



# Riches in the sea

**Despite India's 8,000-km coastline and over 800 available species of seaweed, cultivation of this nutrient-rich, ecology-happy algae is low in the country. Seaweed experts weigh in how its potential can be realised**

**SUCHETA CHAKRABORTY**

ABOUT five years ago, Goa-based marine conservationist Gabriella D'Cruz met a community whose members have been harvesting seaweed for generations by diving to collect the algae off the Gulf of Mannar in Tamil Nadu. The encounter with these women who are paid a measly ₹15-20 for a kilo of seaweed for the labour-intensive, dangerous job of hand-harvesting by freediving for hours left a mark, drawing her into India's seaweed story. Currently, seaweed in India is where spirulina was 10 years ago. "It's a very low-value industry. When you minimise the middlemen and have direct contact with your harvesters, there is a possibility for a better price and safety standards. The industry needs the framing of stringent guidelines, which are currently lacking. India doesn't have a seaweed policy and there's no protection status given to it," D'Cruz says.

Gujarat and Tamil Nadu are the primary suppliers of seaweed, with communities in their coastal areas harvesting and selling it to middlemen who then do business with pharmaceutical and food companies. It's often used as a hydrocolloid, a thickening agent, found in toothpaste, ice creams and whipping creams. "The seaweed industry is like the palm oil industry, it's in a lot of products but we don't really know where it comes from and whether it's sustainable," says D'Cruz, whose firm The Good Ocean consults with companies that want to include seaweed in their products. She hopes to eventually enter the food and beauty industries because she feels that is where change can be spurred. Seaweed has the potential to be a superfood thanks to its high content of vitamins, minerals and iodine, but there continues to be hesitation about direct consumption, which is restricted to dishes like sushi and ramen. "Right now, the key players in the seaweed market are hydrocolloid-based industries. If there are going to be new players, they have to be sensitive to the fact that we need to conserve oceans, work directly with communities and ensure they are paid better," D'Cruz explains.

The Indian government recently allocated ₹637 crore to seaweed cultivation, a step that is crucial for two reasons, as Neha Jain, founder of Zerocircle, an early-stage start-up that makes home-compostable and marine degradable packaging for brands from locally cultivated seaweed, explains.



Goa-based Gabriella D'Cruz is a marine conservationist who started her seaweed company The Good Ocean last year. It consults with companies that want to include seaweed in their products. D'Cruz is looking to start a pilot seaweed farm in Goa by the end of the year

"The first is from the perspective of carbon capture as there is no other plant that captures carbon dioxide as fast as seaweed. Anywhere between 60 to 80 per cent of the oxygen on the planet comes from the ocean, evidence enough that for centuries the oceans have been taking care of us." Seaweed also prevents acidification, and scavenges the chemicals washed into the seas as a result of fertiliser usage in agriculture. Second, she says, the move offers employment opportunities to coastal communities, especially those affected by the climate crisis. She discusses how during field trips to fishing villages in Maharashtra in late 2019,

she learnt that the income of locals dependent on the fishing trade had been drastically affected due to depleting supply of fish. "They are very happy with the idea of a new source of income emerging from the same waters."

Jain shares that the biggest challenge for companies like hers, which are creating seaweed-derived, value-added products, is the issue of biomass availability. There is just not enough seaweed produced in India despite its 8,000 km coastline and over 800 available species. Abhiram Seth, managing director of AquAgri Processing Pvt Ltd, a leader in

developing new technologies for seaweed cultivation and harvesting, offers an explanation. Cultivation of seaweed, he says, doesn't take place in the high seas, but in protected spaces like gulf areas, which do not have high tidal action. In India, however, in gulf areas, cultivation of *Kappaphycus alvarezii*, the weed primarily used for this purpose, is not allowed by the Ministry of Environment, Forest and Climate Change because it is not a native species. "I have found no scientific justification for this," he says. "It is strange considering the entire agricultural backbone of our country is based on exotics, and not native species—the wheat which we grow comes from Mexico, and the rice from the Philippines. Growth of cultivation has been stifled because of this." Moreover, with rising sea temperatures around 2016-17, the planting material lost its vigour, resulting in the need for facilities for its mass propagation. Although initially focused on carrageenan for the food industry, AquAgri is also developing nutritional supplements for cattle, poultry and fish. These have shown to increase their immune response, improving productivity. In cattle, crucially, they help significantly in the reduction of methane emissions.

A solution is land-based cultivation. Dr CRK Reddy, CEO at the Indian Centre for Climate and Societal Impact Research (ICCSIR), Shri Vivekanand Research and Training Institute (VRTI), Gujarat, explains that cultivation in India is done in the sea because it doesn't require much investment as all conditions required for its growth are available in nature. However, monsoons disrupt cultivation for four months every year. A few thousand hectares along the Indian coast need to be cultivated, he says, with about 100 to 200 operating units. "We are optimistic about the seaweed industry in India as we have the resources. India has the potential to be a global competitor provided a blueprint is developed. Our production is cost-competitive and we have a huge consumer base." He informs that ICCSIR supported by a consortium comprising Excel Industries Ltd, Pidilite Industries and the Mamata Group is spearheading a seaweed programme to develop proven cultivation technologies for the reversal of climate change.

A species of brown seaweed known as *Dictyota dichotoma* found along the Saurashtra coast, Gujarat; women in Palk Bay tie seaweed onto ropes, which are strung on rafts and floated in open seas for cultivation. PICS COURTESY/ CRK REDDY AND ABHIRAM SETH



**ABHIRAM SETH**



**CRK REDDY**

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