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**MUD CRAB
FATTENING**



**[ALTERNATIVE
LIVELIHOOD FOR COASTAL
WOMEN ENTREPRENEURS]**



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MUD CRAB CULTURE

[ALTERNATIVE LIVELIHOOD FOR COASTAL WOMEN ENTREPRENEURS]

Introduction:

Aquaculture offers one of the best livelihood options for women especially in coastal areas, that involves high investment and offers plenty of scope for diversification of livelihood for the poor.

During fishing, molted or water crabs are also caught which have very little or sometimes no market value. These crabs can be used for fattening as the weight of these crabs can be increased in a short duration thereby inviting the buyers to quote attractive prices. The export of live mud crabs has gained importance and they appear poised to become a potential sea food globally among the edible marine crustaceans after shrimp and lobster. To meet the ever increasing demand for live mud crabs, soft shelled crabs collected from wild are being fattened on a small scale in maritime states like Andhra Pradesh, Kerala, Karnataka, Orissa, Tamil Nadu and West Bengal (Kathirvel et al, 2004). In the crab fattening process, the water crabs which at the post molt stage fetch a very low price due its poor meat content, if fattened, can command a better price.

Mud crab fattening carried out by a fisherwoman is an eye-opener in the context of providing opportunities for a socio-economically viable avocation

for coastal rural women. The rural women, who have poor access to credit, technology, training and other facilities, can adopt this women-friendly technology of 'Crab fattening' as an alternative livelihood for entrepreneurship development.

Background:

Several technologies for brackishwater species of finfish, shrimp and crab have been developed by the researchers at the Central Institute of Brackishwater Aquaculture (CIBA) Chennai.

Selected small – scale coastal aquaculture technology such as '**Mud crab fattening in Pens**' developed by this organization has been tested and proven to be a viable venture. If this technology is adopted by coastal women, it could effectively become a viable enterprise for their livelihood improvement.

CIBA has trained 100 women in mud crab fattening. The women who have taken up the avocations based on this technology, through CIBA, had started their enterprise on a small scale level and are on the path of self-sustenance.

The crab fattening trials in pens conducted by coastal Women Self Help Groups (SHG) at Kattur village and Thonirevu village, Pulicat, Thiruvallur District and Allambarai kuppam, Kadapakkam, Kancheepuram District, has indicated that this technology is a viable alternative livelihood option for the coastal Women SHGs.



Training the WSHGs on
'Crab fattening technology'

MUD CRAB FATTENING IN PENS

Crab fattening

Mud crab fattening is carried out by stocking soft shelled crabs/water crabs that are held in smaller impoundments for 20-30 days or 3 to 4 weeks. The crabs then fatten or their gonads develop and fill the mantle cavity the process being termed 'fattening'.

Selection of sites for mud crab fattening

Mud crabs breed in brackish water bodies such as estuaries, backwaters and coastal lagoons, where they form a subsistence fishery. Suitable brackishwater areas like lagoons, lakes and canals could be well utilized for crab fattening.

Size of crab pens and materials used for pen construction

Crab could be fattened in small pens ranging from 100 to 200 m² in size with a water depth of 1.5 m. The fencing for pen is carried out using PVC coated GI mesh / 8 Gauge /1.5 size. Blue metal jelly small size (1 unit) is used for foundation. The poles could be either bamboo or casuarina. Cement pipes or stones can be placed inside the pond to minimize mortality due to cannibalism. Plastic silpaulin sheet is used for wrapping the poles to prevent crabs from climbing out of the pens to escape.

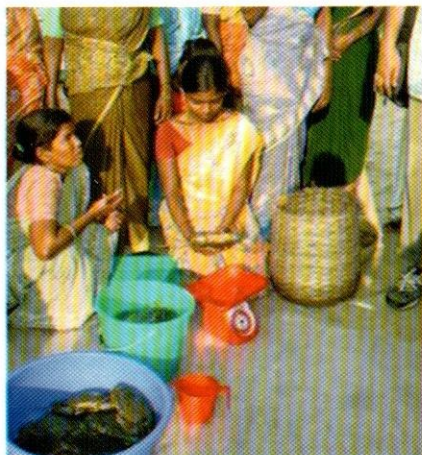


Crab Pens

Crab fattening cycle

Selection of water crabs

The weight of the water crabs preferably used for stocking is about 700 g and above. Damaged crabs (one legged, broken carapace etc) are avoided. Crabs are checked for their condition. They should be active while stocking and checked for any parasites and barnacles.



Recording weights before stocking

Soil and water quality

The soil suitable for crab fattening is sandy or sandy clay. A sand bottom inhibits burrowing and escape.

Mud crabs are highly tolerant to varying salinity conditions. The preferred water quality parameters are:

Salinity	- 10 to 34 ppt.
pH	- 8.0 to 8.5.
Temperature	- 23°C to 30°C
Dissolved Oxygen Content	- should be more than 3 ppm.

Water exchange can be done through tidal water flow. The tidal

water flow through the creek causes sufficient water exchange in the pens.

Stocking

Soft-shelled crabs are stocked for fattening in the size range of 700 g to 1500 g at a density of 1 crab/m². While stocking, the number of crabs need to be counted and weights recorded. The crab fattening cycle takes about 3-4 weeks.



Feeding

Water crabs are fed daily with natural feed like molluscan meat or



Trash fish and clams being processed for feeding

trash fish which can be collected from landing centres. Feeding is @ 5 to 10% of body weight of the crab. CIBA feed can also be fed @ 3% of the body weight. The trash fish used for feeding should be cleaned, degutted, washed and cut into small pieces. Feeding is usually carried out twice daily. The feed quantity can be increased prior to harvesting. (This is supposed to increase the weight and prevent cannibalism during molting).



Feeding the crabs



**'CIBA Crab Feed' being fed
Pen management**

At regular intervals, the crab pen should be checked for any holes or burrows. This will help prevent the escape of crabs. The pen could be erected near the dykes for easy stocking and monitoring. Pens should be frequently cleaned by using brushes for enabling free movement of water inside the pens. Sufficient space is provided for each crab during fattening period to prevent cannibalism.



Cleaning the pen

Monitoring

Regular monitoring of crab pen is necessary for recovering good production of hardened crabs. Crabs should be monitored daily throughout the stocking period. Sampling should be carried out weekly to monitor weight gain and mortality.



Harvesting

Crabs should be harvested after the shell becomes sufficiently hard and prior to the next molting. By pressing the base of walking legs of the crabs, one can ascertain whether the crabs are ready for harvest. Harvesting should be done in the early morning hours or late evening to prevent mortality of crabs. They need to be handled carefully while harvesting to avoid breaking of legs. In case of algal fouling on the crab carapace, brushing would help in removing the same. In a year, 9 to 10 cycles of fattening can be obtained from a pond. Harvesting of

crabs is done by using scoop nets and also by hand picking. The body weight of the harvested crab should be recorded. Crabs of 350 g to 500g size will gain 60 to 80 g and the crabs above 1000 g will gain 10 to 120g.



Pressing the base of walking legs to ascertain the post -moult condition



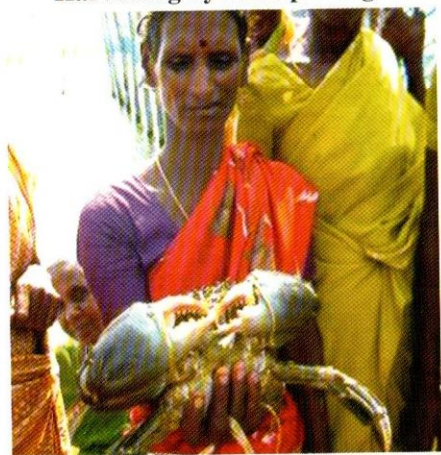
Reduced flesh in water crabs (left) and fully grown flesh in fattened



Harvesting by scoop net



Harvesting by hand picking



Handling a crab

Packing

After harvesting the crabs, the first pair of largest legs (chelate legs) of each live crab is firmly tied up with the body by jute/ nylon thread to curb their movement and to avoid infighting. The harvested crabs are then packed in bamboo baskets or perforated

thermocole boxes and transported. While packing, paddy straw, saw dust, seaweeds and leaves could be placed at the top and bottom in the baskets to avoid damage. This would also help to keep the crabs live and fresh while marketing. For live crabs export, the mud crabs can be washed well with salt water. Thereafter, they can be packed either in bamboo baskets covered with plastic sheets at the bottom or perforated thermocole boxes.



Tying the crabs



Transporting crabs



Packing crabs in basket

Marketing

The hardened crabs should be marketed and sold in live condition. Hardened crabs could be sold not only locally but also globally. Crabs are exported to different countries like Malaysia, Taiwan and Singapore. Water crabs and hardened crabs are marketed in Chintadripet - Chennai, Pulicat and Arambakkam- Tiruvallur District.



Local marketing



Sale

Observation

It is believed that cannibalism is caused due to improper feeding. Adequate feed should be provided at regular intervals to avoid mortality. Crabs climbing up the net is indicative

of insufficient feeding. Crabs moult during full moon.

The dead crabs should be removed immediately from the pen to avoid spread of diseases. Crabs of different sizes can also be stocked in the pens by constructing partitions within them. This also facilitates harvesting the crabs according to size.

Risks associated with crab fattening

There is always a demand for availability of water crabs for fattening. During different seasons there is a fluctuation in the rate fixed for both water crabs and harvested crabs. The presence of middlemen exists during marketing. The rate fixed for the trash fish also fluctuates depending upon the season. Crab mortality occurs during transportation when they are packed improperly. Social problems like poaching also may take place prior to harvest.

Economics of crab fattening per cycle Indicative Economics of mud crab fattening in pens

(1 pen of 1200 Sq ft/ cycle of 21 days - Women SHG Model) Candidate species: larger species of mud crab *Scylla serrata*

S.No.	Particulars	Area
1.	Pen size	1200 Sq.ft
2.	Culture period	21 days
3.	Stocking density	2 crabs /m ²
4.	Stocking	60 kg
5.	Working capital (water crabs, feed, watchman & transportation)	₹16, 400/-
6.	Production (harvest)	56 kg
7.	Survival rate	80 %
8.	Mortality rate	20 %
9.	Weight gain during harvest	50 - 100 g
10.	Cycle per year	6-8 cycles
11.	Total income	₹22, 000/-
12.	Profit / cycle (₹)	₹5600/-

Note:

- (1) Though cannibalism takes place, it is observed that by crab fattening the total weight of crabs stocked is equal to the total weight harvested. Thus, it implies that during the process of crab fattening the weight of crabs is balanced.
- (2) Labour is assumed to be performed by members of the WSHG
- (3) Weight gain is approximately 10%.

Conclusion

Women SHGs need an alternate avocation apart from normal fish sales and marketing due to depletion of natural resources. Brackishwater areas like lagoons, estuaries and creeks available in this area could be well utilized for taking up crab fattening. Molted or water crabs can be used for fattening as the weight of these crabs can be increased considerably in a short span thereby fetching good profits.

If this technology is adopted by coastal women, it can very effectively become a viable enterprise for their livelihood improvement. Owing to the relative ease of these techniques, a reasonably good profit margin and familiarity of coastal communities with the adoption of this technology, this venture has proven to be a potential livelihood option for coastal women.



Coastal women SHG



Dr. S. Ayyappan, DG, ICAR, visiting the crab pen site at Kattur village, Tiruvallur District, TN.