

Mega Indian experiment to sink carbon could help fight warming

Amit Bhattacharya | TNN

Can tossing tonnes of iron powder into the ocean help the world fight global warming? A team of Indian scientists, along with their counterparts from Germany and elsewhere, is embarking on an ambitious 70-day ocean expedition on Wednesday to find answers to that.

The scientists — 29 from India, 11 from Germany and 10 others — will board German research vessel, Polarstern, in Cape Town and head to the experiment site in southwest Atlantic near Antarctica. They will stay in the cold and notoriously stormy waters for nearly two months to test a controversial hypothesis that, experts say, has the potential to clean up as much as 1 billion tonne (1 Gt) of CO₂ from the atmosphere every year and store it below the ocean for centuries.

CO₂ is a greenhouse gas chiefly responsible for global warming. According to current estimates, world emits 7 Gt of carbon into the air annually. "We hope to have a deeper understanding of the technique than previous researches," S W A Naqvi of National Institute of Oceanography, who is the chief Indian scientist for the expedition, told TOI on email from Cape Town.

The experiment, called LOHAFEX — Ioha for iron and FEX for fertilization experiment — will test the efficacy of a technique that could not only become the most important way to dispose of CO₂, but which also has millions riding on it by way of carbon credits. At least two US companies hope to profit from "ocean iron fertilization" (OIF), as the method is called, by selling credits.

During the \$2 million experiment, scientists will throw 20 tonnes of dissolved iron sulphate in 300 sq km of ocean. The iron is expected to stimulate a rapid blooming of phytoplankton, a microscopic algae that grows on the ocean surface. Like all plants, phytoplankton takes up CO₂ from air and converts it to carbon compounds like carbohydrates. The plant quickly dies and

Graphic: Pratima

PUMPING IRON TO FIGHT GLOBAL WARMING?



1 Experts 'seed' 300 sq km of ocean with 20 tonnes of iron



2 Within weeks, the ocean turns green with blooms of tiny plants called phytoplankton. These take up CO₂ from air for photosynthesis



3 Plants die quickly & sink. These are eaten on way down by shrimp-like animals called krill

Key question | Do dead plankton containing carbon from CO₂ sink below 500m? If they do, CO₂ wouldn't surface for 100 yrs. If they sink below 1,000m, CO₂ will be trapped for centuries

If the hypothesis is found to be true, 1 billion tonnes of greenhouse gas, CO₂, could be sunk into the ocean every year. The world currently emits 7 billion tonnes of carbon annually

starts sinking, taking the carbon with it. What happens thereafter is the key to the technique's efficacy: If it sinks well below the ocean surface, the carbon would effectively have been put away for a long period.

Scientists calculate that if the entire southern ocean were fertilized by iron and a sizeable fraction of the phytoplankton sank well below 1,000m, then

about 1 Gt of carbon would be isolated for centuries. Water at depths below 500m takes about 100 years to come to the surface. But OIF remains controversial, with many environmentalists saying it amounts to major tinkering with the marine eco-system. If done on the scales proposed in the future, it could have unforeseen consequences, they warn.

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