DIVERSITY AND ECOLOGY OF FISH OF MODHAVA AND SALAYA COAST OF MANDVI, KACHCHH, GUJARAT

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Abstract: The biodiversity of Gulf of Kutch is studied well in fish ecology and its diversity. Marine fishing in Gujarat has emerged as an important economic activity with reference to food Security, employment generation, poverty reduction and foreign exchange earnings. Its share in the State Domestic Product (SDP) was 0.84 percent in 1980-81, which crossed 1.60 percent at the close of 1990s. A prominent feature of the Kutch Coast is the vast intertidal zone comprising a network of creeks, estuaries and mudflats. The Kutch coast provides conducive environment for several sea based traditional occupations like fishing, salt making apart from land based occupations like agriculture, horticulture.

Keywords: Ecology, diversity, pagadiya, population.

Introduction: Fish are finned, aquatic, cold blooded vertebrates with gills. They share a body plan similar to that of humans and other vertebrate (with a backbone) animals. Fish breath oxygen, feed, move, reproduce, and sense their surroundings like other vertebrate animals, but they do so in water. Over 32,000 known species of vertebrates are fish. Ninety percent of these belong to the Class Osteichthyes, or bony fish. Most of the other ten percent belong to the Class Chondrichthyes, or cartilaginous fish, the sharks, rays, and skates, all of which have a skeleton of cartilage. The third class of fish is called the Agnatha ("without a jaw"), a primitive group of mostly extinct fish, with only two living forms, the lampreys and the hagfish. "The study of the relationships of fish among physical and biological aspects of the environment that means ECOLOGY. Biodiversity is refers as "variety and abundance of life in a given area". The number of valid marine species, about 16,764 (Feb. 19, 2010), is about equal to that of freshwater fishes (15,170). Valid species of fishes apparently restricted to brackish water number only 108. The sum (32,042) is more than the current total number of 31,362, valid species of fishes because some species occur in more than one habitat. An estimate of marine fish species yet to be sampled and described is about 5,000, or twice the number described in the last 19 years, for a projected total of approximately 21,800 valid marine species of fishes. [6]studied deals with the ichthyofaunal diversity of Halali Reservoir in Vidisha district, Madhya Pradesh. The maximum diversity is observed in the family Cyprinidae, which is represented by 154 species. Observations were made on the chief schooling fishes of the Arabian Sea indicated that these fishes migrate from Kachchh to Sind [5]. [4] classified the fish species on the basis of their economic importance. The fishery of *Polydactylus indicus* from the landings of the bull trawlers operating between Kachchh and Bombay was studied by[3]. An abnormal ray from the Gulf was reported by [1]. Maturity and spawning of the silver pomfret, *Pampus argenteus* were studied in the area between the Gulf and Gulf of Cambay [2]. The scientific names of fishes are mostly as given in F.A.O. identification sheets (1974).

India is presently the third largest producer of fish and is playing an important role in global fisheries. The Indian fisheries sector has grown tremendously since 1950s to the present annual production levels of over 7 million tonnes of fish and shellfish from capture fisheries and aquaculture.

Study Area: Gulf of Kutch is the western proximity of Gujarat state and as stated earlier, it harbors huge variety of marine fauna. For the present study few locations of Gulf of Kutch were selected that located on the southern coast of kachchh. The project was conducted at two different coast of Mandvi talukas namely ***Modhava*** and ***Salaya.*** Both are fish landing centre.

Physical features: The mainland of Kutch has a rocky terrain with two hill ranges running parallel in west –east direction. The belt between the southern hill range – Katrol hill range – and the Gulf of Kutch is dominantly costal alluvial plain lined by mudflats on its south where Mandvi (modhava) is located

Water quality: The water quality of the study area is almost free from organic material. It is also free from pollution. The temperature of water in gulf is about 19`-29` C during august to February.

Socio-economic features: The intertidal area and the open sea adjacent to the outfall channel is rich in fisheries resources. More than 400 families are fishing on that area and they almost depending on this fishing. The local fishermen also hire the labour from all over state for unloading, fishing and fish drying.

Methodology:

Primary data collection: Field Surveys were conducted in the two major landing centre of mandvi coast namely Modhava and Salaya.Modhava is considered as important fish landing center. Fish

samples were collected from modhava with the help of local fishermen operating in the sampling sites during January and February months. Fish species were also collected from the fish landing ports. Collected specimens were preserved in 10% formaldehyde solution for taxonomic analysis and further study. Identifications of the fish species were carried out following standard literatusre. Conservation status of each species was determined. The information was gathered through field visit and inquiring directly to the fishermen about the details of the fishing gear they used. This small village is particularly important for its residential dolphin population as well as for its high quality.

Secondary data collection: Secondary data was collected about the fisheries of Kachchh from district fisheries department office. Moreover, published literature in form of papers, reports etc was also used. To study the socio economics and fishing methods at both the sites, questionnaire survey was undertaken on site and questions were asked to different fishing groups.

Result:

Fish diversity: During the field visits, fish species were recorded from the obtained fish catches. The fish species were either collected or photographed for further identification. Total 25 species were recorded from both the sites. From modhava approx. 22 species recorded from by catch, whereas from salaya approx. 4 species recorded. *Harpodon nehereus*, *Pampus argenteus* are common species in both coasts.

Secondary data analysis: According to most of the fishermen, high production is mostly observed during summer onsets. Sometimes they also observe high production during winter. Most agreed on the low fish catch during rainy seasons. Regarding fish catch, 46 % of the fishers obtained more than 50 kg in one trip, 36% catches nearly 50kgs while 18% of the sampled have less than 50 kg of production. Although the amount of fish catch obtained in a trip depends on several factors like season, time of sampling, fishing fear used, fishing time allotted, number of team members on board etc. On basis of observation and also according to fishermen of Modhava the species *harpodon neherius* (Bombay duck) dominates in the total fish catch.Most of the fisher flock of the Modhava and Salaya use “Net fishing” Method and some of them are also engaged in ‘Pagadiya’ fishing.In Net fishing, the net size is about 35m and the mash size of the net is depended on the species which we have to collect and it is about 12cm. By this net some fishermen do pagdiya fishing near the coast whereas some other fishermen use it for off shore fishing. Noteworthy, most of the fishermen do not cover very long distance for fishing. 41% of the population remained in 500m for fishing while only 12% used to go for 11-15 kms for fishing. In Modhava the population is very low and most of the people of the village are fishermen. They fully depended on the fishing activity for their livelihood.The village has about 200-250 homes and even their children also helps them in fishing. In Salaya there is about 400 homes of fishermen whereas about 700 fishermen fishing by boat using Net fishing and about 300-400 fishermen are using pagdiya fishing. In Modhava there is about 60-70 boats for fishing and in Salaya there is about 100-120 boats for fishing. Fishermen of the Modhava and Salaya are mostly fishing alternatively. Duration of the fishing in the sea is almost about 15-20 min. The diversity of fish of the both coast is decreasing and the reason according to the most of the fishermen is pollution and the processing of companies nearby the coast. These decreasing diversity as per them directly affects the fish catch and the livelihood of fisher flock as per the fishermen. Apart from these it was observed that the male members go for fishing and later the sorting and processing of fish and the bycatch products are taken by rest of the family members specially the females and even children.

Conclusion: The present study aimed to assess the fish diversity and socio-economics of fishermen at two sites namely Modhva and Salaya. Both the sites are close to each other and fishing villages having fish landing centers. Primary as well as secondary survey methods were adopted to achieve the objectives which involved study of fish diversity, about the village, availability of fish, the fishing activity carried out by people, fishing gears, ecological factors affecting fish catch etc. Being close to each other, the sites do not show difference in fish diversity and fish catch. Nearly 25 species were recorded from both the sites dominated by *Harpodon neherius (*Bombay duck). Onset of summer is the season when high fish catch is observed while lowest is seen during monsoon. Most fishers remain close to coast while fishing. Gears like different fishing nets and boats are used by the fishermen. A team of 4-6 male members goes for fishing while females are engaged in post fishing processes.It was observed that both the villages are very small and population in total engaged in fishing activity. Moreover, a cooperative approach of fishing was seen in the village wherein the groups jointly go for fishing and the same forms an vital asset of their livelihood.

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TABLE 1: Fish species Collected from both study sites during study period.

Sr. no.	**Scientific name**	**Common name**	**Local name**	**Collected from:**
1.	*Pseudorhombus arsius*	Largetooth flounder	Jeepti/jeebhti	Salaya
2.	*Ilisha megaloptera*	Jewelled shad	Kati/Paturdo	Modhava
3.	*Muraenichthys schultzei*	Maimed snake eel	Wam	Modhava
4.	*Coilia dussumierii*	Golden anchovy	Mandeli	Modhava
5.	*Bregmaceros mcclellandi*	Unicorn cod/Indian cod	Chirii	Modhava
6.	*Scoliodon laticaudus*	Sharp nosed shark	Sandho	Modhava
7.	*Trichiurus savala*	Sliver ribbon fish	Patti/ribbon	Modhava
8.	*Boleophthalmus Dussumieri*	Mud skipper	Levti	Modhava
9.	*Johnius sp.*	Croaker	Dhoma	Modhava
10.	*Sillago sihama*	---	Koonga	Modhva
11.	*Torpedo marmorata*	Marbled electric ray	Boor	Modhava
12.	*Netuma thalassina*	Sea cat fish	Khagga	Modhava
13.	*Latus calcaripus*	---	Dhangani	Modhava
14.	*Pampus argenteus*	Silver pomfret	Vichuda/paplet	Modhava
15.	*Mugil dussumieri*	Mullet	Gandhiya	Modhava
16.	*Harpodon nehereus*	Bombay duck	Bumla	Modhava
17.	*Hamiramphus sp.*	---	---	Modhava
18.	*Scatophagus argus*	Spotted scat	Payra, Bishtara	Modhava
19.	*Sepia aculeata*	Cuttle fish	Makul	Modhava
20.	*Formio nieger*	---	---	
21.	*Pomadasys maculates*	Spotted grunter	Karkara	Salaya
22.	*Chiloscyllium indicum*	Ridge-back cat-shark	Musia	Modhava
23.	*Argyrops spinifer*	Long-spined red bream	Chayo	Modhava
24.	*Decapterus russelli*	Russell's scad	Pira bangada	Modhava
25.	*Scomberomoruscommerson*	Bared seer fish	Surmai	Modhava

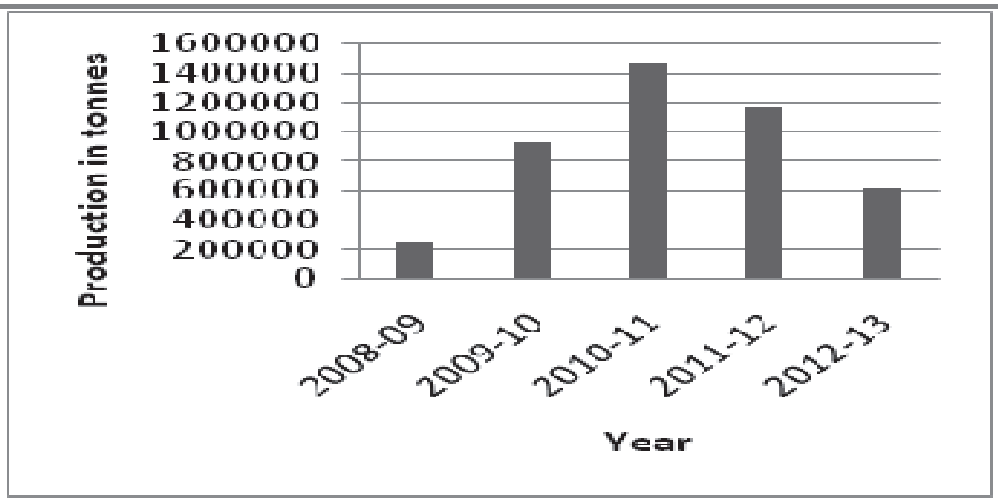

Figure No 01: fish Catch in Salaya

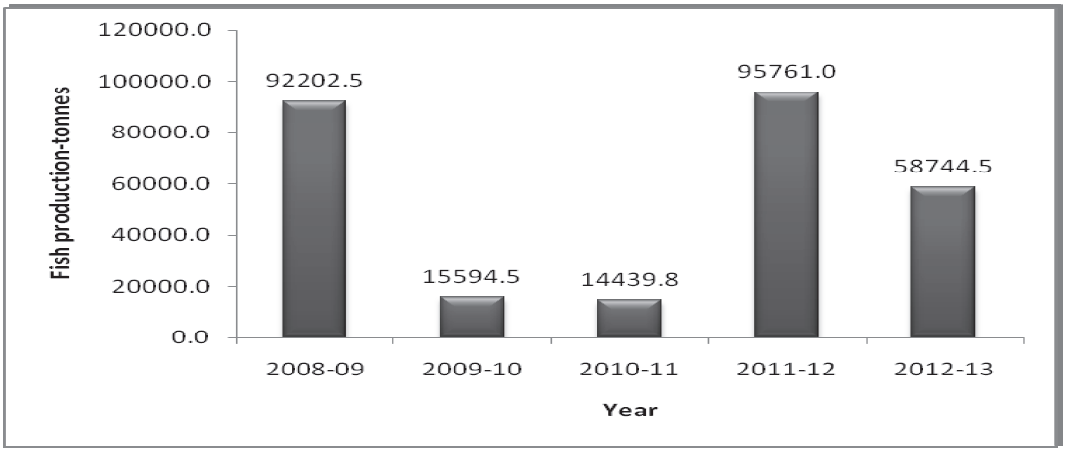

Figure No 02: fish Catch in Modhava

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