

Status of spiny lobster fishery and farming prospects in India

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Abstract

Lobster production from capture fisheries sector in India increased from an annual average catch of 1562 t during the period 2003-2014 to 2466 t (2015-2019). The commercial fishery is comprised of spiny lobster (62%) sand lobsters (37%) and deep sea lobsters (1%). Major share of catch is contributed by multiday trawlers (54.3 %), out-board gill nets (26.9 %) and single day trawlers (11.2 %). Gujarat, Tamil Nadu, West Bengal and Maharashtra contribute bulk (95%) of the highly priced spiny lobster catch which is also having capture based aquaculture (CBA) potential. Species such as *Panulirus polyphagus* region and *Panulirus homarus* found in the northern and southern region of India respectively, are considered as potential species for sea farming due to their fast growth, availability and adaptability to captive conditions. A brief account on availability of juveniles of *P. homarus* in Thiruvananthapuram district of Kerala is also given. The availability of spiny lobsters in near shore waters indicates good prospects for sea farming activities through capture based aquaculture (CBA) which can boost the earnings of the fishermen.

Key words: Spiny lobster, commercial fishery, sea farming prospects, India.

Introduction

Lobsters are luxury seafood with high nutritional value leading to great demand from national and international premium consumer sector. Lobster fishery in India is small scale and mostly the resources are harvested from shallow water. In deeper waters, lobsters are mostly incidental catch in gears targeting other fishery resources. Based on the estimated marine fish landings database of the Fishery Resource Assessment Division, ICAR-CMFRI on gearwise species composition in different maritime states for the period 2017-2019, and data gathered from live lobster holding center located in Thiruvananthapuram district of Kerala, status of lobster fishery in India is analysed and reported. Fishery trend showed that lobster catch increased from an annual average of 1562 t during the period 2003 -2014 to 2466 t during 2015-2019. Lobsters, especially live ones have a prominent place in the sea food export market in terms of both demand

and price from countries such as Japan, Korea, China, Taiwan, Europe and United States of America.

Fishery status

Lobster fishing in India is mostly carried out by region specific traditional fishermen communities inhabiting the coastal belts of maritime states. Lobsters are harvested by various types of commercial crafts and gears including traps which are included as non-motorized category solely used for catching lobsters. Major share of lobster catch in India is contributed by multiday trawlers (54.3 %) followed by out-board gill nets (26.9 %) and single day trawlers (11.2 %). In general, the lobsters are grouped into three categories such as spiny or rock lobsters, sand lobsters and deep sea lobsters. Among them, highly priced spiny lobster species are found in shallow waters with species such as *Panulirus homarus*, *P. polyphagus*, *P. ornatus*, *P. penicillatus* and *P. versicolor*,

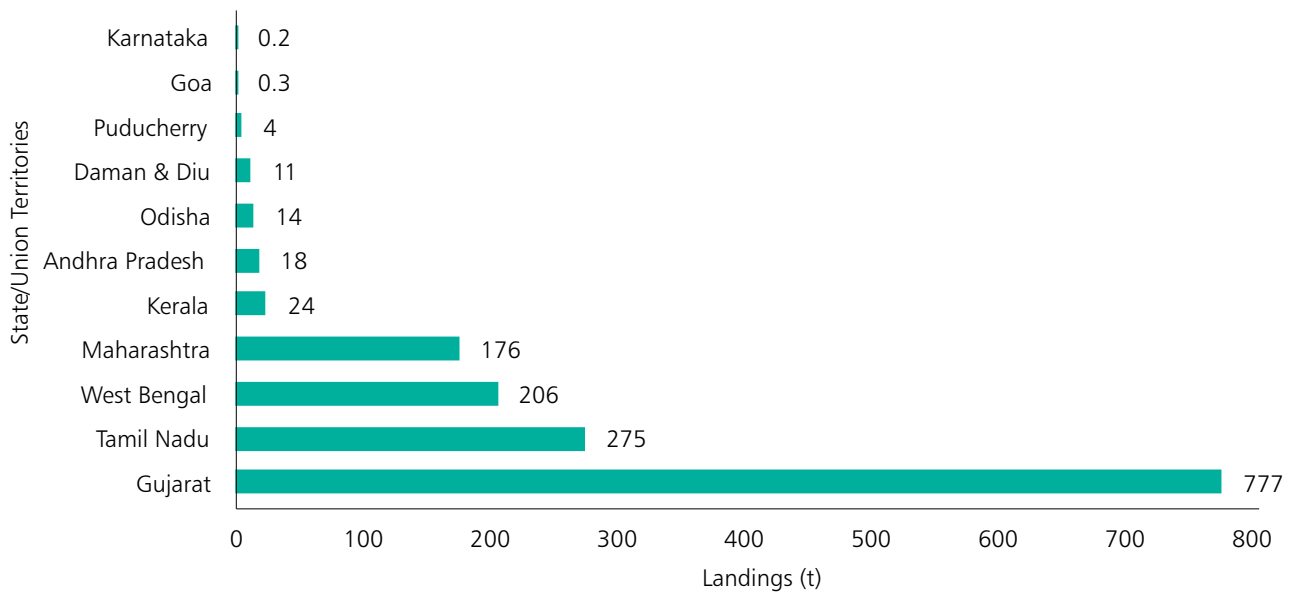


Fig.1. State wise annual average spiny lobster landings (t) in India during 2017-19

forming major portion of the fishery (62%) followed by sand lobsters (37%) and deep sea lobsters (1%).

Among the different categories of lobsters, spiny lobsters are highly suitable for sea cage culture/farming. In India, all the maritime states contribute spiny lobster resources either seasonal or year round. The lobster fisheries with varying status were scaled as rare, minor,

moderate, good and very good based on landings. Thus the category 'rare' indicates incidental occurrence of lobsters ranging from few kilograms to a maximum of one ton, the 1-10 t category as 'minor', > 10 -50 t as 'moderate', > 50-100 t as 'good' and > 100 t 'very good' fishery. Status of spiny lobster fishery and types of gears contributing to fishery along the Indian coast are given (Tables 1-4)

Table 1. Status of spiny lobster fishery along North-West coast of India

NORTH-WEST REGION

State	District	Lobster season	Gears landing lobsters	Fishery status
Gujarat	Valsad	Jan -Dec	MDOL, MDTN, MGN, OBGN, OBOTHs, MBN, OBBN, MTN	Minor
	Amreli, Jamnagar, Junagadh, Navsari, Porbandar	Jan-Dec	MDOL, MDTN, MGN, OBGN, OBOTHs, MBN, OBBN, MTN	Moderate
	Dwaraka, Kutch	Jan-Dec	MDOL, MDTN, MGN, OBGN, OBOTHs, MBN, OBBN, MTN	Very good
	Gir Somnath	Jan-Dec	MDOL, MDTN, MGN, OBGN, OBOTHs, MBN, OBBN, MTN	Good
Maharashtra	Sindhudurg	Jan, Mar-Apr	MTN, MDTN, OBGN	Minor
	Ratnagiri	Jan-May, Aug-Dec	MDTN, MTN, OBGN	Moderate
	Raigad	Jan-Jun, Sep-Nov	MGN, MDTN, OBGN	Moderate
	Thane	Jan-Apr, Jul, Oct-Dec	MDOL, MGN, NM	Moderate
	Palghar	Jan- Mar, May, Jul, Sep, Nov-Dec	MDOL, OBDOL, MGN, NM, OBGN	Moderate
	Mumbai	Jan-May, Aug-Dec	MDOL, MDTN, MGN, MTN, OBGN, NM	Very good
Daman & Diu Union Territory	Diu	Jan-Jun, Sept-Dec	MDOL, MDTN, MGN	Moderate

MTN: Single Day fishing trawlers; MDTN: Multi day fishing trawlers; MGN: Mechanized Gill Net; MDOL: Mechanized dol net; OBGN/OBBSGN/ NMBSGN/ NMGN: Out board gill net/Out board bottom set gill net/ Non mechanized bottom set gill net/ Non mechanized gill net; NM: Non-motorized units/Traps; OBOTHs: Other outboard nets; MBN: Mechanized bag net; OBBN: Outboard bag net; MOTHS: Other mechanized gears; OBBS: Outboard boat seines, MDTNHL: Multi day trawlers-Hooks & line.

Table 2. Status of spiny lobster fishery along southwest coast of India

State	District	Lobster season	Gears landing lobsters	Fishery status
Karnataka	North Kanara,	Oct	NM	Rare
	Udupi	Oct	NM	Rare
Goa	North Goa	Apr, Aug	OBGN	Rare
Kerala	Kozhikode	Jan-Mar, May, Sep-Dec	MDTN, MTN, OBGN	Minor
	Thiruvananthapuram	Jan-Dec	OBBSGN, NM, BSGN	Minor
	Kollam	Jan-Jun, Aug-Dec	MDTN, MTN, OBGN	Moderate

Table 3. Status of spiny lobster fishery along northeast coast of India

State	District	Lobster season	Gears landing lobsters	Fishery status
West Bengal	Midnapur	Jun-Dec	MDTN	Moderate
	South24 Parganas	Jan-Mar, Jun-Dec	MDTN	Very good
Odisha	Balasore	Feb, July, Oct	MDTN	Minor
	Bhadrak,	Jan-Feb, Jun	MDTN	Rare
	Jagatsinghpur	Jan-Apr, Jul-Dec	MDTN, MTN	Minor

Table 4. Status of spiny lobster fishery along South-East coast of India

State	District	Lobster season	Gears landing lobsters	Fishery status
Andhra Pradesh	Srikakulam	Jan, Dec	OBGN, NM	Rare
	Vizianagaram	Feb, Apr, Jul, Oct, Dec	OBGN, NM, OBBS	Minor
	Guntur	Jan-Apr, Jun-Jul, Sep-Dec	MDTN	Minor
	East Godavari	Jan	MDTN	Rare
Tamil Nadu	Thiruvalluvar	Apr, Aug-Dec	NM, OBGN	Rare
	Ramanathapuram,	Jan- Feb, Apr, Jun, Aug -Dec	MTN, OBGN	Good
	Kanyakumari	Jan-Dec	MOTHS, MDTN, OBBS, OBOTHS, MTN, NM, OBGN	Good
	Thoothukudi	Jan-Dec	MTN, NM, OBBS, OBBS, OBGN, MGN	Good
	Thirunelveli,	Jan- Dec	OBGN, NM	Moderate
	Kancheepuram	Jan- Feb, Apr, Jul, Sep	OBGN	Minor
	Nagapattinam	Jan-Apr, Jun-Dec	MDTN, MDTNHL, OBGN, MTN	Minor
	Villupuram	Oct-Nov	MTN, OBGN	Minor
	Chennai	Jan-Apr, Jul-Dec	MDTN, MTN, OBGN	Minor
	Cuddalore	Jul, Sept-Oct, Dec	MDTN, MTN	Minor
Puducherry	Puducherry	Jan-Oct, Dec	MDTN, MTN, OBGN	Minor
	Karaikal	Mar, Sep, Dec	MDTN	Rare

Among spiny lobsters, *P. homarus*, *P. polyphagus*, *P. ornatus* and *P. versicolor* can be considered as most suitable for sea farming due to their fast growth, availability in near shore waters and their adaptability to captive conditions. They are also non aggressive and less cannibalistic. Experimental studies prove that they can be fed with natural feeds such as brown/green mussels, gastropods, clams, chopped sardines or several locally available low value fishes and squids as per

availability. All the four species are found throughout the coastal waters of India with varying magnitude. *P. polyphagus*, commonly known as mud spiny lobster dominates in the lobster landings of Gujarat, Maharashtra, Odisha and Goa. *P. homarus* known as rock lobster or scalloped lobsters are predominant along West Bengal, Andhra Pradesh, Tamil Nadu, Puducherry and Kerala coasts while a minor catch of *P. versicolor* occurs along Karnataka.

Prospects for spiny lobster farming in India

Spiny lobsters fetch very high price in the domestic and export market (Figs. 2 & 3). In the domestic market, categorization into different quality grades is based on their weight, as > 200 g, 100-200 g and < 100 g being the first, second and third grades respectively and accordingly prices are fixed. In the domestic markets of Kerala lobsters fetched a minimum of ₹700 to ₹4000 per kg for those weighing above 100 g while prices for below 100 g body weight ranged from ₹100 to ₹1300 per kg (Figs. 3 & 4). At present, domestic market for spiny lobsters is mostly centered on seafood exporting firms followed by live lobster holding centers, beach resorts, restaurants associated with the tourism Industry, and farmers engaged in sea cage culture.

In 2009, for the first time in India, ICAR-CMFRI successfully demonstrated lobster culture in large marine floating cage at Vizhinjam Bay, Kerala, (Rao *et al.*, 2010). Subsequently lobster culture in sea cages was demonstrated in different areas (Lipton *et al.*, 2010, Gulshad *et al.*, 2010, Divu *et al.*, 2018). At present, lobster culture in India is mostly practiced on a small scale in bays or in near shore waters

within 20 m depth, by stocking juveniles of *P. polyphagus* along Maharashtra and Gujarat coasts and *P. homarus* along Kerala and Tamil Nadu coasts. Lobster culture can be switched between different modes depending on the scale of local lobster capture fishery production. A series of small cages can be installed along bays or near shore waters for areas with 'minor' fishery, large single cage for areas with 'moderate' fishery and several large cages for 'good' fishery. Strong multiple sea cage enclosures for fishery with 'very good' status can be installed in offshore waters away from navigational and fishing routes. Based on the average size of the juvenile stock, lobsters can be cultured in sea cages for varying duration ranging from 3 to 4 months except during monsoon and other adverse weather prone seasons. Areas subjected to strong wind, water current and cyclones also should be avoided. The study conducted during 2017-2019 showed that huge quantities of juveniles of spiny lobsters are landed by trawl nets, dol nets and bottom set gill nets along Maharashtra coast mostly during October-November and January-April. Juveniles of *P. homarus* along Kanyakumari coast were available during November to January. Juveniles of *P. homarus*, *P. ornatus* and *P. versicolor* along Mandapam and Chennai coasts in Tamil Nadu were also recorded. Fishermen are in the habit of using juvenile lobsters either



Fig. 2. *Panulirus ornatus* in landings at Colachel



Fig. 3. *P. homarus* and *P. ornatus* lobsters landed

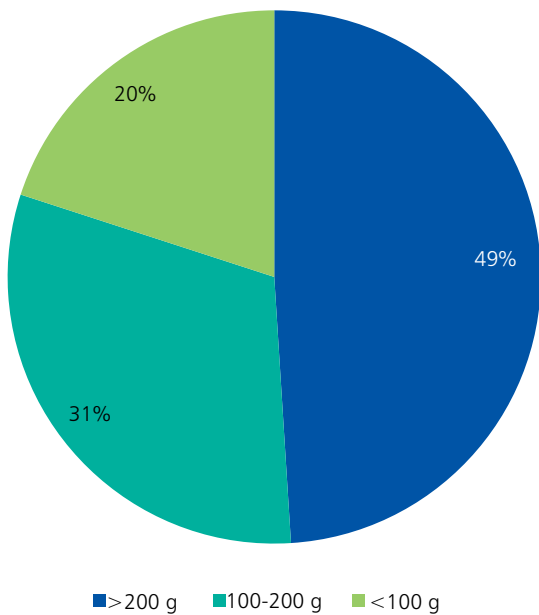


Fig.3. Graded (%) contribution of *P. homarus* in a lobster holding centre

as bait for catching cuttlefish or selling to middlemen and sometimes are even discarded when they occur as accidental catch in a few numbers. The study conducted along Thiruvananthapuram coast of Kerala showed 1.5 t of juveniles of *P. homarus* were traded during the period 2017-19. Abundance of juveniles was observed usually during September-February. The Minimum Legal Weight (MLW) for lobsters meant for exports was implemented by Marine Products Export Development Authority (MPEDA), Ministry of Commerce and Industry, Government of India as 200g for *P. homarus*, 300g for *P. polyphagus* and 500 g for *P. ornatus* and exports consignments can be legally detained if these rules are violated. The experimental lobster cage culture studies conducted at Vizhinjam Bay in Thiruvananthapuram district proved that juveniles of *P. homarus* attained an average body weight of 226 g from an initial weight of 114 g indicating an average growth rate of 0.82 g per day during a culture period of four and half months. Incidence of sizable portion of females becoming berried in sea cage during culture period

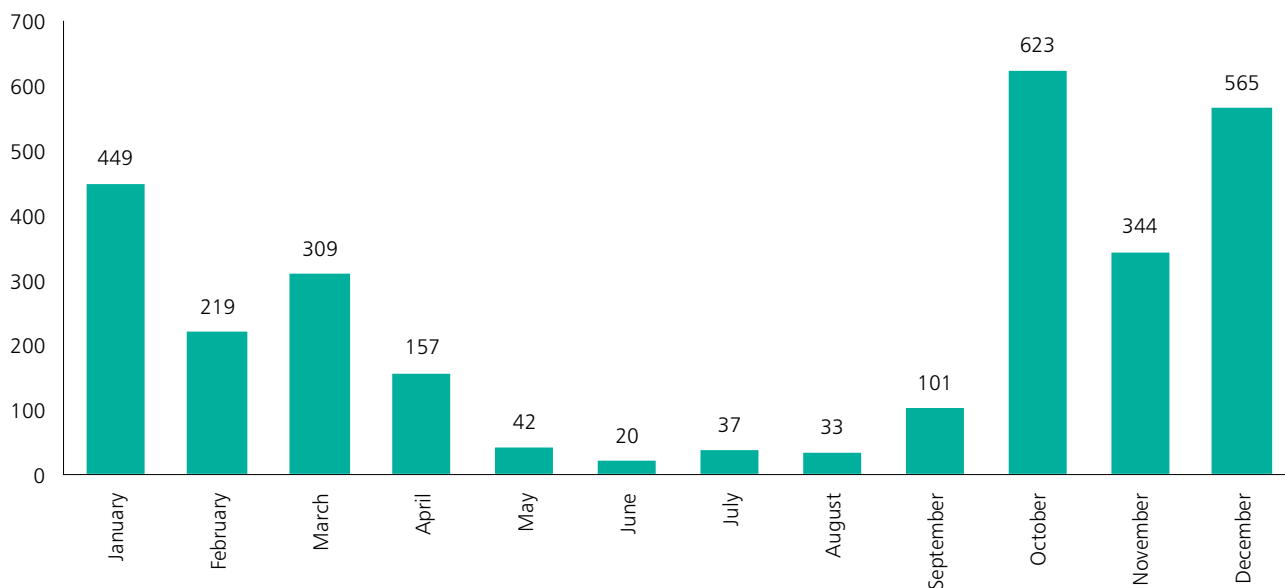


Fig.4. Month wise average stock (kg) of live *P. homarus* at holding centre in Thiruvananthapuram district during 2017-19

was also observed (Rao *et al* 2010) indicating hatching and dispersal of millions of larvae in the ecosystem as they have very high fecundity. The studies conducted at Kanyakumari coastal waters shows 1100- 2400 juvenile lobsters in the sizes 45-90 g can be fattened in 6 m diameter cages (Lipton *et al* 2010). In light of the above facts, augmenting farm/cage production of lobsters through capture based aquaculture (CBA) using lobsters thereby enabling the fishermen to earn more is desirable. Unemployed fishermen youth can also venture into farming activities as several Government agencies

are providing loans with subsidies and other financial support for the establishment of sea farming units in India.

References:

- Divu D. *et al.*,2018. *Aquaculture Research*,49 (2), pp.1080-1086.
- Gulshad M. *et al.*,2010. *J. Mar.Biol.Ass.India*,52 (2):316-319.
- Lipton *et al.*, 2010. *Fishing chimes* 30(2):11-13.
- Rao, G. Syda *et al.*, 2010. *Indian J. Fish.*, 57(1):.23-29.