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Traditional Knowledge in the Management of Wild Freshwater Prawn Seed Collection from North Konkan Region of Maharashtra

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Abstract

The study of traditional knowledge has the potential to provide research guidelines aimed at benefiting the fisher community. Concerted attempts should be made to document, compile and validate the traditional knowledge in fisheries before it is lost with the advent of modern knowledge and urbanization. The wild freshwater prawn seed collection fishery is practiced in the North Konkan region of Maharashtra aimed at collecting *Macrobrachium rosenbergii* (Giant river prawn) seed from the catch. The present study attempted to analyze the use of traditional knowledge in the management of Giant river prawn seed collection fishery. A total of 70 fishers essentially involved in Giant river prawn seed collection fishery in North Konkan region constituted the sample size. The snow-ball method was employed for selecting the respondents across the randomly selected villages. Accordingly, a combination of personal interview and non-participant observation method was used for data collection. The study has documented rich, diverse and potential traditional knowledge associated with the Giant river prawn seed collection fishery. The traditional knowledge on the design of gears employed in Giant river prawn seed collection, fabrication materials used for gears, fishery season, preference time for operating the gears, effect of lunar cycle, rain and flood on catch and its storage has been documented in the present study.

Keywords:
Freshwater prawn seed collection, Traditional Knowledge, North Konkan Region, Maharashtra

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Introduction

Indigenous, traditional, or local knowledge is the knowledge acquired by people in a given community over a time period by experience, experimentation and handling of old people's knowledge (Berkes, 1993). It is adapted to the local culture and environment, is dynamic and ever changing. As stressed by Veitayaki, ancestors took centuries to work out and accumulate traditional knowledge (Veitayaki, 1990). Most small-scale inland fisheries are managed using a combination of this expertise and the involvement of local institutions. Traditional knowledge covers a wide range of subjects such as agriculture, food preparation, education, institutional management, natural resource management, health care and many others. Traditional knowledge is considered as the social capital of the poor. It is their main asset to invest in the struggle for survival, to produce food, to provide for shelter and to achieve control of their own lives (Senanayake, 2006). Fishers are well-versed in their communities' social, cultural, and institutional administration, as well as how resources are allocated and conflicts are prevented or avoided. This data can be used to plan interventions for long-term development (Geoghegan and Smith, 1998). Traditional knowledge, which has formed over generations of direct interaction between human communities and their environment, is likely to

contain concepts and information not found in scientific models (Lalonde and Akhtar, 1994). *Macrobrachium rosenbergii*, the Giant River Prawn is an important candidate species for aquaculture. It is globally distributed in various countries such as Brazil, the United States of America, Alaska, Peru, Mexico, Iran, China, India, Thailand, Indonesia, Myanmar and Bangladesh. The production of giant freshwater prawn stood at 8,680 tons in India during 2019-20 (FAO, 2021). The freshwater prawn farming has received increased attention only in the last two decades due to its high consumer demand. The giant river prawn, *Macrobrachium rosenbergii*, the largest and fastest growing prawn species, is cultured either under monoculture or polyculture with major carps (FAO, 2021). Although there are several freshwater prawn hatcheries in the country, a lack of technical knowledge, inadequate skilled manpower, and an insufficient supply of wild broods have limited hatchery production (Ahmed and Troell, 2010). Freshwater prawn farmers prefer to purchase wildly caught seed which is larger in size, better in growth performance and cheaper compared to hatchery produced seed.

Wild seed collection centers of freshwater prawns including Giant river prawn are located in few Indian states namely Gujarat, Maharashtra, Orissa, Andhra Pradesh and West Bengal (Nair and Salin, 1995). In north Konkan region of Maharashtra, traditional fishers are engaged in wild seed collection of freshwater prawns along the rivers such as Amba, Ulhas, Kalu and Surya. The catch of prawn juveniles is mostly comprised of giant river prawn *Macrobrachium rosenbergii* and is segregated for further disposal. Traps of different shapes and sizes are commonly employed for the capture of the seed (Indulkar and Shirgur, 1995). The seed is usually used for stocking in reservoirs.

Documentation and assessment of traditional knowledge used in the management of wild freshwater prawn seed collection would generate an important database related to the fishery. This database would be helpful in focusing on need-based research and designing management interventions to make the exploitation more eco-friendly, conservative and economical. Local fishers from North Konkan know prime places where predictable aggregation of Giant river prawn seed occurs, and knowledge about the timing and location of seed aggregation is catch-oriented, highly desired, and frequently closely guarded for such spots. This study aims to document the traditional knowledge employed in the wild Giant River Prawn seed collection fishery, with the goal of recognizing its value and potential for informing sustainable management practices.

Materials and Methods

Maharashtra, the second largest state in the country in terms of area appears as a huge irregular triangle with its base on the western coast of the country facing the Arabian Sea. The coastal region popularly known as Konkan comprises six districts namely Palghar, Thane, Mumbai, Raigad, Ratnagiri and Sindhudurg. Maharashtra has a coastline of 720 kilometers and 80000 ha brackish water land (Shingare *et al.,* 2017). The study was carried out in three districts of north Konkan region of Maharashtra i.e., Palghar, Thane and Raigad (Fig.1) where freshwater prawn seed collection fishery is commonly practiced. North Konkan is endowed with 261 kms of coastline from May, 2021 to April, 2022. The Giant river prawn seed collection fishery is practiced popularly by an individual fisher or group of fishers in the region. Seven fishing villages viz., *Maswan, Pisa, Gurawali, Vasundri, Kondheri, Vadavali* and *Patansai (Wakan)* situated in the three districts of North Konkan region were selected randomly for the purpose of data collection.

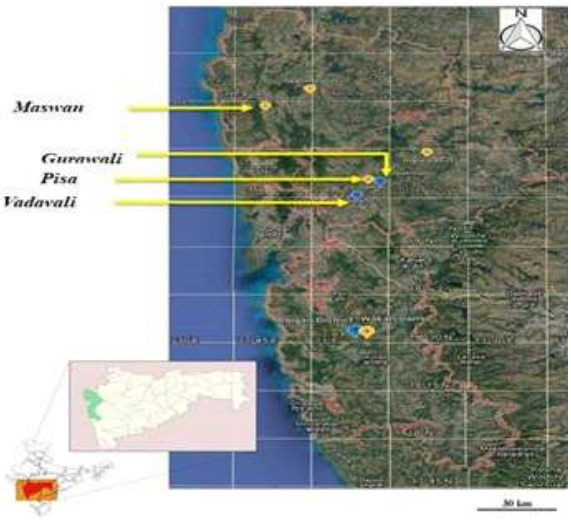

Fig.1: Study locale depicting the state, districts and villages

The villages have historically served as centers for the Giant river prawn seed collection locally known as *Kolambi* fishery. The village Maswan is located on the banks of the Surya River in Palghar district. The *Pisa, Vasundri* and *Kondheri* villages are situated along the Bhatsa river, village *Gurawali* along the Kalu river and Vadavali along the Ulhas river in Thane district. The village Patansai (Wakan) is situated along Amba river in Raigad district.

A total of 70 fishers were interviewed for the study with the help of semi-structured interview schedule designed by incorporating all the items on which the information was required. The respondents were selected using the snow ball method in which people from the community and the interviewees themselves indicate the people to be interviewed (Bailey, 1987). Snow-ball method is non-probability sampling technique where existing study subjects recruit future subjects from among their acquaintances. It is a useful tool for building network and increasing the number of participants (Goode and Hatt, 1952; Langton and Marhea, 2013). Information gathered from the fishers was quantified as percentage of interviewees who mentioned a given answer to asked questions. The majority of respondents' often mentioned answers to particular question were considered as reflecting aspects of traditional knowledge. The findings of the study were also supported by non-participant

Table 1: Profile characteristics of respondents

S.No.	Profile characteristics	Criteria	Frequency	Percentage (%)
1	Age	Young – below 30 years	22	31.43
		Middle –30 to 50 years	40	57.14
		Old – above 50 years	08	11.43
2	Education	Illiterate	07	10
		Read only	04	5.71
		Read and write	01	1.43
		Primary school	06	8.57
		High school	37	52.86
		College	15	21.43
3	Experience	Less – Up to 10 years	28	40
		Moderate – 10 to 20 years	35	50
		More – Above 20 years	07	10
4	Community	Hindu-Warli (ST)	20	28.57
		Hindu-Katkari (ST)	11	15.71
		Hindu-Adivasi (ST)	12	17.14
		Hindu-Koli (OBC)	17	24.29
		Hindu-Agari (OBC)	09	12.86
		Muslim (OBC)	01	1.43

observation and documentary evidences. PIC (Prior Informed Consent) was taken from the fishers with their names, village names and ages.

Results and discussion

Profile of respondents

The age-wise distribution of respondents indicates that the majority (57.14%) belonged to the middle-aged category, followed by 31.43% in the young category and 11.43% in the old category. This suggests that prawn seed collection, being a non-labour-intensive activity, predominantly involves active adult participation.

Regarding educational background, approximately 74.29% of the respondents had completed their education at the high school or college level. Additionally, 8.57% were educated up to primary school, 5.71% were able to read, 1.43% could read and write, and 10% were illiterate. This reflects relatively good access to schooling and higher education in the fishing villages surveyed.In terms of social composition, the majority of the respondents were Hindus, belonging to various sub-castes such as Warli (28.57%), Koli (24.29%), Aadivasi (17.14%), Katkari (15.71%), and Agari (12.86%). Only 1.43% of the fishers identified as Muslim. The diversity in caste and community indicates that traditional knowledge related to prawn seed collection is deeply embedded in local culture and customs, and is practiced across different social groups. As shown in Table 1, 50% of the respondents had 11 to 20 years of experience in the fishery, 40% had up to 10 years of experience, and 10% had more than 20 years of experience. This demonstrates that the majority of fishers were well-experienced, enabling them to preserve and transmit the traditional knowledge associated with Giant river prawn seed collection.

Gears employed

In the north Konkan region, only 2 types of gears are used for the Giant river prawn seed collection activity i.e., traps and bag nets. All respondents (100%) use traps for Giant river prawn seed collection, followed by 2.86 % who employ bag nets along with traps.

Traps

Traps employed for Giant river prawn seed collection are locally referred as *Malai* in Thane and Raigad districts, while they are known as *Malkari* in Palghar district (Fig.2). *Malkari/Malai* are basically wooden traps made up of two components outer one is cylindrical and closed at one end. The outer unit measuring 70-100 cm x 15-20 cm and the inner 18-20 cm x 15-20 cm. The smaller unit known as *kala* fits inside the cylindrical component. *Kala* is conical in the shape with an opening at the end. A circular wooden ring is inserted and fixed at the mouth of the *kala*. The inner unit fits into the outer unit and is removable. In some traps no wooden ring is attached to the *kala* instead the *kala* is inserted and fixed into the outer unit at mouth. Traps are placed on the river bottom during operation. Inner unit facilitates the entry of prawns into the trap which swim against the current. The narrow tapering end of the *kala* prevents the prawn seed from escaping back. The catch gets collected in the outer unit. The minor space maintained between wooden strips of both the units facilitates free movement of water through the traps.

Fig. 2: Malai/Malkari trap

Bokshi

This is essentially a large conical net with a mouth portion rectangular in shape and end portion tapering. The length of the net is approximately 15-16 m, width about 4.5 m and height between 1.5-2 m. The net has a mesh size of about 100 mm at the mouth to 10 mm at cod end. The foot rope of the net is tied to an iron rings of approx. 0.5 kg weight each in which the bamboo poles are inserted before being driven into the muddy bottom for proper rigging. The head rope is tied in a similar way to iron rings to a horizontal bamboo pole fixed to poles (Fig. 3).

Fig. 3 Bokshi net

Malai/Malkari have proven highly efficient in catching prawn seed. Fishers are well aware of the ecology and behavior of freshwater prawns especially Giant river prawn seed and have taken this into account in designing the traps. They know that juveniles of prawns including Giant river prawn move more or less on the bottom as they migrate upstream. In traditional fisheries, most of the gears are standardized after years of trial and error by the fishers (Gangan *et al.,* 2013, Nirmale *et al.,* 2004, 2007,2013).

Bokshi is essentially a large conical net with mouth portion rectangular in shape and end portion tapering. The net is fixed to the poles and set against the current. The catch of the bokshi comprises freshwater fishes including juvenile prawns that move along the current. The fishes get trapped at the cod end after filtration and the gear works on the similar principle as that of bag net(Nirmale *et al.,* 2004, 2007).

Material used for fabrication of gears

About 95.71% of respondents used Malai or Malkari made up of bamboo wood (*Dendrocalamus strictus)* strips. A meagre 4.29% of the respondents used Malai made up of coconut leaf strips (*Cocus nucifera*) and steel wire respectively (Fig.4).

Fig 4 Coconut leaf strips trap

Malai/Malkari made of bamboo wood (*Dendrocalamus strictus*) strips were popularly used by most of the respondents. The species is abundantly distributed in the state of Maharashtra (Nath et.al 2008). Few respondents fabricated *Malai* using coconut leaf strips (*Cocos nucifera*) while some employed *Malai* made up of steel wire. According to the fishers, both bamboo tree wood and coconut tree leaves are flexible and can be conveniently used to make traps of suitable dimension and shape.

TK on maintenance of the gears

About 100% of fishers resorted to sun drying of the traps to ensure their durability. Similarly, if a certain portion of the trap gets damaged, the damaged portion is covered by mosquito net clothing. While to enhance durability, the Bokshi net is also sun-dried. The damaged portion of Bokshi is repaired by net mending.

Sun-drying is one of the common methods to enhance the durability of gears followed by fishers (Gangan *et al.,* 2013,; Nirmale, *et al*., 2004, 2007; Uskelwar *et al.,* 2017). If certain portion of the trap gets damaged, the damaged portion is covered by mosquito net clothing. Small piece of mosquito netting is used to cover the damaged portion and is tied to the trap externally with rope. Fishers usually follow cheaper ways to maintain the gears and thus ensure their efficiency. The damaged portion of *bokshi* is repaired by net mending.

TK on nature of the bottom for operation of gears

For a collection of the Giant river prawn seed selecting the proper site to set traps and *bokshi* is an important aspect to enhance good catch. It could be observed that almost 90% of respondents prefer rocky bottom at the banks of the river to set the traps. These sites are present in the vicinity of the man-made dams

constructed on the respective river. About 60- 70 traps set during peak Giant river prawn seed collection season. The rights to set the traps are owned by the respondents based on mutual tacit understanding. About 7.14% of fishers preferred either rocky or muddy bottom at the river banks to set the traps. A meagre 2.86% of respondents set their traps in the muddy substrate. Fisher operating Bokshi preferred muddy bottom in the middle of the river to set the net.

For a collection of the Giant river prawn seed selecting the proper site to set traps and *bokshi* is an important aspect to enhance good catch. Most of the respondents prefer rocky bottom at the banks of the river to set the traps. These sites are usually located near reservoirs constructed on the respective river. The traps are likely to get swept away as they are placed along with the currents. Stability of the traps can be ensured if they are set on the rocky bottom. They can be set properly on hard substratum and if done so clogging of the traps with mud can also be prevented. Similarly, it is possible that prawn seed prefer to migrate upstream by swimming near hard bottom. Only a few fishers who are the new entrants to fishery preferred either rocky or muddy bottom at the river banks to set the traps. Muddy bottoms are preferred possibly as the last option if the grounds which are tacitly owned by fishers are already occupied with traps set on them.

Fishers operating *Bokshi* preferred muddy bottom in the middle of river to set the net. *Bokshi* is fixed to the poles which are driven into the muddy bottom. Muddy bottom is thus necessary to drive the poles into the bottom.

TK on operation of the gears in Giant river prawn seed collection:

Traps

Giant river prawn seed collection is a simple operation requiring minimal man-power. Traps are placed with the water current in such a position that the mouth faces the direction in which the currents are flowing and remain submerged in the water at least till half of their height. To facilitate the operation of Giant river prawn seed collection two bundhs are constructed using stones, small pebbles etc. One bundh is constructed in a slightly inclined position along the bank of the river to regulate the flow and speed of the current. Regulating the flow and speed of the currents ensures stability of the traps. One smaller bundh is erected in the path of water whose flow has been diverted by the 1st bundh. It is slightly semi-circular in shape. Trap is fixed in the middle of this bundh. Care is taken to make the bundh water tight by use of small pebbles, straws etc. The traps are set in slightly sloping manner for about twelve hours and monitored once midnight to check the catch.

Traps are placed with the water current because the Giant river prawn seeds migrate upstream against the current. For capturing of Giant river prawn seed two bundhs are constructed using stones, small pebbles etc. One bundh is constructed in a slightly inclined position along the bank of river and other smaller semi-circular bundh is erected in the path of water. The distance of the top end of the bundh and the river bank is variable and depends on the flow and speed to be regulated at the time of operation. The bundh is constructed nearer to the bank by increasing the length of the bundh if the currents are swift and the length is reduced if the currents are moderate or mild. Regulating the flow and speed of the currents ensures stability of the traps. One smaller bundh is erected in the path of water whose flow has been diverted by the 1st bundh. It is sightly semi-circular in shape. Trap is fixed in the middle of this bundh. The bundh acts as a barrier for migrating prawn seed and they are thus lured into entering the traps. The traps are emptied in temporary storage gear known as *pishvi* if sufficient quantity is captured.

Bokshi

Operation of *bokshi* is carried out at only one site viz. at Amba river in Raigad district of north Konkan region. To facilitate the operation of *bokshi* net, fishers have constructed a bundh of about 2m height, running across the river. Two openings are provided to the bundh of approximately 4 m width, to which the nets are fixed against the flow. Two bamboo poles (locally known as *Khutte*) are erected respectively at the ends of opening, while 3rd pole (locally known as *Gavhani*) is fixed at top of these poles in a parallel fashion. The rings inserted in these poles facilitate the rigging of the net, to the bamboo poles. Foot rope is tied to the rings at bottom and driven into mud while head rope is tied to the rings as well as to the bamboo poles on top. Since foot rope doesn't have any sinkers so it is driven into mud and, if necessary, small stones are also kept on foot rope to ensure the horizontal opening of the mouth.

To facilitate the operation of *bokshi* net, fishers have constructed a bundh of about 2m height, running across the river. This bundh is mainly constructed for creating barrier and channelizing the water flow into the net to enhance filtration. Giant river prawn seed probably escape the larger meshes at the mouth of the net while migrating upstream. The swifter water flow near the mouth of the net might be responsible for pushing the seed back into the net which get caught in the cod end. As per fishers comparatively larger sized prawn seed is caught in *bokshi*. More field studies on size composition of prawn seed caught in either traps or *bokshi* are needed.

TK on identification of Giant river prawn seed

All respondents identify the Giant river prawn seed based on the external field characters particularly markings in the carapace and coloration of rostrum (Fig.5). Accordingly, fishers claimed presence of horizontal bands (*kale patte*) in the head (*dokyawar*) region (carapace) and pinkish red rostrum (*tambuslalsar kata*). Taxonomic identification of juveniles of *Macrobrachium rosenbergii* includes similar characteristics and corroborates the view of the fishers (Indulkar and Patil, 2004; Bhoy *et al.,*2014) . These characters help the fishers to segregate the Giant river prawn seed from the catch.

Fig 5 Giant river prawn seed

TK on size ranges of Giant river prawn seed

Smaller sized Giant river prawn (1-2 inches) is caught in more proportion (70%) in the traps while larger (2-3 inches) are caught in more proportion (60-70%) in bag net. The size of the Giant river prawn seed caught in traps as reported by the fishers conforms to the findings of Indulkar and Shirgur (1995).

The discrepancy of size range caught in different gears might possibly be due to the tendency of small seed to avoid the fast water currents while migrating upstream or ability of the small juveniles to swim fast irrespective of the speed of the facing currents. Water current significantly influences the prawn migration and maximum migration is noted at low current (Upadhyay *et al.,* 2014). Relatively mild currents are present near to the river banks where the traps are set which conforms former hypothesis. To enhance filtration, *bokshi* is s*et al*most in the middle of the river basin where swift currents are seen. Juveniles are pushed back by the force of water at the mouth of the net and the larger ones relatively slow swimmers get trapped in the cod end. Hence the Giant river prawn seed of larger size having more proportion in *bokshi* net. However more field studies on size composition of juveniles with respect to the gears are needed.

Giant river prawn seed storage

Pishvi

Cylindroconical bag of fine nylon meshed (1-1.5 m X 20-25 cm Diameter) locally known as '*pishvi*' is used to temporarily store the seed (Fig.6). Two pairs of cotton strings are attached at the top end of the *pishvi*. One pair is used to fasten the mouth of the net, while the other end is used to tie the net to a suitable anchor on the bank of river. Traps with the Giant river prawn seed

Fig. 6: Pishvi

are emptied into the *pishvi*. *Pishvi* is kept submerged into the water overnight. A stone is kept at the mouth of the net in submerged position.

Use of similar bags made of nylon netting for storing the catch has been earlier reported by some researchers (Good and Hatt, 1952; Nirmale *et al*., 2004, 2007; Uskelwar *et al.,* 2017)

Indi

Giant river prawn seed is known as *kolambi* in local language. While other catch including prawns and fishes are collectively known as *bhusa*. Giant river prawn seed segregation is done with an aid of rectangular size known as *Indi*. The dimensions of *Indi* vary from 2.5-3.5 X 1.5-2 X 1-1.2 m with mesh size 2-3 mm.

Mixed catch including Giant river prawn seed from traps and *pishvi* is emptied into *indi*. The *indi* is held against the flow of the current. Fishers scoop out the seed coming to the mouth of the net with the aid a suitable container.

Hapas

Hapas made up of fine mosquito netting & measuring 2-2.5 m X 1.5 m X 1-1.2 m are installed in the water column. These *hapas* are fixed to an iron framework. Care is taken to keep them submerged into water column upto half of their height. Giant river prawn seed are stored in these *hapas* for one-two days (Fig.7).

Fig 7 Hapa

As the Giant river prawn seed is not immediately marketed after being caught during peak season storing the seed temporarily becomes of utmost importance for their survival in Giant river prawn seed collection fishery. The catch can be kept in good condition and better survival ensured for a longer period if they are stored in their natural habitat (Indulkar and Patil, 2004). Fishers take advantage of this fact and have evolved over the year's efficient ways to store the seed for few days in same environment from where they are caught.

Floating cages (Pinjara)

Floating cages are locally known as *pinjara*. They are made up in a similar way as *hapas*. *Pinjara* are floating structure measuring 1.5 X1.5 X 1.5 m. Four plastic drums are attached at each side of the frame of the cages to enable buoyancy. Giant river prawn seed is stored in *pinjara* for one-two days.

Floating cages are installed in Pisa and Vasundri locations in Bhatsa River in Thane district. The waters are relatively deeper in Bhatsa River at the sites of Giant river prawn seed collection sites. To enable the storing of Giant river prawn seed in these waters floating structures as above are used.

TK on effect of lunar cycle on Giant river prawn seed collection:

All respondents claimed that more quantity of Giant river prawn seed is collected during new moon day and less during full moon day. The same phenomenon was observed in both *malai/malkari* as well as *bokshi*.

Prawns are generally nocturnal species; they are active mostly during night time. In the absence of moonlight, migration of the Giant river prawn seed is enhanced and as result they are caught in more quantity on new moon day. Negative phototaxis has been earlier reported in case of *Macrobrachium rosenbergii* where adverse effect of light intensity on prawn migration has been noted (Bhoy *et al*, 2017; Indulkar and Shirgur, 1995; Upadhyay *et al.,* 2014). Effect of lunar cycle on availability of fish catch to different gears has been earlier reported by researchers (Gangan *et al.,* 2013; Nirmale, *et al.,* 2004, 2007).

TK on effect of flood and monsoon on Giant river prawn seed collection

All fishers stated that during the days of flooding and spell of heavy rainfall the operation of bag net and setting of traps is difficult.

This can be attributed to the fact that the river waters are more turbulent during flooding and heavy rainfall. The water currents are not manageable by erecting bundhs as discussed earlier at the banks of the river. Traps and bag net can be effectively set during lower and consistent precipitation. More Giant river prawn seed catch is noted to the both gears during low rainfall. Indulkar and Shirgur (1995) reported that the pattern of rainfall is almost parallel with the trend of water flow rates and the traps are fixed depending upon the manageable water current.

Ownership of Giant river prawn seed collection grounds

Sites of Giant river prawn seed collection are owned by respective fishers based on mutual tacit understanding. Though not officially recognized fishers have traditional ownership of the grounds. The ownership of seed collection sites is non-negotiable and is based on the mutual tacit understanding among the fishers. The grounds are identified by certain landmarks such as bundhs dams, or other structures located nearby. Uskelwar *et al* reported similar type of resource allocation in stake net fishery practiced along the south Konkan of Maharashtra

TK on catch composition

As per fishers' maximum catch of Giant river prawn seed to gears is noted during monsoon followed by winter. A variety of other prawn and fishes are also caught as by catch in the operation. The by-catch locally known as *bhusa* includes species such as *Macrobrachium lamarrie, Macrobrachium* spp., *Mystuss* pp., *Anguilla* spp., etc. Maximum bycatch is noted during winter season. Inverse relationship between Giant river prawn seed and by catch is noted during seasons.

The peak breeding season of Giant river prawn is reported during the months of July-August in the estuaries (Bailey, 1987; Wower *et al.,* 2009). After completing the larval stages in the brackish water, the post larvae of *M. rosenbergii* start migrating upstream. Hence more quantity of the Giant river prawn seed is available during the monsoon season and accordingly peak season of Giant river prawn seed collection is noted in ensuing months. Afterwards the catch of Giant river prawn seed starts declining gradually and other prawns and fishes are caught in more quantity as by catch. Similar observation has been made by Bhoy *et al.,* 2017.

Conclusion

The study reveals that the experienced traditional fishers of North Konkan do possess significant local ecological knowledge on Giant river prawn seed.. Similarly, the present study does not attempt to encourage the exploitation of juveniles from the wild and/or denies the traditional knowledge involved in Giant river prawn seed collection. Studies of this kind may help the scientists to understand the views of fishers on ecology and biology of Giant river prawn. The management policy or regulation emerging from the involvement of fishers on their knowledge might have greater chance of success in the management of resources.

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References

Ahmed, N. and Troell, M. 2010. Fishing for Prawn Larvae in Bangladesh: An Important Coastal Livelihood Causing Negative Effects on the Environment. *AMBIO* ,39: 20–29.

Bailey, K.D. 1987. *Methods of Social Research*. The Free Press, Macmillan Publishers, New York, 2-9.

Berkes, F. 1993. Traditional ecological knowledge in perspective. In: J. T. Inglis (Ed.), *Traditional Ecological Knowledge: Concepts and Cases*, Ottawa: International Program on Traditional Ecological Knowledge and International Development Research Centre, pp 1- 9. IRDC, Ottawa.

Bhoy, P.C., A.S. Pawase, R. Pai, M.S. Sawant, S.T.Indulkar, R.A. Pawar and S. Swain. 2017. Species composition of freshwater prawn juveniles in river Amba Raigad district of Maharashtra. *J. Indian Fish. Assoc,* 44 (2): 31-36.

FAO, 2016. Cultured Aquatic Species Information Programme *Macrobrachium rosenbergii* (De Man, 1879), Fisheries and Aquaculture Department. Rome, Itali.

Gangan, S.S. V.H. Nirmale, S.Y. Metar, N.D. Chogale, A.K. Balange and R. Pai 2013. Indigenous knowledge in management of bivalve fishery of south konkan coast of

Maharashtra, India. *Indian Journal of Traditional Knowledge*, 12(1), 72-79.

Geoghegan, T. and A.H. Smith, 1998. Conservation and Sustainable Livelihoods: Collaborative Management of the Mankote Mangrove, St. Lucia. Carribbean Natural Resource and Institute. Vieur fort, St. Lucia.

Goode, W.J. and P.K. Hatt, 1952. *Methods of Social Research*, Mc-Graw Hill, New York, p. 23-25.

Indulkar, S.T. and Patil, S.D. 2004. Identification of different species of genus Macrobrachium collected from natural habitat of Kalu River near Titwala, Thane of Maharashtra, India. *Indian Journal of Applied and Pure Biology*, 19(1):1-5.

Indulkar, S.T. and G.A. Shirgur, 1995. Species composition of different Macrobrachium species in a natural habitat of Kalu river near Titwala, Maharashtra state. *J. Indian Fish. Assoc*, 25, 39-46.

Lalonde, A. and Akhtar, S, 1994. Traditional Knowledge Research for sustainable development. *Nature and Resources*, 30(2): 22-28.

Langton, M. and Z. Marhea, 2013. Traditional indigenous biodiversity-related knowledge. *Australian Academic & Research Libraries*, 36:2, 45-69.

Nair, C.M. and K.R. Salin, 2012. Current status and prospects of farming the giant river prawn *Macrobrachium rosenbergii* (De Man) and the monsoon river prawn *Macrobrachium malcolmsonii* (H.M. Edwards) in India. *Aquaculture Research*, 43, 999–1014.

Nath, V., Pal, R.S. and Banerjee, S.K. 2008. Bamboo: its distribution, production, habitat and agroforestry potential. Tropical Forest Research Institute, Jabalpur (Madhya Pradesh).

Nirmale V.H., Gangan S.S., Yadav B.M., Durgale, P. and Shinde, K.M. 2012. Traditional knowledge on mud crab; Ethnoecology of *Scylla serrata* in Ratnagiri, Maharashtra. *Indian Journal of Traditional Knowledge*, 11(2): 317-322.

Nirmale, V.H., B.S. Sontakki, R.S. Biradar and S.Y., Metar, 2004. Assessment of indigenous knowledge of coastal fisher folk of Greater Mumbai and Sindhudurg district of Maharashtra. *Indian Journal of Traditional Knowledge*, 3(1): 27-36.

Nirmale, V.H, B.S. Sontakki, R.S. Biradar, S.Y. Metar and S.L. Charatkar, 2007. Use of indigenous knowledge by coastal fishery folk of Mumbai district in Maharashtra. *Indian Journal of Traditional Knowledge*. 6(2): 378-382 .

Senanayake S.G.J.N. 2006. Indigenous knowledge as a key to sustainable development. *The Journal of Agricultural Sciences*, 2 (1), 256-259.

Upadhyay, A.S. B.G. Kulkarni and A.K. Pandey. 2014. Migration in prawns with special reference to light and water current as inducers in *Macrobrachium rosenbergii*. *J. Exp. Zool. India*, vol. 17, no. 1, pp. 33-48.

Uskelwar, L.S., V.H. Nirmale, B.P. Bhosale, S.Y. Metar and Chogale, N.D. 2017. Indigenous knowledge used in stake net (wan) fishery practiced along the Ratnagiri coast of Maharashtra. *J. Mar. Biol. Ass. India*, 59, No.2, 45-52.

Veitayaki, J. 1990. Village- level fishing in Fiji: *A case study of Qoma Island*. Unpublished thesis, USP, Suva.

Wower, D., V. Muthu, R. Meier, M. Balke, Y.Cai and K.L.N .Peter, 2009. Evolution of life history traits in Asian freshwater prawns of the genus *Macrobrachium* (Crustacea: Decapoda: Palaemonidae) based on multilocus molecular phylogenetic analysis. *Molecular Phylogenetics and Evolution*, 52.340–350.