

DIVERSIFYING THE LIVELIHOODS OF TRIBAL WOMEN SELF HELP GROUPS THROUGH ADOPTION OF BRACKISHWATER AQUACULTURE INTEGRATED WITH AGRO - BASED TECHNOLOGIES



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• *The Irular*, the nomadic tribal communities live in and around the remote villages of Tiruvalur, Kancheepuram and Cuddalore districts of Tamil Nadu.

• Being a hunter of animals, fishers and gather society, they often lose their traditional livelihood due to the urbanization and associated habitat modification.

• Owing to - meager life skills

- depletion of natural resources
- low fish catch
- marginalized community
- social and economic discrimination.

• These tribes need an alternate occupation apart from their traditional livelihoods

• Aquaculture offers - best livelihood options for women

- diversification of livelihoods for those who live below poverty line



● Brackish water aquaculture technologies developed by CIBA were transferred to the Women Self Help Groups (WSHG) who were suffering in the post tsunami period, seemed to be a blessing for their living.

- A deliberation was intuited among these tribes ;
 - utilize the brackishwater areas like lagoons, estuaries, creeks
 - take up diversified livelihoods through adoption of brackishwater aquaculture and agro-based technologies
 - serve as an better option for the sustainable development.

● Efforts were taken during 2012-2014 to create awareness by bringing diversification in livelihoods among these tribes.



- 100 tribal WSHG members from Tiruvallur and Kancheepuram districts, were demonstrated the brackishwater aquaculture technologies
- Brackishwater aquaculture technologies integrated with agro-based technologies viz;
 - Crab fattening (in tide fed ponds)
 - Crab fattening (pens)
 - Seabass (Asian seabass *Lates calcarifer*)
 - Farm made fish feed development
 - Ornamental fish farming
 - Polyculture of crab and seabass farming in ponds
 - Mushroom farming.



1. Crab fattening (in tide fed ponds)

- Crab fattening in tide fed ponds was practiced in 15 ponds concentrated in this area.
- The size of each pond ranges from 30 ft – 40ft.
- 2- 3 crops is being harvested every year.
- Size of water crabs stocked in the pond ranges from 600 g – 1000 g.
- The water crabs are purchased @ of Rs. 1500/- to 400/-.
- They are fed with trash fish twice a day.
- 75 to 150 kg of water crabs are stocked in each pond ranges and 50 - 125 kg. of fattened crabs are harvested from each pond.



Crab fattening (in tide - fed ponds) by tribal WSHG



- The culture period is 20 - 30 days.
- The profit gained from each cycle is Rs. 12,000/-.
- It was evident from this study that very efficiently women and men jointly performed crab farming roles.



2. Crab fattening (in pens) technology

- ◆ Crab fattening pen in the size of 1200 sq.ft of 25 ft (length) x 25 ft (breadth) x 12 ft (height) with 2 compartments
- ◆ Water crabs purchased from the local markets were stocked in the pens.
- ◆ Each pen with 2 compartments was stocked with 60 kg of water crabs in the size range of 350 to 1500 g in the density of 1-2 crabs/m².
- ◆ The crabs in the first compartment were fed with trash fish @ 10 % of body weight.
- ◆ Crabs in the second compartment were fed with 'CIBA Crab Pellet Feed' @ 3% of body weight.
- ◆ Total quantity of feed was given in two equally divided doses at two intervals in the morning at 8 am and evening at 4 pm daily.
- ◆ The feed intake by crabs was monitored daily and the left over feed was removed before feeding.
- ◆ The duration of fattening period was 21- 30 days.





CRAB FATTENING & FEED TRIALS
PROJECT SITE

Dead fish feed

- **Proved to generate extra income** to the family through the SHG's and also in **creating awareness** among fisher folk about the **value of brackishwater** resources and the **need for conservation** and sustainable utilization.
- **Active participation, infrastructure, support from project fund, community and technical back up** from CIBA have made this initiative a success
- **Role model** for the establishment of similar projects in the other fishing villages along the east coast of India.
- It also exposed them to **a new livelihood option** and reduced the **income disparity** to a large extent.
- **Savings money** of the WSHGs was **reinvested in this enterprise**.
- Profit was shared among the group members and **savings was made in the bank**.
- **Additional loans** were granted by the Indian bank and
- **Subsidy** was also given to this groups from the IFAD Tamil Nadu Govt. schemes.
- Crab fattening technology had a direct impact of generating Rs. 4000/cycle approximately, with 10 cycles per year, the WSHG was likely to make a net profit of Rs. 40,000 per year.



3. Seabass nursery (Asian seabass *Lates calcarifer*) rearing in hapa

- ☀️ *Seabass* nursery rearing in hapas technology was transferred to Marikkolunthu' and Annaparavai' Irular Women Self Help Groups of Kulathumedu village, Pulicat, Tiruvallur District, TN.
- ☀️ Nursery rearing of seabass 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 was done either in open water bodies or in 1.5 m pond system having minimum of 1-1.5 m water depth.
- ☀️ In hapas, seabass fry of 1-1.5 cm size was stocked @ 500 numbers /m² and reared from 45-60 days. The preferred hapa size is 1X1X2M (2 m³).



- After 60 days rearing, seabass fry attain the fingerling size of 6-8 cm, it is fed with either trash fish or pellet feed @ 10-15% body weight daily in two rations.
- In hapa rearing, seabass seed was graded weekly twice in order to separate the shooters and to maintain uniform size.
- Regular grading help in non occurrence of cannibalism, which results in improved survival rate.
- After nursery rearing, tribal women farmers got a profit of Rs.6-10/piece and earned a monthly income Rs.10000-20000.
- Small scale farmers and tribal women self help groups can take up seabass nursery rearing as a livelihood option.





Grading of seabass fingerlings reared in hapas by irular tribal WSHGs



3. Farm made fish feed processing

- ✚ Farm made aqua feed development technology was disseminated to 5 irular WSHGs at New Perungulathur, Chennai, TN.
- ✚ Owing to the relative ease of these techniques, reasonably good profit margin and familiarity of coastal communities with the adoption of this farm made aqua feed development technology has
- ✚ It is proved to be a potential livelihood for the women self help groups.
- ✚ Farm made aqua feeds generated on an average Rs. 1000 for 200 kg of feed production per day.
- ✚ WSHG involved in farm made aqua feeds could generate Rs. 25,000/ month.
- ✚ This particular technology had evinced the maximum interest among the adjacent communities has had a large spill over general interest in adjacent villages.
- ✚ The farm made aqua feed technology also has the scope for expansion on a larger scale.



4. Ornamental fish farming

- Ornamental fish culture technology was transferred to regular tribal WSHGs at New Perungulathur, Kancheepuram dt.
- Farmer can stock 1.0 cm size scat fry either in hapas/tank or in ponds for marketable size production.
- It can be stocked @ 500 numbers/m².
- Scat fry can be fed with low protein artificial feed @ 8-10% body weight daily in two rations.
- The fry can attain 1-2 inch size in 45 days culture period with 70 -80% survival rate.
- Small scale farmers and tribal women self-help groups can take up scat rearing as backyard homestead activity as source of income generation and can earn Rs.8000 - 12000 per month.



- Scat rearing as backyard homestead activity served as a source of income generation to these women self-help groups.
- This homestead activity would facilitate them to earn Rs.8000 - 12000 per month.
- The profit amount was deposited in WSHGs bank accounts.
- Scat rearing as backyard homestead activity proved to be a potential livelihood for the tribal women self help groups





5. Value added fish food product development

- Value added fish food products development technology were disseminated to the 2 'Irrula' tribal community WSHGs at Kulathumedu coastal village, Pulicat, Tiruvallur District, Tamil Nadu.
- Marikkolunthu' and Annaparavai' Irrular Women Self Help Groups of Kulathumedu village received market orders for their fish food products from a Norwegian fish food processing company through their NGO.
- This intervention itself is a scaled up version of the home made pickles, it generated sufficient social acceptance.
- Further the intervention had good scope for up-gradation of scale of production based on the interest shown by the marketing agencies



5. Polyculture of crab and seabass nursery rearing

- ✿ A total of 147 irregular tribal people both men (82 nos.) and women (65 nos.) were the beneficiaries of this trial
- ✿ A total of 2000 nos. of seabass fingerlings with a total length of 6-9 cm and 4-6 g body weight were stocked in the pond
- ✿ A total of 1048 nos. live crabs *Scylla serrata* crabs (249.2 kg) ranging from 100 g – 450 g of size were stocked in the pond.
- ✿ Feeding was adjusted based on the standing biomass and the fish and crab were fed @ 8-10% of the biomass.
- ✿ Regular sampling of seabass and crabs was carried out once in 15 days to assess the growth and to check the health of the stock





- ✿ The crabs and fishes, 20 nos. each were collected to measure the total length and weight for the fishes and carapace width and weight for the crabs. Feed consumption rate was also worked out month wise.
- ✿ This intervention has helped the irular tribal beneficiaries to learn new income generation means and has facilitated them to adopt aqua farming practice as an alternative/supplementary livelihood option.



- ✿ This intervention proves to be a good model of supplementary revenue generation portraying the community participation in adoption of brackish water aquaculture technologies.
- ✿ After three months of culture period, a total of 2 50 seabass juvenile fishes and a total weight of 159.5 kg of crabs have been collected through harvesting and marketed.
- ✿ The total amount of Rs.1,33,908/- was realized out of mud crab and seabass sales from this trial.



6. Mushroom farming

- ❖ Mushroom farming technology was transferred to 2 Irular WSHGs at New Perungulathur, Kancheepuram dt. in collaboration with KVK, (TANUVAS), Kattupakkam, Kancheepuram dt.
- ❖ Mushroom production enhances farm waste utilization. Waste materials (paddy straw) are decomposed and converted into Rich edible food.
- ❖ Oyster mushrooms are produced out of paddy straw.
- ❖ Mushrooms are called vegetable mutton. Mushroom tastes like Non-vegetarian food.
- ❖ Rich in protein and amino acids. Cholesterol free food (zero percentage).
- ❖ Low cost investment, self-employment activity in Rural and peri-urban areas.
- ❖ Enhances easy digestion in human body because of rich in fiber. Portable food for irrespective of ages (6 – 60).
- ❖ Small scale farmers and tribal women self-help groups can take up mushroom farming as backyard homestead activity as source of income generation and can earn Rs.350- 400/- day from a mushroom shed of 10x15 ft size shed. .





Success stories

- From seabass nursery rearing in hapas technology they could earn Rs. 2,00,000/-.
- From crab and seabass polyculture *farming* they could earn Rs. 2,00,000/-.
- Profit amount was deposited in Indian bank account of WSHGs.
- CIBA facilitated 10 sales of seabass seeds.
- Market linkages were also created for these WSHGs.
- These beneficiaries have proven to be the first irular tribal WSHGs to achieve success in seabass nursery rearing in hapas technology in India.

CONCLUSION

- ◆ SHG concept
- ◆ Social Mobilization
- ◆ Self-confidence among the WSGHs
- ◆ Availability of opportunities for training and demonstrations
- ◆ Suitability of aquaculture for tribal women
- ◆ Availability of less technical aquaculture technology
- ◆ Positive growth in status and recognition,
- ◆ Strong institutional linkages
- ◆ Viable enterprise for their livelihood improvement
- ◆ Generated additional income and savings
- ◆ Successful entrepreneurs in the future



THANK YOU