

CAUSES OF FISH LESSENING - A CAUSE BREAKDOWN APPROACH

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ABSTRACT

One of the major sectors of Bangladesh agriculture is represented by the fisheries sector. Being a deltaic land with numerous rivers and inland *haors* and *beels* (lakes and lowland areas of considerable size), and also ponds that are dug in populated areas for the purpose of bathing, washing and often as a source of drinking water, fish has become an integral part of the food culture. In the past, hardly any need was felt for fisheries education and research because population was low and fish was plenty. But they are decreasing day by day. Fish production in the coastal area of Bangladesh has been gradually decreasing over the last few years, which is an alarming issue so far. A study was conducted in 16 coastal villages of four districts of Bangladesh to identify the reasons for decreasing the number of fish population in the rivers. 10 variables are considered for the causes of fish lessening, which are identified through extensive group discussions with the fishermen, physical verification of the villages and related literature review. Few issues like management efficiency, fisherman ignorance, and natural disaster have been analyzed in the study.

Keywords: haors and beels, ponds shrimp culture, fish production, management efficiency, socio-economic development.

PRELUDE

Bangladesh is endowed with vast marine, brackish, and inland waters having plenty fisheries resources. It has 720 km long coastal line along southern part of the country facing Bay of Bengal. The territorial marine water area of the country is 1, 66000 sq. km. of which continental shelf area is 66,440 sq. km.

Contribution of fisheries in the national economy of Bangladesh is substantial, particularly with reference to food consumption, nutrition, employment, and export. The sector contributes 5.24% to GDP, and 4.76% to foreign exchange earnings through export. This sector provides full-time employment for 1.2 million professional fishermen, and 11 million part-time fisher folk which is about 10% of the total population (Ahmad, 2005). The production of fish was estimated to be about 22,15,957 mt during 2004-2005, of which inland fisheries contributed about 17,41,360 mt, and marine fisheries about 4,74,597 mt. The average growth of fish production during the last seven years was 6.5%, which was lagged behind compared to increased demand: however, the present rate of fish production from culture has increased to about 8%.

In recent year's fish production from open water of the country is gradually decreasing and on the contrary the human population is increasing. This is due to anthropogenic activities like habitat destruction, over exploitation, using increased rate of sedimentation, watershed degradation, diversion of water for agricultural uses, conversion of wetlands for agricultural and urban development, and environmental pollution. According to Master Plan Organization (MPO), 3.14 million ha of seasonally inundated flood land was brought under flood control drainage and irrigation projects during the year 2005 and as such there is a dropping of 35% per capita fish consumption (MPO, 1986).

Fisheries sector is playing a very vital role regarding employment generation, animal protein supply, foreign currency earning, and poverty alleviation. According to the report of BBS (2003-2004), fisheries sector is contributing 5.71% of the total export earning and 4.91% to the GDP. About 12 million people are directly or indirectly involved in this sector. Labour employment in this sector has been increasing approximately by 3.5% annually. Fish production in ponds, lakes, borrow pits, floodplains, oxbow lakes, and semi-closed water bodies are increasing day-by-day through transfer of modern technology. Although fish production has been increased to 22.16 lac m tons in 2004-05, which was 17.81 lac m tons in 2000-01, the annual growth rate of fish production has been declined to 5.42 % in 2004-05 while the growth rate was 7.20 % in 2000-01(Appendix Table-1). An attempt has been made to evaluate the causes of this fish declining so that fish production can be enhanced and the socio-economic condition of the fishing communities could be improved.

OBJECTIVES OF THE STUDY

The objective of the research is to find out and analyze the causes of fish lessening in Bangladesh and to provide recommendations for how to overcome the situation. The specific objectives of the study are as follows:

- To identify the main causes of fish lessening;
- To identify the constraints behind combating the causes of fish lessening;
- To formulate and implement various recommendations to reduce/overcome the causes of fish lessening;

METHODOLOGY OF THE STUDY

Both primary and secondary data have been used in this paper. In secondary data, the supporting and relevant materials such as government policies, documents, research articles, textbooks, regarding fishery issues and development have been consulted in order to present the facts in a logical format. A number of key informants have been interviewed from the Department of Fisheries (DOF) and the Institute of Marine Science (IMS) of Chittagong University to assess the status and possible future direction of this important sector of the economy. Primary data were collected on the basis of questionnaire prepared in the light of the objectives of the study. A study was conducted on 160 respondents in 16 coastal villages of 4 districts of Bangladesh to evaluate the reasons for decreasing the fish population in the rivers. 10 variables are considered for the causes of fish lessening. These variables are identified through extensive group discussions with the fishermen, physical verification of the villages and related literature review. During data collection, information was also collected from the fishermen who were engaged in fishing in the 16 coastal villages. The variables are as follows:

- Industrial pollution
- Agrochemicals
- Domestic and municipal wastes
- Oil Pollution
- Ship-breaking operations
- Siltation
- Over fishing
- Degradation of wetlands
- Water resources development activities
- Indiscriminate fishing

CAUSES OF FISH LESSENING

Industrial pollution

According to a DOE report (Farooque, 1997), there are 425 major, 1175 moderate and 2200 minor polluting industries in Bangladesh. With a few exceptions, these dump their wastes in the nearby river without any treatment. According to Faisal et al. (2001), annual emission into water by the industrial sector alone is about 50,000 tons of BOD and 106,000 tons of TSS. The most polluted rivers flowing around major urban or industrial areas are the Buriganga, the Sitalakhya and the Karnafuli and the Rupsha. In addition, ports, shipyards

and shipwrecking industries in Mongla and Chittagong cause significant oil pollution to local water bodies that eventually affect the coastal waters.

Agrochemicals

Farmers use fertilizer and pesticides to increase and protect agricultural yield. These chemicals contaminate soil and water, enter into the food web, and cause bioaccumulation of toxic substances. There are about 250 varieties of pesticides that are used in Bangladesh. Annually between 4000 to 5000 tons of pesticides are used in the whole country and as much as 25% of this may end up in the water bodies eventually discharging into the Bay of Bengal. These chemical residues can kill fish at lethal dose. Even at sub-lethal dosage, other aquatic species may be harmful that are part of the food web of open water fish species.

Domestic and Municipal wastes

The cities and human settlements in the coastal areas of Bangladesh do not have domestic waste treatment facility and therefore, effluents either directly or indirectly find their way untreated into the rivers and hence, ultimately to the Bay of Bengal. The two populous coastal cities, namely, Chittagong and Khulna have the prime role in the contamination of the marine environment by municipal wastes, which are discharged in the Kharnaphuli and Passur rivers respectively. The largest and most populous capital city, Dhaka, although far away from the coast also has its contribution in this regard. It produces huge amount of domestic sewerage and solid wastes which mainly enter the tidal river Buriganga flowing into the Bay of Bengal. Population pressure in the country which does not have adequate sanitation facilities exacerbate this problem while the country's population is growing fast, urban population is growing faster. In 1941, urban population made up 3.38% of the total population and in 1984 it went up to 15.1% with 13.5 million which is estimated to be about 34.8% in the year 2000 with population of about 51.2 million (Rahman and Alam, 1985).

In case of urban areas other than municipal cities, the waste situation is not better. The strength of the river flow is considered sufficient to dilute the load through natural degradation, but in the dry season the dilution factor is reduced considerably and the capacity for self purification is thus reduced: Ahmed (1985) reported fish and other aquatic life mortality as an insult of deoxygenating and the proliferation of toxic gases.

Oil Pollution

Pollution by oil spills and oily substance is a potential threat to the marine environment of Bangladesh. Localized oil pollution is said to be heavy in the vicinity of the Chittagong and Mongla (near Khulna) port areas, being the centers for tanker traffic and transshipment operations. The port city Chittagong is the principal marine traffic, crude oil handling, and petroleum refining and product distribution centre in Bangladesh. Apart from the port areas, there have also been persistent reports of oil slicks in the territorial waters of the country and the upper Bay of Bengal (ESCAP, 1988). With the increase in port activities, but lack of waste reception facilities and appropriate legislation and/or ineffectiveness of present one, port pollution, level is continuously rising. Moreover, there is also accidental oil spillage in mass quantity from oil tankers causing probable damage to mangrove forest and other marine and coastal resources. In last few years, several incidences of oil spillage occurred accidentally within the territorial waters of Bangladesh. The *m.t. Filoti* deposited as much as 2200-3000 ton of crude oil near Katubdia island (Talukdar, 1992; Majumder, 1992), while the *t.t. energy* discharged unknown quantities of oil in the same area in 1992. Such incident undoubtedly had a negative impact on the coastal forest and marine resources.

Ship-breaking Operations

Ship-breaking operations in Bangladesh pollute the coastal soil and water through discharge of various refuse materials and metal fragments from the scrap ships. The operations began in 1969 and started on an industrial scale after 1980 in the face of increasing demand of scraps. Now there are 150 entrepreneurs engaged in this business (Islam and Hossain, 1986) who collect old, damaged, and obsolete sea going ships and oil tankers from abroad which dismantled on the sea-shore from Kumira to Fouzdarhat in Chittagong and near Mongla port in Khulna. As a result, various refuse and disposable materials as well as oily substances are being discharged which often get mixed with the beach oil and sea water.

Siltation

Denudation of the Himalayan has resulted in the formation of the world's largest delta which is still active, growing at a rate of about 17 cm every thousand years (Curry and Moore, 1971; Biswash, 1978). The Ganges-Brahmaputra river system brings this sediment down and drains it into the Bay of Bengal. The Meghna system seems to filter the sediment which passing through the depressions (*haors*) of the Sylhet basin and contributes less to the process. A total of 6 million cusecs of water carrying and estimated amount of 2,179 million ton of sediment is carried down to the sea each year by the Ganges-Brahmaputra river system (Curry and Moore, 1971).

Other major sources in the region are due to the increased runoff during the rainy season, floods, increased erosion of top soil as a result of coastal and inland vegetation depletion. Massive earthworks involve in coastal development projects and possibly also in rapid horizontal expansion of other land use practices (e.g., aquaculture) replacing existing ones have brought changes in the siltation process of the in-shore and estuarine habitats. Mass scale flattening and scarping of hills and foothills in the Chittagong region must have changed the sedimentary process of the area in the recent years, though very local effect is expected.

Over fishing

Fish harvesting in Bangladesh is unregulated. A large variety of fishing nets and traps are used in harvesting fish and prawn in the open waters. Systematic studies to assess fishing intensity and fishing pressure on the sustenance of populations of different fish or prawn species have yet to be carried out in Bangladesh. One study, however, was carried out in 1985 by Tsai and Ali in order to develop measures for carp fisheries management in the open waters. This study found that the carp stock in the upper Meghna river had undergone depletion due to mainly overfishing. Depletion of the carp stock in the Padma river was attributed to (i) Farakka dam (ii) embankments (iii) sedimentation and (iv) overfishing, while the depletion of the stock in the Brahmaputra river was contributed by hydraulic changes produced by (i) embankments (ii) sedimentation, and (iii) in small degrees, by overfishing. However, increase in the human population and consequent increase in the demand for fish, fishing pressure are intensifying in increasing proportions every year. This is believed to have caused overfishing of all the stocks and populations of fish prawn by the use of even banned gears and methods.

Degradation of wetlands

Due to sedimentation and encroachment, wetlands have lost both their productivity and biodiversity. In some coastal areas, people are deliberately trying to trap sediments within the coastal swamps for land reclamation. This is generating more employment and income for the local communities at the expense of fisheries resources. Wetlands are being encroached upon for agricultural, industrial and urban development. These activities are taking up wetlands on permanent basis and might have contributed to extinction of many indigenous varieties of fish.

Water Resources Development Activities

Water development projects like Flood Control and Drainage (FCD), Flood Control Drainage and Irrigation (FCDI), closures across rivers, obstruction of water for irrigation, diversion of channels, etc. have been implemented in Bangladesh since the early 1960s with a view to making the country flood free to reduce sufferings of human being as well as to increase food grain production. These projects produce inimical effects on the aquatic eco-system and thus adversely affect the production of freshwater and brackish water fisheries in inland open water habitats, such as in estuaries, rivers, canals, flood plains, and '*beels*' (deep depressions), which become components of a single integrated fishery production system during the monsoon (wet) season (Ali, 1989).

Indiscriminate fishing

Open-water fisheries are considered "public property" as per the State Acquisition and Tenancy Act of 1950. This has lead to uncontrolled and indiscriminate fishing. State managed or leased water bodies are also managed with the sole objective of revenue generation. There is no post-lease monitoring to ensure that the leased out wetlands are managed according to the terms and conditions spelled out in the lease contract. This

leasing agreement is managed by the Ministry of Land as opposed to the Ministry of Fisheries and Livestock, which is another reason for lack of fish friendly management of the wetlands.

FINDINGS AND DISCUSSION

The following cause variables have been identified and shown in order of weight based on the responses from 160 respondents in 16 villages of 4 coastal districts of Bangladesh for declining fishes.

Table1: Major causes of fish lessening perceived by respondents

Variables	No. of Respondents	Percent
Industrial pollution	31	19.4
Agrochemicals	26	16.3
Domestic & Municipal waste	23	14.4
Oil pollution	20	12.5
Ship-breaking operation	17	10.6
Siltation	13	8.1
Overfishing	12	7.5
Degradation of wetlands	8	5.0
Water resource development activities	6	3.7
Indiscriminate fishing	4	2.5
Total	160	100

Fish production in Bangladesh has been gradually decreasing over the last few years. The rate of decline is identified in the annual growth rate of fish production in Bangladesh during the year 2000-01 to 2004-2005

Table 2: Year-wise Fish Production of Bangladesh 1995-1996 to 2004-2005

[Unit: Metric Ton]

Source	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05
A. INLAND FISHERIES	988,238	1,085,764	1,190,761	1,242,620	1,327,585	1,401,560	1,475,039	1,566,289	1,646,819	1,741,360
(a) Inland Openwater (Capture)	609,151	599,900	615,949	649,418	670,465	688,920	688,435	709,333	732,067	859,269
(1) River & Estuaries	165,637	159,660	156,894	151,309	154,335	150,129	143,592	137,848	137,337	139,798
(2) Sundarbans	7,265	9,225	7,031	11,134	11,648	12,035	12,345	13,884	15,242	15,724
(3) Beel (Depression)	60,768	62,798	67,812	69,850	72,825	74,527	76,101	75,460	74,328	74,925
(4) Kaptai Lake	6,148	5,764	5,932	6,689	6,852	7,051	7,247	7,025	7,238	7,379
(5) Flood Land	369,333	362,453	378,280	410,436	424,805	445,178	449,150	475,116	497,922	621,443
(b) Inland Closewater (Culture)	379,087	485,864	574,812	593,202	657,120	712,640	786,604	856,956	914,752	882,091
(1) Pond & Ditch	307,974	403,830	483,416	499,590	561,050	615,825	685,107	752,054	795,810	756,993
(2) Baor (Ox-bow Lake)	2,764	3,014	3,378	3,536	3,622	3,801	3,892	4,098	4,282	4,388
(3) Shrimp Farm	68,349	79,020	88,018	90,076	92,448	93,014	97,605	100,804	114,660	120,710

B. MARINE FISHERIES	269,702	274,704	272,818	309,797	333,799	379,497	415,420	431,908	455,207	474,597
(a) Industrial	11,959	13,564	15,273	15,818	16,304	23,901	25,165	27,954	32,606	34,114
(b) Artisanal	257,743	261,140	257,545	293,979	317,495	355,596	390,255	403,954	422,601	440,483
COUNTRY TOTAL	1,257,940	1,360,468	1,463,579	1,552,417	1,661,384	1,781,057	1,890,459	1,998,197	2,102,026	2,215,957
ANNUAL GROWTH RATE OF PRODUCTION	7.25	8.15	7.58	6.07	7.02	7.20	6.14	5.70	5.20	5.42

Source: DOF, Fishery Statistical Year Book of Bangladesh 2004-2005.

Actually the decline in fish production in Bangladesh can be explained as the combined effect of the ten variables considered in the field study. Additional information regarding annual total catch and area productivity's by sector of fisheries for July 2004- June 2005; comparison of annual total catch of 2004-2005 with those of 2003-2004; species/group-wise catch in inland & marine fisheries, 2004-2005; annual total catch of inland water by district, 2004-2005 have been attached in the appendices.

Of the ten causes accounting for fish declining in Bangladesh, cause 1 and cause 2 are mostly liable shown in the table 1. Cause 1 has the highest impact on the decline in fish production and is followed by cause 2. Looking at the variables studied, it is clear that the industrial pollution, agrochemicals, Domestic and municipal waste and oil pollution are largely responsible while ship-breaking operation, Siltation, overfishing are moderately and degradation of wetlands, water resource development, indiscriminate fishing are slightly liable for the fish decline in Bangladesh.

RECOMMENDATIONS

Community Participation: The practice of harmonious and effective coordination among different agencies actively or passively connected to the resource has to be evolved without unnecessary delay in implementation of projects that might have impact on the purity of water.

Human resource Development: Development of strategy for providing proper education and training to concerned person involved in the process of fisheries research and activities.

Awareness Building: Awareness building is to be developed among people through different mass media regarding food value of fish.

Adopting Arrangements or Incentives: To minimize the present level of pollution from various sources, adequate arrangements or incentives to be adopted in the whole spectrum of legal or non-legal infrastructure.

Institutional Capability Building: The Department of Fisheries must be equipped with sufficient institutional capability so that it could assess the implications of any project already implemented or undertaken, affecting or if implemented would significantly affect the resource.

Enforcement of Existing Rules and Regulations: To conserve the resource from further degradation legal provisions pertinent to achieve this goal must be strictly enforced and followed and necessary amendment to be introduced.

Reduction Of Post-Harvest Loss Of Fisheries: By developing of fish landing and distribution facilities and proper marketing system, it could be possible to reduce post harvest loss of fisheries.

Capacity Building Relating To Aquaculture: Capacity should be built up in terms of

- Develop appropriate technologies for Aquaculture which will be best fit in Bangladesh considering its climatic, market and social conditions;

- Develop knowledge, and appropriate technical and management skills of the human resources who are/will be involved in Aquaculture;
- Plan to Demarcate areas for Aquaculture (zoning) using GIS.

Development of Infrastructures:

- Road for transportation of both inputs and outputs;
- Develop and update the educational or training infrastructures;
- Develop information communication system to rapid access to information;
- Develop and modernize the market including landing Centres and the marketing channels both for inputs and outputs relating to the fisheries.

Development of Networks

- Develop producers organizations and networks for information, better management and access to finance
- Develop and coordinate with the regional and international networks for update technological, markets and other relevant information and support

CONCLUSION

This paper has thereby reviewed the status, problems and prospects of the fisheries sector of Bangladesh. The key observations made above and the corresponding recommendations represent make a big difference in improving the current status of this sector.

The people of Bangladesh are known to have survived on “fish and rice.” Fish supplies the main part of animal protein in their diet. This sector also employs some two and half million people directly. Its importance in the national economy has grown rapidly in the recent past through export of fish and shrimp to European and North American countries. Therefore, it is important to manage this valuable resource in a judicious way. Moreover, a healthy fresh and marine fisheries sector will also imply a healthy aquatic ecosystem in Bangladesh. Thus, managing the fisheries sectors in an efficient, equitable and sustainable manner will ensure the health and prosperity of the people and the environment of Bangladesh.

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APPENDICES

Annual Total Catch and Area Productivity's by Sector of Fisheries for July 2004- June 2005

Sector of Fisheries	Water Area (Hectare)	Total Catch (Metric Ton)	Catch/Area (Kg/Hectare)
A. Inland Fisheries			
(i) Capture			
1. River & Estuaries	1,031,563	139,798	136
♣ 2. Sundarbans	-	15,724	-
3. Beel	114,161	74,925	656
4. Kaptai Lake	68,800	7,379	107
5. Flood Land	2,832,792	621,443	219
Capture Total	4,047,316	859,269	38.8%
(ii) Culture			
1. Pond & Ditch	305,025	756,993	2,482

2. Baor	5,488	4,388		800
3. Shrimp Farm	217,877	120,710		554
Culture Total	528,390	882,091	39.8%	
Inland Total	4,575,706	1,741,360	78.6%	
B. Marine Fisheries				
(i) Industrial Fisheries (Trawl)		34,114		
(ii) Artisanal Fisheries		440,483		
Marine Total		474,597	21.4%	
COUNTRY TOTAL		2,215,957	100%	

SOURCE: 1. Total catch of River, Beel & Baor of the inland fisheries was estimated on the basis of Frame Survey prepared in 81-83.

2. Kaptai Lake catch has been estimated by BFDC and Sundarban catch by Forest Department.

3. Total catch of the marine fisheries was estimated by the Marine sector, Department of Fisheries.

* Pond production is decreased and open water catch is increased due to flood.

♣Sundarban area is included in River and Estuarine but catch shown separately.

Source: DOF, Fishery Statistical Year Book of Bangladesh 2004-2005.

Comparison of Annual Total Catch of 2004-2005 with those of 2003-2004

Sector of Fisheries	Annual Total Catch (M.T.)		Increase (M.T.) (B)-(A)	Percent Increase
	2003-2004	2004-2005		
	(A)	(B)		
A. Inland Fisheries				
(a) Capture				
1. River & Estuaries	137,337	139,798	2,461	1.79
2. Sundarbans	15,242	15,724	482	3.16
3. Beel	74,328	74,925	597	0.80
4. Kaptai Lake	7,238	7,379	141	1.95
5. Flood Land	497,922	621,443	123,521	24.81
Capture Total	732,067	859,269	127,202	17.38
(b) Culture				
1. Pond & Ditch	795,810	756,993	-38,817	-4.88
3. Baor	4,282	4,388	106	2.48
4. Shrimp Farm	114,660	120,710	6,050	5.28
Culture Total	914,752	882,091	-32,661	-3.57
Inland Total	1,646,819	1,741,360	94,541	5.74
B. Marine Fisheries				
(a) Industrial Fisheries (Trawl)	32,606	34,114	1,508	4.62
(b) Artisanal Fisheries	422,601	440,483	17,882	4.23
Marine Total	455,207	474,597	19,390	4.26
COUNTRY TOTAL	2,102,026	2,215,957	113,931	5.42

* Pond production is decreased and open water catch is increased due to flood.

Source: DOF, Fishery Statistical Year Book of Bangladesh 2004-2005.

Species/Group-wise Catch in Inland & Marine Fisheries 2004-2005

[Unit : Metric Ton]

Species	Inland Fisheries	Marine Fisheries	Total	%
Major Carp	494,213		494,213	22.30
Other Carp	9,298		9,298	0.42
Exotic Carp	267,862		267,862	12.09
Cat Fish	39,935		39,935	1.80
Snake Head	70,400		70,400	3.18
Live Fish	47,588		47,588	2.15
Other Inland fish	583,136		583,136	26.32
Hilsa/Illish	77,499	198,363	275,862	12.45
Bombay Duck (<i>Harponodon nehereus</i>)		37,924	37,924	1.71
Indian Salmon (<i>Polydactylus indicus</i>)		1,074	1,074	0.05
Pomfret (<i>Rup Hail Foli Chanda</i>)		12,035	12,035	0.54
Jew Fish (<i>Poa, Lambu, Kaladatina</i> etc.)		31,730	31,730	1.43
Sea Cat Fish (<i>Tachysurus spp.</i>)		19,037	19,037	0.86
Sharks, Skates & Rays		4,085	4,085	0.18
Other Marine Fish		126,088	126,088	5.69
Shrimp	151,429	44,261	195,690	8.83
T O T A L	1,741,360	474,597	2,215,957	100
	78.58%	21.42%	100%	

- NOTE:
- | | |
|----------------|---|
| 1. Major Carp | - Rui, Catla, Mrigal |
| 2. Exotic Carp | - Silver Carp, Common Carp, Mirror Carp, Grass Carp |
| 3. Other Carp | - Ghania, Kalbasu, Kalia |
| 4. Cat Fish | - Rita, Boal, Pangas, Silon, Aor, Bacha |
| 5. Snake Head | - Shol, Gazar, Taki |
| 6. Live Fish | - Koi, Singhi, Magur |
| 7. Other Fish | - Includes all other fishes except those mentioned above. |

Source: DOF, Fishery Statistical Year Book of Bangladesh, 2004-2005

Annual Total Catch of Inland Water by District 2004-2005

(Unit: Metric Ton)

District	River	Sundarban (old district)	Beel	Kaptai lake	Floodland	Pond	Baor	Shrimp Farm	Total
Dhaka Division									
Dhaka	443		378		38,640	6,077		1.32	45,539
Faridpur	2,102		318		4,479	8,231	241	0.25	15,371
Gazipur	734		662		26,965	7,490			35,851
Rajbari	2,858		105		5,935	4,563	226	0.48	13,687
Gopalganj	243		392		4,813	5,327	76	115.15	10,966
Jamalpur	817		1,767		14,096	4,246		0.28	20,926
Kishoreganj	2,607		5,962		25,484	14,752		20.39	48,825
Madaripur	544		109		5,995	4,489	122	26.47	11,285
Manikganj	544		357		5,352	5,782			12,035
Munshiganj	1,137		37		4,395	5,600			11,169
Mymensingh	1,811		5,620		38,562	26,331			72,324

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Narayanganj	2,508		90		23,845	3,627			30,070
Narshingdi	617		448		8,631	5,723			15,419
Netrakona	1,150		8,021		18,523	19,317			47,011
Sariatpur	1,238		32		5,439	5,604		0.38	12,313
Sherpur	79		2,228		7,702	3,743			13,752
Tangail	370		1,376		12,902	7,462			22,110
Divisional Total	19,802		27,902		251,758	138,364	665	165	438,656
(Dhaka)									
Barisal Division									
Barisal	25,510		9		7,778	16,923		51.49	50,271
Barguna	6,558		-		3,534	10,042		110.30	20,244
Bhola	17,552		1		6,117	19,458		1,139.95	44,268
Patuakhali	3,448		-		7,811	17,371		822.03	29,452
Pirojpur	3,821		5		2,946	9,120		1,649.95	17,542
Jhalokathi	149		3		2,904	7,654		7.94	10,718
Divisional Total	57,038		18		31,090	80,568	-	3,782	172,496
(Barisal)									
Khulna Division									
Chuadanga	87		459		1,999	3,808	799		7,152
Jessore	219		949		9,445	24,463	885	3,731.30	39,692
Jhenaidah	61		432		5,681	10,339	560	2.37	17,075
Bagerhat	2,687	12,925	11		8,535	9,457		36,799.59	70,415
Khulna	569	1,675	85		11,143	20,113	141	27,603.03	61,329
Kushtia	244		226		7,297	3,339	378		11,484
Magura	1,176		107		3,176	7,581	368	16.48	12,424
Meherpur	196		135		2,058	2,714	322		5,425
Narail	277		240		1,607	6,329	203	1,132.65	9,789
Satkhira	146	1,124	13		4,367	7,666	67	24,219.29	37,602
Divisional Total	5,662	15,724	2,657	-	55,308	95,809	3,723	93,505	272,388
(Khulna)									

District	River	Sundarban (old district)	Beel	Kaptai lake	Floodland	Pond	Baor	Shrimp Farm	Total
Rajshahi Division									
Bogra	128		1,488		7,222	19,959			28,797
Dinajpur	24		203		10,184	26,445			36,856
Gaibandha	521		397		9,090	3,327			13,335
Jaypurhat	31		85		3,674	5,178			8,968
Kurigram	812		676		7,688	4,177			13,353
Lalmoirhat	155		130		4,111	2,151			6,547
Naogaon	430		2,679		27,998	18,408			49,515
Natore	206		557		12,785	15,530			29,078
Nawabganj	598		2,162		2,606	7,684			13,050
Nilphamari	149		290		4,187	1,595			6,221
Pabna	3,480		863		11,096	14,817			30,256
Panchagarh	56		25		2,690	9,780			12,551
Rajshahi	606		3,478		6,334	23,815			34,233
Rangpur	123		1,080		4,819	4,791			10,813
Sirajganj	536		503		7,307	13,807			22,153
Thakurgaon	40		88		2,233	13,116			15,477
Divisional Total	7,895		-14,704	-	124,024	184,580			331,203
(Rajshahi)									
Chittagong Division									
Bandarban	9		-		276	-			285

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Brahmanbaria	5,037		271		10,607	28,920			44,835
Chandpur	9,614		141		17,577	21,775		0.07	49,107
Chittagong	1,106		18		13,959	39,140		1,519.64	55,743
Comilla	1,555		95		29,264	46,526			77,440
Cox's Bazar	2,398		-		3,294	18,274		21,704.52	45,671
Feni	173		-		6,138	12,452		1.45	18,764
Khagrachari H.T.			11		-	-			11
Laksmipur	24,721		-		7,696	17,432		1.52	49,851
Noakhali	626		1		13,518	34,183		31.52	48,360
Rangamati H.T.			38	7,379	-	-			7,417
Divisional Total (Chittagong)	45,239	-	575	7,379	102,329	218,702	-	23,259	397,483
Sylhet Division									
Moulvi Bazar	1,072		2,762		7,856	9,162			20,852
Habiganj	180		2,427		14,951	8,518			26,076
Sunamganj	1,558		18,934		18,196	10,552			49,240
Sylhet	1,352		4,946		15,931	10,738			32,967
Divisional Total (Sylhet)	4,162		29,069	-	56,934	38,970			129,135
Grand Total	139,798	15,724	74,925	7,379	621,443	756,993	4,388	120,710	1,741,360
%	8.03	0.90	4.30	0.42	35.69	43.47	0.25	6.93	100

SOURCE: Catch Assessment Survey, FRSS