

Baseline Survey of Fish Diversity at Miani Hor, Balochistan



Report submitted by
Center of Excellence in Marine Biology
University of Karachi
to
Pakistan Wetland Programme
Principal Investigator
Prof. Dr. Pirzada Jamal Siddiqui
Co-investigators
Shabir Ali Amir

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SUMMARY

The aim of this study was to encompass the diversity of fin-fish species of Miani Hor. The area is ecologically very important and comprises of number of habitats (creak areas having mangrove forest, sand-dunes, open sea) as well as support number of economical activities. In January 2011, four days survey of Miani Hor was conducted. The information gathered regarding fishing activities, finfish species diversity and the target species of fishermen for different seasons. The main emphasis was to record all finfish species of the area. General information regarding fishermen population, number and type of fishing boats, gears, market prices of commercially important fish species were also noted.

The information revealed that the fishing activities at Sanmina are going on throughout the year except June and July due to harsh weather condition in the Arabian Sea, the operation of fishing crafts & gears not viable. Two major types of fishing crafts are used in fishing activities, the larger boats (12-15m LOA) that catch mostly sardines, mainly used in fishmeal production whereas smaller and medium boats (6-11m LOA) catch mix fishes, shrimp, crabs and small fishes for fishmeal. The common fishing operates in Sonmiani area are Qatra (Purse-seine net), Kaada (beach-seine net), Thukri (small mesh-size entangle-net for shrimp), Ruch (gillnets for fish) and Goal-jal (castnet) while handline and longline (Sungle, Dori) are also in practiced. Numbers of commercially important fish species are landed at Sonmiani. The abundant species were Sardines (*Sardinella longiceps*, *Escualosa thoracata*), Mulletts (*Mugil cephalus*, *Liza carinata*, *Liza subviridis*, *Valamugil cunesius*), Carrangids (*Trachinotus blochii*) and Sparids (*Sparidentex hasta*, *Acanthopagrus latus*, *A. berda*) Somiani. Some species were common like crockers (*Jhoniops sina*, *J. belengeri*) catfishes (*Arius maculatus*, *A. arius*), white pomphret (*Pamphus argentius*) ladyfishes (*Sillago sihama*) electric-ray (*Narcine timely*). During this study a list of 96 fish species are reported from Miani Hor area with their family, common name and local name.

1. INTRODUCTION

Pakistan has considerable maritime zone, influenced by atmospheric forcing and reversing monsoons resulting in the strong seasonal variability in its oceanographic conditions and thus Pakistan's coastal waters appear to be an ideal place to understand the link between climatic oscillations and community structure of highly diverse marine flora and fauna. A multidisciplinary research approach is required to explore the natural resources of the Arabian Sea.

Placed in the northwestern part of Indian Subcontinent, Pakistan borders the Arabian Sea with a sizeable coastline running for approximately 990 km in the east-west direction. Nearly 320 km of this seashore falls in the province of Sindh whereas the rest of 670 km constitute the Makran coast. The Exclusive Economic Zone, that stretches 200 nautical miles seaward from the coast, provides 240,000 km² area of the Arabian Sea for exploitation of the renewable and non-renewable resources, on which coastal population of the Sindh and Balochistan provinces largely depend for their livelihood. The coastline of Pakistan exhibits a number of wetland areas supporting biodiversity and has direct or indirect impact on marine life and coastal communities. Life inhabiting coastal wetlands includes endangered, endemic, threatened and commercially important forms.

Miani Hor is among the potential fish landing site, comprises of the following fishing villages that are Dam Bunder, Miani Hor, Bhira & Baloch Goth. These are all coastal villages, mainly dependent on fisheries and the total population of these areas were recorded 11678 for the year of 2004 (WWF, 2005). The estimated current population for the year 2010 of Miani Hor area is over 13000 according to population growth rate

(2 % annually increase) of Pakistan. It is also known that the population of these areas is rather increased during fishing season for temporarily employment.

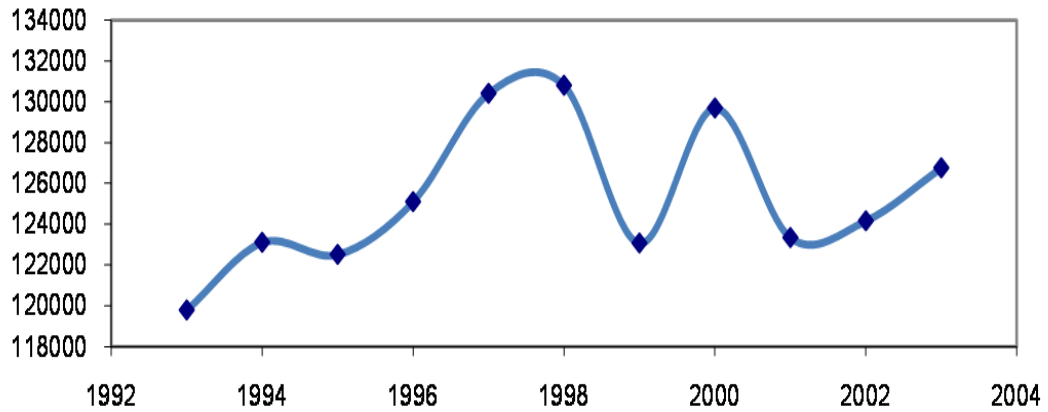


Figure 1. Marine fish (fish and shell-fish) landing in Metric tons at Balochistan coast for the year 1993-2003 (Anon. 2006)

Fishing activities of Miani Hor is considered as small scale or artisanal and wooden boats are mostly used in fishing operation. All fishing gears are operated manually. Before the involvement of synthetic fishing gears and operation of mechanized boats the fisheries resources were high for procuring livelihoods of fishermen. Now the competition for catch has increased many folds and now fishermen using more effective gears like Qatra (Purse seine net), Kadda (beach seine net or dragnet) and Plastic Ruch (Thukri) to meet their livelihood and for better income. Several of these types of efforts are considered as illegal fishing practices which are banned in other coastal areas of Balochistan. This is an alarming issue with respect to the conservation of biodiversity and fisheries products for future generations. In 2003, the reported catch from Miani Hor area was 11,000 metric tons which is 9% of the total catch of Balochistan coast (Shah and Jusoff 2007).

The aim of this study is to encompass the diversity of fin-fish species of Miani Hor. This will broaden our knowledge regarding the biodiversity of coastal areas, helpful

in the development of management measures for fisheries sector (fishing activities, policy, management etc) of Pakistan.

2. STUDY METHODS

2.1 Area Description

Miani Hor is about 90 km from Karachi and located at 25° 15' 0'' N, 66° 30' 0'' E. Total area of Miani Hor is about 55,000 ha. Miani Hor is the only area where three species of mangroves (*Avicennia marina*, *Rhizophora mucronata* and *Ceriops tagal*) occur naturally. The fresh water input from a number of seasonal rivers e.g. Porali and Winder feeds Miani Hor. Sandy beaches, tidal flats and creeks are the main features of the area (Figure 2). These habitats serve as a bank of biological diversity and life varies from tiny planktons to large mammals (dolphins).



Figure 2. Map of the Miani Hor showing study sites.

2.2 Sampling Procedure

In January 2011, four days survey of Miani Hor was conducted to gathered information regarding species diversity of fin-fish and fishing activities of the area. General information regarding the type of fishing crafts, gears, commercially important fish species and by-catch were also noted.

Information on the fishing activity, types of net being used etc. was gathered by questioning fishermen involved in fishing activities at Miani Hor. The daily activities of the fishermen were also recorded in peruse of threats of marine environment like destructive fishing practices and problems facing the local fishermen.

Fishes observed /collected during the survey at Miani Hor were identified up to species level with the help of recent available keys (Bianchi, 1985 and Carpenter *et al.*, 1997). Photographs of fishes were also taken where possible. With the help of literature a list of finfish species (scientific, common and local name) was prepared.

3. RESULT & DISCUSSION

Miani Hor is located in Lasbela District on Mekran Coast of Pakistan. Three coastal villages' viz. Dam, Sonmiani, and Bhira/ Baloch Goth are associated with Miani Hor. The populations of these areas are largely dependent on coastal resources while fishing has been the main occupation of this area throughout history, about 90% of the male are fisher or attached in fisheries related activities. The data of Fisheries department of Balochistan categorized the fishermen population as full time fishermen 3,320, part time fishermen 1490 and 800 occasional fishermen, after computing of all figures the total number of fishermen population of Miani Hor was 5610 for the year of 2003. During 2006 it increased little bit as 3501 fulltime, 1570

part time, 870 occasional and the total fishermen population was 5893. The following figure no. 3 shows graphical representation of total number of fishermen population for the year of 2006 for Balochistan coast.

3.1 Fishing crafts of Miani Hor

Various kinds of traditional and modern fishing crafts are in practiced in Miani Hor areas to capture finfishes and shellfishes. These crafts are ranging from small sail boats (6m LOA) to a large purse seine net operator (15m LOA). These crafts are mostly wooden in construction and locally known Hora while few numbers of altered Fiberglass boats are also used in fishing and locally recognized as Dhonda. According to BFD the number of mechanized boats having inboard engine were 104, outboard engine 672, life boats (altered Fiberglass boats) 42 and 3 sail boats that were registered from Miani Hor area during 2003.

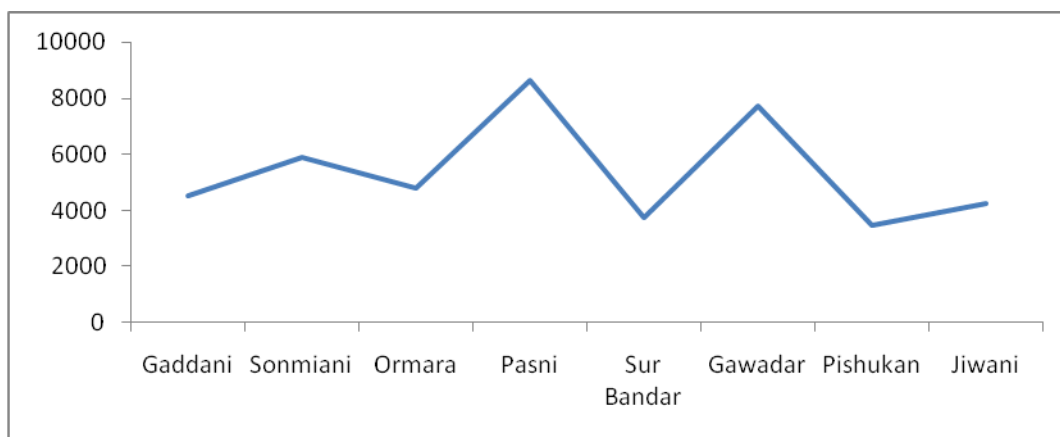


Figure 3. Fishermen population of Miani Hor & other coastline of Balochistan for the year of 2006 (source BFD)

The total number of boats increased up to 856 for the year of 2006 according to BFD. The figure number 4 shows graphical representation of total number of fishing boats of Balochistan Coast during 2006.

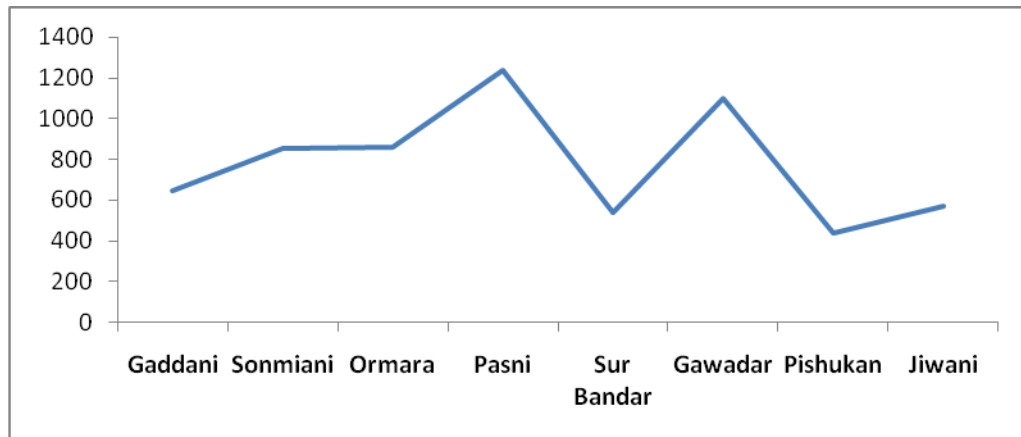


Fig.4. Graphical representaiopn of Fishing boats at Miani Hor and other coastal area of Balochistan

3.2 Fishing gears of Miani Hor

Number of fishing gears is in operation in Sonmiani areas that are ranging from simple hook & line to large seine net. But the most common and popular fishing gears are Thukri (entanglement gear for shrimp) and Qatra & Kadda (Purse seine and beach seine net) while number of other fishing gears like Ruch (gillnet), Dak net (large mesh size for Sua) Mori thukri (gillnet for mullet), Patri thukri (crabs entangle net), Jarri (cast net), Sungle (longline), Dori (handline) are also use in daily fishing activities according to target fish species. These gears are locally assembled from fishing gear netting and materials available in the market.

3.3 Fishing Activities at Miani Hor

The information revealed that the fishing activities of Miani Hor can be categorized into two major categories, one is carried out through larger boat ((12-15m LOA) having 40-70 crews on board and operate big Qatra net (purse-seine net) and the other one use small boats (6-11mLOA) to operate Kada (beach aseine net), Thukri (shrimp entanglement net), Ruch (gillnet) and line gears. Operation of Qatra and Kadda net were continued during present survey period and mostly sardines were caught which

are mainly used in fishmeal production. Thukri and Ruch were also being used by small boats and catching shrimp, crabs and mix fishes were caught. Figure 5 a-c shows a larger boat (Hora), their catch (Sardines) and large net (Qatra). Figure 6 a-d shows a smaller boat (Yakdar) and their catches (white sardines and pomphrets).



a



b



c

Figure 5. a) A large Hora Boat, loaded with Qatra net (seine net) and crews b) Catch of Qatra net c) Mending of Qatra net at Miani Hor



a



b



Figure 6. A small Yakdar Boat, loaded with kaada (beac-seine net) b) Catch of Kaada
 c) Transportation from boat to Market d) Holding of catch for fish exporter

Fishing is almost continued throughout the year except in June -July, Where as a good fishing season starts from August to October. June, July and August is considered as off-season due to harsh weather condition in the Arabian Sea and shrimping is also banned during June and July. Some fishing activities may carry on in creek areas for finfish.

3.4 Production of fish at Miani Hor

The fisheries data shows that more than 300 hundred fish species has been reported in off and on fish-landing at Dam, Miani Hor, but no reference is available. During this survey only 96 species were recorded. Abundant species were sardines (*Sardinella longiceps*, *Escualosa thoracata*), mullets (*Mugil cephalus*, *Liza carinata*, *Liza subviridis*, *Valamugil cunesius*), carrangids (*Trachinotus blochii*) and sparids (*Acanthopagrus latus*, *A. berda*,. Some species were common like crockers (*Jhoniops sina*, *J. belengeri*), catfishes (*Arius maculates*), white pomphret (*Pamphus argentiis*), ladyfishes (*Sillago sihama*) and electric-ray (*Narcine timely*) (Figure 7). Production of fishes during the year of 2010 was 3390.09 metric tons comprise of 1227.29 (36.20%) fish, 62.800 (1.852%) shrimp & lobsters and 2100.00 (61.945%) trash-fish (Gund) use in fishmeal production.

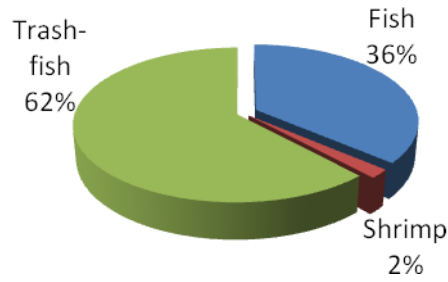


Fig.7. Miani Hor Fish production Pie chart for the year of 2010

3.5 Finfish Diversity along Miani Hor

List of fish species observed in the present survey and from the literature was prepared and presented as Table V. The total number of finfish species of Miani Hor area was 96 and common name is also given for each species.

Table I. Finfish species of Miani Hor. ODS= observed during survey under report.

S. No	Species	Family	English name	Local name	Source
1	<i>Albula vulpes</i>	Albulidae	Bonefish, ladyfish	Viat	ODS
2	<i>Arius maculatus</i>	Ariidae	Spotted catfish	Kun, Gullo	ODS
3	<i>Arius tenuispinis</i>	Ariidae	Thinspine catfish	Kun, Gullo	ODS
4	<i>Arius thalassinus</i>	Ariidae	Giant catfish	Kun, Gullo	ODS, Dr. Fridtjof
6	<i>Ancharius brevibarbis</i>	Arridae			Dr.Fridtjof
7	<i>Strongylura strongylura</i>	Belonidae	Banded needlefish	Aabre, Aalore	ODS
8	<i>Pseudorhombus arsius</i>	Bothidae	Largetoothed flounder	Swaso	ODS
9	<i>Alepes djedaba</i>	Carangidae	Shrimp scad	Bangra,	ODS
10	<i>Carangoides chrysophrys</i>	Carangidae	Longnose trevally	Bangra, kakkar	ODS
11	<i>Caranx sexfasciatus</i>	Carangidae	Bigeye trevally	Bangra, kakkar	ODS
12	<i>Caranx para</i>	Carangidae	Banded scad	Bakko	ODS
13	<i>Scomberoides commersonianus</i>	Carangidae	Blacktip leatherskin	Aal,Saram	ODS
14	<i>Scomberoides tol</i>	Carangidae	Slender qeenfish	Aal, Saram	ODS
15	<i>Trachinotus bailloni</i>	Carangidae	Small spotted dart	Sonaf	ODS

16	<i>Trachinotus blochii</i>	Carangidae	Snubnose pompano	Sonab	ODS
17	<i>Trachurus indicus</i>	Carangidae	Arabian scad	Seem, Chum-ma	ODS
18	<i>Parastromateus niger</i>	Carangidae	Black pomfret	Kala-poplet	ODS
19	<i>Chirocentrus dorab</i>	Chirocentridae	Dorab wolf herring	Pashant	ODS
20	<i>Chirocentrus nudus</i>	Chirocentridae	Whitefin wolf-herring	Pashant	ODS
21	<i>Nematalosa nasus</i>	Clupeidae	Kelee shad	Kolgar	ODS
22	<i>Sardinella gibbosa</i>	Clupeidae	Goldstipr Sardine	Lugger, Luar	ODS
23	<i>Sardinella longiceps</i>	Clupeidae	Oil Sardine	Lugger, Luar	ODS
24	<i>Dussumieria acuta</i>	Clupeidae			Dr.Fridtjof
25	S. gibbosa	Clupeidae			Dr. Fidtjof
26	<i>Anodontostoma chacunda</i>	Clupeidae	Shortnose Gizzard Shad	Goi	ODS
27	<i>Ilisha megaloptera</i>	Clupeidae	Bigeye ilisha	Bee-chum	ODS
28	<i>Opisthopterus tardoore</i>	Clupeidae	Tardoore	Portuk	ODS
29	<i>Cynoglossus arel</i>	Cynoglossidae	Largescale Tonguesoles	Munsa swasoo	ODS
30	<i>Cynoglossus puncticeps</i>	Cynoglossidae	Tonguesoles	sole	ODS
31	<i>Cynoglossus bilineatus</i>	Cynoglossidae	Tonguesoles	Munsa swasoo	ODS
32	<i>Dasyatis zugei</i>	Dasyatidae	Stingrays	pittan	ODS
33	<i>Himantura walga</i>	Dasyatidae	Stingrays	pittan	ODS
34	<i>Drepane punctata</i>	Drepanidae	Spotted batfish	Rupichand	ODS
35	<i>Drepane longimana</i>	Drepanidae	Batfish	Rupichand	ODS
36	<i>Coilia dussumieri</i>	Engraulidae	Dussumier's flag-tail anchovy	Patia	Collected through GNO
37	<i>Thryssa dussumieri</i>	Engraulidae	Thryssa	Padni	Dr. Fridtjof
38	<i>Thryssa hamiltonii</i>	Engraulidae	Thryssa	Padni	ODS
39	<i>Gerres filamentosus</i>	Gerreidae	Long-rayed silver-biddy	Jerkeri	ODS
40	<i>Gerres oyena</i>	Gerreidae	silverbiddy	Jerkeri	ODS
41	<i>Bolephthalmus dusumeri</i>	Gobiidae	Mud skipper	-----	ODS
42	<i>Plectorhinchus gibbosus</i>	Haemulidae	Black sweetlip	Dhotri-gisser	ODS
43	<i>Pomadasys kaakan</i>	Haemulidae	Grunter	Kumpo	ODS
44	<i>Pomadasys maculatum</i>	Haemulidae	Saddle grunt	Tantar	Dr. Fridtjof
45	<i>Pomadasys olivaceum</i>	Haemulidae	Olive grunt	Kumpo	ODS
46	<i>Pomadasys stridens</i>	Haemulidae	Striped grunt	Kumpo	ODS
47	<i>Pomadasys argenteus</i>	Haemulidae	Silver grunt	Kimpo	ODS
48	<i>Hyporamphus limbatus</i>	Hemiramphidae	Congaturi halfbeak	Thute	ODS

49	<i>Hemiramphus far</i>	Hemiramphidae	Blackbarred halfbeak	Thute	ODS
50	<i>Lactarius lactarius</i>	Lactariidae	White milkfish	Bukko	Dr.Fridtjof
51	<i>Gazza minuta</i>	Leiognathidae	Toothpony	Neela punto	Dr.Fridtjof
52	<i>Leiognathus equulus</i>	Leiognathidae	Common Ponyfish	Kaanteri	ODS
53	<i>Leiognathus blochii</i>	Leiognathidae	Ponyfish	Kaanteri	ODS
54	<i>Secutor insidiator</i>	Leiognathidae	Pugnose ponyfish	Kaanteri	ODS
55	<i>Lethrinus nebulosus</i>	Lethrinidae	Emperors	Mulla	ODS
56	<i>Lutjanus johnii</i>	Lutjanidae	John's snapper	Hira	ODS
57	<i>Lutjanus argentimaculatus</i>	Lutjanidae	Mangrove red snapper	Hira	ODS
58	<i>Megalops cyprinoides</i>	Megalopidae	Tarpon	Kinarhal	ODS
59	<i>Liza subviridis</i>	Mugilidae	Green back mullet	Chhodi	ODS
59	<i>Liza melinoptera</i>	Mugilidae	Large scale gery Mullet	Boi, Mori	ODS
60	<i>Liza carinata</i>	Mugilidae	Keeled mullet	Boi, Mori	ODS
61	<i>Mugil cephalus</i>	Mugilidae	Large scale mullet	Pharra, Boi	ODS
62	<i>Valamugil cunnesius</i>	Mugilidae	Long arm mullet	Pharra, Boi	ODS
63	<i>Valamugil speigleri</i>	Mugilidae	Speigler's mullet	Murbo	ODS
64	<i>Nemipterus japonicus</i>	Nemipteridae			Dr. Fridtjof
65	<i>Scolopsis vosmeri</i>	Nemipteridae	Whitecheek monocle bream	Kolonto	ODS
66	<i>Platycephalus indicus</i>	Platycephalidae	Bartail flathead	Kuker	ODS
67	<i>Plotosus lineatus</i>	Plotosidae	Striped eel catfish	Robila	ODS
68	<i>Pomadasys maculatum</i>	Haemulidae			ODS
69	<i>Psettodes erumei</i>	Psettodidae	Indian flounder	Hajjam	ODS
70	<i>Rhinobatos annandalei</i>	Rhinobatidae	Guitarfish	Zahro	ODS
71	<i>Paranibea semiluctusa</i>	Sciaenidae			ODS
72	<i>Nibea albida</i>	Sciaenidae			ODS
73	<i>Argyrosomus hololepidotus</i>	Sciaenidae	Southern meagre	Sooli	ODS
74	<i>Protonibea diacan</i>	Sciaenidae	Jewfish	Sua	ODS
75	<i>Johnius dussumieri</i>	Sciaenidae	Silver Jewfish	Mushka	ODS
76	<i>Johnius belangerii</i>	Sciaenidae	Jewfish	Mushka	ODS
77	<i>Otolithes ruber</i>	Sciaenidae	Rosy jewfish	Mushka	ODS
78	<i>Scomberomorus koreanus</i>	Scomberidae	Korean seerfish	Kalgund	Dr. Frindtjof
79	<i>Scomberomorus commerson</i>	Scomberidae	Barred Spanish mackerel	Gore	ODS

80	<i>Scomberomorus guttatus</i>	Scombridae	Spotted Spanish mackerel	Kulgun	ODS
81	<i>Rastrelliger kanagurta</i>	Scombridae	Indian mackerel	Bangra	ODS
82	<i>Lagocephalus lunaris</i>	Tetradontidae	Lunartail puffer	Tooro	ODS
83	<i>Epinephelus tauvina</i>	Serranidae	Greasy reefcod	Gissar	ODS
84	<i>Epinephelus diacanthus</i>	Serranidae	Thornycheek grouper	Gissar	ODS
85	<i>Epinephelus coioides</i>	Serranidae	Orrangespotted grouper	Gissar	ODS
86	<i>Sillago sihama</i>	Sillaginidae	Silver whiting	Hashoor	ODS
87	<i>Acanthopagrus berda</i>	Sparidae	Black Bream	Tintle	ODS
88	<i>Acanthopagrus latus</i>	Sparidae	Yellofin seabream	Tintle	ODS
89	<i>Crenidens crenidens</i>	Sparidae	Karanteen seabream	Kissi	ODS
90	<i>Sparidentex hasta</i>	Sparidae	Sobaity seabream	Dathi	ODS
91	<i>Sphyraena putnamiae</i>	Sphyraenidae	Barracuda	Kund	ODS
92	<i>Pampus argenteus</i>	Stromateidae	Silver pomfret	Achopito,	ODS
93	<i>Terapon jerboa</i>	Teraponidae	Jerbua terapon	Ginghra	ODS
94	<i>Trichiurus lepturus</i>	Trichiuridae			ODS
95	<i>Lepturacanthus savala</i>	Trichiuridae	Hairtail	Talwar	ODS
96	<i>Muraenesox bagio</i>	Muraenesocidae	Pike conger	Bam	ODS

Miani Hor area comprises of diverse habitat and rich in faunistic diversity. The area has been explored and focused regarding ecological aspects and mangroves of Sonmiani area (WWF 2005, WWF2006). But little is known regarding finfish species diversity in the area where as several reports pointed out that more than 300 finfish species are present in Miani Hor (Shah and Jusoff, 2007). WWF 2005 mentioned in its report that 150 species are landed in 35 categories of daily landing along Pakistan coast. A report of FAO mentioned that 350 commercially important fishes are present in fish landing (Hayat, 2003) while in a recent report it is discussed that fisheries stocks of Balochistan are overfished (Lindley, 2008). The present study was only a survey of four days at Miani Hor revealed the information of 96 finfish species belonging to 36 families. More than fifty commercially important fish species are in landed at Dam (Miani Hor). During this survey following common high value species

were found i.e. mackerel (*Rastrelliger kangurta*, *Scomberomorus guttatus*), seabream (*Acanthopagrus latus*, *A. berda*), carangid (*Trachinotus blochii*), crocker (*Otolithes ruber*), pomphret (*pamphus argenteus*), ladyfish (*Sillago sihama*), mullet (*Mugil cephalus*, *Liza carinata*, *Liza subviridis*, *Valamugil cunesius*), catfish (*Arius* sp), while low value species include sardines (*Sardinella longiceps*, *Escualosa thoracata*). Sardines are mainly used in “Gund” whereas number of juvenile species are included in Gund. These gund is used for fishmeal production. The area is an important ecological habitat as feeding, breeding, and nursery grounds for most of the commercially important fishes, at the same time it also provide shelter for many juvenile fishes. For a comprehensive list of all fish species found in Miani Hor monthly/seasonal study at each site for 1-3 years is required.

There are number of issues related to biodiversity of coastal areas of Miani Hor and other areas of Pakistan. The main issue for marine environment causing depletion in fisheries stock is the use of illegal / harmful fishing gears and indiscriminate removal of fisheries resources. Qatra (pursesine net), Kaada (beach seine net), Gujja (trawl net) and Bholla (tidal tapnet) are frequently used along Miani Hor and all along the Sindh coast. Although operations of these gears are strictly banned in coastal area of Balochistan, but in Miani Hor/Sonmiani these nets are in common practice. As mentioned above that Miani Hor area providing shelter for many juvenile of commercially important fish species, all are targeted on daily bases by the operation of illegal nets. The production of fishes from Miani Hor shows that 62% consist of Gund (trashfish), while 36% on fish and shrimp are only 2% (Figure 12).

The income of fishermen fluctuates in accordance with fishing season. During good fishing season (September to November) their income is high while in offseason there is little or no income. The fishing season usually starts from early September while

last up to April (7 to 8 months). Women do not participate in fishing activities and perform daily household activities whereas children contribute in fishing according to their capabilities.

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