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A brief report on the marine fisheries of Puri, Orissa

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Puri, one of the southern districts of Orissa has 155 kms of coast line with 35 fishing villages and 12 landing centres. Nuagarh (Astarang), Pentakota, Konark (Chandrabhaga), Kaliakona, Arkhakuda are the major landing centres. Nuagarh is the only fishing harbour in Puri district. The present report highlights the marine fish landings for 20 years from 1987-2006 from Puri district.

According to the latest Marine Fisheries Census conducted by the Department of Animal Husbandry, Dairying & Fisheries, Govt. of India and CMFRI (ICAR) in 2005, there are 9,972 fishermen families in Puri with 45,575 fisher population. Among the 13,854 adult males, 9,765 are engaged in full time active fishing, while 2,199 are parttime fishermen and 663 are occasionalists. Most of the full time active fishermen are from Pentakota and Chandrabhaga villages. 5,007 males and 5,360 females are involved in allied activities like marketing of fish, net making and repair, fish curing and processing, peeling and as labourers.

Peak marine fish landings of 23,101 tonnes were recorded in Puri district during 2006. The first sale value of this landings amounts to rupees 91 crores. Nearly 26% of the marine fish landings in Orissa is from Puri district.

Crafts

As per the Marine Fisheries Census 2005 Report of Orissa, there are 3,112 crafts in Puri district out of which 72 are trawlers, 223 gill netters, 2 liners, 11 others in the mechanized sector; 1,162 in the motorized sector constituting one fourth of Orissa state's motorized crafts, and 1,642 in the non-motorized sector. About 88% of the trawlers are owned by fisher folk. These trawlers are mainly operating from Nuagarh (Astarang) Fishing Harbour. They are engaged in multi-day fishing and single day fishing. The multi-day trawlers have 100-120 meter length with 100 hp engines. They operate mostly in

the depth zone of 20-50 m at a distance of 18-40 kms from the shore. These trawlers have 8-9 persons as crew. Duration of fishing trips range from 53-152 hours and actual fishing hours range between 25 and 90. The number of hauls per trip range between 9 and 32. The multi-day trawlers have a trawling speed of 2-5 km/h. Single day trawlers have 90-100 meters length with engine power in the range 62-72 hp. They operate at a distance of 10-22 kms from the shore in the 12-30 meters depth zone. The actual fishing hours is between 3-9 h. The number of crew is 5-6 and they take 2-3 hauls/trip.

Most of the gill netters (beach landing crafts) are concentrated at Pentakota and Konark landing centres. Pentakota, Kaliakona, Konark, Arkhakuda and Astarang are the major centres of motorized crafts. In all the other centres, non-mechanised crafts are in use. The motorized crafts have 6-20 hp Yamaha or Suzuki engines. Catamarans (*teppas*) are employed in the artisanal sector. The craft used for shore seine operation is Padava.

Gears

The major gears in operation are trawl nets, gill nets, drift nets, bottomset gill nets, hooks & lines and shore seines.

The only operating station of trawl nets is Nuagarh (Astarang) fishing harbour. Codend mesh size of the trawl nets is 20-25 mm. *Katla vala* operates during November-May period mainly for sardine fisheries whose mesh size is 2-3 cms. Shore seine operation is limited to Pentakota, Arkhakuda, Puri and Sanapatna (Manikpatna). During 2006, trawl nets contributed 26% of Puri's marine fish landings, followed by gill nets (26%), drift nets (15%), bottom set gill nets (7%), hooks & lines (24%) and shore seines (2%). The mechanized sector contributed about 27%, motorized sector about 68% and the remaining 5% of the landings was from the non-motorized sector.

Seasons

Ban on fishing from 15th April to 31st May, was imposed by the Government of Orissa since 2006. Trawlers from Nuagarh did not operate during the ban period. *Katla vala* were also not operated during third quarter.

The fishing season in Puri starts from July and ends in February. Hence this period is the most productive one. 40% of the average Puri landings during 2001-2006 was during the fourth quarter followed by first quarter (37%), third quarter (15%) and the lean period was the second quarter with an average of 8%. Trawlers were in operation throughout the year except during the ban period. Beach landing crafts were in operation during the first and second quarters. Shore seine operation using Padavas were restricted to the fourth and first quarters only.

From 1992 onwards the total annual landings of Puri were diminishing. The periods 1992-1996 and 1997-2001 coincided with an overall drop in the annual landings. Further, during that period the Astarang fishing harbour was damaged due to floods leading to crippled trawl operations. This is reflected in the poor trawl landings though the efficiency was more buoyant. The trawlers used the private jetty at Nuagarh which is 10 km away from Astarang. This jetty was later reconstructed as the new fisheries harbour during 1986-92 period. During 2002-2006, trawl landings substantially improved and reached 6077 tonnes in 2006.

Figure(1) depicts the relation between catch and catch/hour of trawl nets. During 1987-91 period, the catch/ hour was relatively high (about 92kg). The average landing was maximum (4,065 tonnes) during 2002-06 period even though the same level of exploitation was not possible due to lesser number of operations of the trawl units. During 2002-06 multiday operation was observed. The catch/hour for single day (105kg) operating trawlers was higher than that of multi-day trawlers (68kg).

Another regular fishery was by gill nets. In the mechanized and non-mechanized sectors, gill net landings took place during the entire period. Even though motorization of country crafts took place during 1986-87 period in Orissa, the same was reflected in Puri district landings only in 1989. From 1991 onwards an increasing trend was observed in fishing by

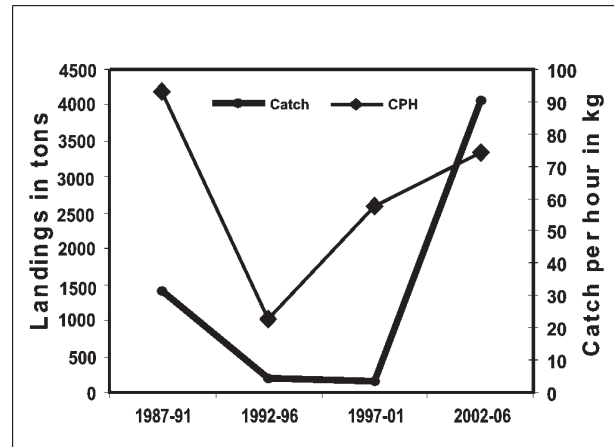


Fig 1. Trawlnet landings in Puri district

motorized crafts using gill nets and hooks & lines.

Catch/hour of gillnets was showing an increasing trend during 2002-06 (Fig-2). Even though the catch doubled from that of 1987-91 period, a similar hike was not seen in the case of catch/hour due to a slight fall in the average fishing hours in the same period.

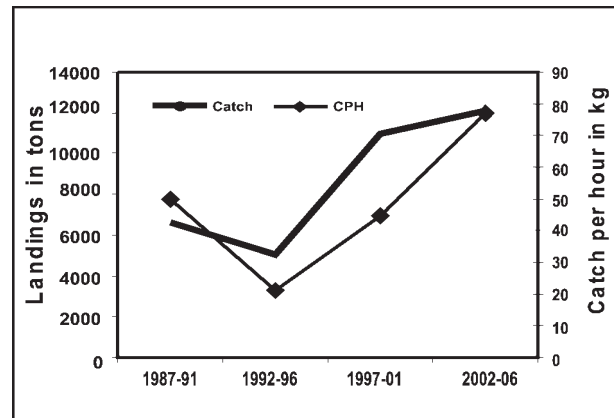


Fig 2. Gillnet landings in Puri district

In the hooks & line fishery (Fig. 3), while the average catch showed unsteady trends, catch/hour showed increase except during 1992-96 period. During later period catch and units showed a decrease with an increased rate of exploitation per hour.

Seine fishing was a regular phenomenon of the artisanal sector by boat seines and shore seines.

Resources

Cat fishes, croakers, carangids, clupeids, ribbon fishes, sardines, prawns, seer fishes, eels and pomfrets are the main resources available along Puri

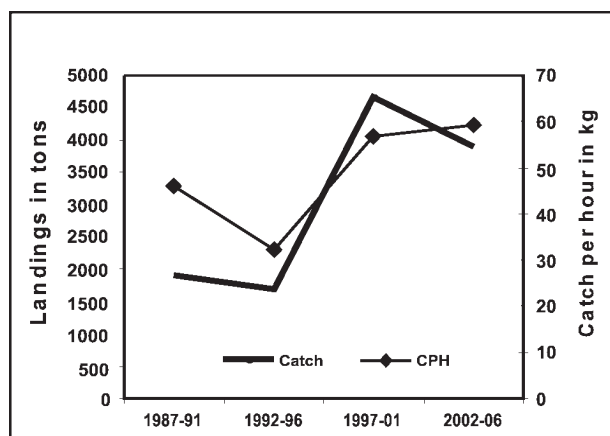


Fig 3. Hooks and lines landings in Puri district

coast in the order of abundance. 75% of the total cost realised from prawn fishery was by *Penaeus penicillatus* during 2006 whose contribution was 50% of the total prawn landings of Puri district.

There are 14 species of penaeid prawns in Puri waters. Out of the 1,444 tonnes, 716 tonnes was contributed by *P. penicillatus*, 176 tonnes by *Metapenaeopsis stridulans*, 126 tonnes of *Parapenaeopsis hardwickii* and 102 tonnes by *Metapenaeus affinis*. A table (Table 1) showing the different fin fishes and shell fishes with their landing centre prices during the year 2006 is given.

Table 1

Resources	Species name	Price range (Rs/kg) during seasons			
		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
ELASMOBRANCHS					
Sharks	<i>Carcharhinus sorrah</i>	15-40	20-40	20-40	15-30
	<i>Sphyrna lewini</i>				15-20
Rays	<i>Himantura bleekeri</i>				10-20
	<i>H.uarnak</i>	10-30	15-25	5-25	10-30
EELS					
	<i>Anguilla bicolor bicolor</i>	10-20	10-15	10-15	6-15
	<i>Muraenesox cinereus</i>	20-40	15-40	20-40	20-40
CATFISHES					
	<i>Arius tenuispinis</i>	10-30	10-40	15-30	10-40
CLUPEIDS					
Wolf herring	<i>Chirocentrus nudus</i>	15-50	20-40	8-40	15-60
Oil sardine	<i>Sardinella longiceps</i>				15-25
Other sardines	<i>S. fimbriata</i>	10-25	20-40	30-40	15-40
	<i>S.gibbosa</i>	10-25			20-40
Hilsa shad	<i>Tenulosa ilisha</i>		150-300	60-250	70-200
Other shads	<i>Tenulosa toli</i>	30-40			25-40
Anchovies					
Setipinna	<i>Setipinna taty</i>	10-30	6-40	5-30	8-30
Stolephorus	<i>Stolephorus devisi</i>	8-30			10-30
Thryssa	<i>Thryssa mystax</i>	6-40	20-40		20-30
Other clupeids	<i>Ilisha elongata</i>	20-70	30-70	20-60	20-60
	<i>I. melastoma</i>		30-50	30-80	
	<i>Raconda russeliana</i>	10-40	30-40	15-40	15-40
	<i>Anodontostoma chacunda</i>				15-20
BOMBAYDUCK					
	<i>Harpadon nehereus</i>			5-10	
HALF BEAKS & FULL BEAKS					
	<i>Strongylura strongylura</i>	10-40	30-40	30-45	30-40
	<i>Hyporhamphus limbatus</i>				30-35
PERCHES					
Rock cods	<i>Epinephelus chlorostigma</i>	20-60			15-40
Snappers	<i>Lutjanus johni</i>	40-70	30-60	30-60	20-40
Threadfin breams	<i>Nemipterus japonicus</i>	10-20			10-20
Other perches	<i>Pomadasyss hasta</i>	40-80		60-80	30-60
	<i>P. maculatum</i>				20-30
	<i>Pricanthus hamrur</i>				10-20
	<i>Drepane punctata</i>	5-10	6-10	5-15	6-12
	<i>Kurtus indicus</i>		20-30		15-30
	<i>Sillago sihama</i>	20-40	20-30		25-30
	<i>Terapon jarbua</i>	15-35	25-40		20-30
	<i>Upeneus vittatus</i>	10-35	8-30	10-30	10-30
GOATFISHES					
THREADFINS					
	<i>Eleutheronema tetradactylum</i>	25-50	20-40	30-60	20-60
	<i>Polynemus indicus</i>	20-40	20-30		20-40

Resources	Species name	Price range (Rs/kg) during seasons			
		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
CROAKERS	<i>Johnius carutta</i>	10-40	10-40	20-35	10-30
	<i>J.dussumieri</i>	10-40	10-40	10-40	10-40
	<i>Kathala axillaris</i>	20-40		20-35	
	<i>Nibeaa maculata</i>				20-40
	<i>Otolithes ruber</i>	20-50	20-50	20-50	20-50
RIBBON FISHES	<i>Trichiurus lepturus</i>	8-20	8-20	10-20	10-18
CARANGIDS					
Horse mackerel	<i>Megalaspis cordyla</i>	10-40	10-50	10-40	10-40
Scads	<i>Decapterus russelli</i>	20-50	30-40	30-40	20-30
Leather-jackets	<i>Scomberoides commersonianus</i>	10-40	10-50	15-50	10-40
Other carangids	<i>Rachycentron canadum</i>	10-25	15-20	10-20	
	<i>Carangoides armatus</i>				25-35
	<i>Caranx ignobilis</i>	10-40	10-40	10-40	10-40
	<i>Selar crumenophthalmus</i>	10-40			10-40
	<i>Coryphaena hippurus</i>				10-15
SILVERBELLIES	<i>Leiognathus bindus</i>	10-30		10-40	10-30
	<i>Secutor insidiator</i>	15-25			10-20
BIG-JAWED JUMPER	<i>Lactarius lactarius</i>	10-40	10-40	10-40	10-30
POMFRETS					
Black pomfret	<i>Parastromateus niger</i>	40-70	30-80		
Silver pomfret	<i>Pampus argenteus</i>	60-200	100-250	40-200	50-200
Chinese pomfret	<i>Pampus chinensis</i>			50-200	50-150
MACKERELS					
Indian mackerel	<i>Rastrelliger kanagurta</i>	10-40			20-40
SEERFISHES					
Narrow-barred Spanish mackerel	<i>Scomberomorus commerson</i>	70-120	70-110		80-130
Indo-Pacific Spanish mackerel	<i>Scomberomorus guttatus</i>	25-80	30-70	25-70	30-70
TUNNIES					
Little tunas	<i>Euthynnus affinis</i>	20-40	20-30		10-20
BILLFISHES	<i>Istiophorus platypterus</i>	10-15			10-15
BARRACUDAS	<i>Sphyrnaea barracuda</i>	10-40			
MULLETS	<i>Mugil cephalus</i>	40-120	40-100		60-70
FLATFISHES					
Soles	<i>Cynoglossus bilineatus</i>	3-15	6-15	5-15	5-12
CRUSTACEANS					
Penaeid prawns	<i>Solenocera crassicornis</i>	20-40		40-80	30-60
	<i>Metapenaeus affinis</i>	60-200	100-200	80-160	70-300
	<i>M.dobsoni</i>	60-100	60-100	60-100	60-100
	<i>M. monoceros</i>	100-200			80-200
	<i>M. lysianassa</i>	40-80			
	<i>Metapenaeopsis stridulans</i>	15-30	20-30	30-50	10-40
	<i>Parapenaeopsis hardwickii</i>	30-50	30-50	40-60	30-60
	<i>P. stylifera</i>	30-50	30-50	40-60	40-60
	<i>Parapenaeus longipes</i>	15-20	20-25	10-30	10-30
	<i>Penaeus indicus</i>	200-300	100-250	100-250	
	<i>P.japonicus</i>	150-250	150-250	150-200	150-250
	<i>P.penicillatus</i>	200-400		150-200	150-400
	<i>P.merguiensis</i>			180-300	200-350
	<i>P.monodon</i>	250-750	250-600	250-550	300-600
Non-penaeid prawns	<i>Acetes indicus</i>				10-15
	<i>Nematopalaemon tenuipes</i>	10-20	10-15		10-20
Crabs	<i>Portunus sanguinolentus</i>	8-30	10-30	10-40	10-30
Stomatopods	<i>Oratosquilla nepa</i>	4-10	4-10	5-10	6-10
MOLLUSCS					
Cephalopods	<i>Sepia aculeata</i>	20-40	15-35	20-30	20-35
	<i>Loligo duvaucelii</i>	10-20	10-15	10-15	10-20
MISCELLANEOUS	<i>Antennarius hispidus</i>				

More than 60 fin fish species and nearly 20 crustaceans including 15 prawns were found in Puri landings during 2006.

The first sale value of *P. monodon* was in the range Rs. 400-500/- per kg., and during 2006 the amount realized from this particular species was more than 64 lakh rupees (Table 2). The landing centre

Table 2
Landings of prawns during 2006

Name of Species	Landings (kg) Trawl net	Bottom set gillnet	Gillnet	Price (Rs. In lakhs)
<i>Metapenaeus affinis</i>	88,772	9,223	3,929	149.1
<i>M.dobsoni</i>	87,111	0	491	70.1
<i>M. lysianassa</i>	280	0	0	0.2
<i>M. monoceros</i>	41,593	0	0	60.3
<i>Metapenaeopsis stridulans</i>	175,857	0	0	49.5
<i>Parapenaeopsis hardwickii</i>	126,348	0	0	55.3
<i>Penaeus indicus</i>	9,015	0	0	18.0
<i>P.japonicus</i>	23,362	0	0	45.3
<i>Parapenaeus longipes</i>	37,532	0	0	7.5
<i>P.merguensis</i>	424	5,516	1,586	19.4
<i>P.monodon</i>	12,378	2,170	0	64.6
<i>P.penicillatus</i>	16,299	700,136	0	1791.1
<i>P. stylifera</i>	31,505	0	0	14.2
<i>Solenocera crassicornis</i>	66,794	0	0	30.1
Others	285	4,014	0	
Total	717,555	721,059	6,006	2374.4

price of *M. dobsoni* was consistent throughout the year with an average Rs. 80/-per kg. Prices of *Johnius dussumieri*, *Otolithes ruber* and *Caranx ignobilis* were also consistent throughout the year.

P. merguensis and *P. penicillatus* were mainly caught by bottom set gill nets whereas all the other varieties were the main stay of trawl nets.

Catfishes, eels, sharks, perches, carangids, seer fishes and tunnies were the main resources found in the hooks & lines catches. Prawns, big jawed jumper, ribbon fishes, croakers, clupeids and cat fishes were found in good quantities in trawl catches. Wolf herring, anchovies, other sardines, other clupeids, horse mackerel, pomfrets, seerfishes, mullets and crabs are maximum in drift/gill net catches.

Scomberomorus commerson, *S. guttatus*, *Ilisha elongata*, *I. melanostoma*, *Lutjanus johni*, *Formio niger*, *Pomadasys hasta*, *Epinephelus chlorostigma*, *Pampus argentus*, *P. chinensis*, *Mugil cephalus*, *Tenualosa ilisha*, *Eleutheronema tetradactylum*, *Chirocentrus nudus* are the commercially important fish species. *Arius tenuispinis* is the only cat fish available in Puri district.

Fishing was interrupted by heavy rains and cyclonic weather conditions every year. In almost all months, juveniles of penaeid prawns like *Parapenaeus longipes*, *Metapenaeopsis stridulans*, non-penaeid prawns like *Nemato-palaemon tenuipes* and pomfrets were found in trawl catches at Nuagarh landing centre.