# Earth System Science Organization
# Ministry of Earth Sciences

## Open Sea Cage Culture

Large scale fish production through mariculture is the only alternative to cope up with the ever increasing demand for fish proteins. One of the major barriers in achieving commercial production of marine finfish is the lack of appropriate culture systems and technologies for the Indian sea conditions. With its expertise in marine engineering and biology, Earth System Sciences Organization – National Institute of Ocean Technology (ESSO-NIOT) has addressed these issues by design and development of sea cages with mooring systems and demonstration of open sea cage culture of commercially important marine finfishes in different sea conditions.

Realizing the vast Exclusive Economic Zone of the country and the huge demand for fishery products, larger 9 m dia HDPE cages with multipoint mooring were designed, developed, deployed and tested in the North Bay (Andaman Islands), Olaikuda (Tamil Nadu) and Kothachathram (Andhra Pradesh) representing fully protected, semi-protected and open sea environments, respectively. Using these cages, the culture of several marine finfishes, such as the Asian Seabass (*Lates calcarifer*), *cobia* (*Rachycentron canadum*), Pompano (*Trachinotus blochii*), *Milkfish* (*Chanos chanos),* Parrot fish *(S. ghobban)* and the Giant Travelly (*Caranx igonobilis)* was successfully demonstrated. The cages withstood even cyclonic weather conditions. The milkfish (*C. chanos*) seeds (5-8 g) were successfully reared to 770 g within 260 days in open sea cages using formulated diet at Okaikuda village off Rameshwaram and a total of 3.5 tonnes of milkfish was harvested. The culture of hatchery produced marine finfishes pompano (*T. blochii*) and the fast growing cobia (*R. canadum*) were also successfully demonstrated with a total harvest of 3 tonnes in the sea cages at Olaikuda. An average body weight of 4 kg was achieved in 8 months in cobia from its initial stocking size of 30 g with an excellent growth performance of 16.5 g / day.

In order to minimize huge investment for nursery rearing in land based larval rearing systems, a concept of nursery rearing of marine finfish fingerlings in sea cages was demonstrated for the first time using seabass seeds from 6 g to 24 g size within a period of 45 days, with 90 % survival rate.

The various configurations of multipoint mooring systems for the open sea cages of different sizes and dimensions were also successfully standardized to withstand rough Indian coastal / offshore waters. After successful demonstration, the Olaikuda villagers in Tamil Nadu are going to take up cobia culture with technical guidance from ESSO-NIOT, by investing their own money up to the tune of Rs. 15,00,000.

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| *Open sea cages - North Bay, Andaman* | *Seabass nursery rearing at Olaikuda* |
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| *Cobia rearing in open sea cages at Olaikuda* | *Seabass being brought to shore by boat* |