

Site suitability evaluation for bivalve mariculture in Maharashtra

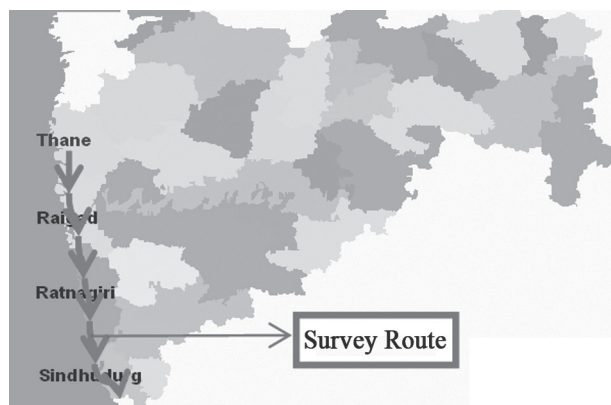
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The coastal stretch of Konkan Maharashtra is endowed with large number of west flowing rivers forming productive estuaries and creeks fringed by mangrove vegetation. The coastline stretching across the districts of Raigad, Ratnagiri and Sindhudurg are marked by the presence of narrow creeks offering sheltered areas for aquaculture activities. Considering the potential for expanding bivalve farming in Maharashtra, surveys for selecting suitable sites for coastal farming were conducted from 5th to 8th October, 2013 covering Thane, Raigad, Ratnagiri and Sindhudurg districts.



The species that contribute to the fishery are clams such as *Meretrix meretrix*, *Marcia opima*, *Paphia malabarica*; oysters such as *Saccostrea cucullata*, *Crassostrea madrasensis* and the green mussel, *Perna viridis*. The areas harbouring natural bivalve beds offers conducive environmental condition for bivalve farming. Therefore, the survey included the most productive bivalve fishing areas such as the Kalbadevi Estuary and Bhatia Creek in Ratnagiri.

Site selection criteria for bivalve farming were the following

- The primary selection criteria was salinity. Marine mussels prefer salinity of 27-35 psu while oysters of the genus *Crassostrea* are highly euryhaline tolerating low salinity ranges and oysters of the genus *Saccostrea* are typically marine. Water salinity above 22-35 psu was considered as the criteria
- Sheltered areas with moderate water current
- Potential pollution problems in the locality
- Water depth ranging from 2 to 6 m during low tide.
- Water temperature between 21-31°C.
- Good phytoplankton production

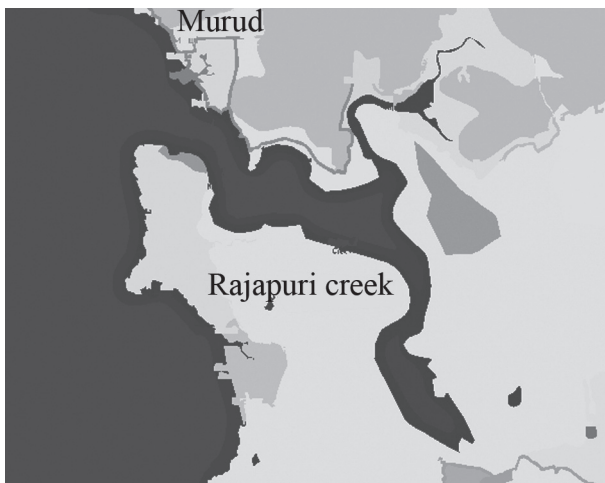
Survey Results

1. **Revdanda** The whole stretch southward of Revdanda up to Korlai beach and Kundalika creek



were surveyed. Shore-front area of Revdanda including part of Kundalika creek was observed to be inappropriate for bivalve farming due to industrialization.

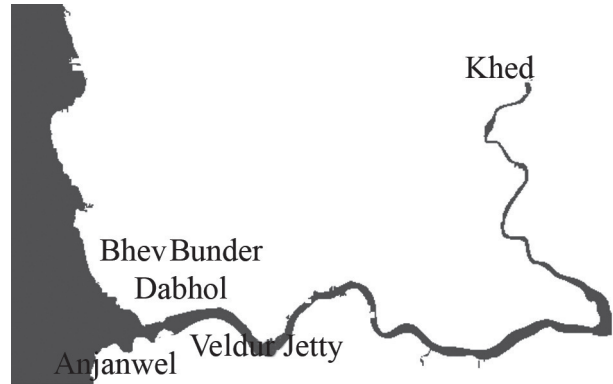
2. Murud coastal stretches in Raigad District and Rajapuri Creek near its bar mouth were surveyed. Natural population of rock oyster *S. cucullata* were observed along the creek. Due to industrialization the area was not suitable for bivalve farming.



3. Dabhol, in the Ratnagiri District was surveyed. Vashishti River flowing from Chiplun merges into the sea at Dabhol as Dabhol Creek. Natural population of the rock oyster, *S. cucullata* were observed. Green mussel, *Perna viridis* is reportedly present in coastal stretches adjoining Bhiv Bunder. Discharges of thermal effluent from Dabhol Power Station and from industries located upstream in Khed exist at this site. However both oyster and mussel farming may be considered here because of the abundance of these bivalve resources in the creek. Further a number of fishermen undertake a sustenance fishery for these resources.

The local fishermen society who evinced immense interest to undertake oyster and mussel farming were sensitised on the various aspects of bivalve farming during the survey. Suitable areas were demarcated near Veldur Jetty for

farming activities with the fishers of Anjanvel Village.



4. Jaigad, a major fishing village in Ratnagiri, located on the banks of Shastri River was surveyed. The stretch adjoining the coast comprises of slightly undulating plains at elevation ranging from 30-60m MSL. Due to the presence of a coal based thermal power plant the site was unsuitable for aquaculture.



5. Kalbadevi Estuary is an important bivalve fishing area in Ratnagiri. Edible oysters (*Saccostrea cucullata* and *Crassostrea* sp.), clams and green mussels are fished within Kalbadevi Creek as well as in rocky inshore regions regularly. This area was found suitable for setting bivalve farms for oysters and mussels. Mussel seeds are available in subtidal mussel beds. A meeting organised with the fishermen community resulted in developing interest for undertaking bivalve farming in the area.



6. Wadatar creek in Sindhudurg District is an important edible oyster fishing area. The edible oysters, *Crassostrea madrasensis*, *C. gryphoides* and *S. cucullata* beds are spread near the bar mouth. The local communities harvest the oysters for consumption and marketing. The area near the Wadatar Bridge, which joins Vijayadurg to Devgad was surveyed and demarcated for farming bivalves.



7. Taramumbari near Devgad is an important bivalve fishing area. The salinity of the creek recorded 31 psu during low-tide period. Green mussels were fished earlier from the area during low tide. However, at present the mussel populations in the bar mouth is smothered by sediments from the ongoing construction of Taramumbari - Mithmumbari bridge. Therefore, this site may be considered later for carrying out mussel farming after the re-establishment of natural mussel population.



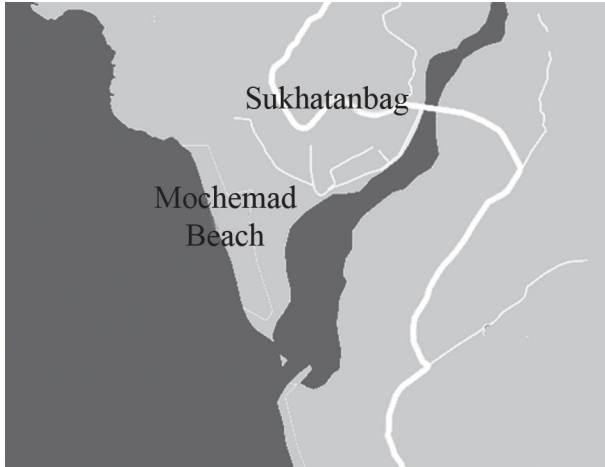
8. Achara situated at a distance of 15 km from Malvan is an important coastal village. Farming sites were identified near the Pirawadi Beach. This appears to be a potential farming site for rock oyster.



9. Devbagh area was surveyed along Tarkarli Beach and estuarine areas of Karli River. Natural population of rock oyster and green mussels are



reported from Devbagh area. This region holds potential for combining the already developed aquatourism with bivalve farming.



10. Vengrula area was surveyed along Mochemad estuarine area. This region holds potential for farming edible oysters.

Conclusions

Oyster farming was initiated in Ratnagiri and Sindhudurg Districts of Maharashtra with local '*Mahila Sahakari Sanstha*' in Kalbadevi Estuary, Wadatar, Taramumbari, Vengrula and Devbagh. In Wadatar, the farming initiated by a ten women group during March 2014, yielded 6,000 t oysters in June 2015. Good settlement of *Crassostrea madrasensis* seeds was observed in Devbagh and Wadatar, followed by Vengrula and Taramumbari. In 2016 the oyster farming programme has scaled-up on a commercial scale with 16 established commercial farms in Wadatar.