



**TECHNICAL ASPECTS, DESIGN AND OPERATION OF BABY SEINE
NET OF RATNAGIRI, MAHARASHTRA**

Miss. Mayuri U. Dongare,
Department of Fisheries Engineering,
College of Fisheries, Shirgaon,
Ratnagiri-415 629, India.

Dr. ASHISH S. MOHITE,
Professor & Head,
Department of Fisheries Engineering,
College of Fisheries, Shirgaon,
Ratnagiri-415 629, India.

Shri. Makarand T. Sharangdhar,
Assistant Professor,
Department of Fisheries Engineering,
College of Fisheries, Shirgaon,
Ratnagiri-415 629, India.

Shri. Shrikant T. Sharangdhar,
Assistant Professor,
Department of Fish Processing Technology,
College of Fisheries, Shirgaon,
Ratnagiri-415 629, India.

ABSTRACT

The present study encompasses the traditional fishing method of baby seine net practiced in Ratnagiri, Maharashtra. Baby seine net was rectangular wall of webbing locally known as Bhusa, held open and dragged with the help of two sticks attached to both sides. Main webbing of the gear was made up of PA monofilament twine of 0.5 to 1.2 mm diameter, similarly PP

multifilament twisted twine of 210D×2×3 was used for selvedge construction both at upper and lower side of the net. 20 to 30 mm mesh size was used for main webbing as well as for top and bottom selvedges. Hung length and hung depth of drag net varied from 40 to 73 m and 1.98 to 2.90 m respectively with horizontal hanging coefficient ranging in between 0.42 to 0.50. Total 2009 to 3610 number of meshes throughout the length were recorded for main webbing as well as for selvedges. Similarly for depth of main webbing number of meshes ranged from 92 to 143 and 1 row of selvedge mesh was observed at top and bottom of the net. Net was mounted with PP multifilament twisted rope of 5 to 7 mm diameter as head rope and foot rope and 2 to 3 mm PP rope was used as gavel line or side rope at both the end of the wall of netting. PVC circular floats of 4 to 6 cm in diameter and oval shaped lead sinkers weighing 20 to 23 gm each, 210 to 250 in numbers were stapled directly to the head rope and foot rope, respectively with the help of 1.5 mm PE twisted multifilament twine at a distance of 80.6 to 90.6 cm. The ends of head rope at foot rope were directly tied to the 1.82 to 1.98 m height and 4 to 6 cm diameter bamboo sticks for operation of this type of gear.

KEY WORDS Traditional fishing methods, baby seine net, *Bhusa*

INTRODUCTION

The design and efficiency of traditional fishing gears draw strength from a practical knowledge accrued over several generations of human enterprise and they remain valid and effective even today. Thus, the present generation has still a lot to learn from this treasure of traditional knowledge (Remesan, 2009). The west coast of India is rich in tradition related to fisheries for two reasons. Firstly, the traditional fishing communities and the like, have a rich legacy of traditional knowledge and secondly, there exists a very wide continental shelf on the west coast enabling better harvesting of fish (Sharma *et al.*, 2012).

The present study is an attempt to document the variations observed with respect to the technical specifications, material used, mode of operation, etc in the traditional fishing method of baby seine net practiced in Ratnagiri, Maharashtra.

MATERIALS AND METHOD

Ratnagiri (16°58'57" N latitude and 73°18'43" E longitude) an important fishing centre was selected as the sampling area for the present study. Structured interview schedule

comprising of two major sections was formulated to collect data required for the present study. The first section dealt with the particulars of the traditional gear owners and second for the detail specifications of the respective traditional gears operated. The information included in the first section was recorded according to Sreekrishna and Shenoy (2001) whereas, information in the second section was collected according to George *et al.* (1983) and Akerman (1986). The technical specifications of the traditional gears and mode of operation were recorded. Collected data was statistically analyzed as required (Snedecor and Cochran,1967).

RESULTS

Double Stick Net/Simple Seining Gear/Baby Seine Net locally known as *Bhusa* was a very simple method employed to catch near shore fishes, in Ratnagiri. The gear comprised of a rectangular wall of webbing, held open and dragged with the help of two sticks attached to both sides of the main webbing, in the surf zone. Technical specifications of the *Bhusa* are stated in the Table 1, its design in Fig 1 and its rigging and operation are depicted in Photo 1 and Photo 2; respectively.

Main webbing of *Bhusa* was made up of PA monofilament twine of 0.5 to 1.2 mm diameter and PP multifilament twisted twine of 210D×2×3 was used for selvedge meshes constructed both at upper and lower side of the net. Mesh size of 20 to 30 mm was used for main webbing as well as for top and bottom selvedges. The hung length of drag net varied from 40 to 73 m with a hung depth ranging from 1.98 to 2.90 m. Total 2009 to 3610 number of meshes throughout the length were recorded for main webbing as well as for the selvedges. Similarly, total number of meshes in depth for main webbing ranged from 92 to 143 and 1 row of selvedge mesh was observed at top and bottom of the net. The hanging coefficient of drag net varied from 0.42 to 0.50. Blue or green colour webbings were most commonly used for construction of this type of gear.

Bhusa was mounted head and foot rope of PP multifilament twisted rope of 5 to 7 mm diameter. PP rope of 2 to 3 mm diameter was used as gavel line or side rope at both the end of the wall of netting. The gavel rope was sieved from first and last column of meshes of netting vertically which served as a support to the main webbing.

PVC circular floats of 4 to 6 cm in diameter were used as floats, on head rope, with a total of 210 to 250 number of floats spaced at a distance of 80.6 to 90.6 cm. Floats were stapled directly to the head rope with the help of 1.5 mm PE twisted multifilament twine. Oval shaped

lead sinkers weighing 20 to 23 gm each were used as sinkers on foot rope. Arrangement of sinkers were similar to the arrangement of floats. Each sinker was placed exactly below the float on foot rope. There were 210 to 250 no. of sinkers placed at a distance varied 80.6 to 90.6 cm. Two sticks of 1.82 to 1.98 m height and 4 to 6 cm diameter of bamboo poles were used as net holding material for operation of this type of net. The ends of head rope and foot rope were directly tied to the bamboo poles by making knots in such a way that it will stretch the net vertically.

The net was operated manually near to the coast at a depth varying from 2 to 3 m without using any fishing craft. The two ends of the net were attached to the two separate wooden sticks having height more than that of the net. Two fishermen were sufficient to operate this gear and to carry the net together in to the sea along with the wooden sticks. After reaching at the desired depth, both the fishermen set them self apart and stretched the net parallel to the shore. The net was then dragged with the help of bamboo sticks towards the shore at both the ends and brought together after reaching the shore. Then the entire net was pulled out of water to collect the trapped fishes inside the net. Catch from this gear comprised of fishes like sardine, sting ray, cat fish, silver bellies etc.

DISCUSSION

Construction and operation of drag net or seine net was studied by many authors. Manna *et al.*, (2011) found the drag net operation in Krishna river at a depth of 0.5 to 2 m. Similar studies was carried out by Devi *et al.*, (2013) in central valley region of Manipur, Ray (2013) in Sundarban, Das and Barat (2014) in lentic and lotic water bodies of Cooch Behar district of West Bengal, Purkayastha and Gupta (2014) in Chatla floodplain area of Barak valley, Assam and Samajdar and Saikia (2014) in Birbhum district of West Bengal.

Indigenous fishing knowledge of Sundarbans was observed by Ray (2013) and reported that such type of nets are commonly used in ponds and rivers as well as in the marshy areas and rivers during the dry season when water flow is minimal. This net was usually hauled by a team of fishers, the number depending on the size and weight on the ground rope.

Remesan (2009) studied inland fishing gears and methods of North Kerala and found that the bag net with rectangular mouth was held open with the help of two sticks attached to both sides. Four parts of the net, about 2 m from the mouth section were made of PA 210Dx2x2 and rest with 210Dx2x3. Selvedge was 2 mesh depth and was made of PA 210Dx14x3. In Ratnagiri,

rectangular wall of webbing of the gear was made up of PA monofilament twine of 0.5 to 1.2 mm diameter. Similarly, PP multifilament twisted twine of 210D×2×3 was used for selvedge construction both at upper and lower side of the net. It was observed that, 20 to 30 mm mesh size was used for main webbing as well as for top and bottom selvedges. Remesan, (2009) found uniform mesh size of 15 to 20 mm for main webbing and 30 mm for selvedges. Ray, (2013) investigated the seine net of Sundarbans which was locally known as *Ber jal* and was made up of webbing having mesh size 5 to 20 mm. Similar range of mesh size, of 5 to 10 mm was recorded by Das and Barat (2014) for seine nets (*Haath jal*) of lentic and lotic water bodies of Cooch Behar district, West Bengal. Whereas, slightly higher range of mesh size i.e. 25 to 50 mm was observed by Purkayastha and Gupta (2014) in Chatla floodplain area, Barak valley of Assam. Samajdar and Saikia (2014).reported that the drag net of Birbhum district was a very large size net having length and height of 10 m and 7 m, respectively.

While, Das and Barat (2014) found the drag net with hung length of 20 and hung depth of 2 m, operated in West Bengal. In Ratnagiri, hung length and hung depth of drag net varied from 40 to 73 m and 1.98 to 2.90 m, respectively with horizontal hanging coefficient ranging in between 0.42 to 0.50. On the contrary, slightly higher range of length that is 50 to 200 m long and 5 to 6 m deep was recorded by Ray (2013). It was seen that in Ratnagiri, PVC circular floats of 4 to 6 cm in diameter and oval shaped lead sinkers weighing 20 to 23 gm each, 210 to 250 in numbers were stapled directly to the head rope and foot rope to stretch the net vertically. While Remesan (2009) reported that, about 40 sinkers each weighing approximately 15 gm were attached to the rope in the lower part of the drag net mouth at 10 cm intervals. Remesan (2009) stated in his study that two wooden sticks each having length of 2 m was attached to the sides of the net to facilitate dragging.

Exactly similar type of operation for drag net as done in Ratnagiri was reported by Remesan, (2009) from backwaters of Kozhikode and Kannur district of north Kerala. On other hand Devi *et al.*, (2013) described the operation of drag net locally known as '*Moonamba*'. This gear was operated by dipping the net completely inside the water and turning the net mouth along with current. As soon as the fisherman feels the entanglement of the fish, they clip the net mouth, lift it up and take out the fishes. Ray, (2013) explained the operation of *Ber jal* seine net. The length, depth and mesh size vary with the size of the water body and the species to be caught. After surrounding part of a water body with this net, the two ends of the net are drawn together and the ground rope was hauled up from the centre of the water body to catch the fish.

Samajdar and Saikia (2014) studied on drag net where big area was arrested and the net was spread from the top to bottom. The two ends of the net were then pulled by fishermen to catch fishes entangled in the net.

CONCLUSION

The documented information on the technical specifications and operation of the traditional fishing method of Baby Seine Net *Bhusa* practiced in Ratnagiri, Maharashtra would serve as a base line information for the technological modifications the method may undergo in the coming years.

ACKNOWLEDGEMENT

Authors wish to thank the authorities of College of Fisheries, Shirgaon, Ratnagiri (Dr. Balasaheb Sawant Kokan Krishi Vidyapeeth, Dapoli) for providing the necessary facilities, and their kind encouragement and guidance during the course of the investigation.

Table 1 TECHNICAL SPECIFICATIONS OF BABY SEINE NET / BHUSA

Study area	Ratnagiri
Local name	<i>Bhusa / Phera</i>
Specifications of Twine	
Material	PA Monofilament
Colour	Blue or Green
Diameter (mm)	0.5 to 1.2
Mean (mm)	0.89 ± 0.07
Mesh size (mm)	20 to 30
Mean (mm)	22.5 ± 0.11
Hung length (m)	40 to 73
Mean (m)	50.80 ± 3.06
Hung depth (m)	1.98 to 2.90
Mean (m)	2.33 ± 0.10
Specifications of Main webbing	
No. of meshes In length	2009 to 3610
Mean	2466 ± 150.04
No. of meshes In depth	90 to 143
Mean	113 ± 5.32
Hanging coefficient of net	0.42 to 0.50
Specification of Selvedge meshes	
Material	PP multifilament 210D×2×3
Selvedge meshes	2
Colour	White
Specifications of Head rope	
Material	PP multifilament
Diameter (mm)	5 to 7
Mean (mm)	6 ± 0.18
Length (m)	40 to 73
Length (m)	50.8 ± 3.06
Specifications of Foot rope	
Material	PP multifilament
Diameter (mm)	5 to 7
Mean (mm)	6 ± 0.18
Length (m)	40 to 73
Mean (m)	500.8 ± 3.06
Specifications of Gavel line	
Material	Polypropylene (PP)
Diameter (mm)	2 to 3
Mean (mm)	2.25 ± 0.11
Length (m)	1.98 to 2.90
Mean (m)	2.33 ± 0.10
Specifications of Floats	
Material	HDPE/Cork

Shape	Circular
Diameter (cm)	4 to 6
No. of floats	210 to 250
Mean	228 ± 3.59
Distance between floats (cm)	80.6 to 90.6
Mean (cm)	81.59 ± 2.38
Specifications of Sinkers	
Material	Lead / shies
Shape	Oval
Wt per sinker (gm)	20 to 23
No. of sinkers used	210 to 250
Mean	228 ± 3.59
Distance between sinkers	80.6 to 90.6
Mean	81.59 ± 2.38
Specifications of Sticks	
Material	Bamboo
Diameter (cm)	4 to 6
Mean (cm)	5.55 ± 0.28
Height (m)	1.82 to 1.98
Mean (m)	1.91 ± 0.018

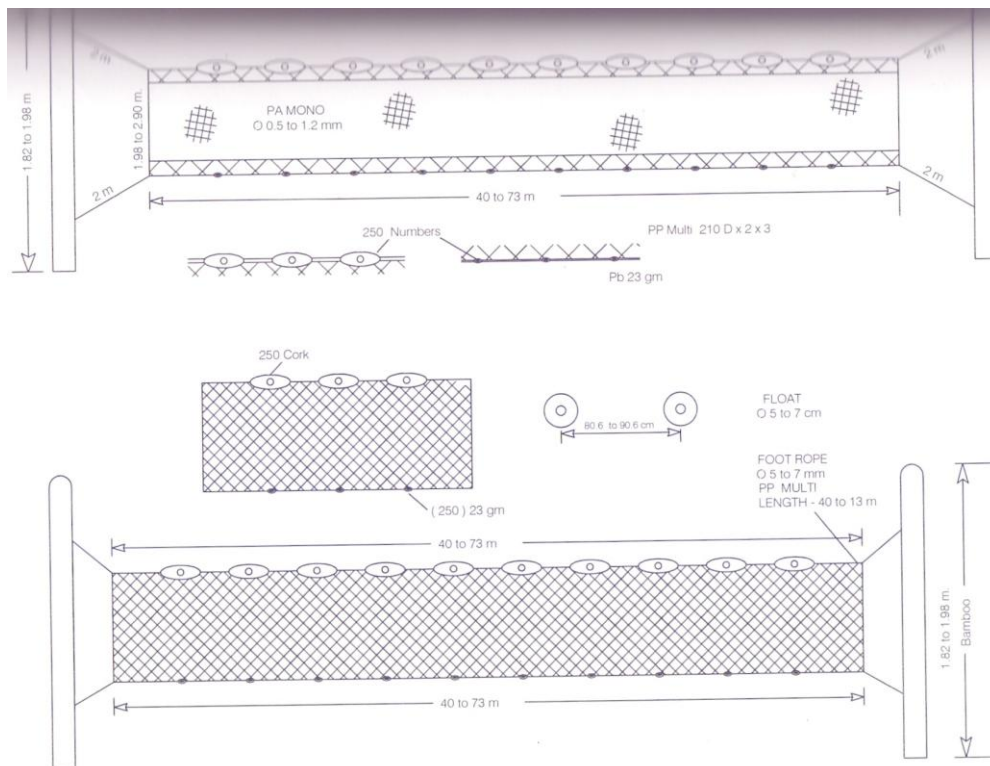


Fig 1 DESIGN OF BABY SEINE NET / BHUSA



Main webbing



Attachment of gavel line



Attachment of sinker



Attachment of float



Attachment of bamboo stick

Photo 1 GEAR ACCESSORIES AND RIGGING OF BABY SEINE NET / BHUSA



Starting of fishing operation



Pulling of net along with the captured fish shoal



Removing of captured fishes

Photo 2 OPERATION OF BABY SEINE NET / BHUSA

REFERANCES

- Akerman, S. E., 1986. The coastal set bag net fishery of Bangladesh trials and investigations Bay of Bangal programme, BOBP/REP/34 (FAO), GCP/RAS/040/AWS. **1-25**.
- Das, R. K. and Barat, S., 2014. Fishing gears operated in lentic and lotic water bodies of Cooch Behar district, West Bengal, India. *Indian journal of traditional knowledge*. **13(3): 619-625**.
- Devi, B. N., Mishra, S. K., Das, L., Pawar, N. A and Chanu, T. I., 2013. Traditional Fishing Methods in Central Valley of Manipur, India. *Indian Journal of Traditional Knowledge*, **12(1): 137-143**.
- Gabriel, K., Lange, E., Dahm, T., Wendt., 2005. Fish catching methods of the world. (4th edn.) Blackwell Publishing Ltd., UK.
- George, V. C., Khan, A. A and Varghese, M. D., 1983. Shore seines for reservoirs- part I- design and performance. *Fishery Technology*, **20(1): 5-8**.
- Manna, R. K., Das A. K., Krishna Rao, D. S., Karthikeyan M. and Singh D. N., 2011. Fishing crafts and gear in river Krishna. *Indian journal of traditional knowledge*, **10(3): 491-497**.
- Purkayastha, P. and Gupta, S., 2014. Traditional fishing gears used by the fisher folk of Chatla floodplain area, Barak valley, Assam. *Indian Journal of Traditional Knowledge*, **13(1): 181-186**.
- Remesan., M. P., 2009. Inland Fishing Gears and Methods of North Kerala. CIFT. Niseema Printers and Publishers, Cochin: **1-101**.
- Ray, T., 2013. Indigenous fishing knowledge of Sundarban. *An e-journal of Folklore Foundation, Odisha, India, Lokaratna*, **Vol V & VI**.
- Samajdar, I. and Saikia, S., 2014. Traditional fishing gears of Birbhum district, of West Bengal, India. *Indian journal of traditional knowledge*, **13(1): 187-194**.
- Sharma, A., Sharma, R., Shukla, S. and Sawant, P., 2012. Indigenous Technical Knowledge (ITK) in Fisheries sector of West coast of India, Narendra Publishing House, Delhi: **212 p**.
- Snedecor, G. W. and Cochran, W. G., 1967. Statistical Methods, Sixth Edition, Oxford and IBH Publishing Co., New Delhi: **593 p**.
- Sreekrishna, Y. and Shenoy, L., 2001. Fishing gear and craft technology. Directorate of Information and Publication of Agriculture. Indian Council of Agriculture Research, New Delhi: **242 p**.