company is also looking to make boats for small and medium fishermen. Typically, boats used by small fishermen consume 15-20 litres of subsidised fuel and costs around Rs 10,000 a month in maintenance. NavAlt aims to make a 10-person boat that can save fishermen at least Rs 2 lakh in fuel. "We are trying to make five boats in the first phase and then 100 in the second phase," he says.

Shell Foundation has granted NavAlt Rs 1.5 crore for this project. Abhay Srivastava, Business Development Advisor, Shell Foundation, says the fishing community in India faces numerous challenges. The number one being that most of them are below the poverty line. "The fishermen have been shelling out a lot of money for sustenance and maintenance of boats. NavAlt is already two steps ahead of the problem. It has conducted some pilot projects in Gujarat and Maharashtra," he says, adding that this is an area where not much innovation or investment has happened.



NavAlt launched leisure boats for tourism in 2021 of different sizes which can carry 6-30 passengers.

NavAlt also wants to make solar boats that are faster than traditional ones: the earlier aim was to match the speed of the conventional ones. For this project, the company is working with the Ministry of Defense, says the founder.

Thandasherry envisages use of fuel cells, which may solve issues like range and speed. The company also wants to power big ships using wind propulsion to

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bring down carbon footprint and improve efficiency.

Around the world

Now, it could be smooth sailing for NavAlt. A report by Future Market Insights says the global electric boats market will grow at a CAGR of 11.0% over 2018-2028. This growth comes amid increasing adoption of small boats for various purposes such as maritime security and fishing. Another report, by **IDTechEx**, states 15,000 solar boats were sold across the world in 2020. This number is expected to grow to 70,000, creating a \$1.4-billion market by the end of 2030. Already, Australia-based solar ferry Solar Sailor, with a capacity of 186 passengers, by Ocious Technology is known to be a leader in this space.

But it may be too early to predict the future of this segment just yet. Ashok Panjikaran, Head-Business Development and Incubation at Kerala Startup Mission, says this area needs a lot of development and investment. "There is tremendous opportunity, but it is yet to be explored at a greater level. It needs a lot more understanding, experimentation and development before national schemes and subsidies can be planned," he adds.

Srivastava of Shell Foundation explains that such a product didn't exist in India a few years ago. Fishermen hadn't seen it, neither did the financiers nor the policymakers. So, policy development won't be quick. "Only time will tell what kind of policies are required to support this sector. Gradually, we will be able to understand if solar fishing boats will really add value to fishermen. We are a few years away from answering this question," he adds.

But there is no looking back for Thandasherry. Doubters have only powered him up so far. "I think we still have about 22 boats to deliver this year. That is our first focus," he adds, eyes glinting at the possibilities of proving people wrong again.

(Edited by Ram Mohan)