

Prospects of Soft Shell Crab Production In India

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Crabs are the third most well-known, in delicacy, among the crustaceans on the planet. They are known for their sweet-flavoured and firm meat and exhibited in different forms such as claw meat, colossal, jumbo, etc. making it a sought-after export commodity. Mud crabs have a huge demand in the international market. Despite being a highly demanded food item, its research findings on its hatchery and grow-out techniques need further intensification since crab farming is emerging as a profitable option among the farmers. Despite being a candidate species for commercial production for export, it has not been adopted for commercial culture operations due to the limited seed production, non-availability of artificial feed and lack of economic feasibility and standardized culture technology in all culture phases. At present, Rajiv Gandhi Centre for Aquaculture (RGCA) Aquaculture Technology Incubation Centre of Marine Products Export Development Authority (MPEDA) Nagapattinam district of Tamilnadu the hatchery producing seed, but it is not fulfilling the demand for crab farming.

The *Scylla* spp. is widely distributed in the Indo-Pacific region. Major producing countries are China, Philippines, Indonesia, etc. As per the FAO statistics 2021, the *Scylla serrata* production was approximately 3,00,000 MT. In India's capture fisheries, crustaceans contribute 12%, of which crabs constitute 0.57% (CMFRI, 2017). In the world, production has increased from 3788 MT, in 1990, to more than 1,80,000 MT in 2014 (FAO, 2016). The commercial-scale of mud crab culture is fast developing in Andhra Pradesh, West Bengal, Odisha, Tamil Nadu and Kerala.

Crab aquaculture consists of different aspects that can generate revenue in the long run and short term. Seed production at the hatchery as (production of crab instar), nursery rearing of crab instar to crablets, the grow-out culture of crablets in the earthen pond, pen culture soft shell crab production and crab fattening can help in short term revenue generation. However, soft shell crab production can be the best livelihood option for the farmers. It has high export value, high demand and it keeps on increasing every year. As a result, there are vast opportunities for earning foreign exchange

Soft-shell crab is which have recently moulted their exoskeleton and are still soft. Soft-shell crabs are immediately removed from the water as soon as they moult to prevent their shell's hardening. Entire soft-shell crab is edible except mouthparts, gills and abdomen. The blue crab is used in the US and in Japan, the shore swimming crab is also used along with the blue crab. In Italy, the common Mediterranean crab is the main species. Four species of mangrove crabs are used for commercial aquaculture worldwide; *Scylla serrata*, *S. tranquebarica*, *S. paramamosain*, and *S. olivacea*. These four species have slightly different life cycles and their habitats are mangrove forests, where they get their other common name of mangrove crab. Out of four species, *Scylla serrata* (Green Mud crab) and *Scylla olivacea* (Brown Mud crab) are available in Indian waters.

Currently, farming of soft-shell mangrove crabs has also been practiced in many Asian countries such as Thailand, Myanmar, Vietnam, Malaysia, Indonesia, and more recently, the Philippines, Bangladesh, Brunei and India. Large-scale soft-shell mangrove crab farming in Asia started during the early 1990s when there was a strong demand for soft-shell crabs in domestic and international markets. Soft-shell crabs are available year-round. Because of its profitability, there is an increasing interest in engaging in this crab farming business venture in Asia. Thailand is the leading state in the production of soft shell crabs.

There are two culture techniques available for the soft shell crab production: the culture with the floating boxes and the other vertical system.

Floating boxes with Detachable cover

Plastic boxes are placed on floating platforms made of PVC pipes or wood. Each crab stocked in these boxes is checked every 3 to 4 hours for moulting and fed twice a day (40% morning and 60% evening). In order to grow larger, crabs must periodically moult through a process known as ecdysis the new shell develops and hardens in 4-8 hours. The exoskeleton is soft immediately after moulting. The crab expands its body and limbs by taking in water inside before the new shell hardens and usually increases in size by 30-50%. The moulting frequency decreases as the crab grows larger.

The soft shell farming pond may range from 0.5 to 1.0 ha. The floating platforms and crab boxes should be placed at least 3 meters away from the dike and for better water circulation on the fourth side, the gate (water inlet/outlet) is to be situated at least 5 meters away from the floating platform and crab boxes. Herbivorous fish like milkfish can be stocked in the pond to maximize the additional profit and avoid algal development on the box.



Fig.1. Crab culture in floating boxes



Fig.2. Mud crab, *Scylla serrata*

The Indoor Vertical system

Crab is an aggressive and cannibalistic in nature, especially when they moult. The vertical system provides a separate box for each crab, equipped with a recirculating water system for waste removal and increasing oxygen. It can automatically discharge wastes generated to maintain a good quality water environment in each box. When it needs a thorough cleaning, each box can be drained completely. Each crab shelter has a door with an open and lock mechanism to prevent the crab escape. It is equipped with an observation window, which helps to check crabs without opening the box. According to customer demand, the vertical system can be custom made into different floors and different boxes on each floor.

This kind of crab houses can save much more land, improving the land utilization ratio up to 300 times. It is also easy to cultivate seawater crab breeding for the inland area and far away from the sea.

In both systems, one can run 5-6 cycles in a year and there will be continuous profit in a short time. Hence, it will gain popularity among farmers. However, the vertical system is gaining importance worldwide due to its ease in operation and control of the system.

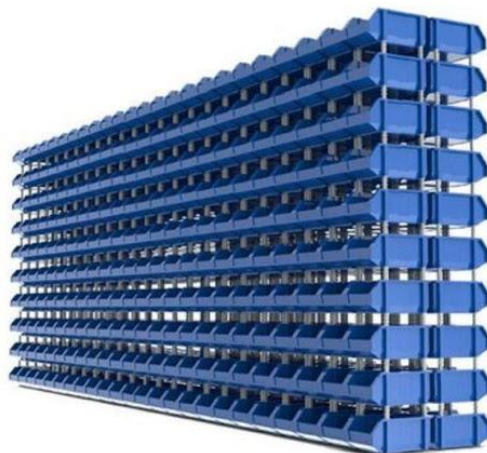


Fig. 3. Indoor Vertical system (Image source: www.marineaquafarm.com)

Water Quality Management

Sl. No.	Parameter	Range
1.	pH	7.5-8.5
2	Temperature	25-35°C
3	Salinity	15-35 ppt
4	Dissolved Oxygen	>3 ppm
5	Total Ammonia	< 1 ppm
6	Nitrate	<0.2 ppm
7	Alkalinity	80-120 ppm
8	Hardness	<4000 ppm
9	Turbidity	20-30 cm

Conclusion

Soft shell crabs have a huge demand and high value in the international market. This mud crab enterprise is believed to become a profitable venture for small farmers due to its minimum culture duration. Due to the high global market demand, it can be alternative species for shrimp culture. Farmers can earn extra income and generate employment by doing commercial soft shell crab farming.

References:

FAO, 2021. Cultured Aquatic Species Information Programme *Scylla serrata*. http://www.fao.org/fishery/culturedspecies/Scylla_serrata/en#tcNA00D9

FAO, 2016. The State of World Fisheries and Aquaculture. Food and Agriculture Organization of the United Nations.

CMFRI, 2017. Annual Report. Kochi, Kerala