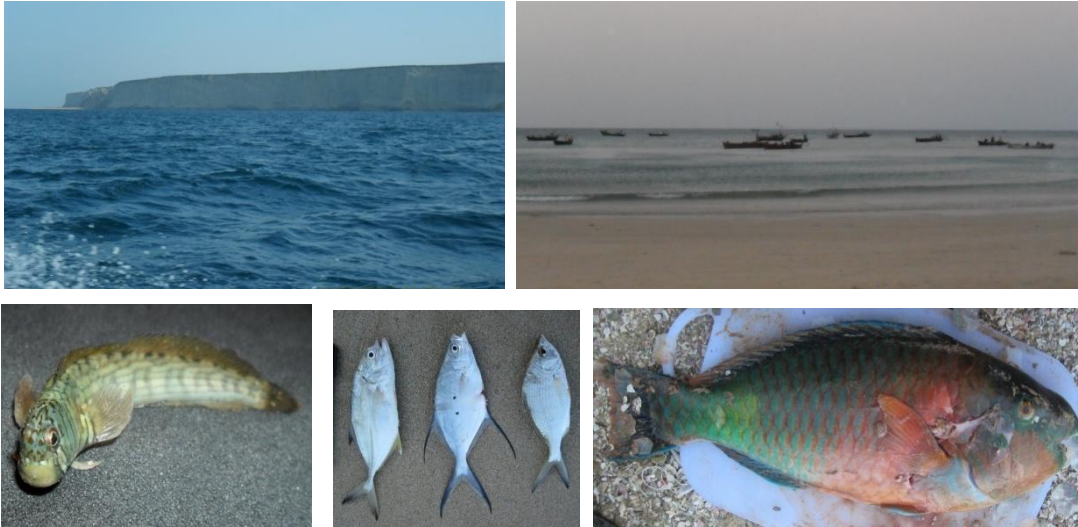


Baseline Survey of Fish Diversity at Astola Island, Balochistan



Report submitted by
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to
Pakistan Wetland Programme

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Summary

Astola is an Island located in the Arabian Sea (Latitude 25° 7'21.51"N and Longitude 63°50'51.53"E.), locally known Haft Talar (means seven hills). It is the largest offshore island of Pakistan and about 39 km far away from Pasni, Balochistan. There is no permanent residence at Astola Island. During fishing season (October to January) number of fishermen comes to island from different areas of Pakistan (Sindh and Balochistan), stay there for several weeks by installing their temporary camps in the vicinity of Astola Mountain. They start fishing activities early in the morning and return to their camp before evening. During this survey around 50 boats were seen participating in fishing near Astola Island. Entanglement net is very popular net among fishermen for targeting lobster while handline, longline and troll-line also use by the fishermen for catching large Mackerel and other commercially important fishes.

The present study and the review of literature revealed the information of 75 finfish species belonging to 35 families while seasonal survey of at least two years is recommended to know the exact position of finfish diversity and distribution in the coastal water of Astola Island.

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.

Balochistan coast including Astola Island has rich fisheries resources in its coastal waters. Fishing activities around Astola Island is mainly linked with Pasni Fish harbour. Mostly fishing boats operating in the coastal water of Astola are registered in Pasni area while fishing boats registered in Karachi also participate in fishing activities during fishing seasons. Small fishing boats sale out their catch in Pasni. Larger boats mostly freeze their catch in ice, which is

generally sale out in Karachi or other fish landing sites. There is no separate statistic available regarding fishing activities or fish species capture from the vicinity of Astola Island.

The main objective of the present study was to enlist the diversity of fin-fish species of Astola area including commercially important species, targeted species and by catch of the different targeted fisheries.

2. Study Methods

2.1 Area Description

Astola is a small island in the north coast of the Arabian Sea, is also named as Haft Talar (Seven Hills). It is about 39 km away from Pasni port, Balochistan and located at $25^{\circ} 07' 22''$ N & $063^{\circ} 51' 00''$ E (Figure 2). The island has isolated withered rocks on the south-east side, sandy beaches, important nesting sites for green and leatherback turtles, on the northern side and caved cliffs on the south facing side which provide suitable conditions for animal and plant communities.

2.2 Sampling Procedure

In January 2011, two days survey of Astola Island was carried out 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 Astola Island. 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 Astola area 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 and Discussion

There is no permanent residence of human population at Astola Island but a number of fishermen install their camps for temporary stay during fishing season. The number of fishermen population at Astola vary from nil during harsh weather condition (June, July, August) to more than 100 fishermen during good fishing season.

3.1 Fishing crafts around Astola Island

Small fishing boats ranging from small boats (8 m LOA) to a large Hora (14m LOA), mostly wooden in construction were seen at Astola Island. These boats were mainly from Pasni area while several boats were also from Karachi. According to fishermen three days are required to reach from Karachi to Astola Island. The fishermen use mainly wooden boats for their fishing practices. These wooden crafts are named locally according to their size and locality (Hussain and Amir, 2006). The popular fishing crafts using along Balochistan coast are known as Charpok, Yakdar, Gallet and Launch, while Hora are very common along Sindh. Most of the fishing crafts participating in fishing activities along Astola Island are having outboard engines.

3.2 Fishing gears use around Astola Island

Large mesh size gillnets or entanglement nets are mainly used in the coastal water of Astola Island. Monofilament and multifilament both type of netting is used in preparation of fishing

nets. Hand braided netting of multifilament nylon thread is also used in preparation of fishing nets. These nets are used to target lobsters.

Line gears are also common in fishing activities to target large fishes. The main line gear is handline while longline and troll-line are using to target demersal and large mackerel fishes.

3.3 Fishing activities around Astola Island

The fishermen visit to Astola Island to target lobster. More than 30 boats were present at Astola. Only few boats were catching large fishes while most of them were there for lobsters. Lobsters are locally known kikta. Bottom set tangle nets of 200 m in length and 19-40 meshes in depth are used in lobster fishing. Net is usually operated in shallow coastal water having rocky or rocky cum sandy habitat. The net is anchored from both ends and left for overnight. The fishing season for lobster starts from mid of August to December. Their usual practices were to catch lobsters which are kept alive by holding in triangular wooden box till adequate number of lobsters (50-80) of marketable size is obtained. A number of finfish species also entangled in lobster fishing nets which are mostly discarded for no ice preservation facility is available at hand except for some fish which they save for their daily food.

Hand line is locally known as “Chirdan” and very common to target commercially important fishes. These line gears are prepared from monofilament nylon line and the specification of line, hook and sinkers are selected according to the target species.

Fishermen were using large hooks (1-4 number) for targeting, mackerel and barracudas. Handline was especially prepared to target mackerel and barracudas by using steel wire at the end of nylon line and two hooks are joined together with this steel wire. According to fishermen that nylon line can easily cut down by the sharp teeth of these large fishes. Sardines and live grunter (locally known kabloosh) is used as bait.

3.4 Fish fauna of Astola Island

Faunistic diversity of finfishes of Astola Island areas is very rich. Fish species observed during present study and recorded from the literature are listed in Table 1. The species were mostly bycatches of Indian Mackerel (IM) fishing and Lobster fishing (LF). Besides, dead specimens along the shoreline was also recorded and included in the list with an indication of source of collection (either observed in bycatches or collected from the beaches).

Table I. Finfish species of Astola Island

| S. # | Species | Family | English name | Local name | Status |
|------|--------------------------------------|-------------|------------------------------|---------------|--------------------------------|
| 1. | <i>Albula vulpes</i> | Albulidae | Bonefish, ladyfish | Mushk | Catch from gillnet |
| 2. | <i>Arius maculatus</i> | Ariidae | Spotted catfish | Kun, Gullo | Catch from gillnet |
| 3. | <i>Abalistes stellatus</i> | Ballistidae | Starry triggerfish | Tooro | (PWP , 2009) |
| 4. | <i>Strongylura strongylura</i> | Belonidae | Banded needlefish | Aabre, Aalore | (PWP , 2009) |
| 5. | <i>Omobranchus mekranensis</i> | Blenniidae | Rock skippers | ----- | (PWP , 2009) |
| 6. | <i>Omobranchus fasciolatus</i> | Blenniidae | Rock skippers | ----- | Collected from Astola |
| 7. | <i>Pseudorhombus arsius</i> | Bothidae | Large toothed flounder | Swaso | (PWP , 2009) |
| 8. | <i>Alectis indicus</i> | Carangidae | Indian threadfinned trevally | Ushtar | (PWP , 2009) |
| 9. | <i>Alepes djedaba</i> | Carangidae | Shrimp scad | Bakoi | Collected in gillnet |
| 10. | <i>Carangoides chrysophrys</i> | Carangidae | Longnose trevally | Pattar | Observed in fishing boat |
| 11. | <i>Caranx malampygus</i> | Carangidae | Bluefin jack | Gishran | (PWP , 2009) |
| 12. | <i>Caranx para</i> | Carangidae | Banded scad | Bakko | As a bycatch during IM fishing |
| 13. | <i>Scomberoides commers onnianus</i> | Carangidae | Blacktip leatherskin | Saram gazdani | Observed in fishing boat |
| 14. | <i>Selaroides leptolepis</i> | Carangidae | Yellowstripe scad | Seem | Observed in fishing boat |
| 15. | <i>Trachinotus baillonii</i> | Carangidae | Smallspotted dar | Kainchan | Observed in fishing boat |

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|-----|--------------------------------|----------------|-------------------------|----------------|--------------------------------|
| 16. | <i>Scoliodon laticaudus</i> | Carcharhinidae | Spadenose shark | Bhambol pishik | (PWP , 2009) |
| 17. | <i>Heniochus acuminatus</i> | Chaetodontidae | Longfin bannerfish | ----- | Bycatch during lobster fishing |
| 18. | <i>Chirocentrus dorab</i> | Chirocentridae | Dorab wolf herring | Pashant | Observed in fishing boat |
| 19. | <i>Nematalosa nasus</i> | Clupeidae | Kelee shad | Kolgar | Observed in fishing boat |
| 20. | <i>Anodontostoma chacunda</i> | Clupeidae | Shortnose Gizzard Shad | Goi | Observed in fishing boat |
| 21. | <i>Ilisha megaloptera</i> | Clupeidae | Bigeye ilisha | Bee-chum | Observed in fishing boat |
| 22. | <i>Opisthopterus tardoore</i> | Clupeidae | Tardoore | Portuk | Observed in fishing boat |
| 23. | <i>Cynoglossus puncticeps</i> | Cynoglossidae | Tonguesoles | sole | Observed in fishing boat |
| 24. | <i>Cynoglossus bilineatus</i> | Cynoglossidae | Tonguesoles | Munsa swasoo | Observed in fishing boat |
| 25. | <i>Cyclichthys orbicularis</i> | Diodontidae | Orbicular burrfish | ---- | (PWP , 2009) |
| 26. | <i>Tetrosomus gibbosus</i> | ostraciidae | Hunchback trunkfish | | Dead at Astola Island |
| 27. | <i>Drepane punctata</i> | Drepanidae | Spotted batfish | Shak | Collected in Gillnet |
| 28. | <i>Thryssa hamiltonii</i> | Engraulidae | Thryssa | Padni | Collected in Gillnet |
| 29. | <i>Gerres oyna</i> | Gerridae | Lined silver-biddy | Mudro | Collected in Gillnet |
| 30. | <i>Plectorhinchus gibbosus</i> | Haemulidae | Black sweetlip | Lunti,Soredaf | Collected in Gillnet |
| 31. | <i>Plectorhinchus schotaf</i> | Haemulidae | Grey sweetlip | Soredaf | Collected in Gillnet |
| 32. | <i>Pomadasys kaakan</i> | Haemulidae | Grunter | Kumpo | Collected in Gillnet |
| 33. | <i>Pomadasys stridens</i> | Haemulidae | Striped grunt | Kumpo | Collected in Gillnet |
| 34. | <i>Pomadasys argenteus</i> | Haemulidae | Silver grunt | Kimpo | Collected in Gillnet |
| 35. | <i>Leiognathus daura</i> | Leiognathidae | Ponyfish | Mith | Collected in Gillnet |
| 36. | <i>Lethrinus nebulosus</i> | Lethrinidae | Emperors | Gadeer | Pasni fish Harbour |
| 37. | <i>Lethrinus ramak</i> | Lethrinidae | Yellow banded emperors | Gadeer | Pasni fish Harbour |
| 38. | <i>Lutjanus fulviflamma</i> | Lutjanidae | One-spot golden snapper | Hira | (PWP , 2009) |
| 39. | <i>Lutjanus johnii</i> | Lutjanidae | John's snapper | Kanalcha | Collected from Gillnet |
| 40. | <i>Liza subviridis</i> | Mugilidae | Green back mullet | Chhodi | Collected from gillnet |
| 41. | <i>Liza melinoptera</i> | Mugilidae | Large scale gery Mullet | Boi, Mori | Collected from gillnet |
| 42. | <i>Liza carinata</i> | Mugilidae | Keeled mullet | Boi, Mori | Collected from gillnet |
| 43. | <i>Mugil cephalus</i> | Mugilidae | Large scale mullet | Pharra, Boi | Collected in Gillnet |
| 44. | <i>Valamugil cunnesius</i> | Mugilidae | Long arm mullet | Pharra, Boi | Collected from gillnet |

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|-----|------------------------------------|-----------------|--------------------------|----------------|----------------------------|
| 45. | <i>Valamugil speigleri</i> | Mugilidae | Speigler's mullet | Murbo | Collected from gillnet |
| 46. | <i>Scolopsis vosmeri</i> | Nemipteridae | Whitecheek monocle bream | Kolonto | (PWP , 2009) |
| 47. | <i>Scolopsis bimaculatus</i> | Nemipteridae | Thumbprint monocle bream | Kolonto | (PWP , 2009) |
| 48. | <i>Scolopsis taeniatus</i> | Nemipteridae | Banded monocle bream | Kolonto | (PWP , 2009) |
| 49. | <i>Platycephalus indicus</i> | Platycephalidae | Bartail flathead | Kuker | Collected in Gillnet |
| 50. | <i>Plotosus lineatus</i> | Plotosidae | Striped eel catfish | Robila | (PWP , 2009) |
| 51. | <i>Abudefduf vaigiensis</i> | Pomacentridae | Indo-Pacific sergeant | ---- | (PWP , 2009) |
| 52. | <i>Psettodes erumei</i> | Psettodidae | Indian flounder | Hajjam | (PWP , 2009) |
| 53. | <i>Scarus fuscopurpureus</i> | Scaridae | Purplebrown parrot fish | Tota machli | (PWP , 2009) |
| 54. | <i>Scarus sordidus</i> | Scaridae | Daisy parrotfish | Tota machli | Collected by diver |
| 55. | <i>Johnius dussumieri</i> | Sciaenidae | Silver Jewfish | Mushka | Collected in Gillnet |
| 56. | <i>Johnius belangerii</i> | Sciaenidae | Jewfish | Mushka | Collected in Gillnet |
| 57. | <i>Otolithes ruber</i> | Sciaenidae | Rosy jewfish | Mushka | Collected from Handline |
| 58. | <i>Scomberomorus commerson</i> | Scombridae | Barred Spanish mackerel | Gore | Observed in fishing boat |
| 59. | <i>Scomberomorus guttatus</i> | Scombridae | Spotted Spanish mackerel | Kulgun | Observed in fishing boat |
| 60. | <i>Rastrelliger kanagurta</i> | Scombridae | Indian mackerel | Bangra | Observed in fishing boat |
| 61. | <i>Scorpaenopsis lactomaculata</i> | Scopaenidae | Scorpion fish | ---- | (PWP , 2009) |
| 62. | <i>Epinephelus tauvina</i> | Serranidae | Greasy reefcod | Nambo | (PWP , 2009) |
| 63. | <i>Epinephelus chloristigma</i> | Serranidae | Brownspotted grouper | Golori | (PWP , 2009) |
| 64. | <i>Epinephelus diacanthus</i> | Serranidae | Thornycheek grouper | Nambo | (PWP , 2009) |
| 65. | <i>Siganus canaliculatus</i> | Siganidae | White-spotted spine foot | Mahparri | Collected from fishermen |
| 66. | <i>Siganus spinus</i> | Siganidae | littlespine foot | Mahparri | Collected from fishermen |
| 67. | <i>Sillago sihama</i> | Sillaginidae | Silver whiting | Hashoor | Collected from Gillnet |
| 68. | <i>Acanthopagrus berda</i> | Sparidae | Black Bream | Tintle | (PWP , 2009) |
| 69. | <i>Acanthopagrus bifasciatus</i> | Sparidae | Two-bar seabream | Shumala | (PWP , 2009) |
| 70. | <i>Acanthopagrus latus</i> | Sparidae | Yellofin seabream | Tintle | (PWP , 2009) |
| 71. | <i>Argyrops spinifer</i> | Sparidae | Long-spined red bream | Sorro, Malelak | Collected through Handline |
| 72. | <i>Diplodus sargus</i> | Sparidae | One spot seabream | Tippuch | Dead at Astola Shore |
| 73. | <i>Sphyrna putnamiae</i> | Sphyrnaeidae | Barracuda | Kund | Dead at Astola Shore |

| | | | | | |
|-----|------------------------------|--------------|----------------|---------|----------------------------|
| 74. | <i>Terapon jerbua</i> | Teraponidae | Jerbua terapon | Ginghra | Collected through Handline |
| 75. | <i>Lepturacanthus savala</i> | Trichiuridae | Hairtail | Talwar | Observed in fishing boat |

The coastal settlements Damb, Ormara, Kalamat, Pasni, Gawadar, Ganz and Jiwani are historically the well known fishing centers and contributing a lot in fishery production of Pakistan (Qureshi, 1952). Fisheries resources along Astola Island are also high due to the presence of coral reefs and rocky areas around Astola. Fauna of surrounding areas of Astola Island is diverse and variety of finfish and shellfish are present in the coastal water of Astola. The fishermen take long journey to capture commercially important fishes. Species of fishes from the Astola Island in the previous report (PWP, 2009) were only related to bycatch of fishes captured during lobster fishing. This is the main issue of Astola Island that small boats engaged in lobster fishing usually lack space for ice to preserve these fishes and cannot be marketed as Pasni, the nearest market is quite far from Astola (a day is required to transport these fishes from Astola to Pasni). In addition a visit to Pasni is also costly owing to high fuel prices. A number of dead fishes were found along the Astola coast because the fishermen through bycatches overboard at sea and these fishes wash off the shore as the chance of survival of fish is very low after being caught in nets.

Some trawlers were seen near Astola Island fishing, but these type fishing is strictly banned in Balochistan. There is a regular complain of illegal fishing is going on in the coastal water of Balochistan from the fishermen of Pasni. Lindley (2008) reported that coastal resources of Balochistan are also overexploited.

Plastic (monofilament) netting being used in fishing nets is very efficient to capture fishes. Consequently the fish is being removed from the sea beyond allowable yield. Plastic nets that are easily broken underwater and get entangled in rocks where they stay for long time but fish still

gets entangled in these waste nets. Discarded plastic netting was seen all along the Astola Island. In the previous study (PWP, 2009) it was reported that a porpoise was dead at Astola beach and during the present survey another porpoise was found dead at Astola. The cause of death might be due to entanglement in the waste fishing net around Astola.

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