

Purse seine fishing in Maharashtra

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Purse seines are one of the important gears operated along the west coast of India for harvesting shoaling pelagic fishes, mostly oil sardine and mackerel. Purse seine fishing method invented to harvest the large shoal of pelagic fish in Maine, United State of America during 1830's later is was spread to Norway, Sweden, Japan etc. In India purse seine was introduced on experimental basis in 1954 under Indo-Norwegian project off Quilon, Kerala and other attempt was made in Goa in 1957 when the territory was still ruled by Portuguese. The commercial purse seining taken up by the fishers in Karnataka during the mid 1970s was later adopted by the fishers in Kerala and Goa. In Maharashtra, fishers from the southern region

(Ratnagiri and Sindhurg) adopted purse seine fishing in late eighties and Mirkarwada emerged as a major base of operation for these purse seiners. In northern Maharashtra, fishers were mostly engaged in set bagnet (*Dol* nets) and trawl fishing until the late 1990s when a few trawl fishers shifted to purse seine fishing expecting better economic prospects. Initially, purse seines operated in Maharashtra mostly targeted mostly the pelagic fishes like oil sardine, Indian mackerel, large carangids. Later, with modifications and technological changes several fishes including catfishes and croakers were harvested (Pravin and Meenakumari, 2016; Shibu *et al.*, 2017). Purse seiners currently operating in northern Maharashtra are also targeting very high value,

large sized croakers such as *Protonibea diacanthus* (Ghol) and *Otolithoides biauritus* (Koth).

Before the introduction purse seines, mostly small-scale exploitation of oil sardine and mackerel was done by artisanal fishers in coastal area using shore seines (*rampani*) and gillnets as well as small trawlers. The number of purse seiners increased and boom in purse seine fishery lead to migration of labourers to southern Maharashtra, mostly from Andhra Pradesh initially and later from Bihar, Uttar Pradesh and West Bengal. Due to the promising economic returns purse seining technology was soon adopted in northern Maharashtra (Mumbai) and new purse seiners were introduced or trawl fishing boats were converted to purse seines. The increase in purse seine fishing in nearshore waters lead to conflicts between trawl, *DoI* net and gill net fishers. This led to the notification on 13th October, 1999 under the state's Marine Fisheries Regulation Act (MFRA) whereby, the use of purse-seine gear by any mechanized fishing vessels within territorial waters of 12 nautical miles (nmi) of Greater Mumbai, Thane, Raigad, Ratnagiri and Sindhudurg districts were prohibited.

Following the success of larger mechanized purse seining vessels, small scale fishers also made modifications in their wooden country crafts and purchased suitable small sized purse seine nets. The number of FRP mini purse seines (9-13 m OAL) are increasing, especially in southern Maharashtra. These vessels currently using two 9.9 hp engines and a supporting engine of 5-6 hp for faster hauling and pursing the bottom of net, have a crew of 7-12. The net length varies from 300-600 m and 30-45 m height.

During 2010 there were 435 purses seiners operating along the Maharashtra coast (Marine Fisheries Census, 2010) and their overall length (OAL) ranges from 14-18 m, engine power 110-240 hp, length of net 700-1500 m, depth of net 70-100 m and mesh size 24-46 mm. The average marine pelagic fish landing in Maharashtra before introduction purse seine (1960-1990) was 76,000 tons while after introduction purse seine (1991 to 2016) it increased by about 66% to 115,000 tons (Fig.3). The combined average landing of Indian mackerel and oil sardine in Maharashtra grew from 9% to 23% after introduction of purse seine. Some of the important technology adoption by purse seine fishing in recent years is hydraulic power block for hauling the purse seine and Automatic Identification System (AIS) useful for navigation and tracking fishing boats.



Fig. 1. A mechanized purse seine unit moving to fishing ground



Fig. 2. A motorized FRP mini purse seine unit at sea

The increasing number of purse seines have coincided with the trend of low catches in small scale sectors and since there is overlapping area of operation among these sectors, it has lead to conflicts at sea. The committee appointed by Government of Maharashtra to study the status of purse seine fishing and its impact on the traditional fishing and ecology along the Maharashtra coast submitted its report in May 2012. Based on these recommendations Government of Maharashtra issued an order on 5th February 2016 to regulate purse seine fishing in Maharashtra to resolve conflicts among the traditional small scale fishers and purse seine fishers.

The committee has demarcated the different zones for purse seine fishing in Maharashtra while reserving the rights of traditional fishers also (Fig. 4). These zones are:

Zone (I)- Zai to Murud: Area from shore to 12 nautical miles (nmi) shall be reserved for traditional fishing. The purse seine, ring seine including mini purse seine fishing shall be prohibited in this Zone.

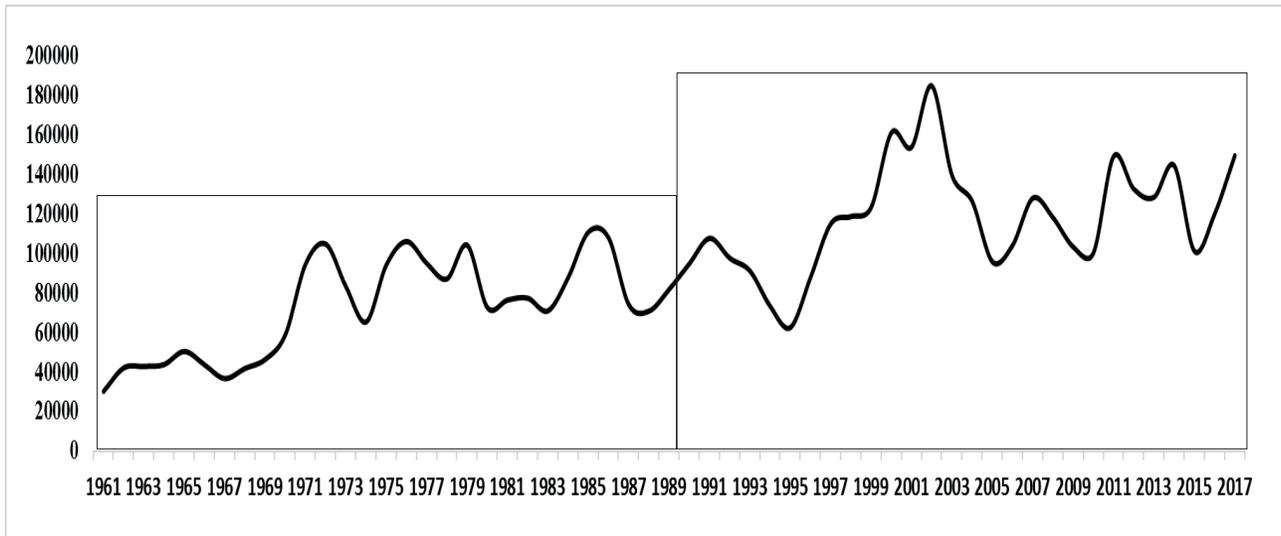


Fig.3. Trend of pelagic fish landings prior to and post-introduction of purse seines in Maharashtra

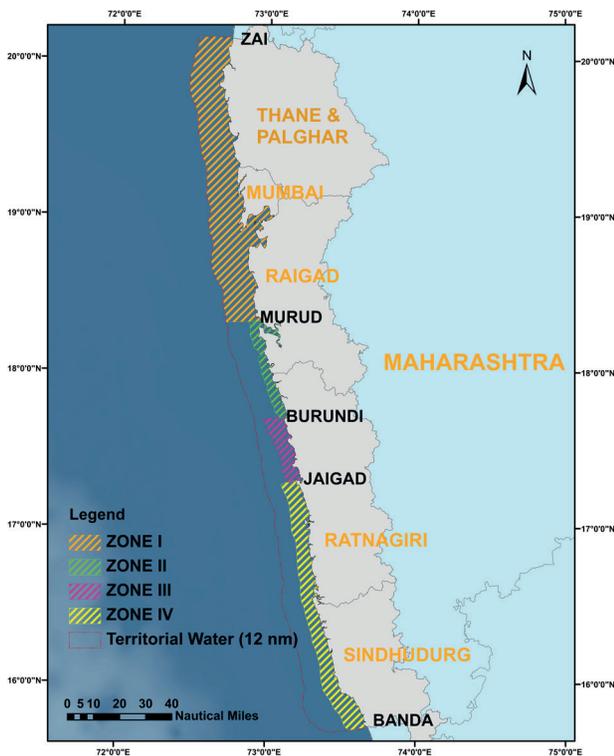


Fig.4. Zonation of the fishing grounds for operation of seines along Maharashtra coast

Zone (II) Murud to Burundi: Area up to 10 m (5 fathom) depth from shore shall be reserved for traditional fishing. The Purse seine, ring seine and mini purse seine fishing shall be permitted beyond the 10 m (5 fathom) depth.

Zone (III) Burundi to Jaigad: Area upto 20 m (10 fathom)

depth from shore shall be reserved for the traditional fishing. The purse seine, ring seine and mini purse seine fishing shall be permitted beyond the 20 m (10 fathom) depth.

Zone IV Jaigad to Banda: Area upto 25m (12.5 fathom) depth from shore shall be reserved for traditional fishing. The purse seine, ring seine and mini purse seine fishing shall be permitted beyond the 25-meter (12.5 fathom) depth.

The State Department of Fisheries, Government of Maharashtra will also not issue new licenses for purse seine/ring seine (including mini-purse seine). The number of existing and operational purse seine, ring seine and mini-purse seine fishing licenses shall be brought down gradually to 262 and finally to 182. Purse seine, ring seine and mini-purse seine gear shall be operated by any mechanized vessel, during the period September to December only and within the specified zone.

To conserve the fish stock the use of hydraulic winch (Boom) is also prohibited for purse seine/ring seine (including mini-purse seine) fishing operations. In addition, gear specifications for purse seine/ ring seine (including mini-purse seine) that can be operated by any mechanized fishing vessel in the territorial waters of the State have been notified as given below.

The purse seine operation often creates sectoral conflicts and concerns in small scale fishers. Implementing the Maharashtra Marine Fishing Regulation Act, 1981 and Notification on Purse seine operation is tedious task unless

Table 1. Gear specifications mandated for operating seines along Maharashtra coast

Zone		Specifications of Purse Seine/Ring Seine (including mini-purse seine) Nets	
		Length (m)	Height (m)
I	Zai to Murud	Operation of purse seine, ring seine and mini purse seine nets are prohibited in this zone	
II	Murud to Burundi	125-500	10-40
III	Burundi to Jaigad	250-500	20-40
III	Jaigad to Banda	300-500	25-40

monitoring mechanisms like Vessel Monitoring System (VMS) and AIS is present in all fishing vessels, along with onboard inspections at sea. As per the Jurisdiction of MFRA, 1981 state can enforce and regulate fishing in the

territorial waters (12 nmi). Beyond this zone, presently there are several ambiguities among fishermen on fishing, licensing and regulations and hence implementing the new regulations will require concerted efforts.