

# Design, technical aspects and operation of cast net without central line and without pockets of Ratnagiri, Maharashtra

■ MAYURI DONGARE, ASHISH S. MOHITE AND MAKARAND SHARANGDHAR

Received : 18.06.2016; Revised : 21.08.2016; Accepted : 07.09.2016

See end of the Paper for authors' affiliation

Correspondence to :

**ASHISH S. MOHITE**  
Department of Fisheries  
Engineering, College of  
Fisheries, Shirgaon,  
RATNAGIRI (M.S.) INDIA  
Email : ashishmohite@  
yahoo.com

■ **ABSTRACT** : The present study encompasses the traditional fishing method of cast net practiced in Ratnagiri, Maharashtra. Cast net without central line and without pockets were made up of 3 to 6 panels joined together vertically by take up ratios to form main conical webbing. PA monofilament having diameter of 0.5 to 1.3 mm was commonly used for construction of main webbing of cast net. Two rows of selvedge meshes of PA multifilament of 210 D×3×3 were provided at bottom edge of the net. Selvedge was absent at the apex end of the net. For all panels of main webbing and for selvedge section, mesh size varied from 20 to 40 mm. At apex, all meshes were closed together and were tied to the pulling chord which was made up of PP twisted multifilament rope of 3 to 4 mm diameter and 4 to 7 m in length. For first three panels, joining of the panels was carried out by 1:2 ratio by making knot locally called as *Vasan*. From panel number 4 to 6 the ratio was maintained as 2:3. The total depth of net varied from 3 to 5 m. PP twisted multifilament rope of 18 to 26 m in length having diameter of 3 to 5 cm was used as sinker line to which oval shaped lead sinkers having 3 to 4 mm diameter and 180 to 225 in numbers were tied at 12 to 16 cm interval. The fish species harvested by the cast net were mullet, lady fish, silver biddies, glass fish, shrimp and crabs.

■ **KEY WORDS** : Traditional fishing methods, Cast net, *Pag*

■ **HOW TO CITE THIS PAPER** : Dongare, Mayuri, Mohite, Ashish S. and Sharangdhar, Makarand (2016). Design, technical aspects and operation of cast net without central line and without pockets of Ratnagiri, Maharashtra. *Internat. J. Agric. Engg.*, 9(2) : 150-155, DOI: 10.15740/HAS/IJAE/9.2/150-155.

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 was 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 cast net without central line and without pockets practiced in Ratnagiri, Maharashtra.

## ■ METHODOLOGY

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



**Table 1 : Technical specifications of cast net without string without pocket / pag**

Sampling stations of Ratnagiri area		Mirya, Karla, Mandavi, Bhatye, Kalbadevi						
Panel	Local name	Pag						
Specifications of panels of the net								
	Section	No. of panels No. of meshes In length	In depth	Mesh size (mm)	3 to 6 Specification of selvedge	Selvedge meshes No.		
1	Upper	82 to 84	10	Range	Material PA multifilament (210D×3×3)	Top	Bottom	
	Lower	82 to 84		20 to 40		Absent		2
2	Upper	164 to 168	20	Average	Ratio of creasing ( <i>Vasan</i> ) : 1: 02 for first 3 panel and 2 : 03 for 4 <sup>th</sup> to 6 <sup>th</sup> panel			
	Lower	164 to 168		28 ± 0.22				
3	Upper	328 to 336	40					
	Lower	328 to 336						
4	Upper	656 to 672	60					
	Lower	656 to 672						
5	Upper	1312 to 1344	80					
	Lower	1312 to 1344						
6	Upper	1968 to 2016	90					
	Lower	1968 to 2016						
<b>Specifications of depth of net</b>								
Depth of panel 1(m)				0.25 to 0.75				
Mean (m)				0.41 ± 0.05				
Depth of panel 2 (m)				0.55 to 0.99				
Mean (m)				0.71 ± 0.04				
Depth of panel 3 (m)				0.9 to 1.75				
Mean (m)				1.01 ± 0.08				
Depth of panel 4 (m)				0.95 to 1.93				
Mean (m)				1.10 ± 0.12				
Depth of panel 5 (m)				1 to 1.56				
Mean (m)				1.21 ± 0.20				
Depth of panel 6 (m)				1.25				
Total depth of net (m)				3 to 5				
Mean				4.11 ± 0.23				
<b>Specifications of sinker line</b>								
Material				PP twisted multifilament				
Diameter (cm)				3 to 5				
Mean (cm)				3.5 ± 0.12				
Length (m)				18 to 26				
Mean (m)				22.3 ± 1.08				
<b>Specifications of sinkers</b>								
Material				Lead				
Diameter (mm)				3 to 4				
Mean (mm)				3.5 ± 0.12				
Length (cm)				2.5 to 4				
Mean (cm)				3.24 ± 0.15				

Table 1 : Conted.....

Table 1 : Contd.....

Wt per sinker (g)	18 to 22
Mean	20.2 ± 0.55
Distance between sinkers (cm)	12 to 16
Mean (cm)	13.83 ± 0.47
No. of sinkers used	180 to 225
Mean	202 ± 4.21
<b>Specifications of pulling chord</b>	
Material	PP twisted multifilament
Diameter (mm)	3 to 4
Mean (mm)	3.8 ± 0.18
Length (m)	3.9 to 7
Mean	4.92 ± 0.37

Similarly for panel 3, upper and lower edge meshes ranged in between 328 to 336 while total 40 number of meshes were present in depth. There were 656 to 672 meshes in upper and lower edge and 60 meshes in depth. Panel 5 was constructed with 1312 to 1344 number of meshes in lower edge and 80 number meshes in depth. While net observed with 6 panel had total of 1968 to 2016 number of meshes in upper and lower edge and for this panel 90 meshes were kept in depth. For first three panels, joining was carried out by 1:2 ratio. It means that, one mesh of upper panel and two meshes of lower panel were joined by making knot locally called as *Vasan*. From panel number 4 to 6 the ratio maintained was 2:3. In which two meshes of upper panel were joined to 3 meshes of lower panel (*Vasan*).

It was observed that, machine made netting shaped through cutting was first made as a panel and such 3 to 6 panels were joined by the take up ratios. The total depth of net varied from 3 to 5 m. Total depth of net varied from fisherman to fisherman and accordingly depth of panel also varied. It was recorded that depth of panel one ranged from 0.25 to 0.75 m while for panel 2 it was recorded in between 0.55 to 0.99 m. Depth of panel 3 was measured from 0.9 to 1.75 m and for panel 4 and 5 depth recorded were ranged from 0.95 to 1.93 m, 1 to 1.56 m only one cast net was observed with 6 panels which had 1.25 m depth in its last panel.

It was recorded for cast net that, PP twisted multifilament rope of 18 to 26 m in length having diameter of 3 to 5 cm was used as sinker line to which sinkers were attached. Oval shaped lead sinkers having 3 to 4 mm diameter at centre were used as weight for faster sinking of cast net. Total 180 to 225 number of sinkers

weighing each 18 to 22 g were attached to the sinker line at a distance of 12 to 16 cm. PP twisted multifilament rope of 3 to 4 mm diameter and 3.9 to 7 m length was fixed to the apex of the net, which was used as pulling cord for hauling the net. It was seen that, the bottom diameter or circumference of Cast net of this type varied from 6 to 10 m.

Cast net without central line and without pockets was operated in shallow waters from small non-motorized fishing craft or from the shore. Non-motorized wooden fishing crafts of length, width and height varying from 4 to 6.5 m, 0.4 to 0.6 m and 0.4 to 0.85 m, respectively were used for cast net operation. Cast net without central line and without pockets was mainly operated in area with obstacles and uneven bottom to catch fishes hidden underneath. The operation of the cast net is a skilful job as it has to be thrown skillfully so as to spread it in a circular manner over the water surface trapping the fish underneath it. At the start the left hand was inserted through the loop made in the free end of hauling rope and the central line and net was coiled, and was held in the left hand. The net was piled into loops upon the left arm in bent position and passed on to the right forearm. The net was thrown on the water surface with the swing of the body towards right side so as to spread flat on the water surface and sink quickly to the bottom thus entangling the fishes under it. The net was shot and allowed to set on the bottom. The net was manually examined for the fishes caught and then they were taken out of the net. After collection of the fishes, the net was carefully pulled outside the water and cleaned. The fish species found in the cast net were mullet, lady fish, silver biddies, glass fish, shrimp and crabs.

In north Kerala, Remesan (2009) found that, main webbing of cast net were fabricated by hand using PA 210×D3×3 ultrafilament twine. The same twine is used to make the foot rope after hand twisting 13 to 15 numbers of twine. Emmanuel *et al.* (2008) reported that, in tropical open lagoons, cast net was constructed using nylon monofilament, polyethylene and polyester (PES) multifilament twine.

It was found that, in Ratnagiri, for all panels of main webbing and for selvedge section of this type of cast net, mesh size varied from 20 to 40 mm. Similar range of mesh size *i.e.* 5 to 30 mm for similar type of cast net locally known as 'Jhinguri' was seen by Srivastava and Srivastava (2011) in Suraha lake, Uttar Pradesh. Slightly higher range of mesh size that of 40 to 50 mm and 50 to 60 mm was reported by Ray (2013) from Sundarbans, Odisha and by Remesan (2009) from north Kerala, respectively. Srivastava *et al.* (2002) from Kumaon Himalayan region, recorded that, the mesh size of cast net varied from 10 to 50 mm. Emmanuel *et al.* (2008) reported that, in tropical open lagoon, cast net was constructed using mesh opening of 29 mm and the mesh circumference of 58 mm. On the other hand cast net made up of 6 to 60 mm mesh size was observed by Das and Barat (2014).

Ray (2013) reported that the standard 'Khepla Jal' measures about 4 m in depth with the bottom circumference of 6 to 9 m diameter. Whereas, Okoh *et al.* (2007) reported the use of cast net having length varying from 3.31 to 4.61m, of a tropical lotic freshwater ecosystem, of Nigeria. Similar range of length of cast net, was measured during present investigation in Ratnagiri. Emmanuel *et al.* (2008) studied the cast net in tropical open lagoon and stated that, the circumference of the cast net was 7.92 m. Das and Barat (2014) studied cast net operated in lentic and lotic water bodies of West Bengal, India and observed that the height of cast net ranged from 4.30-5.20 m.

Remesan, (2009) reported that in north Kerala, PA multifilament of 210 D×3×3 was used as sinker line or foot rope to which sinkers were tied at regular intervals. On the contrary, in Ratnagiri, it was recorded that, PP twisted multifilament rope of 18 to 26 m in length having diameter of 3 to 5 cm was used as sinker line to which sinkers were tied. Emmanuel *et al.* (2008) studied cast net of this type in tropical open lagoon and found that, Kuralon rope with 3 mm diameter was used as sinker

line at the bottom of the cast net.

Srivastava and Srivastava (2011) reported that, in Suraha lake, Ballia, Uttar Pradesh metallic sinkers were used on the periphery of the cast net. Remesan (2009) studied different types of cast nets from north Kerala and found that tubular lead sinkers each having 10 to 12 mm length and weighing approximately 50 g were used. In Ratnagiri, oval shaped lead sinkers having 3 to 4 mm diameter at centre were used as weight for fast sinking of cast net. Total 180 to 225 number of sinkers each weighing 18 to 22 g were attached to the sinker line at a distance of 12 to 16 cm. Similarly, Emmanuel *et al.* (2008) stated in his study, that in tropical open lagoon, 71 numbers of lead sinkers each weighing 9 g were attached to the foot ropes at almost regular intervals during construction of cast net without string without pocket.

### Conclusion :

The documented information on the technical specifications and operation of the traditional fishing method of cast net without central line and without pockets 'Pag' 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.

---

Authors' affiliations:

**MAYURI DONGARE AND MAKARAND SHARANGDHAR,**  
Department of Fisheries Engineering, College of Fisheries, Shirgaon,  
RATNAGIRI (M.S.) INDIA

---

### ■ REFERENCES

- 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.1-25pp.
- Das, R.K. and Barat, S. (2014).** Fishing gears operated in lentic and lotic water bodies of Cooch Behar district, West Bengal, India. *Indian J. Trad. Knowl.*, **13**(3) : 619-625.
- Emmanuel, B.E., Chukwu, L.O. and Azeez, L.O. (2008).** Cast net design characteristics, catch composition and selectivity in tropical open lagoon. *African J. Biotechnol.*, **7**(12): 2081-

2089.

**George, V. C., Khan, A. A. and Varghese, M. D. (1983).** Shore seines for reservoirs- part I- design and performance. *Fishery Technol.*, **20**(1): 5-8.

**Okoh, F.A., Eyo, J.E. and Ezenwaji, H.M.G. (2007).** Species composition and abundance of cast net fishery of a tropical lotic freshwater ecosystem. *Bio-Res.*, **5** (1): 201-206.

**Ray, T. (2013).** Indigenous fishing knowledge of Sundarban. *An e-journal of Folklore Foundation, Odisha, India, Lokaratna, V & VI*: 1-11.

**Remesan, M. P. (2009).** *Inland fishing gears and methods of North Kerala*. CIFT. Niseema Printers and Publishers, Cochin: 1-101pp.

**Sharma, A., Sharma, R., Shukla, S. and Sawant, P. (2012).** *Indigenous technical knowledge (ITK) in fisheries sector of*

*West coast of India*, 212p. Narendra Publishing House, DELHI, INDIA.

**Snedecor, G. W. and Cochran, W. G. (1967).** *Statistical methods*, 6<sup>th</sup> Ed., 593p. Oxford and IBH Publishing Co., NEW DELHI, INDIA.

**Sreekrishna, Y. and Shenoy, L. (2001).** *Fishing gear and craft technology*. Directorate of Information and Publication of Agriculture. Indian Council of Agriculture Research, 242p. NEW DELHI, INDIA.

**Srivastava, P. K. and Srivastava, S. J. (2011).** Indigenous fishing gears in Suraha Lake, Ballia, Uttar Pradesh, India. *J. Wetlands Ecol.*, **(5)**: 73-78.

**Srivastava, S. K., Sarkar, U. K. and Patiyal, R. S. (2002).** Fishing methods in streams of the Kumaon Himalayan Region of India. *Asian Fisheries Sci.*, **15**: 347-356.

★ ★ ★ ★ ★ of Excellence ★ ★ ★ ★ ★  
9<sup>th</sup> Year