

A PRELIMINARY STUDY OF THUKRI NET FISHERY AT SONMIANI BAY

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ABSTRACT

Key-words:

INTRODUCTION

Balochistan coast extends about 772 km between the Hub river in the east and border of Iran in the west. The coast may be characterized by a bay, the "Sonmiani Bay", backed by a lagoon called the Miani Hor (1,600km²) (Fig-1). The lagoon displays a variety of geomorphic and biological features which are very important for the ecological study of the coast. The coastal area of Balochistan is known to have a well diversified marine fauna and flora. The fish fauna is also diverse and more than 500 fish species, 12 of squids/cuttle fish/ octopi, 5 species of lobsters and 5 species of shrimp are recorded. The main resources of Balochistan have not been fully exploited except for fish. The total fish production of Balochistan coast during the period from 1991-to-2002 showed steadily increasing trend. The production increased from 107081mt, to 123000mt in 2000. The rate of increase was 1.47% per year (Table-1). In the year 2000, fish and fishery export products of 84.693mt, a valued of Rs. 7.878 billion were exported from Pakistan. During the year 2000 out of total production, 123000mt (25.9%) were contributed by Balochistan (Source: FAO & M.F.D. 2001). In addition the total marine resources of Pakistani water is estimated to be about 600,000 mt/year, out of which inshore waters are 500,000 mt and offshore water (EEZ) are 100,000 mt approximately. (Source: Kazmi, in press). However, technology for resource harvesting and utilization has yet to be developed on scientific basis and viable scale.

Table 1. Production of fish from Balochistan in metric tons (from 1991 to 2000)

Year	Balochistan Coast	EEZ	Total (mt.)
1991	107081	6360	113441
1992	112253	25338	137591
1993	119794	30677	260471
1994	123108	49693	172801
1995	122515	2221	124736
1996	125099	2457	127556
1997	130406	6028	136434
1998	130799	7009	137808
1999	123073	18545	141618
2000	123000	18500	141500

Source: FAO & MFD, 2001.

The Sonmiani Bay is one of the important fish-landing centre, comprising of three main villages. (Sonmiani, Damb and Bhira) These three villages have a diverse ethnic background. The population of these villages are approximately 3,000, 6,000 and 1,000 people respectively.

The Thukrinet fishery is well developed and it has now spread through out Balochistan coast, because of its high earning capacity and environmental friendliness. It is generally used by traditional fisherman because it is comparatively cheaper and operated by small sized boat known as "Hora". With registered at Damb are 320 in numbers. (Source: C.B.O. at Dam). In fact Thukri is mainly employed for catching shrimp, the valuable category of fishery resources with by-catches of some commercially important fin-fish and shell-fish resources. Informations on number of the units in operation, the fishing effort and production etc., of this fishery are not available except in some papers, (Khan, 1944; Khalil-uddin, 1955; Qureshi, 1952 & 1954; Anonymous 1955; Moinuddin *et al.* 1962;

Anonymous, 1978 and Vanzaling *et al.*, 1982). Few more informations on resources at Miani are also available, first report on the shrimp population from Miani Lagoon is of Ahamd and Ayob (1996) and another by Ahmad and Abbass (1999).

The present study of Thukrinet fishery of Sonmiani is based on the available research data for one year complete fishing session, from September 2000 to April 2001. Since the study is underway the preliminary investigations are presented in this paper.

METHODS:

The Fishing Gear (Thukri)

Thukri net is one of the most frequently used fishing nets on the coasts of Balochistan. The Thukri fishery perhaps about 100 years ago operated in the Mediterranean sea was introduced in Arabian sea about 2-3 decades ago (Islam, 1988). Thukri net is locally made by fishermen from nylon and polythelene with a length of 180-190 meters, and 1.5-2.0 meter width. It is large wall-like net and are hung like vertical curtains of netting below the surface of water with the help of floats. The mesh sizes classified accordingly by local fishermen as punjpai, hasthpai, and dahpai. A complete Thukri net generally consists of 4-6 pieces with a weight of about 20-25 kg. Each net costs of Rs. 4500 to Rs.5000. The average life of thukri net is about one year, with regular maintenance (**Fig. 2**).

The Fishing Craft

The Thukri net is generally operated from small sized boats "Hora" which are propelled by long tail out-board motors of 6-10. H.P.engine. The length of the boat for this fishing are from 17-45 feet, and breadth of 5-8 fees. The price of the Hora varies between 1.0 lac to 1.5 lacs and its average life span is 8-10 years, subject to maintenance.

Sampling Programme

Biological sampling of the catch by Thukri nets was conducted fort-nightly at the Dam landing centre, for catch rate, catch composition and size ranges of 5 major shrimp groups and fin fishes. Information regarding economic aspects of the fishery was collected with the help of specially prepared questionnaires used while interviewing the fishermen.

Biological sampling began in September 2000 and continued till April 2001 following the lunar calendar and the Thukri net survey schedule. There was no fishing on the scheduled sampling days in May, June, July and August due to rough weather conditions and ban period imposed by the Fisheries Dept. Govt. of Balochistan.

Identification of Species

For identification purpose, identification sheets by FAO of Bianchi and Munro (1955) were consulted.

RESULTS:

Fishing Area and Operation

In Sonmiani the Thukri net operated in the shallow coastal areas at depths of 8-20 meters and about 5-20 km away from the coast. The area of operation depends on seasonal conditions. It is observed that the fishermen sail out in the early morning and often return in the afternoon.

The Thukri net fishing is mainly confined within the Sonmiani, where the fishing centres like Hadi, Wanti, Bera, Hen, Ken and Duni are close to each other (**Fig. 1**). However during winter when sea is calm, operation outside the lagoon is also done but it is preferred to fish near the Sonmiani Bay at Kurputte, Wadi Bender and Zeree.

Fishing Effort

All the Thukri nets are not operated every day due to various reasons, mostly depending on tides, climatic condition, season and technical reasons. The minimum number of boats are operated or fishing is avoided during the rainy season or when the winds are strong. While, the maximum number is recorded in winter when the sea is calm. Thus the number of fishing days in a month depended on both the catch rate and seasonal changes in sea condition. The soaking time was 4-6 hours/day.

The fishermen operated Thukri net for about 160 days (20days/month) during eight active fishing months and the total Thukri net fishing effort was estimated to around 51,200 (160 x 320) boat-days/year. The maximum fishing effort was during September and the lowest in April.

Table 2. Penaeid shrimps caught from sonmiani, during the study period.

SPECIES	LOCAL NAME	ENGLISH NAME	AVERAGE SIZE (mm)
<i>Fenneropenaeus merguensis</i>	Jaira	Banana shrimp	160-200
<i>F. penicillatus</i>	Jaira	Red tail shrimp	155-190
<i>Metapenaeus affinis</i>	Kalari	Jhinga shrimp	120-150
<i>M. stebbingi</i>	Kalari	Peregrine shrimp	90-120
<i>Parapenaeopsis stylifera</i>	Kidi	Kidi shrimp	100-120

Table 3. Catch of fish species with local/english names, collected by Thukri-net from September, 2000 to April, 2001 at Sonmiani.

S/NO	LOCAL NAME	ENGLISH NAME	FAMILY	GENUS/SPECIES
1	Bothan	Electric Ray	Torpedinidae	<i>Narcine brunnes</i>
2	Bhambor	Lady Fish	Sillaginidae	<i>Sillago sihama</i>
3	Bungro	Scade/Travelly	Carangidae	<i>Decapterus russeli</i>
4	=	=	=	<i>D. macrosoma</i>
5	Chuki	Tuna/Mackerel	Scombridae	<i>Auxis thezard</i>
6	Dhother	Grunt	Pomadasyidae	<i>Pomadasy maculatam</i>
7	=	=	=	<i>P.hasta</i>
8	=	=	=	<i>P.kaahan</i>
9	Hajjam	Indian halibut	Psettodidae	<i>Psettodes erumil</i>
10	Jirkani	Tooth Pony	Leiognathidae	<i>Gazza minute</i>
11	Kanteri	Pony Fish	=	<i>Secutor insidiator</i>
12	Kissi	Sea Bream	Sparidae	<i>Mylio latus</i>
13	=	=	=	<i>Rhabdosaryus sarba</i>
14	=	=	=	<i>Lithrinus nebulosus</i>
15	Karo-Pitho	Black Pomfret	Carangidae	<i>Formio niger</i>
16	Kukker	Flat-Head	Platycephalidae	<i>Cociella crocodila</i>
17	Kango	Gar-Fish	Belonidae	<i>Thylosurus crocodilus</i>
18	Kagga	Sea Cat-Fish	Ariidae	<i>Arius maculates</i>
19	Mangra	Shark Hard Fish	Carcharhidae	<i>Carchahrinus macloti</i>
20	Mangra	Spade Nose	=	<i>Scoliodon</i>
21	Mushka	Croaker	Sciaenidae	<i>Johnius elongate</i>
22	=	=	=	<i>J.carutta</i>
23	=	=	=	<i>Otolithes rubber</i>
24	=	=	=	<i>O.cuvieri</i>
25	Mori/Murbo	Mullet	Mugilidae	<i>Liza vaigiensis</i>
26	=	=	=	<i>L.subviridis</i>
27	Paddane	Anchovy	Engrulidae	<i>Thrissocles malabarica</i>
28	Paddane	Anchovy	=	<i>T.hamiltoni</i>
29	=	=	=	<i>Coilia dussumieri</i>
30	Palli	Shad	Clupeidae	<i>Hilsa toil</i>
31	=	=	=	<i>Hilsa kelee</i>
32	Pittan	Sting Ray	Dasyatidae	<i>Himantura uarnak</i>
33	Talwar/Chind	Hair Tail Fish	Trichiuridae	<i>Trichiurus lepturus</i>
34	Sole/Swasoo	Sole	Soleidae	<i>Solea elongate</i>
35	=	=	=	<i>Zebrias synapturidis</i>
36	=	=	Cynoglossidae	<i>Cynoglossus bilineatus</i>
37	=	=	=	<i>C.praeusteus</i>
38	Toto	Puffer-Fish	Tetraodontidae	<i>Tetrosomus gibbosus</i>

Catch Composition

In all 5 species of Penaeids, namely *Fenneropenaeus merguensis*, *Fenneropenaeus penicillatus*, *Metapenaeus affinis*, *Metapenaeus stebbingi*, *Parapenaeopsis stylifera* are present in catches in the order of abundance. In *Metapenaeus* population some specimens resist specific identification. A detail study is required to determine the species. Percentage of different species of Shrimps, with average length is given in Table-2.

Among the by-catches, 38 species of fin fishes are collected by Thukri net during survey period, given in table-3, of these Anchovies (Paddane) of the family Engraulidae were first in abundance (19.5%), the croakers (Mushka) of family Scianidae occupied the second position amounting to (14.5%), followed by Grunts (Dother) of family Haemulidae (11.8%).

Catch Rate

The catch rate of shrimps was maximum in the month of September i.e. 18.5 kg/boat/day and minimum in April 0.5kg/boat/day. The catch rate of shrimp species month-wise is shown in **figure-3**.

The catch rate of fin fishes varied from a minimum of 0.5kg/boat/day in the month of March to a maximum of 45.kg/boat/day in the month of September. The month-wise catch rates of the fin fishes are given in the figure-4.

Production

The production by the Thukri net of the penaeids for one year fishing season, were (5 x 160) estimated at about 600 kg to 700 kg/boat/year and of fin fishes (by-catches) were at about 3840 kg/boat/year.

DISCUSSION AND CONCLUSION:

The results of the catch composition of shell fish and fin fish is somewhat similar to that of the earlier studies made by Ahmed and Ayob (1996) and Ahmed *et al.*, 1999.

Specimens of shrimps and finfish collected fortnightly from the Sonmiani were examined. The shrimps were found to belonging to the species *Fenneropenaeus merguensis*, *F. penicillatus*, *Metapenaneus affinis*, *M. stebbingi* and *Parapenaeopsis stylifera*. The most abundant species in the catch was *F. merguensis* which comprised about 80% of the total catch. The present study showed that the *F. penicillatus* is the second most abundant penaeid found in the Miani Hor (Sonmiani).

The survey also shows that a large number of finfish species are present in the Miani lagoon, many of which are economically important. The important commercial species collected belonged to the genera *Thryssa*, *Johnius*, *Pomadasys*, *Solea*, *Sillago* and *Liza*. It was also noted that as the by-catches the finfishes were significantly higher in abundance compared to other animal-groups collected from Sonmiani. The climate and normal salinity condition seems to be favorable for finfish to live in the lagoon.

The catch of present study shows that the genus *Thryssa* was first in numerical abundance (19.5% of total catch). The results matches with the investigations on *Thryssa* spp which is reported to be frequently caught along the entire coast of Pakistan. Zupanovic and Moinaddin (1973) and Anonymous (1978) found *Thryssa* to be abundant in all depths.

Most shrimp and finfish caught exhibited more or less same size ranges and same predominant age classes. They were mostly sub-adults and mature individuals. The penaeid shrimp caught by this net were on an average, fairly large in size and contained much less juveniles and immature individuals, compared to other gears.

The Thukri net operated in Sonmiani seems to be more efficient and economical gear for bays and inshore fisheries. As the most catches are subadult and adults of selected species of shrimps and finfish, hence this type of artisanal fishery does not seem to be destructive to the shrimp and finfish stocks. It would appear that the Thukri net is selective gears and friendly to environment.

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