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Study of Trap Efficiency in Sorada Reservoir of Odisha

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ABSTRACT: Three types of box traps were set in Sorada reservoir of Ganjam District of Odisha as three treatments. They were Ghoni, Sepeti and Dori. These traps were set in replications in the three different stations of the reservoir such as Buguda, Khilabadi and Pankalabadi. The traps were designed in the three different ways. A small coconut piece was hanged in each trap by a wire. The traps were checked for the catch of fish and prawn in the early morning of each day except the closing season and unfavorable climatic conditions. The data base was created by taking the fish catch data. It was observed that, the catch of fish was more in the month of March-April and that of the prawn started in the month of May and went onwards up to September. The CPUE was calculated for each gear for the catch of fish and prawn. The results revealed that, the CPUE value for the trap Dori was 961.0 g/trap/day for the catch of fish and was 158.0 g/trap/day for the catch of prawn. Therefore, it can be concluded that, Dori is the selective gear for the catch of both fish and prawn.

Keywords: Trap, *Macrobrachium rosenbergii*, reservoir, CPUE.

INTRODUCTION

Reservoirs are the man-made lakes which, at present, cover more than 1% of the total land surface of India. These are created for different purposes, but mainly for irrigation, power generation and other water resource development purposes. The reservoirs of India are classified as small reservoirs (less than 1000 ha), medium reservoirs (1000 to 5000 ha) and large reservoirs (more than 5000 ha). During 1995, the country had 19,370 reservoirs, covering a total area of more than 3 million ha (3,153,366 ha) which included 19,134 small reservoirs with an area of 1,485,557 ha, 180 medium reservoirs covering 527,541 ha and 56 large reservoirs with a water surface area of 1,140,268 ha. The average fish catch of the reservoirs of India is 49.90, 12.30 and 11.43 kg/ha for small, medium and large reservoirs respectively. The average reservoir production of the nation is 20.13 kg/ha (Sugunan, 1995).

Odisha is one of the maritime states offering vast scope for the development of its freshwater, brackish water and marine fisheries resources. The freshwater resources of the state include 1.32 lakhs ha area under tanks and ponds, 2.0 lakhs ha reservoir area, 1.80 lakhs ha area under swamps and jheels and 1.71 lakhs ha water area of rivers and canals. The production potentiality of the reservoirs of Odisha is 0.20 lakh MT, but the present production level is 0.30 lakh MT (2016-17), (Fisheries Dept., Govt. of Odisha, 2017). During 1995, the state had 1,442 reservoirs, covering a total area of 198, 198 ha which included 1,433 small reservoirs with an area of 66,047 ha, 6 medium reservoirs covering 12,748 ha and 3 large reservoirs with a water surface area of 119,403 ha. The average fish catch of the reservoirs of Odisha is 25.85, 12.76 and 7.62 kg/ha for small, medium and large reservoirs respectively. The average reservoir production of the state is 9.72 kg/ha (Sugunan, 1995).

With the implementation of the State Reservoir Fishery Policy, the fishing rights of reservoir/MIPs of 40 ha and above has been vested with the Fishery Department which in turn has leased out the reservoir and MIPs to the PFCS and SHGs for the exploitation of the fishery resources for upliftment of the dependent people. Among the different reservoirs in Odisha, Sorada reservoir is one which is located at Sorada in Ganjam district. It has been leased to the PFCS, Sorada. This reservoir comes under Surada block, Ganjam district, Odisha (19° 45′ N Latitude and 84° 26′ E longitude) with a catchment area of 43km^2 and water spread area of 400 ha. The fish catch of the Sorada reservoir during 2017-18 was 128 MT.

Fish catch from reservoirs tends to be low due to the presence of underwater obstacles, which limit the use of active fishing gear. As a result, passive gear such as gill nets is more commonly used. Among them, the Rangoon net, an entangling type of gill net without a foot-rope, is the most frequently used. Another type of entangling net, known as *uchivali*, has a reduced fishing

height and is typically employed in shallow, marginal areas of reservoirs. Shore seines are also utilized in certain reservoirs. Additionally, various other types of fishing gear, including long lines, hand lines, pole and lines, cast nets, dip nets, and traps, are used for harvesting fish and prawns from reservoirs.

The prawn catch from Sorada reservoir is significantly lower compared to the fish catch. During June, July, August, and September, the total prawn catch from the reservoir was recorded at 40.3 kg, 66 kg, 73.7 kg, and 4 kg, respectively, with gill nets being the primary gear used for harvesting (PFCS, Sorada). Freshwater prawns are highly valued in both domestic and international markets, making them one of the most important species for inland aquaculture. The giant freshwater prawn (*Macrobrachium rosenbergii*) holds particular economic significance due to its rapid growth and high market demand, offering substantial export potential. The low prawn catch in Sorada reservoir may be attributed to the use of non-selective fishing gear.

Traps are generally more effective for harvesting giant freshwater prawns. These passive fishing gears are designed to prevent the escape of prawns once they enter. Various types of traps, including *Dori*, *Sepa*, *Ghoni*, and *Sepeti*, are employed in the reservoir for prawn harvesting. Many workers have reported on using of different traps used in Indian waters like Mohan Ranjan (1993); Nair (1993) etc. Kurup *et al.* (1993) have described use of different traps in Vembanad lake of Kerala. In assam different traps efficiencies were studied by different researchers like Sharma (2001); Bhattacharjya *et al*. (2004); Gurumayum and Chooudhury (2009); Baruah *et al.* (2010). Detailed designed of different traps have been given by Pravin and Meenakumari (2012). However, the efficiency of these traps should be assessed based on their Catch Per Unit Effort (CPUE) to determine the most effective gear for prawn capture.

Each water body exhibits a distinct pattern of fishing craft and gear, reflecting the economic conditions of the local fishing community. Fishermen often rely on locally available, low-cost materials to create efficient fishing tools that maximize their catch. In the case of reservoirs, detailed records of fishing gear used for fish harvesting are limited. Moreover, indigenous knowledge regarding prawn harvesting techniques remains largely undocumented in Indian reservoirs. Therefore, this study aims to document the selection and efficiency of traps used for harvesting the giant freshwater prawn (*Macrobrachium rosenbergii*) from Sorada reservoir in Ganjam District, Odisha, based on the Catch Per Unit Effort (CPUE).

The lacal fishermen use different traps for catching fish and prawn from the reservoir, but they should know which type of trap has more efficiency to catch fish and prawn from the reservoir. So this research may be useful for them to harvest fish and prawn by using particular type of trap.

MATERIALS AND METHODS

Before starting the research work a study was undertaken to know the different types of gear used for harvesting the fresh water prawn (*Macrobrachium rosenbergii*) and catch of this species from the Sorada reservoir of the Ganjam District of Odisha. From the study it was known that the fishermen are using a type of trap, Beja for harvesting the small fishes and prawn from the reservoir, but to harvest the giant fresh water prawn there was no alternative except the gill net. The catch of giant fresh water prawn is very less and also the catch is in particular season from May to August. Therefore three different box traps are used as three treatments to select a particular gear to harvest the highly demanded species from the reservoir.

Sorada reservoir in the district of Ganjam has five stations like Podakhari at Kesharipatna, Khilabadi, Balighai at Pankalabadi, Buguda and Malatimandap at Sorada. From these five stations, the three different types of traps with their replications were used in three stations as Pankalabadi, Buguda and Khilabadi to catch prawn. So, two traps of each variety were used in the above three stations every day except the closed season and some unfavorable climatic situations. From the Sorada town, Khilabadi is 3km; from Khilabadi, Buguda is 3 km and from Buguda, Pankalabadi is 5km. From Khilabadi, Pankalabadi is 9 km. Buguda is nearer to the river Padma.

Fig. 1. Satelite map of Sorada reservoir.

Design and preparation of traps. The three different types of box traps were designed as per Pravin and Meenakumari (2012). The trap, Ghoni was designed as follows:

It is rectangular and height is more

- Height: 50 cm, Length: 37 cm , Breadth: 37 cm
- Front side with one mouth: Mouth size – Breadth: 9 cm, Depth (where both sides of bamboo splits are joined together: 11.5 cm
- Bamboo Strips thickness: 0.5 cm, Gap between the strips: 0.2-0.3 cm
- Size of Opening for the removal of fish/prawn (Upper side of trap); length: 11cm and breadth 11 cm with cover.
- The strips are sewed together with nylon rope
- Thickness of the bamboo strip at the gate of the mouth : 1 cm
- Thickness of bamboo strip in the mouth : 0.3 cm The trap, Sepeti was designed as follows:
- Height: 50 cm, Length: 47 cm, Breadth: 50 cm ,Tapering end length : 24 cm
- Front side with one mouth: Mouth size – Breadth: 21 cm, Depth (where both sides of bamboo splits are joined together: 21 cm
- Bamboo Strips thickness: 0.3 cm, Gap between the strips: 0.2-0.3 cm
- Size of Opening for the removal of fish/prawn (Upper side of trap); length: 11cm and breadth 11 cm with cover.
- The strips are sewed together with nylon rope
- Thickness of the bamboo strip at the gate of the mouth : 1 cm The trap, Dori was designed as follows:

This trap is rectangular, but height is less than Ghoni and Sepeti.

- Height: 37 cm, Length: 80 cm, Breadth: 37 cm
- Front side with two mouths: Mouth size – Breadth: 9 cm, Depth (where both sides of bamboo splits are joined together: 12 cm
- Bamboo Strips thickness: 0.3 cm, Gap between the strips: 0.2-0.3 cm
- Size of Opening for the removal of fish/prawn (Upper side of trap): length: 11cm and breadth 11 cm with cover.
- The strips are sewed together with nylon rope
- Thickness of the bamboo strip at the gate of the mouth : 1 cm.

METHOD

The three treatments are mentioned below:

- Treatment 1 : T1-Use of ghoni as box trap
- Treatment 2 : T2-Use of sepeti as box trap
- Treatment 3 : T3-Use of dori as box trap

The traps as mentioned in Plate-1 were set at 10 ft water depth with floats as demarcation. The traps were checked at early morning time of each day and fish and prawns were harvested from the traps. The dry coconut piece was hanged in the trap with a metal wire for luring the prawns, before setting in the reservoir (Laxmappa *et al.*, 2014). The traps were hanged by a rope with a float and set in a particular area of the station. The distance between the traps is variable. In rainy season the traps are set close to each other, but in other season the traps are set at a distance of 5to 7 ft as in rainy season the fishes move in a line through the current of water. So the traps were set a distance of 5-7ft in each station to harvest the fish and prawn. The study period was 19 weeks *i.e.*, from 1st January to 11th June, 2019.The closing period was from 1st April to 30th April, 2019. In this closing period there was no fishing. Every day the catch was collected from each trap from each station also and a data base was prepared to know the catch performance of all the traps. Weekly average fish catch data was calculated also and represented in the tabular form. From this weekly average data the % of catch of each species by individual gear was also calculated. Then total catch by the individual gear from the three stations was calculated week wise and divided by 6, as each variety of gear was in a replicated way was set in the reservoir. This was represented as CPUE for this particular gear (Rahman *et al*., 2016). Then the mean was taken to know the CPUE of that particular gear and then it was compare among all the gears. The highest mean value of CPUE represents the selectivity of the gear. This gear was considered as a selective gear for harvesting the fish from the Sorada reservoir. Likewise the selectivity of the gear was calculated for harvesting the fresh water prawn (*Macrobrachium rosenbergii*) from the Sorada reservoir.

Statistical analysis. The recorded values were evaluated statistically through DMRT (Duncan's multiple range tests) by statistical package SPSS version 19.0 (SPSS Incorporation, Chicago, USA). A 5% level of possibility ($p<0.05$) was taken to decide the statistically significant responses between the treatments means. Results are represented as mean ± S.E. (standard error). Moreover, the data arrangements and graphs were performed by using MS excel sheet 2007.

Plate 1. Different traps used in Sorada reservoir.

RESULTS AND DISCUSSION

Before going to start the research work a study was undertaken about the catch of fresh water prawn. The Secretary and members of the PFCS of the Sorada gave their opinion that the giant fresh water prawn (*Macrobrachium rosenbergii*) is not plentily available throughout the year. They are generally available from the month of May to September by the gill net. In the year 2016, the catch was more in the month of August, *i.e.,* 71.1 kg, in the 2017, the catch was more in the month of June, *i.e.*, 95.8 kg. Likewise in the year 2018, the catch was more in the month of August, *i.e.*, 73.7 kg. So the members of PFCS suggested that to implement new technique to harvest the highly priced prawn in other days. Therefore an attempt was undertaken to set the different box traps to harvest the prawn from that reservoir. The programme was started in the month of 1st January to 11th June, 2019 for 19 weeks *i.e.*, 133 days.

Catch of fish and prawn from the station, Buguda. The catch data of different fish and prawn are represented in the Table 1-3. In these tables the weekly average fish catch data was represented. The data was collected daily early morning except the closing season in the month of April and unfavorable climatic situation like Fani cyclone. The catch data of the station, Buguda is presented in the Table 2. The catch was more in the 13th week as 5800g, mainly in the last week of March and April. The closing season was from the Dt. 01-04-19 to 28-04-19. Again the daily catch was less in the month of May and June. But in the 19th week the weekly catch was slightly more, as one day one Bami (*Anguilla bengalensis*) of wt. 2200 g was in the trap, Dori. The prawn catch was nil from the starting up to the 17th week, but from the 17th week the catch started. As in 17th, 18th and 19th week the total catch was 460 g, 500 and 650g respectively. Among all the species of fish in the trap the catch or availability of Kerandi (*Puntius sophore)* was maintained in all the traps in full research period *i.e.*, in 19 weeks. But other species were not available in the trap in each day.

Catch of fish and prawn from the station, Khilabadi. The catch data of fish and prawn is presented in the Table 3. This table shows that the catch was more *i.e.*, 4650g in the 11th week. Like Buguda, the prawn catch was nil from the starting up to the 17th week. The fish catch was less from 17th week to 19th week. The prawn catch in 17, 18 and 19th week was 500, 550 and 500g respectively. There is an irregularity of the catch of fish species in the trap except Kerandi (*Puntius sophore*). The catch of another species Phali (*Notopterus notopterus*) was every day in this station and in all the traps except sepeti in 19th and 18th week. The catch of Bami (*Anguilla bengalensis*) was nil in this station. Tambasi (*Ompok bimaculatus*) catch was only in 5th and 11th week. Boria (*Cirrhinus reba*) catch was nil from the 1st week to 3rd week. There was no catch in the closing season *i.e.*, from Dt. 01-04-19 to 28-04-19. The harvesting of the fish from the trap was mainly done in the early morning**.**

Catch of fish and prawn from the station, Pankalabadi. The catch data of fish and prawn is presented in the Table 4. This table shows that the catch was more *i.e.*, 4900g in the 12th week. Like other centres, the prawn catch was nil from the starting up to the 17th week. The prawn catch in 17th, 18th and 19th week was 600, 700 and 750g respectively. The fish catch was less from 17th week to 19th week. The catch of fish and prawn was more in this station as compared to other station of the Sorada reservoir. There is an irregularity of the catch of fish species in the trap except Boria (*Cirrhinus reba).* All species were available in this station as compared to other stations and one extra species was seen here *i.e.*, Singhi (*Heteropnustes fossilis*). There was no catch in the closing season *i.e.*, from Dt. 01-04-19 to 28-04-19. The harvesting of the fish from the trap was mainly done in the early morning.

Average wt (g) of fish and prawn in the traps in overall study period. Table 5 represents the average wt of fish and prawn harvested from the traps in overall study period in three stations. The average wt. of fishes were like Boria (*Cirrhinus reba*)-50-200g, Serena (*Puntius sarana*)-20-70g, Tambasi (*Ompok bimaculatus*) -100-200g, Kantia (*Mystus vittatus*)- 50-100 g, Phali (*Notopterus notopterus)*-100-250 g, Kerandi (*Puntius sophore*)-10-20g, Bami (*Anguilla bengalensis*) 200-500g, Singhi (*Heteropneustes fossilis*)-50-100 g and Prawn (*Macrobrachium rosenbergii*)-40-60 g. Dora (2018) has reported similar types of fishes with different growth.

CPUE (Catch Per Unit Effort) for the gears for harvesting the both fish and prawn. The CPUE was calculated as the total catch of the individual gear divided by the nos. of gear used that time. Rahman *et al*. (2016) calculated CPUE for different gears used in the Kajal river of Southern Bangladesh for studying the decline causes of ichthyofauna. He calculated the total catch of fish in individual gear and divided it to the no. of time the gear was used. Table 6 represents the CPUE for the gear Ghoni for harvesting the both fish and prawn. This shows that the CPUE was more in the 13th week *i.e.*, 767.0 g/trap/day. But the mean CPUE for the gear Ghoni was 519.8 g/trap g/trap/day. Table 7 represents the CPUE for the gear Sepeti for harvesting the both fish and prawn. This shows that the CPUE was more in the 10th week *i.e.*, 368.0 g/trap/day .But the mean CPUE for the gear Sepeti was 286.0 g/trap/day. Likewise CPUE for the gear Dori for harvesting the both fish and prawn was calculated and it was represented in the Table 8. This shows that CPUE was more in the 10th week *i.e.*, 1260 g/trap/day. But the mean CPUE for the gear Dori for harvesting the both fish and prawn was 961.0 g/trap/day. As compared to

all the gears the Mean CPUE was more for Dori for harvesting the both fish and prawn. So Dori is the selective gear for harvesting the both fish and prawn.

Table 1: Weekly average fish catch (g) from the Station, Buguda.

	Jan				Jan				Jan				Jan			
***Species**	**Week 1**				**Week 2**				**Week 3**				**Week 4**			
	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**
Boria	200	100	440	**740**	220	160	460	**840**	250	120	500	**870**	300	170	520	**990**
Serena	90	50	150	**290**	140	80	180	**400**	120	100	200	**420**	100	80	250	**430**
Tambasi	100	90	100	**290**	100	50	150	**300**	100	50	140	**290**	50	0	100	**150**
Kantia	100	50	150	**300**	80	70	100	**250**	0	0	200	**200**	0	0	0	**0**
Phali	120	80	160	**360**	100	80	120	**300**	80	60	140	**280**	120	100	300	**520**
Kerandi	100	100	200	**400**	150	100	250	**500**	150	150	200	**500**	200	100	300	**600**
Bami	0	0	200	**200**	250	200	350	**800**	300	250	450	**1000**	250	200	450	**900**
Prawn	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Total	710	470	1400	**2580**	1040	740	1610	**3390**	1000	730	1830	**3560**	1020	650	1920	**3590**

	Jan-Feb				Feb				Feb				Feb			
***Species**	**Week 5**				**Week 6**				**Week7**				**Week 8**			
	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**
Boria	200	140	400	**740**	120	60	200	**380**	100	100	200	**400**	50	50	200	**300**
Serena	90	70	180	**340**	60	40	100	**200**	50	50	100	**200**	100	50	150	**300**
Tambasi	100	80	170	**250**	300	300	500	**1100**	150	100	450	**700**	0	0	100	**100**
Kantia	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Phali	100	80	320	**500**	0	0	0	**0**	300	200	600	**1100**	400	150	650	**1200**
Kerandi	200	200	400	**800**	400	300	600	**1300**	500	300	600	**1400**	700	300	800	**1800**
Bami	350	200	400	**950**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Prawn	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Total	1040	770	1870	**3580**	880	700	1400	**2980**	1100	750	1950	**3800**	1250	550	1900	**3700**

***Scientific name of the fish species**

Boria	*Cirrhinus reba*
Serena	*Puntius sarana*
Tambasi	*Ompok bimaculatus*
Kantia	*Mystus vittatus*
Phali	*Notopterus notopterus*
Karandi	*Puntius sophore*
Bami	*Anguilla bengalensis*
Prawn	*Macrobrachium rosenbergii*

Table 1 (Contd…): Weekly average fish catch (g) from the Station, Buguda.

	Feb-March				March				March				March			
***Species**	**week 9**				**week 10**				**week 11**				**week 12**			
	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**
Boria	0	0	0	**0**	100	0	100	**200**	0	0	0	**0**	100	50	150	**300**
Serena	0	0	100	**100**	80	60	160	**300**	50		100	**150**	50	50	200	**300**
Tambasi	0	0	150	**150**	100	0	150	**250**	0	0	150	**150**	0	0	200	**200**
Kantia	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Phali	300	200	500	**1000**	250	200	550	**1000**	200	100	300	**600**	480	400	600	**1480**
Kerandi	500	300	1200	**2000**	600	300	1200	**2100**	600	300	1100	**2000**	650	350	1300	**2300**
Bami	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Prawn	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Total	800	500	1950	**3250**	1130	560	2160	**3850**	850	400	1650	**2900**	1280	850	2450	**4580**

	March-April				May				May				May			
***Species**	**week 13**				**week 14**				**week 15**				**week 16**			
	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**
Boria	150	50	200	**400**	0	0	0	**0**	130	50	120	**300**	120	80	150	**350**
Serena	50	50	150	**250**	80	70	150	**300**	150	50	200	**400**	90	70	160	**300**
Tambasi	100	0	150	**250**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Kantia	100	0	200	**300**	100	50	150	**250**	100	0	100	**200**	50	50	150	**250**
Phali	900	400	1100	**2400**	600	280	700	**1580**	400	200	600	**1200**	300	200	560	**1060**
Kerandi	700	500	1000	**2200**	600	500	1200	**2300**	600	400	800	**1800**	500	200	800	**1500**
Bami	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Prawn	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Total	2000	1000	2800	**5800**	1380	900	2200	**4430**	1380	700	1820	**3900**	1060	600	1820	**3460**

***Scientific name of the fish species**	
Boria	*Cirrhinus reba*
Serena	*Puntius sarana*
Tambasi	*Ompok bimaculatus*
Kantia	*Mystus vittatus*
Phali	*Notopterus notopterus*
Karandi	*Puntius sophore*
Bami	*Anguilla bengalensis*
Prawn	*Macrobrachium rosenbergii*

Table 2: Weekly average fish catch (g) from the Station, Khilabadi.

	Jan				Jan				Jan				Jan			
***Species**	**Week 1**				**Week 2**				**Week 3**				**Week 4**			
	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**
Boria	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	200	100	400	**700**
Serena	50	50	100	**200**	100	50	100	**250**	50	50	200	**300**	50	0	150	**200**
Tambasi	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Kantia	200	100	300	**600**	200	100	350	**650**	250	150	400	**800**	0	0	0	**0**
Phali	350	250	500	**1100**	400	200	600	**1200**	400	200	550	**1150**	400	200	700	**1300**
Karandi	400	200	800	**1400**	400	300	800	**1500**	300	200	500	**1000**	450	150	600	**1200**
Bami	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Prawn	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Total	1000	600	1700	**3300**	1100	650	1850	**3600**	1000	600	1650	**3250**	1100	450	1850	**3400**
	Jan-Feb				**Feb**				**Feb**				**Feb**			
***Species**	**Week 5**				**Week 6**				**Week7**				**Week 8**			
	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**
Boria	200	100	500	**800**	250	150	350	**750**	300	200	400	**900**	300	100	400	**800**
Serena	0	0	0	**0**	100	0	150	**250**	100	100	200	**400**	100	50	150	**300**
Tambasi	100	0	200	**300**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Kantia	0	0	0	**0**	0	0	0		100	0	100	**200**	0	0	0	**0**
Phali	350	250	600	**1200**	400	200	800	**1400**	300	200	850	**1350**	500	100	800	**1400**
Karandi	400	200	700	**1300**	500	300	700	**1500**	400	300	900	**1600**	400	350	750	**1500**
Bami	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Prawn	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Total	1050	550	2000	**3600**	1250	650	2000	**3900**	1200	800	2450	**4450**	1300	600	2100	**4000**

***Scientific name of the fish species**

Boria	*Cirrhinus reba*
Serena	*Puntius sarana*
Tambasi	*Ompok bimaculatus*
Kantia	*Mystus vittatus*
Phali	*Notopterus notopterus*
Kerandi	*Puntius sophore*
Bami	*Anguilla bengalensis*
Prawn	*Macrobrachium rosenbergii*

Table 2 (Contd…): Weekly average fish catch (g) from the Station, Khilabadi.

	Feb-March				March				March				March			
***Species**	**week 9**				**week 10**				**week 11**				**week 12**			
	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**
Boria	350	150	500	**1000**	250	150	450	**850**	350	150	500	**1000**	250	200	450	**900**
Serena	150	50	200	**400**	150	100	250	**500**	100	50	150	**300**	50	50	100	**200**
Tambasi	0	0	0	**0**	0	0	0	**0**	0	0	200	**200**	100	0	200	**300**
Kantia	0	0	0	**0**	100	50	150	**300**	0	0	0	**0**	0	0	0	**0**
Phali	400	200	700	**1300**	250	100	750	**1100**	450	250	750	**1450**	350	250	600	**1200**
Karandi	500	300	900	**1700**	700	500	1300	**2500**	500	300	900	**1700**	400	250	950	**1600**
Bami	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Prawn	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Total	1400	700	2300	**4400**	1450	900	2900	**5250**	1400	750	2500	**4650**	1150	750	2300	**4200**
	March-April				**May**				**May**				**May**			
*Species	**week 13**				**weeek 14**				**week 15**				**week 16**			
	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**
Boria	300	200	700	**1200**	300	200	800	**1300**	350	150	500	**1000**	200	100	400	**700**
Serena	100	50	150	**300**	50	50	100	**200**	80	70	100	**250**	50	0	100	**150**
Tambasi	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Kantia	0	0	0	**0**	0	0	0	**0**	80	70	100	**250**	0	0	0	**0**
Phali	400	300	700	**1400**	500	300	720	**1520**	350	300	600	**1250**	300	100	400	**800**
Karandi	450	250	800	**1500**	400	200	700	**1300**	250	150	600	**1000**	200	100	400	**700**
Bami	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Prawn	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Total	1250	800	2350	**4400**	1250	750	2320	**4320**	1110	740	1900	**3750**	750	300	1300	**2350**

***Scientific name of the fish species**

Boria	*Cirrhinus reba*
Serena	*Puntius sarana*
Tambasi	*Ompok bimaculatus*
Kantia	*Mystus vittatus*
Phali	*Notopterus notopterus*
Kerandi	*Puntius sophore*
Bami	*Anguilla bengalensis*
Prawn	*Macrobrachium rosenbergii*

Table 3 (Contd…): Weekly average fish catch (g) from the Station, Khilabadi.

	May				May-June				June up to 11th June			
***Species**	week 17				week 18				week 19			
	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**
Boria	150	50	200	**400**	50	50	200	**300**	100	0	150	**250**
Serena	50	0	50	**100**	30	20	50	**100**	50	30	70	**150**
Tambasi	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Kantia	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Phali	150	100	250	**500**	100	0	200	**300**	120	0	200	**320**
Karandi	100	100	400	**600**	100	50	250	**400**	100	80	120	**300**
Bami	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Prawn	150	50	300	**500**	150	50	350	**550**	150	100	250	**500**
Total	600	300	1200	**2100**	430	170	1050	**1650**	520	210	790	**1520**

***Scientific name of the fish species**

Boria	*Cirrhinus reba*
Serena	*Puntius sarana*
Tambasi	*Ompok bimaculatus*
Kantia	*Mystus vittatus*
Phali	*Notopterus notopterus*
Kerandi	*Puntius sophore*
Bami	*Anguilla bengalensis*
Prawn	*Macrobrachium rosenbergii*

Table 4: Weekly average fish catch (g) from the Station , Pankalabadi.

	Jan				Jan				Jan				Jan			
***Species**	Week 1				Week 2				Week 3				Week 4			
	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**
Boria	200	100	400	**700**	250	150	400	**800**	250	150	350	**750**	300	100	500	**900**
Serena	100	100	200	**400**	150	50	300	**500**	150	50	250	**450**	200	100	300	**600**
Tambasi	150	50	250	**450**	250	50	200	**500**	0	0	0	**0**	100	100	350	**550**
Kantia	50	50	200	**300**	120	80	200	**400**	100	100	300	**500**	0	0	0	**0**
Phali	100	100	400	**600**	250	150	300	**700**	170	100	380	**650**	200	100	400	**700**
Karandi	250	150	300	**700**	150	50	400	**600**	150	50	300	**500**	200	100	300	**600**
Bami	250	200	360	**810**	200	0	300	**500**	0	0	0	**0**	200	0	400	**600**
Singhi	100	0	300	**400**	150	100	250	**500**	0	0	0	**0**	100	100	200	**400**
Prawn	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Total	1200	750	2410	**4360**	1520	630	2350	**4500**	820	450	1580	**2850**	1300	600	2450	**4350**
	Jan-Feb				**Feb**				**Feb**				**Feb**			
***Species**	**Week 5**				**Week 6**				**Week7**				**Week 8**			
	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**
Boria	300	100	600	**1000**	200	100	550	**850**	250	100	550	**900**	250	100	500	**850**
Serena	150	50	350	**550**	120	80	200	**400**	200	100	300	**600**	150	100	250	**500**
Tambasi	200	100	300	**600**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Kantia	100	100	250	**450**	100	100	300	**500**	0	0	0	**0**	0	0	0	**0**
Phali	170	130	700	**1000**	250	50	500	**800**	300	100	500	**900**	300	200	450	**950**
Karandi	150	50	350	**550**	200	100	300	**500**	200	50	350	**600**	100	100	400	**600**
Bami	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	100	100	400	**600**
Singhi	150	50	200	**400**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Prawn	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Total	1220	580	2750	**4550**	870	430	1850	**3050**	950	350	1700	**3000**	900	600	2000	**3500**

***Scientific name of the fish species**

Boria	*Cirrhinus reba*
Serena	*Puntius sarana*
Tambasi	*Ompok bimaculatus*
Kantia	*Mystus vittatus*
Phali	*Notopterus notopterus*
Kerandi	*Puntius sophore*
Bami	*Anguilla bengalensis*
Singhi	*Heteropneustes fossilis*
Prawn	*Macrobrachium rosenbergii*

Table 4 (Contd…). Weekly average fish catch (g) from the Station, Pankalabadi.

	Feb-March				March				March				March			
*Species	week 9				week 10				week 11				week 12			
	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**
Boria	200	200	600	**1000**	300	200	600	**1100**	300	200	550	**1050**	300	100	700	**1100**
Serena	250	150	300	**700**	200	100	300	**600**	100	100	300	**500**	200	100	400	**700**
Tambasi	200	100	200	**500**	0	0	0	**0**	0	0	0	**0**	200	100	300	**600**
Kantia	200	100	400	**700**	0	0	0	**0**	0	0	0	**0**	100	0	400	**500**
Phali	150	100	400	**650**	150	50	500	**700**	150	50	600	**800**	300	100	500	**900**
Karandi	150	100	250	**500**	100	100	400	**600**	200	100	400	**700**	200	100	300	**600**
Bami	0	0	0	**0**	250	200	400	**850**	0	0	0	**0**	0	0	0	**0**
Singhi	200	0	300	**500**	200	100	300	**600**	0	0	0	**0**	200	0	300	**500**
Prawn	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Total	1350	750	2450	**4550**	1200	750	2500	**4450**	750	450	1850	**3050**	1500	500	2900	**4900**
	March-April				May				May				May			
*Species	week 13				weeek 14				week 15				week 16			
	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**
Boria	400	100	500	**1000**	300	200	700	**1200**	300	100	500	**900**	200	100	400	**700**
Serena	250	50	200	**500**	100	100	200	**400**	80	70	200	**350**	50	50	100	**200**
Tambasi	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Kantia	300	100	350	**750**	100	0	300	**400**	0	0	0	**0**	0	0	0	**0**
Phali	300	100	650	**1050**	300	100	500	**900**	200	100	400	**700**	200	0	300	**500**
Karandi	100	100	400	**600**	120	80	300	**500**	130	70	350	**550**	150	100	200	**450**
Bami	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Singhi	0	0	0	**0**	0	0	0	**0**	200	100	300	**600**	300	0	400	**700**
Prawn	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Total	1350	450	2100	**3900**	920	480	2000	**3400**	910	440	1750	**3100**	900	250	1400	**2550**

***Scientific name of the fish species**

Boria	*Cirrhinus reba*
Serena	*Puntius sarana*
Tambasi	*Ompok bimaculatus*
Kantia	*Mystus vittatus*
Phali	*Notopterus notopterus*
Kerandi	*Puntius sophore*
Bami	*Anguilla bengalensis*
Prawn	*Macrobrachium rosenbergii*

Table 4 (Contd…) : Weekly average fish catch (g) from the Station, Pankalabadi.

	May				May-June				June up to 11th June			
*Species	week 17				week 18				week 19			
	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**	Ghoni	Sepeti	Dori	**Total**
Boria	50	50	300	**400**	100	0	100	**200**	100	0	150	**250**
Serena	50	0	100	**150**	50	40	60	**150**	0	0	0	**0**
Tambasi	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Kantia	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Phali	0	0	200	**200**	0	0	100	**100**	100	70	150	**320**
Karandi	50	50	100	**200**	0	0	0	**0**	0	0	0	**0**
Bami	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
Singhi	100	100	200	**400**	100	50	150	**300**	100	50	150	**350**
Prawn	200	100	300	**600**	250	100	350	**700**	200	150	400	**750**
Total	450	300	1200	**1950**	500	190	760	**1450**	500	270	850	**1670**

***Scientific name of the fish species**

Boria	*Cirrhinus reba*
Serena	*Puntius sarana*
Tambasi	*Ompok bimaculatus*
Kantia	*Mystus vittatus*
Phali	*Notopterus notopterus*
Kerandi	*Puntius sophore*
Bami	*Anguilla bengalensis*
Prawn	*Macrobrachium rosenbergii*

Table 5: Average wt (g) of fish and prawn in the traps in overall study period.

Local name of the Species	Scientific name of the species	Average wt
Boria	*Cirrhinus reba*	50-200
Serena	*Puntius sarana*	20-70
Tambasi	*Ompok bimaculatus*	100-200
Kantia	*Mystus vittatus*	50-100
Phali	*Notopterus notopterus*	100-250
Kerandi	*Puntius sophore*	10-20
Bami	*Anguilla bengalensis*	200-500
Singhi	*Heteropneustes fossilis*	50-100
Prawn	*Macrobrachium rosenbergii*	40-60

Table 6: CPUE (Catch Per Unit Effort) in g/trap/day for Ghoni.

Station	Week 1	week 2	week 3	week 4	week 5	week 6	week 7	week 8	week 9	week 10	week 11	week 12	Week 13	week 14	Week 15	week 16	week 17	week 18	wee k 19
Buguda	710	1040	1000	1020	1040	880	1100	1250	800	1130	850	1280	2000	1380	1380	1060	800	550	590
Khilabadi	1000	1100	1000	1120	1050	1250	1200	1300	1400	1450	1400	1150	1250	1250	1110	750	600	430	520
Pankalabadi	1200	1520	820	1300	1220	870	950	900	1350	1200	750	1500	1350	920	910	900	450	450	500
Total	2910	3660	2820	3440	3310	3000	3250	3450	3550	3780	3000	3930	4600	3550	3400	2710	1850	1430	1610
*CPUE	485	610	470	573	552	500	542	575	592	630	500	655	767	592	567	452	308	238	268
Mean CPUE	519.8																		
* CPUE = Total catch / number of traps used (*i.e.*, 6 traps, each station with 2 traps)																			

Table 7: CPUE (Catch Per Unit Effort) in g/trap/day for Sepeti.

Station	Week 1	week 2	week 3	week 4	week 5	week 6	week 7	week 8	week 9	week 10	week 11	week 12	week 13	wee k 14	week1 5	week 16	week 17	week 18	week 19
Buguda	470	740	730	650	770	700	750	550	500	560	400	850	1000	900	700	600	560	400	280
Khilabadi	600	650	600	450	550	650	800	600	700	900	750	750	800	750	740	300	300	170	210
Pankalabadi	750	630	450	600	580	430	350	600	750	750	450	500	450	480	440	250	300	190	270
Total	1820	2020	1780	1700	1900	1780	1900	1750	1950	2210	1600	2100	2250	2130	1880	1150	1160	760	760
*CPUE	303	337	297	283	317	297	317	292	325	368	267	350	375	355	313	191	193	127	127
Mean CPUE	286																		
* CPUE = Total catch / number of traps used (*i.e.*, 6 traps, each station with 2 traps)																			

Table 8: CPUE (Catch Per Unit Effort) in g/trap/day for Dori.

Station	Week 1	week 2	week 3	week 4	week 5	week 6	week 7	week 8	week 9	week 10	week 11	week 12	week 13	week 14	week 15	week 16	week 17	week 18	week 19
Buguda	1400	1610	1830	1920	1870	1400	1950	1900	1950	2160	1650	2450	2800	2200	1820	1820	1550	1280	3070
Khilabadi	1700	1850	1650	1850	2000	2000	2450	2100	2300	2900	2500	2300	2350	2320	1900	1300	1200	1050	790
Pankalabadi	2410	2350	1580	2450	2750	1850	1700	2000	2450	2500	1850	2900	2100	2000	1750	1400	1200	760	850
Total	5510	5810	5060	6220	6620	5250	6100	6000	6700	7560	6000	7650	7250	6520	5470	4520	3950	3090	4710
*CPUE	918	968	843	1037	1037	875	1016	1000	1117	1260	1000	1275	1208	1087	912	753	658	515	785
Mean CPUE	961																		
* CPUE = Total catch / number of traps used (*i.e.*, 6 traps, each station with 2 traps)																			

Table 9: The calculated and tabulated value of t-test based on the gear wise fish catch at different stations of Saroda Reservoir.

Stations	Between treatments	Calculated value	Tabulated value	Probability
Station-1 **(Buguda)**	Sepeti and Ghoni	0.895	1.761	P>0.05
	Ghoni and Dori	1.979	1.761	P<0.05
	Dori and Septi	1.963	1.761	P<0.05
Station-II **(Khilabadi)**	Sepeti and Ghoni	0.965	1.761	P>0.05
	Ghoni and Dori	1.967	1.761	P<0.05
	Dori and Sepeti	1.879	1.761	P<0.05
Station-III **Pankalabadi**	Sepeti and Ghoni	2.265	1.745	P<0.05
	Ghoni and Dori	1.917	1.745	P<0.05
	Dori and Sepeti	3.211	1.745	P<0.05

The catch data of different fish and prawn are represented in the Table 1-4. In these tables the weekly average fish catch data was represented. The catch data of the station, Buguda is presented in the Table 2. The catch was more in the 13th week as 5800g, mainly in the last week of March and April. The catch data of fish and prawn of the station Khilabadi is presented in the Table 3, which shows that the catch was more *i.e.*, 4650g in the 11th week in the month of March. Again the catch data of fish and prawn of the station Pankalabadi is presented in the Table 4, which shows that the catch was more *i.e.*, 4900g in the 12th week in the month of April. The catch was less in the starting period *i.e.*, in January due to less temperature, but when temperature was increased *i.e.*, in February – April, the catch was also increased. The catch of fishes is variable for the different species for different months. As the catch of IMC was maximum from the reservoir NanakSagar of Uttarakhand in the month of February and for *Labeo calbasu* the maximum catch was in March. The maximum catch is variable for species wise (Raveendar *et al.*, 2018). Again the daily catch was less in the month of May and June. This is mainly due to the increase in temperature and decrease in the water level of the Sorada reservoir. This year the level of water is very less and the main reason is elevated temperature and supply of more water from the Sorada reservoir to Berhampur town for drinking purpose. But in the 19th week the weekly catch was slightly more in the station, Buguda as one day one Bami (*Anguilla bengalensis*) of wt. 2200 g was caught in the trap, Dori. The average wt of fish and prawn is presented in Table-5 which shows that the different size of fishes ware harvested from the traps. The more wt of individual fish was 200-500g in case of Bami (*Anguilla bengalensis*). The average wt of prawn (*Macrobrachium rosenbergii*) was 40-60g, the size of a matured prawn (Sugunan, 1995).

The prawn catch was nil from the starting up to the 17 th week, but from the 17th week the catch started. As in

17th, 18th and 19th week the total catch was 460 g, 500 and 650g respectively. This is because as the Majority of prawns migrate down streams to esturine reaches for the purpose of hatching their young ones. From the reservoirs the prawns move to the rivers and then rivers to the estuary for their breeding purpose. Males were more commonly observed in May and June, while females were abundant from July to October. Berried females first appeared in the last week of May, with their numbers peaking in the middle of the monsoon season, particularly in August and September. Fully mature males, females, and berried females were noted during the period when floodwaters were receding. The presence of adults and berried females, initially recorded in May, persisted until the end of October (Reservoir Fisheries of India, FAO). So when the prawn moves for breeding in the month of May to September the fishermen catch the prawn. Again the catch of prawn in the station, Pankalabadi was more than Khilabadi and than Buguda. Because prawn moves for breeding from the station Pankalabadi to Buguda through Khilabadi. So at the starting place for breeding journey, they were trapped more. This catch data in trap of Sorada reservoir also shows that the population of prawn is less in the reservoir, as the catch of the prawn in other days is nil. Generally the box traps catch the fresh water prawn from the reservoir (Laxmappa *et al*., 2014), but here no catch in the traps in other months except from the May to June.

Among all the species of fish in the trap the catch or availability of Kerandi (*Puntius sophore*) was maintained near about in all the traps in full research period *i.e.*, in 19 weeks. But other species were not available in the trap in each day. As Kerandi is a weed fish , so generally it is always available in the reservoir. The Dori has two entry points, so maybe this is the cause to catch more fishes/ prawns from the reservoir. Other traps have only one way as the entry point of the fishes/prawn, so the catch is less.

Statistical analysis. The significant difference of species catch between the gears was examined through t-test. There is a significant difference of species catch between Ghoni & Dori and Dori & Sepeti at both the stations Buguda&Khilabadi. In these stations no significant difference is obtained between Septi and Ghoni relating to species catch indicating the gears are equally important at both the stations. In the station Pankalabadi, the species catch from one gear differs from the other ($P<0.05$). Such differences may be attributed to the differences in the species of fishes caught by them.

CONCLUSIONS

The results revealed that, the CPUE value for the trap Dori was 961.0 g/trap/day for the catch of fish and 158.0 g/trap/day for the catch of prawn. Therefore, it can be concluded that, Dori is the selective gear for the catch of both fish and prawn. Further study is necessary for different nets used in harvesting the fish and prawn from the reservoir also.

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