

# SEABASS NURSERY REARING IN HAPAS - A LIVELIHOOD OPTION FOR THE WOMEN SELF HELP GROUPS

UNDER CIBA - TSP



**B. Shanthi, M. Kailasam, A.R.T. Arasu,  
V.S. Chandrasekaran, P. Mahalakshmi  
and K. Ambasankar**



**CENTRAL INSTITUTE OF BRACKISHWATER AQUACULTURE**

(Indian Council of Agricultural Research)

75, Santhome High Road, R.A.Puram, Chennai - 600 028.



# SEABASS NURSERY REARING IN HAPAS - A LIVELIHOOD OPTION FOR THE WOMEN SELF HELP GROUPS

## INTRODUCTION

Aquaculture offers one of the best livelihood options for women especially in coastal areas and offers plenty of scope for diversification of livelihood for those who live below poverty line. Aquaculture encompasses a wide range of different aquatic farming practices with regard to species (including seaweeds, molluscs, crustaceans, fish and other aquatic species groups), environments and systems utilized, with very distinct resource use patterns involved, offering a wide range of options for diversification of avenues, for enhanced food production and income generation in many rural and peri-urban areas.

Women in India have contributed substantially to the social and economic growth of the economy. Women in coastal areas play an indispensable role in fishery sector by taking part in various activities both in capture and culture fisheries, such as, fish farming, transportation and marketing of fish in domestic sector, shrimp-peelers in fish processing plants, workers in shrimp hatcheries, culture and fattening of mud-crabs, aqua feed production, preparation, processing and marketing of value added fish products and so on.

## BACKGROUND

*Irula* tribal community is concentrated near Pulicat lake at Kulathumedu coastal village, Pulicat, Tiruvallur district, Tamil Nadu. Around 275 families live in this village. There are 15 Women Self Help Groups (WSHGs) in this village. Two ponds one of brackishwater and other of freshwater were dug by the kings who lived in this area. Later due to the seasonal changes, the freshwater pond got converted into brackishwater pond. During 2004, this village was affected due to tsunami but there was no casualty. Many NGOs came to assist these tribals with many livelihood options. As these tribals needed an alternate occupation apart from normal fish sales and marketing due to depletion of natural resources like fishes in the sea due to tsunami. A deliberation came up among these tribals to utilize the brackishwater areas like lagoons, estuaries and creeks available in their area for taking up a venture like crab fattening. The molted or water crabs were made use for fattening as the weight of these crabs can be increased in a short duration by fattening method and thereby inviting attractive prices among the buyers.

Crab fattening technology developed by Central Institute of Brackishwater Aquaculture (CIBA) was transferred among the tribal WSHGs. Two tribal WSHGs were selected and crab fattening technology in tide fed ponds was demonstrated by CIBA during the year 2009. Owing to the relative ease of these techniques, reasonably good profit margin and familiarity of coastal communities with the adoption of this technology has proved to be a potential livelihood for the coastal women. Thus, crab fattening technology was popularized among these tribals as one of the livelihood option.

Seeing the success of this technology adoption by these tribal WSHGs, nursery rearing of seabass fish juveniles in hapas, customized by CIBA was demonstrated and transferred to these successful *Irular* tribal women SHGs as an another livelihood option by CIBA under the CIBA-Tribal Sub Plan (TSP).

Seabass nursery rearing in hapas developed by CIBA, which has been tested and proved as viable ventures is discussed in this extension series. If this technology is adopted by coastal women self help group it can effectively become a viable enterprise for their livelihood improvement. Since, the technology can be used by the women in the local water bodies and



reasonable profit margin is obtained, this technology has great potential for expansion among the coastal villages for a constant revenue generation.

CIBA has trained 30 tribal women self help groups in seabass nursery rearing in hapas for small scale marketing under the CIBA-TSP plan during 2012 -13. The tribal women self help group members who have taken up this avocations through CIBA training and demonstrations, have started their enterprise on a small scale level and are on the path of self-sustenance

### ASIAN SEABASS *Lates calcarifer*

The brackishwater finfish Asian seabass is a commercially important fish for aquafarming. Asian seabass, *Lates calcarifer*, is an ideal candidate species suitable for brackishwater aquaculture either in ponds or in cages. Seabass can tolerate wide range of salinity from 0 - 40 ppt and can be farmed in marine, brackish and freshwater conditions. The fish can grow above 1.0 kg in 8-10 month period and fetch Rs.250- 350/kg depending upon the size.

### SEABASS NURSERY REARING IN HAPAS

Seabass nursery rearing in hapas is an important component of farming practice, where the seabass fry is reared to fingerling size in net hapas, ponds and tanks. Hapa nursery rearing can be done either in open water bodies or in 1.5 m pond system having a minimum of 1-1.5 m water depth. In hapas, seabass fry of 1-1.5 cm size can be stocked @ 500 nos./m<sup>2</sup> and reared from 60 to 90 days. The preferred hapa size is 1x1x 2 m<sup>2</sup>. After 60 to 90 days rearing, seabass fry can attain the fingerling size of 6-8 cm.

### STEPS FOLLOWED IN SEABASS NURSERY REARING IN HAPAS

#### 1. Installation of hapas in open water

Hapa with a mesh size of 1.5mm was installed in earthen pond system having minimum of 1-1.5 m water depth. WSHGs were divided into 2 groups and each group was given 10 hapas.



#### 2. Stocking of seabass seed in hapas

In each hapa, seabass fry of 1.5 – 2.0 cm size were stocked @ 500 nos./m<sup>2</sup>. It is advisable to stock uniform sized seabass seed. The WSHGs stocked 1000 nos. of seabass fry in each hapa. A total of 10 hapas were supplied to these WSHGs and a total of 10,000 seabass fry were stocked in these hapas.



#### 3. Removal of hapas & seed collection for grading

Each hapa should be removed and taken slowly with care to the bund. The seabass fry should be transferred from the hapas to the plastic tubs and buckets filled with brackishwater and size wise segregation should be carried out to avoid cannibalism, while growing.



#### 4. Seed segregation

As the fish grows to bigger size (above 3 cm.), aeration using battery aerators should be provided in all the segregation tubs and buckets filled with sea water. Frequent water exchange has to be done simultaneously. In hapa rearing, seabass seed should be graded weekly twice in order to separate

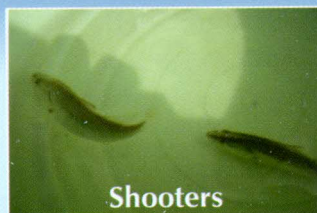




the shooters and to maintain uniform size. Regular grading would help avoiding cannibalism, so as to improve survival rate.

### 5. Grading of seabass seed according to size

Grading is done mostly by 3 to 4 women SHG members. They change duties among the group members by every alternate week. After grading uniform sized seabass seed, they were re-stocked in the hapas after fixing in the ponds.



### 6. Cleaning and re-fixing the hapas

After grading, the hapas are to be cleaned using brushes by 3 - 4 women SHG members. During this time, the hapas can be checked for the holes and damages if any. After cleaning and checking, the hapas will be tied back to the casuarina poles in the ponds.



### 7. Feed preparation and feeding

Farm made feed can be given to the seabass fry. While feeding, the powdered fish feed is made into a dough form with water and mixed with cooked fish meat (fish meat from tilapia, sardines, mackerel etc.). The feed can be kept in the feed tray tied inside the hapa. Thus, feed @ of 5 - 8 % of body weight of the fry is fed. Feeding is done twice a day before 8.00 AM and after 5.00 PM.



### 8. Transportation of seeds

Once, seabass reaches 5 cm, they can be sold to farmers for grow out culture. Harvested seabass fingerlings can be packed either in polythene covers or open containers with the oxygen. Seabass fingerlings can be transported in open tankers with 500 - 1000 L with provision of oxygen bubbling for long distance transportation.



### MARKET RATES

Seabass can be cultured in freshwater, brackishwater and marine water bodies either in ponds or in the cages. There is a great demand for the stockable size seed among the farmers. Seabass seed has good market demand for any size group and fingerlings has high demand from farmers side because it can be stocked directly either in pre grow out culture or grow out culture ponds. Usually seabass seed can be sold @ Rs. 2.0/cm in size.

### Steps to be followed for better growth of seabass fry in the nursery rearing

- Availability of slightly bigger size fry (2.0 cm and above).
- Same size group (size differences less than 1%) should be stocked.



- The fry should be completely weaned to the artificial diet.
- Seed should be supplied after adjusting to the required salinity.

### BENEFITS OF THE TECHNOLOGY

- Seabass nursery rearing in hapa can be cultured in brackishwater canal, cage and brackishwater aquaculture ponds.
- The seabass nursery rearing in hapa can be carried out near the vicinity in village community ponds.
- It can be carried out as homestead activity and time requirement will be 1-2 hrs/ day.
- There is no marketing problem.
- Seabass farming is done traditionally in many states.
- Farmers are familiar about this fish.
- Seabass fingerling price increases as per size.
- As the consumer prefers white flesh meat compared to red meat there is always demand for seabass fish.

### ECONOMICS

S.No.	Particulars	Amount (Rs)
<b>A. Operational cost</b>		
1	Cost of hapas (1 no.)	140.00*
2	Cost of casuarina poles	60.00**
3	Cost of seabass seed (2cm size; 1000 nos.)	4000.00
4	Cost of farm made feed	350.00***
5	Labour cost	350.00****
6	Miscellaneous (Cost of fish meat, buckets, nylon rope etc.,)	1000.00
Total		5900.00
7	Interest for operational cost @ 12%	708.00
Total cost		6608.00
<b>B. Revenue</b>		
Revenue through sales of seabass seed (70% survival rate = 700 nos; @ Rs 12/pc)		8400.00
Net income (B-A) per hapa		1792.00
Net income for 20 hapas		35840.00
Total income for three crops per year		107520.00

Note: \*Each hapa cost is Rs.700/- it can be used for Five crops.

\*\*For each hapa 30 kg of casuarina poles required. It cost Rs.300/- and can be used for five crops

\*\*\* Seven kg farm made feed is required to produce 700 fingerlings. Feed cost Rs 350 @ Rs.50 / kg

\*\*\*\* Daily 10 minutes labour required for each hapa and for 90 days 15 hours are required. It costs Rs.350/-

### SEABASS NURSERY REARING IN HAPAS BY WOMEN SELF HELP GROUPS

Seabass nursery rearing in hapas carried out by a tribal and coastal woman is an eye-opener in the context of providing opportunities for a socio-economically viable avocation for tribal and coastal rural women. The tribal and coastal women, who have poor access to credit, technology, training and other facilities, can adopt to seabass nursery rearing technology which is women friendly and serves as an alternative livelihood for entrepreneurship



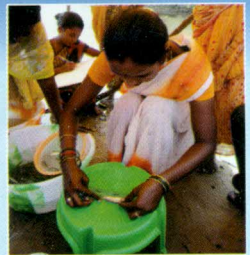
development. Owing to the relative ease of this technique, reasonably good profit margin and familiarity of coastal communities with the adoption of seabass nursery rearing technology has proved to be a potential livelihood for the tribal and coastal women self help groups.

“Marikolunthu” and “Annaparavai” coastal tribal women self help groups of Kulathumedu village, Pulicat, Tiruvallur District, Tamil Nadu, have experienced seabass nursery rearing in hapa as a viable alternative livelihood option for the coastal women self help groups. Each WSHG had 12 members. Each hapa of 2 m<sup>2</sup> was managed by 1 or 2 members in a group. Ten hapas managed by each WSHG group. A profit of Rs. 22,500/- were drawn by each WSHG. Therefore 2 WSHG earned a total amount of Rs. 45,000/- This amount was deposited in the Bank and a corpus fund was accumulated in the WSHG’s savings. After 3 trials of seabass nursery rearing in hapa, these WSHGs will use this corpus amount to invest in this enterprise on their own. Thus, sustainable development could be achieved.

The nursery reared seabass fingerlings were supplied by these WSHG to the fish farms in Tamil Nadu, Andhra Pradesh and Gujarat. These WSHGs who have adopted this technology through CIBA trainings and demonstrations have started their own enterprise on a small scale level and are progressing towards self-sustenance.

**CONCLUSION**

The women SHGs need an alternate occupation apart from the normal fish sales and marketing due to depletion of natural resources and low fish catch in the sea. Brackishwater areas like lagoons, estuaries and creeks available in the coastal areas can be well utilized for taking up seabass nursery rearing. If this technology is adopted by a coastal woman it can very effectively become a viable enterprise for their livelihood improvement. The adoption of technology among the coastal women SHGs implemented by CIBA will help generate additional income and savings, which will increase the level of self confidence among the SHGs to become successful entrepreneurs in the future.



**Dr. M. Sakhivel**  
President  
AFI with beneficiaries



Seabass seed distribution  
to the WSHGs beneficiaries



**Dr. A.R.T. Arasu**  
Head, FCD, CIBA  
along with  
WSHGs beneficiaries



Motivating the  
WSHGs beneficiaries

Technical Assistance by  
**M. Sithifathima**  
**S. Kothainayaki**  
**R. Sasirekha**



**Dr. S. Ayyappan** Director General, ICAR,  
**Dr.A.G.Ponniah,** Director CIBA and officials of CIBA with the beneficiaries