Revised Survey Report

This Survey Report is Prepared for Office of the Executive Director Mangrove and Marine Biodiversity Conservation Foundation of Maharashtra and Additional Principal Chief Conservator of Forest, Mangrove Cell, Mumbai

The Survey is carried out by Pramod v Vichare Retd.. Fisheries Development Officer and Fisheries Consultant for NORID. along with Pramod Shinde the Program Coordinator, and Project Associate Persons of the Mangrove Foundation.

PURPOSE -

The Goal of this survey was to find out the suitable sites for Mud Crab Culture with Crab Fattening Technique to support conservation of mangrove and enhancing livelihood in selected villages of Raigad Dist in the Maharashtra State.

Preface -

The FISHCOPFED - NORID has Submitted the proposal regarding implementation of Mud Crab Fattening Programme on Pilot basis in the coastal districts of Maharashtra State. With reference to this proposal it was instructed to carry out field survey to indentify 5 villages for implementation of mud crab fattening programme. The list of the 17 villages along with details of project Associate Persons was provided to NORID to carry out the survey in the selected villages.

In the first stage, survey was carried out for the 10 villages from Pen, Alibag, Roha and Tala Tahasil total 19 sites were identified and examined to find our suitable area for mud crab fattening programme.

The survey was conducted from 12th jan 2018 to 15 Jan 2018 and almost all the sites visited during low tide period. The name of the Village, Tahasil and number of sites surveyed etc are listed below .

Sr no	Date	Tahasil	Village Name	Latitude	longitude	No of Site	Remark
1	12-1-2018	PEN	Koproli	19.0124	73.1000	1	
			Shirkichal	18.740	73.0501	2	
2	13-1-2018	ALIBAG	Shahpur	19.0990	73.0803	3	
			Kurul	18.6462	72.892	1	
			Revdanda	18.553	72.930	2	
			Bhonang	18.5402	72.978	1	
3	14-1-2018	ROHA	Dapoli	18.4813	73.009	1	
			Gofan	-	-	3	
			Uchal	18.3400	73.0818	4	
4	14-1-2018	TALA	Rahatad	18.2952	73.09361	1	
TOTAL		**4 TAHASIL**	**10 VILLAGES**			**19 SITES**	

** (Longitude and Latitude mentioned above are related to Particular Village and not to the Particular Site)

Material & Method

In Order to ascertain the suitability of sites for mud crab fattening programme the field survey was conducted and following factor were examined.

A) Physical Features

- **a.** Area available with natural embankment
- **b.** Geographical features of the site
- **c.** Access to the site
- **d.** Distance from main road
- **e.** Source of water
- **f.** Depth of water during low tide
- **g.** Infrastructural Facilities.

B) Water Parameters and Climate

- **a.** Air temp
- **b.** Water temp
- **c.** Salinity
- **d.** PH
- **e.** Do2 Content
- **f.** Pollution
- **g.** Chemical contamination.

C) Social Aspects

- **a.** Type of population
- **b.** Occupation
- **c.** Availability of wild crab and fisher crab around the site.

The survey was conducted during low tide in order to examine the depth of water available at the time of visit at the located spot. The depth of water and natural embankment position are the important factors. In absence of natural embankment and minimum 3-4 feet water depth the floating frames for crab holding boxes cannot be installed. Hence while conducting the survey first preference was given to the site which holds required depth of water and having natural embankment position.

The water parameter was measured with digital and electronic devices, PH was measured with accuracy of + - 0.02 ph unit with digital PH pen (battery operated) temp was measured by using centigrade thermometer , Dissolved oxygen level of the was measured by digital oxygen meter, and salinity measured by portable salinometer (refracto meter)

The information related to social aspects like availability of wild crab and fisher crab was collected from the local sources through inquiry with local fisherman and pisciculturist available at site. It was revealed from the sources that from Revdanda to Roha there are 30-35 villages where mud crab are collected on large scale, Revas is the main wholesale market for the crab, karanja and revdanda are another two places where hole seller & exporters purchase the procured crab from crab fishers.

Kurul and shapur in Alibag tahasil Gophan, and Virzoli near Uchal in Roha , Shirkichal in Pen Tahasil and Rahatad village in Tala Tahasil are the major 5 spots for the procurement of wild crab.

REPORT DETAIL -

On 12th Jan 2018 Two villages namely koproli and shirkichal was surveyed.

Koproli -**P**en small village / hamlet and 2 to 2.5 k.m. away from pen having population around 1600 . There is a full grown mangrove forest covering many acres but major portion of mangrove forest belongs to pvt and also far away from the human settlement and not accessible by road. No mud flat, tide pool or water logged portion suitable for crab culture was observed during the survey and it is concluded that the koproli village is not suitable for mud crab fattening program.

Shirkichal-**P**en is another small village 14-20 km away from Pen near Dharamtar Creek. Small fishing Jettry namely Amba wadi is in operation near village and around 50 to 70 small fishing boats are operated from this jetty local fishermen told that. daily around 1 quintal wild crabs are collected from the mangrove forest and in the creek and more than 100 to 150 crab fisher are engaged in this occupation. the procured crab consist of brown and green crabs (average 300 to 400 gm) and these crabs are either supplied to wholesale market at “Karanja” or sold at local market near “Wadkhal”

The village is separated by small bandhara like structure may be khar land bandhara for protection from in cursing of the creek water during high tide. There are no of small tide pools observed adjacent to bandhara. Two sites near Jetty are indentified which were small oval shaped tide pools one approx 50 sq met. And another 80 to 100sq mt. The water depth at the time of visit i.e. during low tide was measured which was 1.20mt and 1.35 mt respectively the water parameters were tested and found suitable for crab culture.

(Table – Annexure - A)

The identified sites iare not accessible by road but being adjacent to jetty can be accessed through boat the identified sites are half .km away from Shirkichal No.2 village and are at walk able distance.

Electricity is not available at the site which may be required for implementation of the programme. One diesel pump is required to maintain the necessary water depth in the culture pond.

Considering the fact the indentified sites are suitable for crab fattening programme subject to provision of electricity and diesel engine for intake of water during culture period.

On 13th Jan 2018 four sites from Alibag Tahsil Shahapur, Kurul, Bhonang and Revdanda were surveyed.

Shahapur- **A**libag-

Shahapur village is well connected by road and 10 to 12 km away from main rd (Mumbai-Alibag) main source of salt water is Dharmtar Creek and one tributary of the Dharamtar Creek a streach of 5 to 6 km observed near Shahapur village and Dholpada. The depth of water in this tributary was more than 5 met all along the stretch

The water sample collected from two different spot from tributary and one from the tidal pool which is opposite side of the small bridge and oval in shape approximately 1 ½ acre in size. The collected samples were analyzed for water Quality and found suitable for crab culture (see Annexure A}- for list of parameters analyses) photos of each location can be seen in Annexure 'C.'

The tidal pool site is being adjacent to tar road well accessible and very suitable for operation. This tide pool is provided with natural sluice gate arrangement fixed underneath the bridge during high tide flow of water opens the gate and

water rush towards tide pool. during low tide water rushes back to main creek and sluice gate get closed automatically because of back pressure.

The local villagers mainly comprise of Agri Samaj well aware of Crab collection, and have fair knowledge of mud crab culture activities. During the Survey it was revealed that crab farming in construction pond is being done in their own paddy field. The crab lets are collected from creek basin and stocked in the constructed pond. With 50 to 60% survival rate average 600gms of crabs are harvested in 8 to 10 months. The crabs harvested are locally sold to the hotels or sold ate Roha and Revdanda.

The site identified i.e. tide pool in Shahapur village is ideal site for crab fattening programme on following ground.

1) Tide pool have natural embankments
2) Sufficient water depth
3) Have natural sluice gate facility.
4) Well accessed by road
5) Surrounded by mangrove bushes
6) Electricity is available adjacent to site
7) Water parameters are suitable
8) Crab fisher is available in the village and ready to participate in the programme.
9) Wild crabs are available in the creek.

Kurul – **A**llibag -

Kurul village is 7 km away from Alibag city well connected by road the Akshi creek is main source of salt water. different mangrove species found occupied different zone along the creek. The fiddler crab, scyla species of crab and other edible crabs were noticed near surface of mud. The mud flats of mangroves almost exposed due to low tide session, we did not see any suitable site around which have natural embankment and sufficient water depth. How ever naturally produce Oyster were collected on large scale by the local fisher women from the exposed basin of Akshi Creek, on enquiry with local fishermen it was told that more than 50to 100 women are engaged in this occupation and earning good income from it.

The oyster collected from Kurul Village have great demand in Sason Dock market in Mumbai. The Akshi creek has great potential for Oyester production, presently the oyster farming is being done purely on traditional basis. If these activities are supported technically and financially this Occupation will take definite shape in future.

Bhonang – **A**libag -

Bhonang is another village surveyed on 13th Jan 2018 during low tide session situated at 19 Km towards South from Alibag one small tributary of kundlika tiver is situated near Bhonang. The depth of water in the creek stream was very low during low tide season and no suitable spot identified for Crab Fattening programme.

Revdanda – **A**libag -

Revdanda village surveyed during the low tide session creek basin was almost dry no suitable spot identified around mangrove vegitation since no water logged portion observed. Water parameters collected from creek portion were analyzed and found suitable for crab culture shri sharad varsolkar member of the local mangrove foundation met during visit.

On 14th Jan 2018 Three site from Roha Tahasil & One Site from Tala Tahasil

Dapoli, Gophan, and Uchal and one Village Rahatad form Tala Tahasil where surveyed and 9 sites were examined

Dapoli – **R**oha -

Dapoli village situated at the border of Raigad and Ratnagiri district 28 km from Alibag and 15km from Roha. Village is situated 1.2 km from main road. The creek portion was almost exposed completely because of low tide, no suitable site identified because no possibility of water supply during low tide session (refer Photographs)

Gophan – **R**oha -

Gophan village is 10km away from Roha and ½ km away from main road. Suitated at the bank of Kundalika river majority population is fisherman. The river portion is densely surrounded by big mangrove trees. We identified 3 suitable sites for crab fattening programme. The identified sites were closed to main creek and separated by MIDC road one small nala found adjacent to MIDC road wth sufficient water depth at the time of visit was observed in the nala. The two sites indentified were totally dry but have good natural embankments form

all side and sites are close to the main creek hence water can be pumped by diesel engine. Another site was a small tide pool around 1 Acer in size and oval in shape had sufficient water depth more than I met at the time of visit. All the three sites are accessible by road. The water samples from main creek kundlika and from oval shape pond and also from the small nala near MIDC road were collected and tested. The salinity of the water was almost zero and PH level was also 7.0 and 6.5 (Annexure A) which are unsuitable for crab culture.

The consistent water supply of suitable saline water (i.e. 15 to 30ppt) cannot be assured from the available water source hence the identified sites cannot be recommended for crab fattening programme.

Uchal – **R**oha -

Uchal is small village from Roha tahsil 13 km from Roha and ½ km from main road. Main occupation of the people in Uchal is agriculture and fishermen population in the village is negligible on enquiry it was informed that Virzoli the nabouring village have majority of fishermen and all the fishing activities are done from Virzoli,but this village is not listeid in mangrove foundation programme. This information is given by Shri Shankar Harekar member Mangrove Foundation who Accompanied during visit. The mangrove forest is 1 km away from main road and cannot accessed by vehicle. It was noticed that one earthen Bundhara (Kharland Bandh) has been constructed to protect agriculture land from incursion of creek water.

It was noticed that there are thick patches of well grown mangroves all along the bandh. And between mangrove the horizontal shape few empty patches are available.

Three sites approx 2500 sq met, 3000 sq met and 1000 sq met were identified first two sites have natural embankments at one side and two sides are completely open. The portion towards creek side is partially open. The third site is around 1000 sq met very close to the creek and almost open from all side. Since all there three sites are close to creek the water can be pumped by diesel engine. To maintain the required depth of water during culture period artificial embankments at all the three sites shall be provided one diesel engine for regular water supply is also needed..

One khar land percolation small tank admeasuring 2-3 ha in size in opposite direction of the main creek was noticed which is also suitable site for this project. The water samples from main creek and from the percolation tank near khar land bandhara was collected and analyzed . the water parameters found suitable for crab culture (pl see Annexure-)

The crab fishers are available in Virzoli near by village which is not included in mangrove foundation list the wild crab are not available near site will have to procure from outside.

Three identified sites can be used only after construction of earthen embankment in order to maintain required depth of water and necessary sluice gate arrangement towards creek side will be required. Electricity is not available at the site will have to arrange from nearby resident.

The crab fattening program cab ne implemented in percolation tank adjacent to khar land bandh. For regular operation one small boat is required along with electricity supply at the site.

Raharad – **T**ala -

Rahatad Village is situtated in Roha Tahsil and situated at the bank of Rajapuri Creek Population Rahatad is around 2000 and consist of mix community like Kunbi, Koli, Budha, Muslim. The agriculture and fishing are the main occupation of the people.

We observed one medum jetty and 15-20 small fishing boat found offshore during visit police patil Shri Eknath Dave accompanied during the visit. No of traps to procure the mud crabs from mangrove forest were observed near Jetty. Basn of main creek

Rajpuri is 1 ½ km away from the village but 2 big tributaries flows in the direction of Rahatad Village with thick. . We found that both these tributaries are well surrounded by mangrove forest. It was observed that due to low tide session entire portion of both the tributaries up to mouth of Rajpuri creek was totally dry. We did not find any tide pool, water logged portion around both the tributary 3-4 ha area with natural embankments is available near left tributary but intake of water is not possible during low tide. Shri Eknath Dave told us that there are more than 50 crab fisher in the village procuring green and red crabs daily on large scale. The traditional round shape traps are used to catch the crabs. Very important information was given by fisherman that between these two tributary one island type site is available inside the well grown mangrove bushes which is exposed to main Rajapuri Creek and Sufficient water depth is maintained at this location even during low tide.

We could not approach the site since entire creek portion was marshy and muddy during at the time of visit .durng high tide session with the help of boat the site can be examined. The availability of wild crab and crab fisher in the Rahatad Village is good sign for promotion of Crab Fattening program.

CONCLUSION

The Survey was conducted in ten village of Raigad District. The survey revealed that the Raigad Distric has great potential for mud crab farming. Among 10 village only three villages Bhonang, Dapoli & Gopfan we couldn't confirm the availability of wild mud crab, rest of the seven villages have considerable source of wild crab. The information collected from local sources revealed that major percentage of the procured crabs are brown crabs belongs to species Scylla olivacea, green crab scyll serrata is comparatively less in number and red crabs are procured occasionally.

The survey was conducted during low tide session, almost all the sites could be verified on the ground of water availability even during lowest water level in the creek. The survey revealed that except Shahapur Shrkichal, and Uchel village in rest of the 6 villages the creek portion was either totally dry or with very low level of water. The Gofan village situated at the bank of kundlika river had few good sites but salinity and PH is not suitable.

The Water Parameters of the water samples analyzed during survey at the different sites and the suitable range of water parameters for mud crab culture are as follows.

Sr no	Parameter	Suitable Range for Mud Crab Culture	Existing Range found during Survey	Remarks
1	Temperature (in Centigrade)	24 - 35	28--32	Water Parameters are in favorable Range
2	Salinity PPT	15---30	22—29	
3	PH	7.5—8.5	7.5—8.2	
4	Do2 ppm	Above 3 ppm	Above 3 ppm	
5	Turbidity	Semi Turbid	Turbid	

We would like to suggest that the mud crab availability in Raigad District is very good even crab lets are observed in great quantity in the exposed portion of the creeks. These are the most favorable condition for mud crab culture, however because of non availability of water during low tide period, the crab fattening programme in more than 3 villages. Cannot be implemented, water parameters are in favorable range.

I would like to express my sincere thanks to all project associates of Mangrove Foundation

Who accompany us during survey .Their communication net work with local villagers is excellent, which helped us to collect important information on various aspects.

Annexures A, B, C and Photographs Already Submitted

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