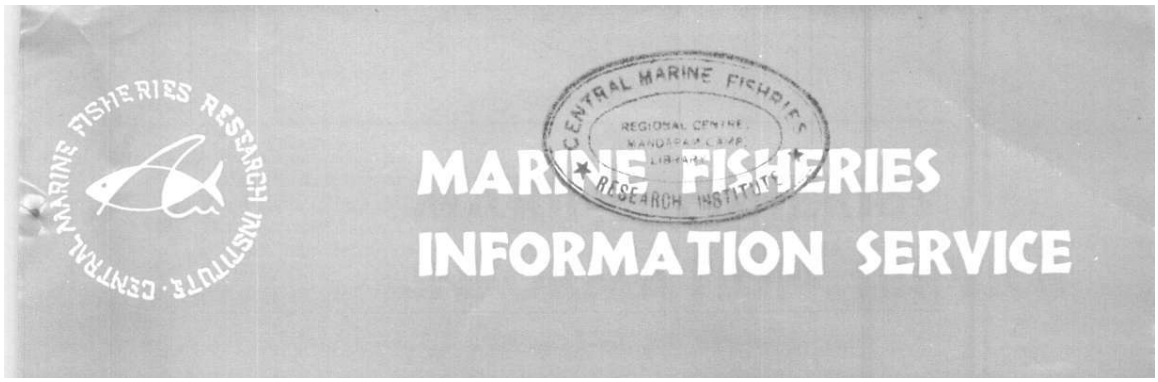
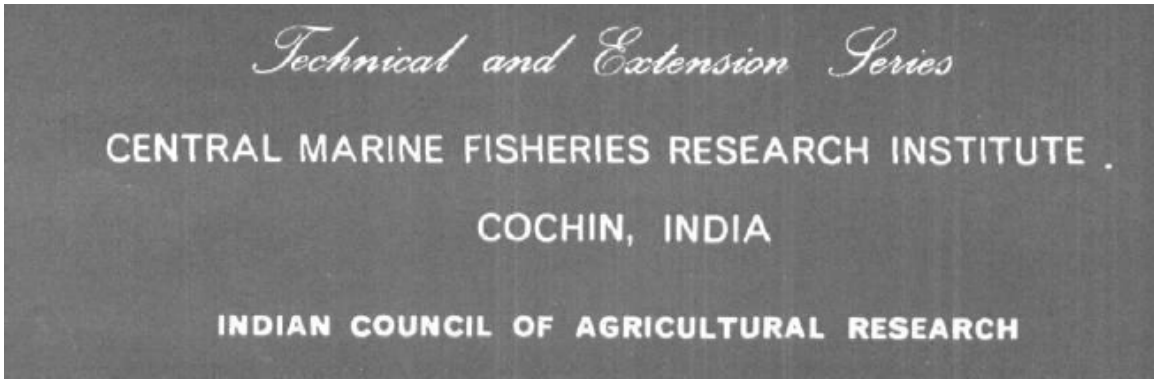


Abbreviation - Mar. Fish. Infor. Serv. T & E Ser., No. 54 : 1983
(October, November and December 1983)

The MARINE FISHERIES INFORMATION SERVICE: Technical and Extension Series envisages the rapid dissemination of Information on marine and Brackish water fishery resources and allied data available with the Fishery Data Centre and the Research Divisions of the Institute, results of proven researches for transfer of technology to the fish farmers and industry and of other relevant information needed for Research and Development efforts in the marine fisheries sector.



PROVEN TECHNOLOGY
7. TECHNOLOGY OF CULTURED SEAWEED PRODUCTION

Major highlights

Production of seaweeds by culture practices is done generally by vegetative propagation of small fragments of some agarophytes, alginophytes and carrageenophytes. The fragments of the seaweed to be grown are inserted into the twists of the coir ropes or in the alternative tied to the mesh intersections of the HDP ropes (3 mm thick) which are fabricated in the form of 5 x 2 m size nets and floated at subsurface level in the inshore waters or in saline ponds with the help of sinkers and buoys. *Gracilaria edulis* and *Gelidiella acerosa* reach harvestable size after 2 and 2½ months respectively when the seaweed is harvested and processed for agar extraction.

Operational details

The seaweed culture farm either in the sea or in saline ponds will have several nets of 5 x 2 m size fabricated with coir (2.5 cm thickness) or HDP ropes (3 mm thickness). In the case of ponds, they should be preferably of sandy-loam bottom and of size 60 m x 30 m with free flow of seawater through sluice gate. The culture site must have a minimum depth of 1 m. The seed material is generally collected from natural beds and cleaned thoroughly to get rid of the debris, sand and other epiphytic algae. The length of the seed material is 4 to 5 cm for *Gracilaria edulis* and *Gelidiella acerosa*. The seed fragments are inserted into the twists of the coir rope but if it is a HDP rope net, the fragments of *G.edulis* and *G.acerosa* are tied to the mesh intersections of the nets with the help of nylon twine (No. 6). Fragments of *G.acerosa* are also tied to the nails fixed on the coral stones with the help of nylon twine (No. 6) and introduced in the inshore waters or in ponds. To minimise sedimentation on the plants, the stones are kept in cages. The minimum period for the seed material to reach harvestable size is 2 months for *G.edulis* and 2½ months for *G.acerosa*. Again the nets are reintroduced into the ponds or into the inshore waters with fresh seed material. Likewise six crops could be harvested in a year for *G.edulis* and 4 harvests for *G.acerosa* in a place like Mandapam where Gulf of Mannar or Palk Bay could be made use of for culture operations in a year alternating each other. The weight obtained after harvest is generally 3 times the initial weight. In the case of cultivation in inshore waters the crop is exposed to certain hazards such as grazing by fish and sedimentation. These problems can be minimised by carrying out culture operations in 4 to 5 m deep areas using floats and sinkers. Periodical cleaning of the nets is very essential to remove sediments and attached organisms.

Production

One kg seed material of *G.edulis* yields an average of 3 kg per sq.m of net after 60 days growth. In one ha area of nets (i.e. 1000 nets) 30 tonnes of fresh *G.edulis* could be obtained in one harvest. Six harvests could be made in a year if the condition of the sea is favourable. The nets could be used for several crops. *G.acerosa* cultured on nets in the inshore waters yields three fold increase in weight after 2½ months growth. In the case of cultivation on coral stones, three fold increase in the yield would be obtained after 5 months.

Inventory of materials

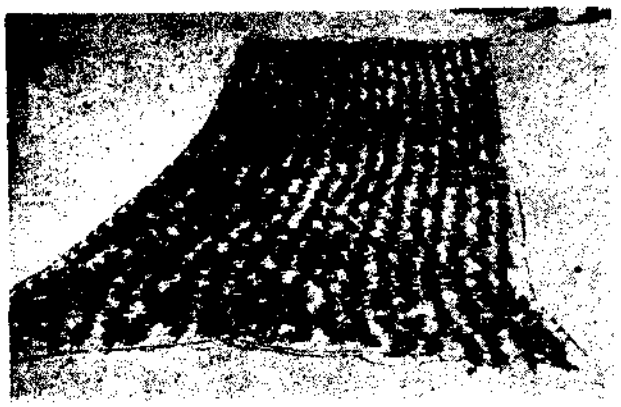
Cost of production of *G. edulis* only has been worked out so far and discussed here. For the cultivation of *G. edulis* in one ha, 1000 coir nets of 5 x 2 m size, 2000 casuarina poles of 1.5 m height and 10,000 kg of fresh seed material (for initial introduction) are required. The cost of 2000 casuarina poles is Rs. 6,000/- and cost of 1000 coir rope nets is Rs. 33,000/- including charges for fabrication. The seed material will be collected for the initial introduction from the natural beds and from the cultured crop for the subsequent seeding. Wages for seeding, harvesting and maintenance of the seaweed farm for 4 persons at the rate of Rs. 10/- per day for 360 days workout to Rs. 14,400/-. The total expenditure for one year would be Rs. 54,000/- including miscellaneous expenditure of Rs. 600/-.

Estimated cost of production

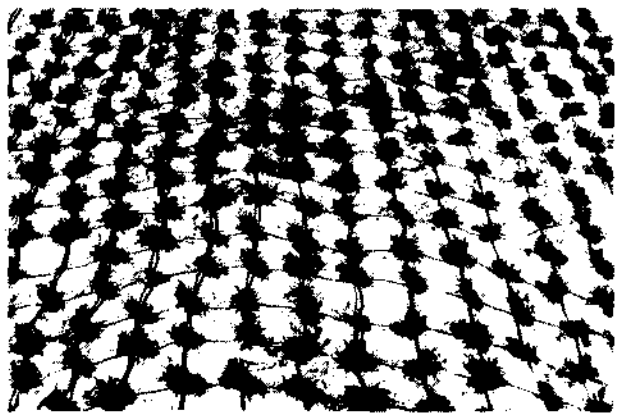
The estimated cost is arrived at on the assumption that a minimum of four harvests could be made in a year. A total of 120 tonnes (fresh weight) of crop could be obtained from the four harvests in a year when the yield is 3 kg/m^2. If the seaweed is dried (75% moisture) and marketed at a rate of Rs. 2,000/- per tonne, the net profit would be Rs. 6,000/- for one year.

Prospects

India has a good scope for starting a seaweed culture industry based on the know-how available at the Central Marine Fisheries Research Institute. Potential areas for seaweed culture would be the coastal areas of Palk Bay and Gulf of Manner near



G. edulis
Culture net with seed material



G. edulis
Portion of the culture net showing the introduced seed material

G. edulis
Culture net showing 30 days growth

G. edulis
Culture net after 60 days growth

Mandapam and near the islands of Gulf of Mannar. Many industries producing agar and algin are being set up in India and the commercial harvest of seaweeds have gained importance in the coastal areas of Ramanathapuram, Tirunelveli and Kanyakumari districts of Tamil Nadu. Culture of seaweeds on large scale would be of great help to augment the supply of seaweeds in addition to that harvested from the natural beds. The Central Marine Fisheries Research Institute can extend the technical know-how through training programmes at managerial and operative levels.

Prepared by the scientists of seaweed culture project