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Fishing Gears and Crafts Commonly Used at Hatiya Island: A Coastal Region of Bangladesh

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ABSTRACT

The study was conducted on traditional fishing nets and crafts that are used by professional fishermen (including small, medium and large scale fishing) at Hatiya in the district of Noakhali, Bangladesh. Primary data were collected from local fishermen through Personal Interview (PI), Focus Group Discussion (FGD) and observation; secondary data were collected from District Fisheries Officer (DFO) and Upazila Fisheries Officer (UFO). The study reveals different types of fishing nets including fixed purse nets, gill nets, dip nets and cast net are used in the locality. The mesh size of the fixed purse nets vary in 0.1-2.5 inch (anterior end) and 0.2-0.5 inch (posterior end), gill nets vary in 0.5-15 inch, dip nets vary in 0.1-0.2 inch and cast net 0.5-1 inch during study. Generally these nets are lasting in 2-3 years. For nets preservation no chemical or medicine are used, only the net is dried under the sun and put it on a safe and dry place. The present study suggests that different types of boats such as chandi, kosha, balam, tempu and dinghi nauka are being used at Hatiya. Traditionally sundari, jarul, gamari, chaplas and garjan woods and bamboos are used in boat making which are locally available and last for 5-10 years. Usually 90% of the boats are propelled by the engine and 10% of the boats are propelled by the sail and row. Most of the boats have no license which reflects lack of awareness and weak control by the regulatory agency.

Key words: Fishing gear, fishing net, crafts, Hatiya island

INTRODUCTION

Suitable water temperature along with heavy rainfall and vast water body makes Bangladesh tremendously diversified with about 800 fresh and marine fish species (Minar *et al*., 2012a; Hossain *et al*., 2012). In Bangladesh most of the people depend on fish for their protein demand (Minar *et al*., 2012b; Begum *et al*., 2012). At present 27, 01,370 MT (Metric ton), of fish are annually produced and contribution to GDP is 3.74% (Sarower-E-Mahfuj *et al*., 2012; Begum and Minar, 2012). Most of the fish collectors are the rural people whom are known as fisherman (jele in local term in Bangladesh) (Kabir *et al*., 2012). About 12.80 lakh are the inland fisherman and 7.70 lakh are the marine fisherman of Bangladesh (DoF, 2012). Survey from many literatures

showed the present socio economic condition, educational status, health facilities, Family Size and Type, Sources of Income, Occupational Status, Annual Income, Sanitary Facilities, Electricity Facilities and other benefits which denote their life style in Bangladesh which are not satisfactory (Kabir *et al.*, 2012; Bhaumik and Saha, 1994). A survey made by Alam and Bashar (1995) stated about the annual income that is about BDT 2,442 i.e., about 70% lower than the per capital income. Most of the literatures that are found are limited only their livelihood assessment but not about the fishing gear and crafts they use during the time of fishing.

Coastal area of Bangladesh is composed of 19 districts and 147 upazillas and the Exclusive Economic Zone (EEZ) (Minar *et al.*, 2013). Hatiya is one of the largest coastal island in Bangladesh located in the northern part of the Bay of Bengal (BoB), at the mouth of the Meghna River. It is an island that is one of the most important fishing areas of Bangladesh (Banglapedia, 2006). There are 10,500 fishermen in Hatiya (personal commun-cation with UFO, Hatiya).

Fishing gears are refers to those device having different shape and size and used in the water body to capture different sizes of fish. But when the fishing gear of different country is compared, it becomes evident that fishing techniques have developed from only a few basic ideas for capturing fish for the benefit of humans. Moreover, a watchman controlling the quantity of the catch in a gear can work only during daytime and then the water is clear which reduces the amount of time the gear can be operated. Fishing crafts are the device have different shape and size and used to transport the captured fishes. In some modernized fishing crafts they have the facility of processing, preservation, storing capacity so that they can catch fish with a long duration. Different types of crafts are in operation in the marine artisanal and small-scale fisheries are used in Bangladesh (Karim, 1978).

Hatiya has rich fishing resources which are the essential part not only for fishermen, but also for the people of Hatiya. These provide direct and indirect jobs and provide economic benefits in relation to population. After meeting domestic demand for fish are transported to various districts. These resources make a significant contribution to the economy of Hatiya and the economy of Bangladesh. Thus, studies in fishing nets and crafts provide the essential basis for the proper exploitation of fishery resources.

Hence, forth No. literature has been found that are cited the available crafts and gears in Bangladesh used in fishing operation. So, the present study was concentrated to find out the different fishing gears and crafts are used in Hatiya Island with their detailed description.

MATERIALS AND METHODS

The study was conducted during February to July, 2010 and the data were collected from seven stations of Hatiya Island such as Sukhchar, Nalchira, Char king, Tomaruddin, Burirchar, Sonadia and Jahajmara. In this area, fishing is the main way of livelihood for the fisher folks. The study employed a combination of different methods, techniques and tools for data collection. These consisted of a desk study to review secondary sources of information, semi-structured interviews, observation and group discussion to collect qualitative and quantitative data. Primary data was collected by semi-structured questionnaire. Secondary data were collected from various commune's annual reports and documents. These include general information such as present condition of fishing gears and crafts, common names, numbers, types and sizes, the species are caught, specialty, problems created by the gears and crafts, problem faced, mechanization and socio-economic situation of the fish farmers etc. Data were collected by personal communication from UFO (Upazilla Fisheries Officer), DFO (District Fisheries Officer) and the fishermen. Interviews were conducted by face to face interview method. Semi-structured questionnaire

interview was collected. The semi-structured interview was designed to elicit specific responses to specific questions. Open-ended questions were used in the semi-structured interview to explore broad issues in a non-directive, non-threatening manner.

Group discussions were used to collect primary data. The checklist focused on the fishing activity, the gears and crafts used in the fishing activity and detailed description. The procedure was to first talk with village head and key informants to ask for organizing group discussions of experienced fishermen in that community and then identify a place and time appropriate for group discussion. In total, I organized 3 group discussions at Hatiya. Each group gathered 7-9 villagers, including women, men, young and old people, who were invited by villages' head.

The interviews provided information about fishing gears and crafts at Hatiya, several types and sizes of gears and crafts, operations, number of men need to operate, time of use, carrying capacity, construction cost, repairing frequency, life span of the gears and crafts, efficiency, preservation process, owner of the gears and crafts, leasing condition, the difficulty of their life, about governmental help, issues relating to livelihood activities, alternative livelihoods.

RESULTS AND DISCUSSION

Fishing method means the manner in which the fishes are captured. Fishing nets and crafts are developed for this purpose.

Fish is found in different depth of water. Upon studying their position several types of gear has been evolved such as fishing at bottom, mid water and surface etc. In case of commercial fishery catching practice has been converted from single to bulk catching also (FAO/UNDP, 1986).

The nets found at Hatiya are classified under four groups those are fixed purse nets (behundi, bata and bagdhara jal), cast net (jhaki jal/khapla jal), farmed or dip nets (thela and khara jal), gill nets (lata, ilish/chindi jal, poa and ghongra jal) (Table 1). According to UFO of Hatiya there are about 60,000 nets and 10,500 fishing crafts are being used to catch fish in this island. Various types of fishing nets are locally used which are called behundi jal ((Fig. 1a), bata jal (Fig. 1b), bagdhara jal (Fig. 1c), jhaki (khapla jal) (Fig. 1d), thela jal (Fig. 1e), khara jal (Fig. 1f), lata jal (Fig. 1g), ilish/Chandi jal (Fig. 1h), poa jal (Fig. 1i), or ghongra jal. There are five different types of crafts are being used those are chandi nauka, kosha nauka, balam nauka, soto tempu and dinghi nauka. Most of the fisherman use behundi jal at six months and chandi jal in another six months to catch fish. The behundi jal is governmentally banded, because it catches all sized fish, the author found several potka fish (Tetraodon kutkutia), mud crabs (Liocarcinus vernalis), shrimp (Penaeus monodon), raj chewa (Taenioides buchanani) and other trash fishes are being caught

Table 1: Fishing nets used at Hatiya

Category	Name of gears	Shape	Mesh size (inch)	Construction cost (Tk net^{-1})
Fixed purse net	Behundi jal	Conical	2-2.5 and 0.2-0.5	2,00,000-2,30,000
	Bata jal	Conical	1.5-2 and 0.2-0.5	50,000-70,000
	Bagdhara jal	Triangular	0.1-0.5	2,000-3,000
Cast net	Jhaki jal	Conical	0.25-0.5	5,000-10,000
Gill net	Lata jal	Rectangular	0.5-1	50,000-1,00,000
	Chandi jal	Rectangular	4-4.5	3,00,000-4,00,000
	Poa jal	Rectangular	3.5-4	1,00,000-2,00,000
	Ghongra jal	Rectangular	10-15	1,00,000-2,00,000
Farmed or dip net	Thela jal	Triangular	0.1-0.2	5,000-6000
	Khara jal	Triangular	0.1-0.2	10,000-12,000

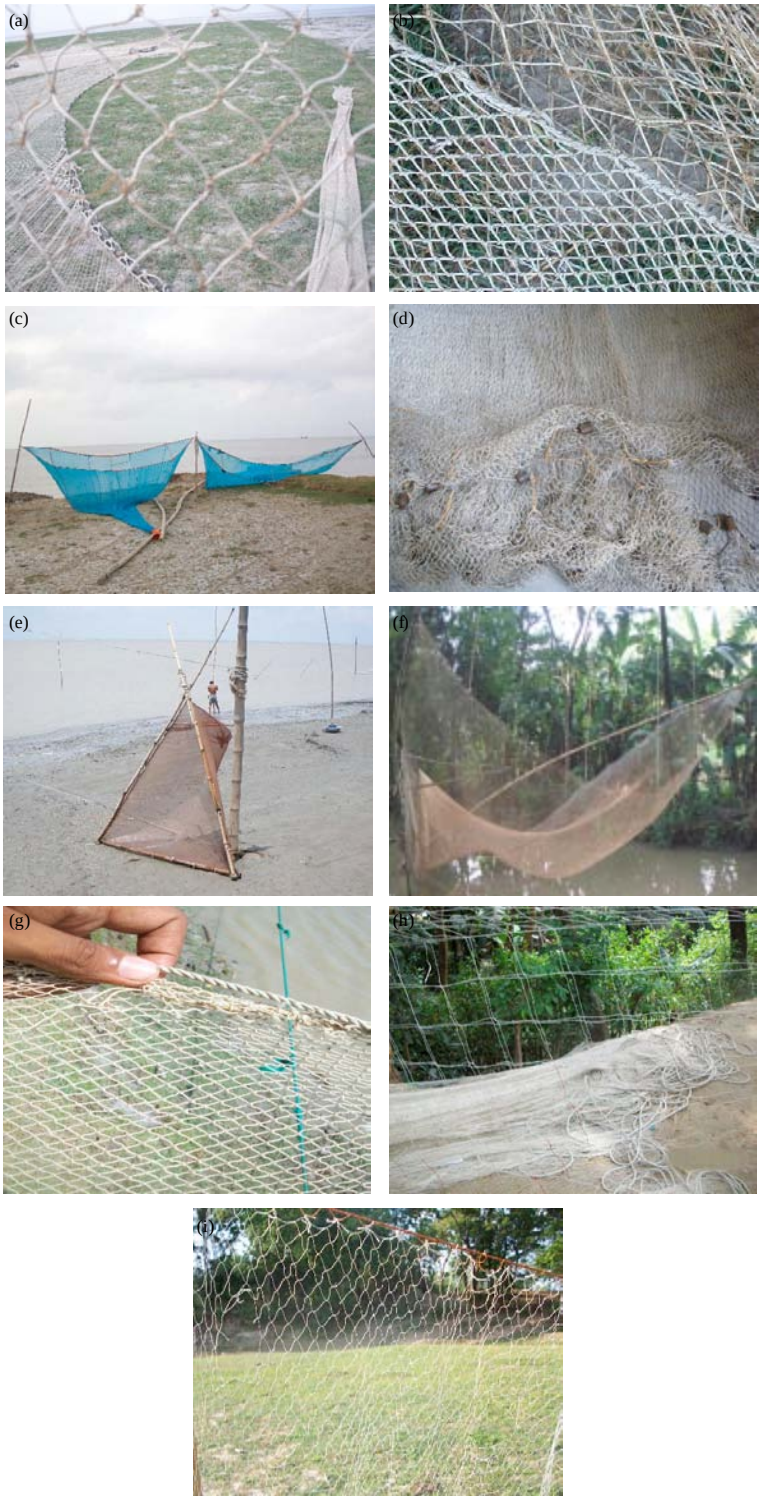

Fig. 1(a-i): Several types of gear available in Hatiya island (a) Behundi jal (mesh size) (b) Bata jal (two different mesh size), (c) Bagdhara jal, (d) Jhaki jal (mesh), bottom pocket, (e) Thela jal, (f) Khara jal, (g) Lata jal (mesh size) (h) Illish/Chandi jal (mesh size) and (i) Poa jal (mesh size)

with the original catch (Labeo bata, Monopterus cuchia, Lates calcarifer, Alopias vulpinus, Anabaste studineus, Pseudapocryptes elongatus, Pangasius pangasius, Otolithoides pama, Brachypleura novazeelandiae), but these are thrown to the nearby shore and creates huge loss of the biodiversity. According to fish laws of sea 1983 the mesh size of the behundi net is greater than 0.3 inch which is changed in 2004 and the correction size of behundi net is greater than 0.45 inch. Ten percent of the catch is sold in fresh condition; others are sold as dry fish (DoF, 2008). Having these detrimental effects the net is being widely used in the island. The bata net is smaller then behundi net but are being used at Hatiya which have also the same affect over native fisheries stock.

Chandi jal is one types of the gill net used to catch ilish; it is also used to catch other fishes. Though the author found four types of gill net at Hatiya (lata jal, poa jal, chandi jala and ghongra jal) but several types of gill net is introduced all over the Bangladesh, those are apsha jal (Potuakhali, Bhola, Barisal and Borguna), barian jal (Chittagong), bag air mara jal (Rajshahi, Pabna, Bogra, Dhaka, Khulna and Potuakhali), chatka jal (Pabna, Dhaka, Barisal and Potuakhali), chapila jal (Maymonshing, Pabna, Dhaka, Khulna and Barisal), singhi jal (Maymonshingand Faridpur), kheta jal (Pabna) etc. Das and Bondopadhay (2000). Chandi jal is used in Rajshahi, Khulna, Chadpur, Chittagong, Noakhali, poa jal is used in Dhaka, Chandpur, Noakhali.

Jhaki jal is widely used at Hatiya, the benefit of this net is it can handle easily; mobile and fishing duration is short. It is also widely used at Dhaka, Mymensingh, Bakarganj, Rajshahi, Jessor, Bogra, Pabna, Rangpur, Dinajpur known as 'khapla jal', in Rangpur and Chitagong it is known as 'chlatki'. It is known as 'dhundi and kheo' in Sylhet, 'teora' in Jessor, 'pheka' in Dinajpur.

The thela and bagdara jal is used in this area to catch the shrimp PL (post larvae). In the time of collection, other different fish fry is also caught. It is reported that at the time of collection of Penaeus monodom PL other 12-551 shrimp PL, 5-152 finfish fry and 26-1636 plankton are washed out and creates a huge biodiversity loss to the environment (Hoq *et al*., 2001). Thela jal is very common in Mymensingh, Sylhet, Chittagong and other districts of Bangladesh. Khara jal is used to catch small and medium sized fish which is also common in Pabna, Bogra, Rangpur, Dhaka, Chandpur, Comilla, Feni and other districts of Bangladesh. A survey was conducted by Kabir *et al*. (2012) and he found that in old Brahmaputra river region, the fisherman are mainly used Jhaki jal, Dharma jal, Current jal, Moiya jal, Ber jal, Thella jal,Bair, Chandi bair, Borshi for catching several types of fish.

Fishermen use different types of crafts differ in length, breadth, depth, shape and size from region to region of the country. The crafts or boats are built traditionally by the rural carpenters according to their individual plan with planks. It is also difficult to classify them according to the net used because fishermen used the same boat for operating different nets. Most of the fishing boats are manually operated by using paddles and pole propulsion with or without sails. But it is not common in the lower reaches of the river. The size of the sail depends on the size and types of boats and the shape of the sail is usually rectangular, square or triangular.

Now-a-days fishermen are widely using mechanized or motorized boats for fishing. Kosha nauka (Fig. 2a) (plain bottom) are used in low tide area and internal canals which are non-mechanized and used to catch small fishes. In high tide area the dingi (Fig. 2b), chandi (Fig. 2c) (the rounded bottom mechanized boats) are introduced, the sotto tempu (Fig. 2d) and balam (Fig. 2e) are (rounded bottom mechanized boats) used to catch fishes in deep sea. In Bangladesh, there are about 3,06,642 fishing crafts (including 141 trawler, 43,960 traditional

Fig. 2(a-e): Several crafts used for fishing in Hatiya island (a) Kosha nauka, (b) Dingi nauka, (c) Chandi nauka (d) Soto tempu and (e) Balam nauka

Table 2: Fishing crafts used at Hatiya

	Size (m)							
Craft name	Length	Width	Height	Shape of bottom	Persons need to operate	Boat type	Life span (years)	Gears used
Chandi	10-15	2-4	2-3	Rounded	8-10	Mechanized	8-10	Mainly chandi jal
Kosha	8-10	2-4	1-2	Flat	2-3	Non-mechanized	4-5	Mainly current jal
Balam	10-15	5-8	2-4	Rounded	10-15	Mechanized	8-10	Behundi jal, chandi jal
Soto tempu	8-10	2-4	2-3	Rounded	5-8	Mechanized	4-5	Behundi jal, chandi jal
Dinghi	5-6	2-3	1-2	Rounded	5-6	Non-mechanized or Mechanized	4-5	Behundi jal, chandi jal

and 21,433 mechanized boat) are engaged in fish transportation (DoF, 2012). At Hatiya 10,500 fishing boats are introduced in fish transportation (personal communication with UFO, Hatiya). Every year a huge amount of fish is caught by the fishermen but the fishermen are bound to give the catch to the land lord with a very low price for their bindings. and gears are delivered them by the local Mahajan.

Fish is considered as one of the cheapest sources of protein among the exploitable resources of the aquatic ecosystems. Chandi jal and behundi jal are widely used in Bangladesh also operates in the estuary of Meghna at Hatiya. The operation of various nets in different seasons has taken advantage of the seasonal behaviour of different commercial species of fish. *T. ilisha* and Shrimp PL are widely caught at Hatiya. The amount of fish yield is fluctuating from year to year.

Bata (Labeo bata), Kuchia (Monopterus cuchia), Coral fish (Lates calcarifer), Guilla (Alopiasvulpinus), Koi (Anabas testudineus), Chewa (Pseudapocryptes elongatus), Charkuti, Pangus (Pangasius pangasius), Poa (Otolithoides pama), Bashpata (Brachypleura novazeelandiae) are caught mainly with different Fixed Purse net (mainly behundi and bata jal) in summer season. Bagdara jal is also used to capture the shrimp fry at summer season. Chandi jal is operated after winter to the beginning of rainy season and used to capture *T. ilisha* from October to January.

There are various types of fishing crafts including a number of indigenous fishing techniques are used at Hatiya (Table 2). The fisher folks who maintain a subsistence economy still resort to their primitive and traditional fishing crafts and nets. They use woods, bamboos, irons to make their boats which is furnished by coulter and burned oil. Most of the fishermen of Hatiya are still using traditional fishing crafts and nets which are obsolete because of their inefficiencies. Generally fishing nets and crafts are robbed but sometimes robbed the total catch with nets and crafts. No Governmental and non-governmental survey has been conducted about the estimation of fishing nets and crafts of Hatiya. No licensed boat is found by the author study. The working duration of the author was short so the actual number is not estimated. It is very important to conduct the long time survey to know about the accurate number and knowledge about this valuable resource of our country.

CONCLUSION

Fishing crafts and gears are normally used to conduct fishing activities. In Bangladesh mechanized fishing is hence forth not so popular. Traditional fishing instruments are mostly used all over its country fisherman. But the scattered document of fishing gears and crafts should be gathered. Therefore, it is possible to comparison the use of fishing crafts and gears among different can be done. Such way, we can have concept about the variety of fishing crafts and gears in Bangladesh.

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