



# ANNUAL REPORT 2017



**Department of Fisheries, Bangladesh**  
**Ministry of Fisheries and Livestock**

# Annual Report 2017

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Director General  
Department of Fisheries  
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## *Preface*

Bangladesh is blessed with vast and well diversified inland open waters, estuaries, brackish and marine waters with the potential fisheries resources from these water bodies are the richest in world. Fisheries sector has been playing increasingly an important role in our economy for few decades. The fisheries sector of Bangladesh has both prospects and challenges. Department of Fisheries (DoF) is carrying out activities related for providing animal protein to the huge population of Bangladesh through fisheries and aquaculture, fisheries conservation, proper management and planned development of fisheries resources to uplift the socio-economic conditions of the fishers. The sector by exploring the opportunities of creating employment for the rural people, earning foreign currency by exporting shrimp as well as quality and safety in fish and fishery products. Department of Fisheries also assists government in formulating policies and acts required for the sustainable development and integrated natural resources management and fisheries conservation.

Fish provides about 60% of animal protein of our daily life. In order to ensure overall development of the sector, DoF is implementing several projects and programs under both development and revenue budget. The annual report 2017 brought together the brief of the activities performed by the DoF. The report also presents the development of fisheries sector to visualize the potential and achievements in the contemporary period.

I strongly believe that this report will be helpful for the field officers of DoF, planners, researchers, development partners, extension workers, NGOs and all other relevant stakeholders of fisheries sector. I appreciate the initiatives of my colleagues who have given their valuable time, effort and endeavor in preparing this report. I offer my heartfelt thanks, gratitude and acknowledgement to them.

**Md. Goljar Hossain**

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## **1.0 Introduction**

Bangladesh, a riverine country blessed with many rivers-canal, depressions and oxbow lakes, ponds and floodplains, covering a huge area of water resources of 4.70 million hectares. Besides, there is a huge marine fisheries resources expanding over an Exclusive Economic Zone (EEZ) of 1, 66,000 sq. km. Since time immemorial, these inland, coastal and marine waters are the main sources of fish. As an agro-based country, the contribution of fisheries sector to national economy has always been important and main source of animal protein, employment opportunities, food and nutritional security, foreign earnings, aquatic biodiversity conservation and socio-economic development. Fisheries sector contributes 3.61% to GDP and 24.41% to agricultural GDP. Fish supplements to about 60% of our daily animal protein intake. About 11% of the population depends directly and indirectly on the fisheries sector for their livelihood.

Extension programs of sustainable aquaculture technologies for fish and shrimp, conservation and management of the freshwater and marine open water capture fisheries, optimization and fine-tuning of fish inspection and quality control programs and use of information and communication technologies in fisheries sector has been taken to achieve the much desired targets. As a part of the 'Digital Bangladesh' program the Government initiated e-Extension services of fish and shrimp culture and extension programs to provide appropriate services to the door steps of the farmers. In addition of these, existing laws and acts related to fisheries have been amended and updated to ensure quality fish and shrimp production and to make available quality inputs.

In conformity with the targets of 'Vision-2021' of the present Govt., the Department of Fisheries (DoF) has also envisioned some important programs and targets to achieve that goal. Initiation of good practices in environment friendly fish and shrimp farming for promotion of export, biological management of jalmohals, establishing easy access of real fishers to the open water capture fisheries, creation of employment opportunities and other various pragmatic programs have been taken by the DoF to facilitate achievement of 'Vision-2021'. It is expected that all these programs will contribute to reduce present poverty from 6.5 crores to 2.2 crores by the year 2021.

### **1.1 History of the Department of Fisheries**

Department of Fisheries, Bangladesh was first established in the undivided Bengal of the British India in 1908 and since then it has experienced many changes. In 1910, the DoF was merged with the Department of Agriculture, but as per the recommendations of Mr. T. Southwell, the DoF regained its status as an independent organization in 1917. The DoF was abolished again in 1923. However, after a long gap, following the recommendations of Dr. M. Ramswami Naidu, the DoF was revived in May, 1942. Since the inception of the then East Pakistan, the activities of DoF had been continued. After the independence of Bangladesh in 1971, the organization renamed as Department of Fisheries (DoF) instead of the Central Fisheries Department in April 1975, and in 1984, the Central Marine Fisheries Department merged with the DoF as Marine Fisheries wing.

## 1.2 Vision, mission and mandate

**Vision:** Meet the demand of animal protein, poverty alleviation and promote foreign earnings.

**Mission:** To support sustainable growth in fish and shrimp production with other aquatic resources for domestic consumption, exports and management of open-water fisheries resources through community participation leading to equitable distribution of the benefits for optimal economic and social growth in Bangladesh.

**Strategic objectives:** The key objectives of the sector are:

- a. Enhancement of the fisheries resources and production;
- b. Poverty alleviation through creating self-employment and improvement of socio-economic conditions of the fishers;
- c. Meet the demand for animal protein;
- d. Achieve economic growth and earn foreign currency by exporting fish and fisheries products;
- e. Maintain ecological balance, conserve bio-diversity and improve public health.

### Targets under 7FYP

- a. Increased 45% aquaculture and 20% fisheries production by 2020
- b. Increased 20% hilsa and 18% marine fisheries production by 2020
- c. Raise per capita protein intake to 60 g from domestically produced fish and fisheries product by 2020
- d. Raise export earnings to US\$ 1.25 billion by 2020 from frozen shrimp, fish and value added fish products
- e. Ensure quality seed and feed at growers level
- f. Reappear at least 75% of endangered fish species in sanctuary area by 2020 from baseline
- g. Creation of more (25%) employment opportunity for unemployed youths
- h. Fish farmers/ fishers income raise by 20% by 2020.
- i. Participation of women in aquaculture production, fisheries CBOs and fish and shrimp processing industries increase to 25%
- j. Good Aquaculture Practices (GAP) and Good Manufacturing Practices (GMP) at all stages of fish/shrimp supply chain to comply international market.
- k. Food safety measures for domestic markets.

### Mandate

- To disseminate improved aquaculture technologies through training and demonstration and to extend advisory services to the farmers.
- To enhance fisheries resources through facilitating conservation and management measures.
- To assist the administrative ministry in formulation of policies, acts etc.
- To enforce quality control measures and issuance of health certificates for

exportable fish and fish products.

- To conduct fisheries resources survey and assessment of stock to develop fisheries data base for proper planning.
- To facilitate arrangement for institutional credit for fish and shrimp farmers, fishers and fish traders.
- To facilitate alternative income generating activities for rural poor and unemployed people towards poverty alleviation.
- To formulate and implement development projects towards sustainable utilization of fisheries resources to ensure food security.

### 1.3 Organizational Setup

DoF has the following wings to render its services:

- ❖ Inland Fisheries,
- ❖ Marine Fisheries,
- ❖ Fisheries Resource Survey System (FRSS),
- ❖ Fish Inspection and Quality Control (FIQC), and
- ❖ Training.

#### 1.3.1 Manpower under revenue

In line with the Vision-2021 of the present democratic government in Bangladesh, the country is now well-poised to succeed in its quest for a Digital Bangladesh. While Bangladesh is making great strides towards holistic and sustainable development, Department of Fisheries has been working hard since its inception to render the services and responsibilities for sustainable fisheries production and socio-economic development by providing modern and effective aquaculture technologies and efficient fisheries management practices to the fishers. The organization holds 5927 positions under the Director General (DG) along with one Additional Director General (ADG), seven Principal Scientific Officer/Directors: there are eight divisional Deputy Directors, 64 District Fisheries Officers, 487 Senior/Upazila Fisheries Officers, and other staff members. Regardless, there is insufficient amount of staff and manpower with various crucial positions remaining vacant. Manpower under revenue budget and manpower in position of DoF are shown in following table 1.

Table 1: Manpower under revenue budget and manpower in position

Manpower Scenario			
Class	Sanctioned Posts	Posts in Position	Vacant Posts
I <sup>st</sup> Class - Cadre	1298	644	654
Non-Cadre	333	199	134
Class II	661	370	291
Class III	2101	1658	443
Class IV	1525	1356	169
<b>TOTAL</b>	<b>5927</b>	<b>4227</b>	<b>1691</b>

In order to meet the SGDs goals as well as EU requirements aligning the 7<sup>th</sup> Five Year Plan, it needs appropriate institutional framework with adequate educated qualified and skilled manpower to face future challenges for sustainable fisheries development. DoF do not have institutional set-up that provide quality technical support and know-how to undertake and successfully complete the massive task of rural fisheries development at union level. Globally, efficient service delivery and service receivers are now getting the highest priority. The service providers are encouraged to invent new processes to deliver the service at the door step of the people without any hindrance and delay. So, for ensuring prompt, trouble-free, people oriented, and efficient service delivery system, it would be strengthened to international standards with adequate professionally committed manpower with logistic supports and legal frameworks for efficient discharge their assigned duties and responsibilities. A way forward to institutional capacity of DoF is mentioned below in brief:

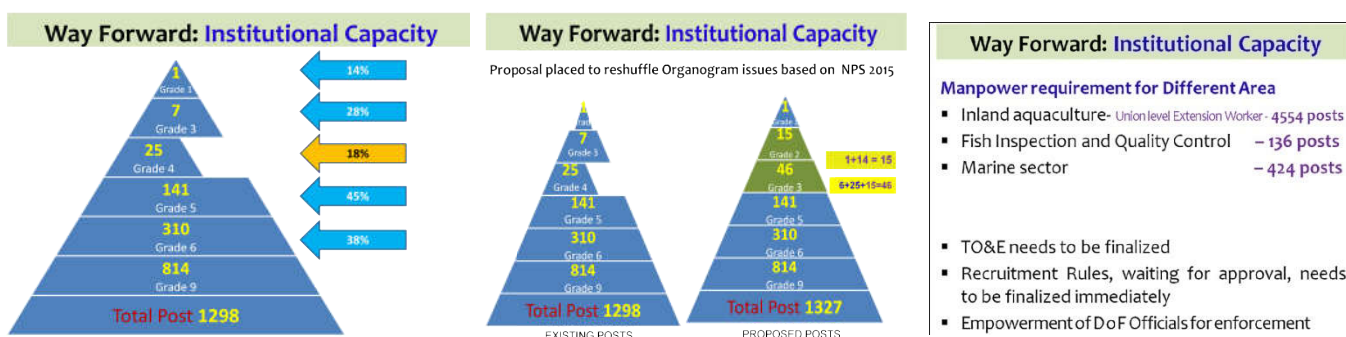


Figure 1: Manpower status

## 1.4 Budget allocation

The Departmental Budget is a comprehensive blueprint of the annual activities expressed in financial terms. The budget has two distinct categories: (a) Revenue and (b) Development.

### 1.4.1 Revenue budget

Activities which include expenditures of pay and allowances, supplies and services, repair-maintenance and rehabilitation, miscellaneous, procurement of civil works and projects and program apart from Annual Development Program (ADP) fall under revenue budget. During

the last five years, non-development budget of DoF is shown below.

Table 2: Non-development budget of DoF (Taka in lac)

Code No.	Description	2012-13	2013-14	2014-15	2015-16	2016-17
4500	Pay of Officer	2367.58	2463.72	2671.00	4869.27	5113.20
4600	Pay of Staff	2986.11	2597.12	2871.55	5771.53	4624.58
4700	Allowances	3632.19	4823.82	4855.35	5670.38	6909.21
4800	Supplies and Services	4027.43	4952.35	4394.08	4738.57	5597.20
4900	Repair-Maintenance	604.76	674.01	722.00	754.70	743.56
7000	Civil Works	0	383.00	283.25	390.00	310.00
6800	Assets Procurement	246.95	247.00	371.38	349.00	360.00
<b>Total</b>		<b>13865.02</b>	<b>16141.02</b>	<b>16168.61</b>	<b>22543.45</b>	<b>23657.75</b>

### 1.4.2 Development budget

Development budget includes all expenditures included in Annual Development Program (ADP).

Table 3: Development budget of DoF (Taka in lac)

Financial Year	Number of Project	Development budget						Achievement
		Expenditure			Allocation			
		Total	LC	PA	Total	LC	PA	
2012-13	27	15618.06	9282.99	6335.07	15337.00	9331.00	6006.00	102%
2013-14	26	23407.57	14932.23	8475.34	21761.00	14979.00	6782.00	107%
2014-15	21	31035.11	23536.45	7498.66	30906.00	24390.00	6516.00	100%
2015-16	26	38285.53	30123.84	8161.69	38252.00	30222.00	8030.00	100%
2016-17	22	33187.07	28154.35	5032.72	34461.00	29004.00	5457.00	96.30%

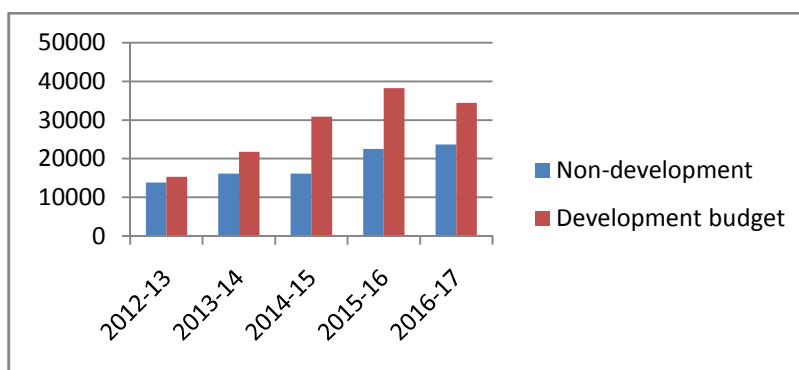


Figure 2: Development and Non-Development budgetary allocation of last five years

### 1.5 Revenue earnings

There are two major sources of government revenue earnings:

- Tax Revenues (TR)
- Non-tax Revenues (NTR)

All revenue earning by the DoF is non-tax revenues. During last five years, non tax revenue earned by the DoF is shown in Table 4.

Table 4: Non tax revenue earned in last five years

(Taka in Thousand)

Economic Code	Description	Financial Year				
		2012-13	2013-14	2014-15	2015-16	2016-17
1901	Punishment	0	2830	2556	7171	8449
2037	Rent of Govt. Vehicles	80	67	52	18	41
2047	Fish hunting fee	450	35	1438	3256	3177
2071	Other service fee	0	183	17744	16922	16373
2101	Rent of non residence	-	168	265	122	216
2111	Rent of Residences	200	1784	869	1707	1000
2326	Fish and fisheries product	140000	63782	62947	124242	63575
2366	Tenders and other documents	3260	1031	1812	1104	235
2371	Non usable materials and scrap etc.	300	2332	3	94	33
2376	Miscellaneous non commercial sale	2370	163	138	531	1627
2671	Refund of extra payment	10000	30	9	191	2
2681	Miscellaneous revenue earning	20000	21380	4012	3941	5982
	<b>Total</b>	<b>176660</b>	<b>94590</b>	<b>98298</b>	<b>159299</b>	<b>100710</b>

## 2.0 Fisheries Resource Management

Bangladesh is endowed with rich and vast fisheries resources. Due to favorable natural conditions and geographical location, these fisheries resources having high potential of



Fishing trawlers in the port, Chittagong



Inland open water, Gazipur

increasing fisheries production. Country's fisheries resources are divided into two major groups such as inland fisheries and marine fisheries. Inland fisheries is further divided into two groups i.e. aquaculture and inland capture. Inland fisheries occupies an area of 46.99 lakh ha and marine capture covers 118813 sq.km along with 200 nautical miles of EEZ from the base line. The Culture fisheries include ponds, ox-bow lakes and coastal shrimp farms. The flood-plains and the beels, which cover an area of 28.10 lakh ha, offering tremendous scope and potential for augmenting fish production by adopting aquaculture- based enhancement techniques.

The country has huge opportunities for the development of brackish water aquaculture boosting

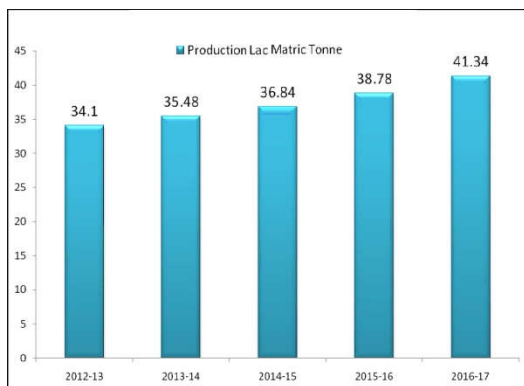


Figure 3 : Fish Production of last 5 years

shrimp production and earning substantial amount of foreign currencies. Production of shrimp from culture and capture fisheries increased to a great extent in the beginning of 1980's. Since then, brackish water shrimp farming has been expanded to over 2.75 lac ha of land by 2017 from 1.4 lac ha in 1980. It is expected that with the introduction of improved scientific method of shrimp culture, the present production of shrimp will be increased substantially.

The country has limited access to marine fisheries resources in the Bay of Bengal. Only demarsal fish and shrimp are being trapped from here. Other potential marine resources are yet to be exploited on commercial scale. Only 17% of total fish production comes from marine capture fisheries and 83% from inland fisheries. The status of fisheries resources and fish production of the Country is shown in *Annexure 2*.

The present democratic government has undertaken new policy for sustainable aquaculture production; provide need based aquaculture extension services, implements fish conservation activities which increased the national fisheries production as well as the growth rate in fisheries sector. Besides these, fisheries extension and conservation activities, AIGs and rehabilitation program for poor fishers etc. were undertaken. Through the execution of Fisheries Friendly Policy of the present government, total fish production has been increased from 34.1 lac metric ton in 2012-13 to 41.34 lac metric ton in 2016-17.

## 2.1 Aquaculture extension approach

DoF carries out its extension services by involving good number of professionals at different hierarchy. DoF motivate and facilitate fish farmers and fishers for adopting socio-eco-friendly management regimes in aquaculture and fisheries resource management to enhance production and productivity. Provides updated research findings and better farm techniques to farmers/growers for increasing production through establishing effective linkage between the various research institutes and the fish farmers. DoF serve as liaison agency between farmers and other organizations, both public and private.

In the recent past, several development projects of DoF have been launched with strong extension and institutional strengthening components for both carp and shrimp culture. Different approaches and strategies of aquaculture have been adopted under different projects. Extension

services include technical advice on all sorts of aquaculture and related activities, user-friendly mobile apps, publication and distribution of booklets, posters, leaflets etc. In addition to regular revenue budget-led extension and advisory services, following approaches are also focusing aquaculture and fisheries extension:

- Demonstration of aquaculture technology;
- Problem solving advices in the office;
- Use of Fisheries information & community centre;
- Farm visit and advice; and
- Farmers training

## 2.2 Fish seed & post larvae production

### 2.2.1 Fish seed produced in hatchery/farms

During 1961-62 to 1974-75 the government has established Fish Seed Multiplication Farms (FSMFs) to supply and required quantity of quality seeds to the fish farmers. During that period, mostly wild fish seeds collected from the rivers were reared in the FSMFs and supplied to the fish farmers. In the mid 60s, due to reduction in the availability of wild carp seeds in the rivers and as the natural fish seeds were not able to meet the growing demand of the fish farmers, the Govt. has established fish hatcheries to produce quality fish seed and at the same time the induced breeding technology was disseminated to the private sectors. At present the country is self-sufficient in carp seeds production, though quality fish seeds are produced in a limited scale. For that DoF has promulgated Fish Hatchery Act, 2010 for the production of quality spawn and fingerlings by regulating fish hatchery and farms.

Table 5: Production of carp hatchling during 2013-2017

Source of Production	2013		2014		2015		2016		2017	
	No of	Production (kg)	No of	Production	No of	Production (kg)	No of	Production (kg)	No of	Production (kg)
Government fish	76	9944	81	9222	76	9944	89	14775	85	12826
Private hatchery	852	477393	866	59858	852	477393	<b>902</b>	<b>614433</b>	<b>814</b>	<b>650636</b>
<b>Total</b>	<b>928</b>	<b>486439</b>	<b>947</b>	<b>69080</b>	<b>928</b>	<b>486439</b>	<b>991</b>	<b>629208</b>	<b>899</b>	<b>663462</b>

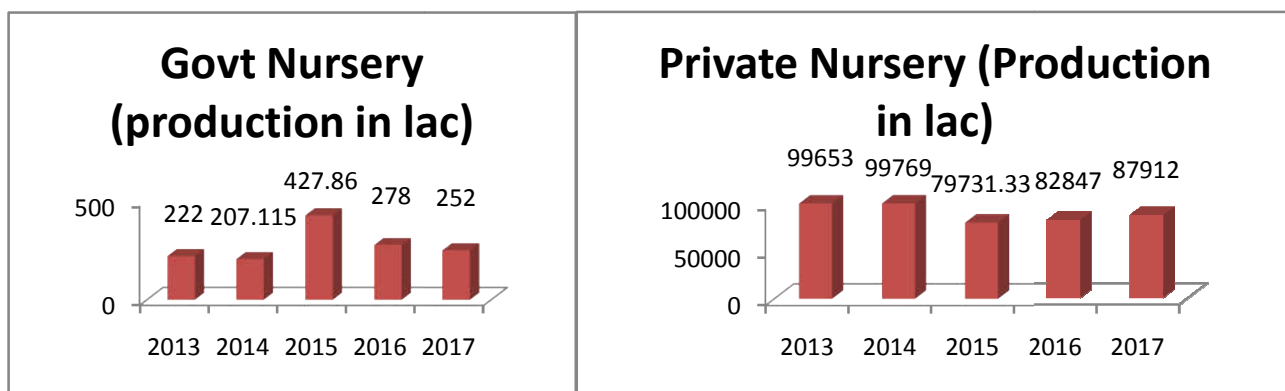


Figure 4 : Fry Production in 2013-2017



Fish seed produced by induced breeding

With the establishment of Brood Bank Project, DoF has taken initiative to produce quality brood fishes free from genetic drifts and in-breeding problems. Both Government and private fish hatcheries are producing quality brood for the production of quality hatchlings and fingerlings. Information regarding expenditures and income of Government FSMFs is shown in Annexure-(a).

### 2.2.2 Fish spawn/fry collected from natural sources

During sixties and early seventies aquaculture activities included mainly rearing of natural carp hatchlings collected from the river Jamuna, Padma, Boral, Old Brahmaputra and fertilized eggs from the river Halda of Chattagram. Availability of hatchlings from natural sources is declined due to habitat destruction and change in ecological system. The natural sources carp hatchling production during 2011-2017 is shown in the following Table

Table 6: Carp hatchlings collection from natural sources

Year	Fish Hatchling (Kg)
2011	4370
2012	4093
2013	3326
2014	2695
2015	4412
2016	4819
2017	5067

### 2.2.3 Shrimp/prawn PL production in hatchery

Due to introduction of and extension of breeding technology of galda and bagda, many private entrepreneurs have established shrimp hatcheries for the production of shrimp post larvae (PL). About 36 galda and 49 bagda hatcheries have been established by both Govt. and private sector which produced 1383.04 crore bagda and 5.05 crore galda PL in the country in 2017 (Table-9).

Table 7: Production of galda and bagda PL during 2013-2017

Name	2013		2014		2015		2016		2017	
	No. of hatchery	Production (PL in lac)	No. of hatchery	Production (PL in lac)	No. of hatchery	Production (PL in lac)	No. of hatchery	Production (PL in lac)	No. of hatchery	Production (PL in crore)
Galda	21	331	27	270	21	331	27	4.13	36	5.05
Bagda	60	92392	55	115880	60	92392	55	1244.05	49	1383.04
<b>Total</b>	<b>81</b>	<b>92723</b>	<b>82</b>	<b>116150</b>	<b>81</b>	<b>92723</b>	<b>82</b>	<b>1248.18</b>	<b>85</b>	<b>1388.09</b>

## 2.3 Freshwater aquaculture

### 2.3.1 Freshwater fish culture in ponds

Currently pond aquaculture has been practiced in a total area of about 3.72 lakh ha which is 7.89 % of total inland water. Pond aquaculture is producing about 17.20 lakh mt fish which contributing 44.34% of total inland production in 2016-17. The pond production involves composite culture produces an average 4618 kg/ha whereas there are records of 90 mt/ha production of Pungas under intensive farming.



Fish culture in pond

Table 8: Status of pond culture (2016-17)

SI NO	Farming System	Area (ha)	Production (mt)
1	Extensive	36196	42359
2	Semi intensive	233776	780958
3	Intensive	87895	542923
4	Highly intensive	14538	353543
Total		372405	1719783

### 2.3.2 Fish culture in paddy field



Fish culture in Paddy fields, Dumuria, Khulna

Paddy fields and seasonal floodplains are promising and potential resources for aquaculture. It has been estimated that paddy fields cover an area of about 80 lakh ha of which 26.95 lac ha floodplains which remain 4-5 months under water. Previously Government has taken initiative to increase fish production from these

flood plains through stocking fish fingerlings. Through 2nd ADP and 3rd Fisheries project, farmers were motivated to stock in suitable floodplain. SHISHUK (an NGO) has been leading community based floodplain aquaculture in Daudkandi of Comilla District and achieved an average production of 2100 kg/ha/year. DoF along with partner NGOs has taken initiatives to maximize fish production from rice fields and to extend the coverage area. If 10% of paddy field will come in this culture system where paddy field go under water, then near about 85 lac mt more fish will grow annually producing 300 kg fish per ha.

### 2.3.3 Fish culture in borrow-pit and khal/Ditch

Different types of water bodies improved under Enhancement of Fish Production through Restoration of Water bodies Project (EFRWP) and other completed projects also included in the aquaculture systems. Information of developed water body and its area are shown in Table 11.



Aquaculture in borrow-pit in Feni



Khal re-excavation in Joshore

Table 9: Improvement of different types of water body through various completed and ongoing projects.

Types of water body	2 <sup>nd</sup> phase (FCDI)	3 <sup>rd</sup> phase (FCDI)	4 <sup>th</sup> phase(FCDI)	EFRWP (2015-20)	Total developed water body (ha)
	Developed water body in hectare 2000-2001 and 2002-2003 Financial year (Completed)	Developed water body in hectare 2006-2007 to 2009-2010 Financial year (Completed)	Developed water body in hectare 2011-2012 to 2013-2014 Financial year (Completed)	Developed water body in hectare 2015-2017 Financial year (On going)	
Close Khal/ Dead river	181.122	101.531	189.30	176.15	648.11
Ponds	58.052	122.762	150.167	164.5	397.729
<b>Total</b>	<b>447.139</b>	<b>454.570</b>	<b>611.058</b>	<b>340.65</b>	<b>1045.839</b>

### 2.3.4 Fish culture in baor (Ox-bow lake)

A total of about 600 baors having an area of 5,488 ha are situated in the south west part of the country. Different development projects have been implementing to increase the fish production from baor. Attempts have been taken for increasing fish production by adopting improved aquaculture through fingerling stocking and management practices. Six baors of Jashore and Jhenaidah district were under the



Fish harvesting in Jashore

MoU signed between Ministry of Land and Ministry of Fisheries and Livestock for biological management.

Besides this, 30 baors are managing by OLP-2 project of DoF with the financial support of IFAD. These baors covered an area of 1137 ha and fish production has increased from 80 kg to 750 kg/ha (DoF 2008). Local fisher communities are being involved in the baor management and improved their livelihood.

### 2.3.5 Cage culture

Several decades ago, attempts were taken to raise fish in cages under different development projects by several institutions / organizations of the country. Now a days, cage culture is popularizing as one of the most interesting and attracting means of livelihood and people's are engaging day by day in this culture system with fish species like monosex tilapia, pangas, koi, singh, magur, thai sorpunti etc.



Cage culture in open water, Chandpur

Cage culture of monosex tilapia is being practiced in Chandpur, Laxmipur Faridpur, Barishal, Mymensingh, Dhaka, Munsigonj, Gopalganj, Norsindi, Pabna and other regions of the country. In 2016-2017, about 2490 mt fish were produced from 5874 cages (area 110000 m<sup>3</sup>) by cage culture.

### 2.3.6 Pen culture

Pen culture is also one of the potential means of producing fish from vast water body or water channel. In recent years, pens are made with different materials like bamboo, net, iron-meshed, wooden pillar etc. The area of pen also varies in size from half to few ha. The fish species reared in the pen are carp, tilapia, pangas etc. Feeds are also applied in pen culture system but not regularly. Both single and multi owner are found in pen management. Culture

period also varies from June to December depending on availability of water. Pen culture is becoming popular in and around Dhaka and Narayanganj and expanding every year. In 2016-2017, about 13364 mt fish were produced from pen culture.



Pen culture in canal, Jashore

### 2.3.7 Fresh water mud eel culture

*Monopterus albus* is an important freshwater air breathing, swamp mud eel fish. It commonly occurs in the freshwater of Bangladesh, Pakistan, Northern and Northeastern India and Nepal. Once, indigenous *albus* was abundant throughout the Bangladesh, plenty in mud holes in shallow 'beels' and 'boro' paddy field particularly in old Sylhet, Mymensingh and Tangail Districts. But now a days this fish is hardly found in the open water area. The biodiversity, ecosystem of natural water bodies are being decreased due to global warming and climate change. *M.albus* is exported to many countries of south East Asia and Europe. *Albus* is an important fish for the livelihood of Adivasi people in terms of home consumption and trade. The tribal people belonging to the Garo, Hajong, Shawtali and Koch-Rajbongshi community believes this fish to be therapeutic one and traditionally use for treatment of various ailments, viz. weakness, anemia, asthma, hemorrhoids and diabetes. Direct consumption of fresh blood of the fish is reported to cure weakness, anemia and asthma.

Considering the importance of this species in nutritional, medicinal, economic and biodiversity, Department of Fisheries practiced its culture system by a project. It is developed by aquaculture method and open water management method.

Table: 10 Fresh water mud eel culture

Year	No.Stakeholder	Area (ha)	Cuchia production (mt)	Remarks
2015-16	1190	48.3	35.80	Continuing mud eel culture practice.
2016-17	1210	49.8	93.12	

Source: Culture of cuchia and crab in the selected area of Bangladesh and research project.

## 2.4 Coastal aquaculture

### 2.4.1 Shrimp (bagda) culture

Black tiger shrimp (*Penaeus monodon*) in Bangladesh is known as Bagda. Bagda grows faster and bigger in size, the species is very popular for coastal aquaculture among shrimp species available in Bangladesh. Bagda culture has been starting in the south-west region of the country using agricultural land since early 1970s. The larvae of shrimp and other fish are trapped into the crop fields during high tide and reared for several months. With the increasing demand of shrimp and prawn in the international market expansion of shrimp farming was observed in dyke elevated rice fields (traditionally known as gher).



Bagda farming in the Pond at Khulna

In 1994 government declared the coastal region as `Open for brackish water shrimp farming` through a government order. From then, brackish water shrimp farming has been expanded rapidly. By 2016 over 205654 ha of land were brought under bagda culture and till it is increasing. The highest shrimp culture area was in south-west region i.e Bagerhat, Khulna and Satkhira region because of abundant source of saline water and shrimp post larvae (fry) in the Sunderbans mangrove forest and surrounding rivers and estuaries. Among the coastal districts, the highest production of bagda was observed in Bagerhat, Khulna, Satkhira and Cox`s Bazar. The culture system of bagda involves traditional extensive to improved extensive. In 2016-17 bagda production in Bangladesh was 68272.00 mt.

Table 11: Shrimp farming and production

Year	Area farmed (ha)	Shrimp production (mt)	Remarks
2011-12	209456	57784.87	Paddy and salt are produced in very near to coast as alternative crops. White fish and crabs are also produced in some places as by-culture.
2012-13	210053	68948	
2013-14	215305	71430	
2014-15	216468	75274	
2015-16	206763	68217	
2016-17	205654	68272	

Source: Fisheries statistical yearbook of Bangladesh 2016-2017, FRSS, DoF.

### 2.4.2 Prawn (galda) culture

The Giant freshwater prawn (*Macrobrachium rosenbergii*), called as Galda in Bangla, were being trapped and reared with other fishes in the tidal pond and low lands. Generally, the species were harvested from the river/canals, floodplains and beel areas which have connectivity with rivers. At present *Macrobrachium sp.* is being cultured in gher in organized way along with other aquaculture, agriculture and horticulture crops. Different culture systems such as monoculture, poly-culture along with other fishes and aquaculture in paddy fields along with paddy are being practiced. The unit production of Galda under the different systems ranged from 375 kg/ha to 750 kg/ha. The highest production was observed in monoculture (760 kg/ha). Currently galda are farming in gher, pond and paddy field covering an area of about 0.67 lac ha. About additional 0.6 lac mt fish are produced along with galda.

Table 12: Prawn (galda) farming and production

Year	Area farmed (ha)	Production (mt) Prawn
2010-2011	62874	30868
2011-2012	65777	45162.95
2012-2013	65221	43713
2013-2014	59972.23	42097
2014-2015	59115	42053
2015-2016	68746	46189
2016-2017	67063	48574

Source: Fisheries statistical yearbook of Bangladesh 2016-2017, FRSS, DoF.

### 2.4.3 Introduction of SPF black tiger shrimp

Shrimp aquaculture is an important foreign currency earning sector of Bangladesh. Besides, more than a million coastal people depend on their livelihood on Black Tiger Shrimp (*Penaeus monodon*) culture. By 2015-16 over 206763 ha of lands are used for black tiger shrimp cultivation in south-west region i.e Bagerhat, Khulna, Satkhira and Cox's Bazar. At present, 59 Bagda shrimp



SPF PL

Bagda shrimp hatcheries are operating in Bangladesh to produce post larvae (PL) for shrimp farms. These shrimp hatcheries produce about 1114.12 crore shrimp PL in the year 2015-16. All these shrimp hatcheries are using the wild brood stock from the Bay of Bengal that are mostly contaminated with microbial pathogens.



SPF Shrim in Bagerhat

Since the broods are collected in batches of 100 or more by fishing trawlers, it is practically impossible to screen out the broods from known pathogens through PCR tests. Besides, the shrimp hatcheries use many individual brood shrimp for maturation in community tanks. So, it is virtually impossible to screen-out the pathogen free brood shrimp in this set up.

During the last one decade, there have been intensive efforts to domesticate *P. monodon* (black tiger shrimp) broods to produce SPF stock through selection. The PL of these domesticated SPF broods have performed better in terms of disease, survival, growth and FCR. The domesticated broods are known to be produced in Hawaii, Mosambique and Thailand. The SPF broods have been successfully introduced in Vietnam, Malaysia and Philippines. In the year 2014 Bangladesh imported and introduced SPF broods first time from Hawaii of America.

As per the government Fish Hatchery Act 2010 and Fish Hatchery Rules 2011, it is mandatory for hatcheries to supply disease free PL to the farmers. Therefore, for the sustainability of tiger shrimp hatcheries and farming it is imperative that the shrimp hatcheries use SPF (Specific Pathogen Free) Black Tiger Shrimp to produce disease free PL. By introducing SPF broods, contamination of pathogens to the post larvae from the broods could wholly or largely be eliminated depending on the degree of compliance with prescribed bio-security rules.

At present, disease free PL producing programs are continuing by SPF Black Tiger Shrimp brood. In the year 2015 about 3.1 crore and upto September, 2016 about 12.80 crore disease free PL are supplied among the farmers of Bagerhat, Khulna, Satkhira and Cox's Bazar districts.

#### **2.4.4 Crab culture and crab fattening**

Recently traditional mud crab (*Scylla serrata*) culture has been practiced in Bangladesh based on capture and fattening of juvenile from the wild. Now mud crab is recognized as a valuable export commodity. After shrimp, mud crabs have become the second-most exported crustacean from

Bangladesh. Because of high prices in international markets, mud crab farming is gaining popularity in the coastal districts of Bangladesh. It has been harvested in greater Khulna, Barisal and Chittagong regions. Mud crabs are less susceptible to disease and more resistant to adverse environment conditions and climate change. Many shrimp farmers are switching to mud crab farming. Two types of crab are available in the coastal region of Bangladesh- *Scylla serrata* and *Scylla olivacea*. From this only mud crab (*Scylla serrata*) is culturable in Bangladesh.



Mud Crab Frame at Bagerhat

Based on the increasing demand of gravid female in the south-east Asian countries, a sustainable aquaculture technology has been developed. Culture of juvenile crab in pen and cage is now practicing in some selected areas of Bangladesh. This culture technology and production performance changed the socio-economic condition of the adopted communities and the fellow farmers also become interested to practice this kind of crab fattening. Department of Fisheries is implementing a project for the development of culture and management technique of crab in the selected areas of coastal region of Bangladesh.

Indigenous Technological Knowledge (ITK) of stakeholders and based on the lessons learnt from the culture practice the existing culture technology will be redesigned for future expansion. The mud crab aquaculture will generate income and employment and enhance export earnings. Crab farming and production in Bangladesh is shown below.

Table: 13 Crab farming and production

Year	Area farmed (ha)	Crab production (mt)	Remarks
2015-2016	19408	13160	Now-a-days Crabs are cultured as main crops in coastal area.
2016-2017	27010	14421	

Source: Fisheries statistical year book of Bangladesh 2016-2017, FRSS, DoF.

## 2.5 Inland Open- water fisheries resource management

The open water body of Bangladesh is looks like a vast sea as recognition of her large water body. It has potential as inland open water resources, including 8,53,863 ha of rivers and estuaries, about 1,77,700 ha of Sundarbans, 1,14,161 ha of natural depressions or beels, 68,800 ha of Kapti reservoir and about 2691910 ha of floodplains. Annual flooding during the rainy

season inundates up to 60% of the total land surface. Bangladesh possesses the 5<sup>th</sup> largest inland fisheries resources and 4<sup>th</sup> fish production in the world. After China and India, Bangladesh is the third largest country in the world of inland fisheries. The inland open water is inhabited by 260 species of fish and 25 species of shrimp. Despite the existence of huge resources the inland capture fisheries has over the years been replaced as top fish producing source by aquaculture, due mainly to decline and degradation of resources. The priority is given to improve biological management that will restrict the declination of resources and production. The DoF has prepared a sub strategy on Inland Capture Fisheries based on the National Fisheries Strategy 2006 and National Fisheries Policy 1998.

### 2.5.1 Community based fisheries management

Bangladesh has achieved recognition for its inclusive fisheries management through local community engagement. Community based management of resources is a time-driven and successful activity initiated by DoF. Bangladesh is emerging as a country of having positive lessons from community based management of open water. Consultative Group on International Agricultural Research (CGIAR) awarded CGIAR Science Award-2004 to Community Based Fisheries Management Project (CBFM-2) of DoF for its outstanding innovative performance in the field of community-based fisheries management. At present 6 out of 21 ongoing development projects under implementation includes community based fisheries management and more than 0.20 million people are enjoying the benefits. Establishment of Community Based Organizations (CBOs) and village level sub committees has been recognized as the first and fundamental step in creating sustainable co-management of fisheries resources in the decision making process by user's group. Initial work on networking by community based organizations has been started at regional level. More emphasis has been given to work with community based fisheries management in the inland capture fisheries sub-strategy.



**Community based Fish culture Training in Bangladesh**

### 2.5.2 Integrated natural resource management

Department of Fisheries implemented Integrated Natural Resource Management Systems (INRMS) by local users contributes to conserving the biodiversity and livelihoods in the selected wetlands and floodplains of the Jamuna - Padma delta region through Wetland Biodiversity Rehabilitation Project. This activity may be extended in other suitable areas in due course of time.

### 2.5.3 Fingerling stocking

Natural recruitment of carp spawn and fingerling declining due to human interferences and environmental degradation hampered the productivity of open water capture fisheries resources. To improve the productivity of open water the Ministry of Fisheries and Livestock through the

Department of Fisheries initiated regular program from revenue and development budget to release fingerlings of major carp in open water bodies, floodplains and closed water bodies throughout the country. Stocking of fish fingerling into beels and floodplains is a temporary measure to address the quick declination of fish production in open water.



**Fingerling stocking in Nowabgonj**

Table: 14 Stocking of fish fingerling in open water bodies and floodplains

Financial Year	Fund allotted Tk (crore)	Water area (hectare)	Fingerling released		No.of beneficiaries
			Number (million)	Weight (mt)	
2009-10	3.37	103657	14.40	200.45	530347
2010-11	4.00	123092	12.39	241.12	2363631
2011-12	8.86	109070	15.23	570.19	2365631
2012-13	8.74	142053	17.14	480.24	1012000
2013-14	7.16	114516	18.95	385.52	974186
2014-15	7.15	13679	15.54	317.72	1054100
2015-16	7.23	84746	29.33	320.38	1387300
2016-17	16.48	144539	23.90	968.98	801135

### 2.5.4 Beel nursery:

Beel nursery has been proved to be a significant tool for increasing fish production in natural



Beel nursery activities in Nowabgonj

water bodies. DoF has continued the program as regular activity under revenue and development budget in various low lying rice field, floodplain, beel, haor, canal, river and government/non-government water bodies from 2009-10 fiscal year to increase natural

production in these areas along with surrounding linked water bodies. During last year 1229 beel nurseries were successfully established in 2225.17 ha which produced 120.30 million fingerlings.

### 2.5.5 Establishment of fish sanctuary

Introduction of sanctuary approach for fisheries resource conservation opened up a new horizon for sustainable use of valuable fish species. To stop the degradation of aquatic biodiversity specially species diversity of fish and other aquatic species in openwater, a set of technical interventions like establishment of fish sanctuaries, fish habitat restoration have been undertaken during the past years. Establishment of aquatic sanctuary is one of the effective tools for conserving fishstock, protecting biodiversity and increasing fish production. During the last five years, total number of 534 fish sanctuaries were established by DoF in different selective water bodies. As a result, a substantial increase in production of fish was found in those water bodies. At the same time there were found abundance of endangered species like Chital, Foli, Kalibaosh, Air, Tengra, Meni, Rani, Sarputi, Pabda, Kajoli, Gojar, Tara baim etc. On the other hand, to ensure the migration of fish during the breeding period, different connecting canals of rivers, dead rivers and beels were excavated and re-excavated by DoF. Besides, for the conservation and development of Hilsha fishery five sanctuaries were established in the selected river system. Hence, establishment of sanctuary has become obligatory to protect and conserve these species from extinction and increase fish biodiversity. From this point of view sanctuaries are managed regularly from 2015-16 fiscal year under revenue program.

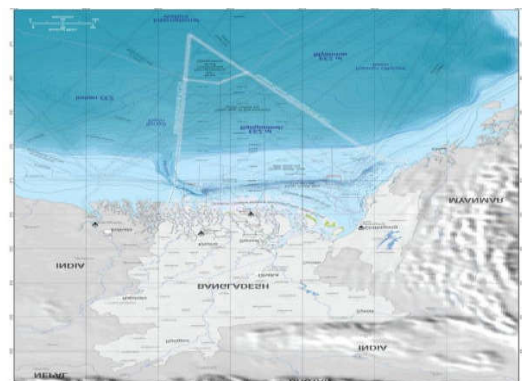


**Fish Sanctuary, Kansunabil**

## 2.6 Marine fisheries resources management

### 2.6.1 Bangladesh marine boundary

Bangladesh is blessed with vast her coastal and marine resources. The coastal area of the country is considered as one of the natural wonders of the world. Located in the delta region of the Padma, Meghna and Brahmaputra river basins, this unique forest extends across Khulna, Satkhira, Bagerhat districts of Bangladesh have been listed separately in the UNESCO World Heritage List. The maritime boundary of Bangladesh was fixed with Myanmar in an equitable manner by the International



**Maritime boundary of Bangladesh**

Tribunal for the Law of the Seas (ITLOS) in Hamburg on 14 March, 2012. In accordance with the Tribunal’s decision, Bangladesh has achieved exclusive economic and territorial rights over the sea extending 200 nautical miles into the Bay of Bengal, a substantial share of outer continental shelf beyond 200 miles, and 19.31 km (12 nautical miles) of territorial waters around the St. Martin Islands.

Subsequently, Bangladesh now has rights over maritime resources such as oil, gas, fish and the entire aquatic wealth that lies within its territorial waters, exceeding its original claim of 1, 18,813 square km.

### 2.6.2. Maritime fisheries resource conservation and management

Visionary government has taken initiatives to develop blue-economy concept and Bangladesh is chosen as a pilot country to implement blue economy development in 2014. Current management and exploration is to address Sustainable Development goals (SDG) Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development .Targeting By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics.

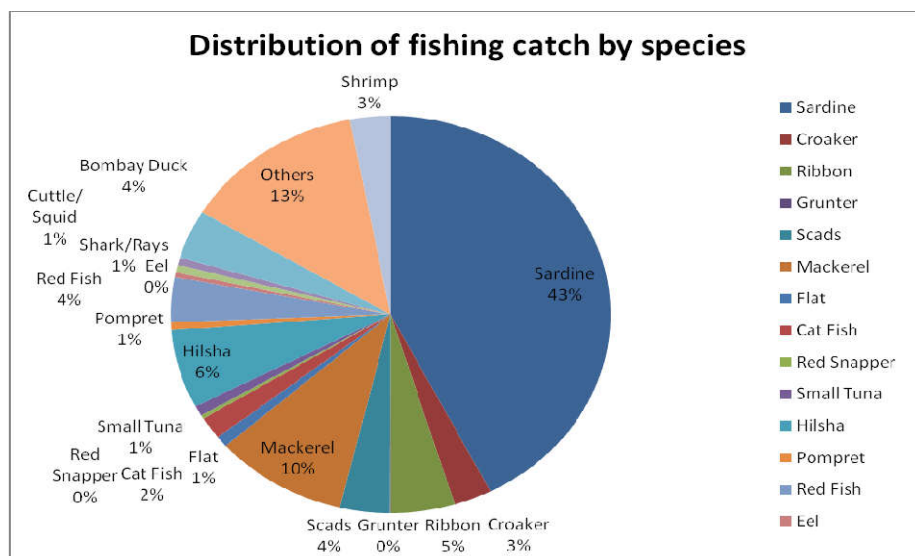


Figure 5. Pie chart of marine fish catch of national fleet, by species in 2016-17.

### 2.6.3 Stock assessment

#### A. Procurement and engagement of multipurpose survey and research vessel:

1. Bangladesh has acquired a high-tech multipurpose survey and research vessel ‘R.V. Meen Shandhani’ with the aid of Islamic Development Bank and Malaysian Government

under the Marine Fisheries Capacity Building project of DoF. Honourable Prime Minister has launched it on 19 November, 2016.

2. A TCP project “Technical Support for Stock assessment of Marine Fisheries Resources in Bangladesh” funded by FAO has been cooperating DoF in marine stock assessment by operating survey cruises by ‘R, V. Meen Shandhani’.
3. ‘R, V. Meen Shandhani’ has conducted 16 surveys including shrimp surveys, demersal surveys, pelagic surveys and one biodiversity survey in the Bay of Bengal with the technical and financial support of FAO.
4. Surveys identified 349 species consisting of fish species, shrimps, crabs and cephalopods.



Survey Vessel R. V. Meen Shandhani

## **B. Establishment of Integrated Database:**

A database has been established which is accessible via DoF website, consistent with project provision. Data on craft and gear are collected and incorporated into the project Database (192.168.2.102/bmfc). Updated data from the land based survey are incorporated into the project’s website once in a year after ratification. Authorized persons and organizations can access data from the project site at [www.fisheries.gov.bd](http://www.fisheries.gov.bd).

### **2.6.4 Enacting Acts, Rules and Policies**

1. Marine fisheries sector is governed by the Marine Fisheries Ordinance, 1983, Marine Fisheries Rules, 1983.
2. A modern act, "The Marine Fisheries Act 2017" is approved by the Cabinet and underway for the final approval.
3. All industrial trawlers and mechanized fishing boats are required to have license for fishing.
4. Industrial fishing trawlers are mandatorily to take sailing permission (SP) from Marine Fisheries Office under the Department of fisheries (DoF).
5. Trawlers are allowed to catch fish/shrimp in an area of not shallower than 40 meter depth. Mechanized fishing boats are allowed to fishing below 40 meter depth.
6. The Fish and Fishery Products (Fish Inspection and Quality Control) Rules, 1997 provide guidelines for the production of safe seafood in trawlers.

7. Currently, 63 freezing trawlers have been licensed by the Fish Inspection and Quality Control Office as their factory vessel complied with sanitary and hygienic standards.

### **2.6.5 Monitoring Control and Surveillance (MCS):**

#### **a. Establishment of Vessel Tracking Monitoring System (VTMS) :**

- i. Vessel Tracking Monitoring System has been established at Patenga in Chattogram DoF Office for tracking fishing vessels that are operating in the Bangladesh territory of the Bay of Bengal.
- ii. The VTMS equipment were installed in 133 industrial trawlers through Bangladesh Marine Capacity Building Project as trial basis .

#### **b. Training and awareness programs**

- i. Fishers are provided with training on the FAO-CCRF, compliance with various acts, regulations and rules emphasizing the importance of conservation for sustainable exploitation of marine and coastal resources.
- ii. Regular meetings are arranged on various issues of non-compliances happen by fishers with the presence of representatives from the Bangladesh Navy, Bangladesh Coast Guard, Rapid Action Battalion (RAB), Bangladesh Police, Marine Mercantile Department, Border Guard Bangladesh, Bangladesh Marine Fisheries Association, Mechanized Boats Owner Associations, District Fisheries Officers of coastal districts to help mitigation measures and comply with rules and regulations.
- iii. Mass awareness campaigns are organized in major fish landing centers and in fishing villages to actively discourage the deleterious impacts of destructive fishing methods. Fishers and the representatives of local people are motivated to show respect for Acts and Rules promulgated to restore our biodiversity and protect the resilience of the marine environment.
- iv. Strong Monitoring, Control and Surveillance (MCS) procedures are in place to increase boat registration and issuance of fishing licenses. The National Plan of Action (NPOA) has been drafted to eliminate Illegal, Unregulated and Unreported (IUU) fishing in the Exclusive Economic Zone (EEZ) of Bangladesh.

### **2.6.6 Management approaches**

#### **a. Mesh size and Gear control**

- i. Mesh size of trawl nets and gears are controlled for industrial trawlers.
- ii. Minimum mesh size 45 mm is mandatory at the cod end for shrimp trawl nets and 60 mm for the fish trawl nets.
- iii. ESBN (Estuarine Set Bag Net) has been banned (Prohibition in operating illegal estuarine set bags net throughout the year has been declared on 7 April, 2017).

#### **b. Seasonal Ban**

- i. To facilitate spawning and conservation of marine fisheries resources, fishing has been banned for 65 days from 20 May to 23 July each year, for industrial fishing

- ii. The government has adopted coordinated program to conserve and protect Juvenile Hilsa and Brood Hilsa during spawning season. For smooth spawning, catch of brood Hilsa has been prohibited for 22 days every year in 7000 square km in the coastal waters.
- iii. Juvenile Hilsa Conservation Week has been observed in 23 districts as a national program to protect Juvenile Hilsa and ensure its growth.

**c. Zone restriction**

- i. Under The Marine Fisheries Ordinance-1983, 40 meter water depth is reserved for small-scale fisheries to minimize the conflict between industrial vessels and artisanal fishers.
- ii. Harvesting provisions are made in three tiers: (1) up to 40 m in depth from the coastline where artisanal boats operate; (2) from 40 m to 200 m in depth where industrial trawlers operate; and (3) from 200 m in depth to the end of the EEZ for long-lining.
- iii. Fishing in less than 40 meters depth by the industrial fishing trawlers is completely prohibited by Marine Fisheries Rule 1983.
- iv. A gazette notification on 07 April 2013 has made a prohibition not to fishing by any means in 10m depth near shore.

**d. Limited licensing**

No new fishing license for industrial fishing vessels (mid water/ bottom trawler/shrimp trawler) are providing since 2015 .

**2.6.7 IUU catches monitoring**

- 1. The Government has amended the Marine Fisheries Ordinance, 1983 to incorporate FAO-CCRF to control, deter and eliminate Illegal, Unreported and Unregulated (IUU) fishing to conserve marine life.
- 2. The European Union through its Council Regulation EC 1005/2008 has laid down Catch Certificate Scheme (CSS) to combat IUU Fishing. Under this Scheme any company wanting to export marine fishes to European Union countries must have IUU-Catch Certificate (CC) approved by the flag state's Competent Authority.
- 3. The Marine Fisheries Ordinance 1983 was amended in 2010 to facilitate issuing IUU-Catch Certificates by the Director, Marine Fisheries Office as Competent Authority.
- 4. Every month five industrial fishing trawlers are inspected to monitor IUU catches in the Bay of Bengal.

## 2.6.8 Marine protected Area

1. As a protective management measure, in the year of 2000 the Government declared 698 km<sup>2</sup> Marine Reserve area in the Bay of Bengal to protect and conserve the breeding grounds of marine fish.
2. In 2014, Government declared Swatch of No Ground as a Marine Protected Area to safeguard whales, dolphins, sea turtles, sharks, and other oceanic species under the Wildlife (Conservation and Security) Act, 2012.
3. Honorable Prime Minister has given a positive consent to declare Saint Martin island as a marine sanctuary to protect the biodiversity and natural coral reef.
4. A project named “Eco Fish” is involved to create an MPA (Marine Protected Area) of 976 km<sup>2</sup> area at Nijhumdwip is under process.

## 2.6.9 Fleet structure

In Bangladesh, traditional fisheries exist side by side with commercial fisheries. About 201 industrial trawlers were active in fishing out of 247 industrial fishing trawlers in the fiscal year of 2016-17. At the same time 67,669 mechanized and non-mechanized boats were engaged in traditional fishing in the Bay of Bengal. These traditional mechanized and non-mechanized fishing boats are involved in use of relatively simpler gears such as gillnets, set bag nets, trammel nets by the array of boats. Non-mechanized boats are engaged in daily fishing by nature in a very low depth close to coastline involving 3-5 fishermen. Mechanized boats typically fish for 5 to 7 days within 40 m depth of contour carrying ice cubes in their boats. Number of fishermen varies from 10 to 25 based on size and gear used.

Based on preservation capacities, industrial trawlers are of two kinds; trawlers having freezer and wooden body trawlers without freezers inside are non freezer trawlers. Based on fishing mode they are also different types like bottom fishing trawlers, mid-water trawlers and shrimp trawlers. Gross tonnage capacity of industrial fishing fleet ranged between 56 to 148 mt for wooden body and 251 to 668 mt for steel hulled freezer trawlers.

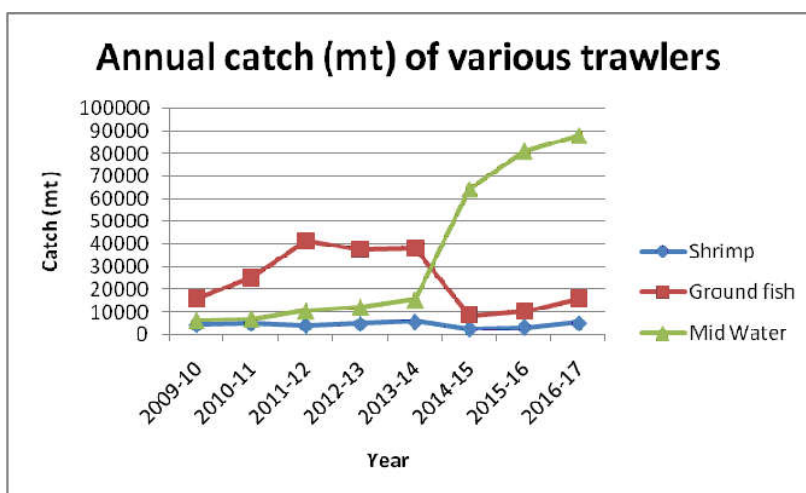


Figure 6: Historical annual catch by industrial trawler fleet (gear-wise), 2009-10 to 2016-17.

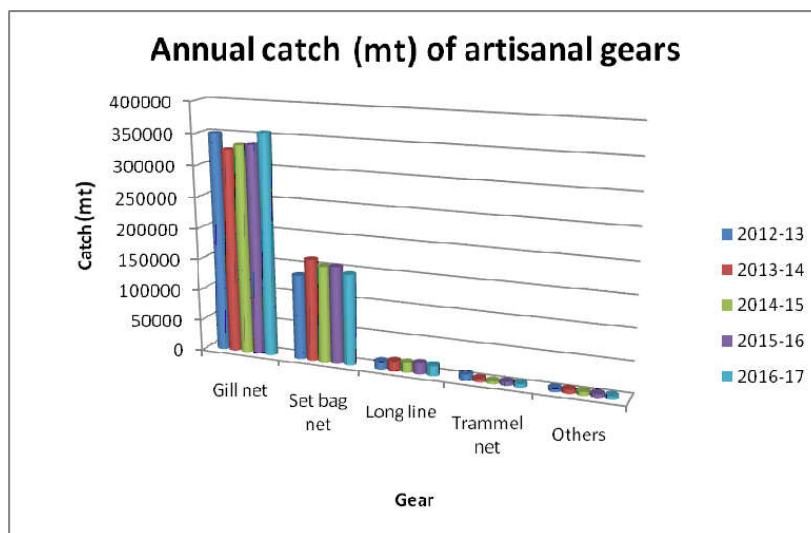


Figure 7: Historical annual catch by artisanal fleet (gear-wise), from 2012-13 to 2016-17.

### 2.6.10 Licensing activities of mechanized fishing boats

Marine Fisheries Office (MFO) under DoF provides license for mechanized fishing vessels but the licensing required prior Certificate of Inspection (COI) from MFO and vessel registration from the Marine Mercantile Office (MMO). At present combined camps are being operated by MFO and MMO at different fishing sites to provide the same through one stop service.

Table: 15 Licensing activities of mechanized fishing boats

Year	License Issues (Nos.)			Revenue (Lac taka)
	New	Renew	Total	
2013-2014	614	1226	1840	29.74
2014-2015	319	1167	1486	45.81
2015-2016	273	1269	1542	40.89
2016-2017	313	1255	1568	41.57

### 2.6.11 Licensing activities of industrial fishing vessel/trawler

During 2016-17, a total number of 247 industrial trawlers were engaged in fishing into the EEZ. The fleet comprised of 37 shrimp trawlers, 98 demersal trawlers and 112 mid-water trawlers. 42 trawlers are permitted to fish on trial trip basis by the order of High Court Division of Honorable Supreme Court. Fishing license for industrial fishing vessels also require prior registration and COI from MMO. They also require fishing license from MFO or from coastal DFO's offices. All fishing licenses are subject to be renewed every year.

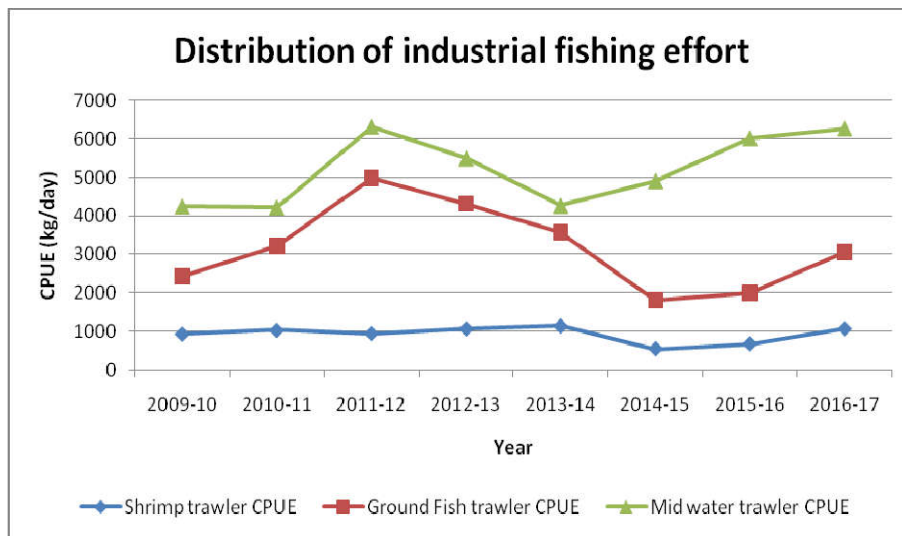


Figure: 8 Map of the distribution of industrial fishing effort, by gear type for the national fleet.

### 2.6.12 Deep sea fishing

1. Government has taken initiative to introduce 16 long liner and purse seiner vessels, 9 for long-liner and 7 for purse seiners to fish tuna and tuna like pelagic fished in the EEZ and in high seas beyond 200 meter depth.
2. Bangladesh achieved her Cooperating Non-Contracting Party (CNCP) status to the Indian Ocean Tuna Commission (IOTC) in 2016 and in a process to achieve full membership that is the Contracting Party Status of IOTC that would help Bangladesh to build up tuna industry in near future.

### 2.6.13 Hilsa Fishery conservation, exploitation and management

Hilsa is the national fish of Bangladesh. As a single species, it makes the highest contribution to the country's total fish production which is about 12% of the total production. Juvenile Hilsa measuring up to 25 cm are known as Jatka. To achieve sustainable hilsa production it is imperative to protect jatka and berried Hilsa during the peak spawning period to ensure the unbated release of matured eggs. The government has adopted coordinated program to conserve and protect jatka and mother hilsa during spawning season, and has also developed a separate economic code for the conservation of jatka. Since 2007, Jatka Conservation Week has been observed in 91 coastal upazilas of 23 districts as a national program to protect jatka and ensure both of its growth and production of hilsa through reducing over-fishing of hilsa and facilitating recruitment.



National fish of Bangladesh hilsa, *T. ilisha*

During the ban period (February to May), the jatka fishers receive an annual allowance of 30 kg of food-grain per household per month. Government also provides financial incentives and distributes trade materials to enlisted jatka fishers as Alternative Income Generation (AIG) support. Under this arrangement, about 65% of Bangladesh's total catch of hilsa currently originates from the marine environment. Restriction in operating illegal estuarine set begs net (behundi jal) throughout the year has been declared on 7 April, 2017.

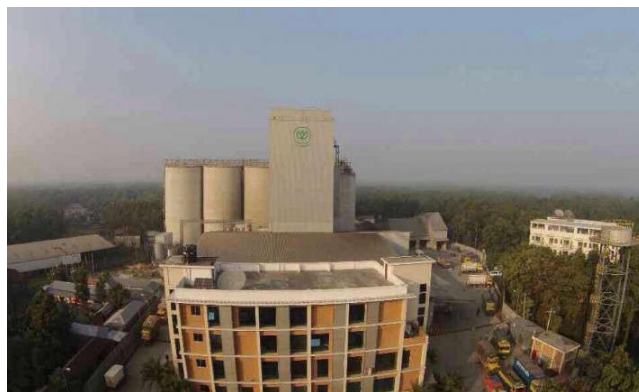
### 2.6.14 Disaster management activities

DoF has undertaken activities to mitigate disaster through short term, midterm and long term planning. These include plans to

- Restore the aquaculture production chain in cyclone-affected coastal areas providing aquaculture inputs to coastal fish farmers.
- Restore the livelihood of cyclone-affected coastal fishers providing fishing nets and assistance to repair their boats.
- Ensure the steady economic growth of the fisheries sector of the coastal region by assisting fishing communities and families by strengthening their resilience, knowledge and capacity, and their ability to recover from disasters as quickly as possible.
- Improve the Government's knowledge-base of the existing status of coastal fishers and small-scale fisheries

## 3.0 Fisheries Regulatory Activities

### 3.1 Fish Feed and Animal Feed act 2010 and Fish Feed Rules 2011



Feed Factory in Bangladesh

Fish feed is one of the most important factor for commercial aquaculture. There were no rules and regulations to maintain the quality of the feed and feed ingredients for the farmers before 2010. But the present democratic fish-friendly government has taken initiative to formulate the acts and rules and Fish Feed and Animal Feed Act 2010 and Fish Feed Rules 2011 are formulated. Currently it is implementing all over the country. The Status of the Fish Feed and Animal Feed Act 2010 and Fish Feed Rules 2011 are given in the table below.

Table 16: Status of the Fish Feed Act 2010 implementation (2016-2017)

Serial No.	Division/Head Office	Types of fish feed company (no.)				Total revenue earn (lac Tk)
		Fish feed production: Category :1	Fish Feed Import-Export: Category:2	Fish Feed Sale: Category-3 a and b	Total Number	
1	2	3	4	5	6	7
1	Dhaka	60	45	595	700	5.99
2	Chittagong	52	26	603	681	4.36
3	Rajshahi	42	24	483	549	4.34
4	Khulna	11	19	604	634	3.82
5	Sylhet	0	0	122	122	0.87
6	Barisal	3	2	135	140	0.70
7	Rangpur	8	2	169	179	0.84
8	Mymensing	26	20	356	402	3.45
<b>Total</b>		<b>202</b>	<b>138</b>	<b>3067</b>	<b>3407</b>	<b>24.37</b>

### 3.2 Fish Hatchery Act 2010 and Rules 2011



Fish Hatchery



Shrimp Hatchery

Aquaculture of Bangladesh is flourishing with the rapid expansion of public and private hatcheries providing support for good quality fish seed. But with the expansion of private hatcheries and for earning immediate profit the quality of fish seeds has declined over the years. The quality reduction is mostly observed in private hatcheries. There are many reasons for the low quality, for instance, inbreeding, inter-specific hybridization, negative selection, improper brood-stock management. Furthermore, hybridization and cross breeding are threatening the genetic diversity of indigenous wild stocks of Indian Major Carps. To protect these undesirable practices, Bangladesh government promulgated the Fish Hatchery Act and Rules for the quality of artificial seed production in both public and private hatcheries. Under the act and rules, every hatchery must be taken registration from competent authority of DoF. The Status of the Fish Hatchery Act 2010 and Fish Hatchery Rule 2011 are given the table below:

Table 17: Status of the Fish Hatchery Act 2010 and Fish Hatchery Rules 2011 (2016-2017)

Division	Total Pvt. Hatchery (no.)	Registered(no.)	Unregistered(no.)	Total revenue earn (lac Tk)
Dhaka	51	41	10	0.48
Chittagong	226	224	02	2.13
Rajshahi	175	173	02	1.62
Khulna	129	125	04	1.83
Sylhet	22	22	00	0.43
Barisal	44	41	03	0.52
Rangpur	88	75	13	0.69
Mymensing	215	35	180	2.33
<b>Total =</b>	<b>950</b>	<b>736</b>	<b>214</b>	<b>10.03</b>

### 3.3 Protection and Conservation of Fish Act 1950 and Rules 1985

The provisions of Fish Act-1950 safeguard the breeding and growth of carp and other important fishes contributing to increase fish production in the country. Public awareness program were



Fish act implementation at Dhaka city

chalked out and implemented by the Upazila Fisheries Officers through meetings, general campaigns round the year and during observance of National Fish Week to create mass awareness about Fish Acts. Different awareness materials like posters, leaflets, booklets etc. were printed and distributed. In addition, TV spot prepared and broadcasted, street drama staged, workshops/seminars organized to create mass awareness. Appropriate measures were also taken to implement the Fish Act-1950 with assistance from local administration and law and enforcement agencies like Police, RAB and Navy etc. Mobile courts were conducted throughout the country.

Table 18: Enforcement of Fish Acts and Rules during 2016-17

Division	No. of undisposed case in the last year (No)	Present Cumulative no. of case filed (No)	Present Cumulative no. of case disposed (No)	No. of case	Punishment imposed by mobile court		
					No. of Current Jail seized	Jail	Fine (Tk)
Barishal	1	1013	963	398	434210	412	3342100
Khulna	12	1	1	00	53140	54	40550
Rajshahi	17	10	9	05	5257	12	85900
Dhaka	98	194	215	10	16755	146	1239370
Sylhet	80	02	07	00	8559	00	90620
Chittagong	549	755	647	01	22613	358	1616200
Rangpur	28	7	14	00	1742	01	48500
<b>Total</b>	<b>785</b>	<b>1982</b>	<b>1856</b>	<b>414</b>	<b>542276</b>	<b>983</b>	<b>6463240</b>

Considering the livelihoods of the fishers in the off-seasons and during implementation of fish acts, different income generating activities (IGA) program have been undertaken for the affected fishers.

### 3.4 Mass awareness campaign on regulatory framework

Mass awareness campaigns are organized in major fish markets, landing centers and in fishing villages to actively discourage the deleterious impacts of destructive fishing methods. Fishers and the representatives of local people are motivated to show respect for Acts and Rules promulgated to restore our biodiversity and protect the fisheries resource in Bangladesh. Regular meetings are arranged on various issues of non-compliances happened by fishers with the presence of representatives from the Bangladesh Navy, Bangladesh Coast Guard, Rapid Action Battalion (RAB), Bangladesh Police, Border Guard Bangladesh, Various Fisheries related Associations, boats owner associations, District Fisheries Officers to help mitigation measures and comply with rules and regulations.

## 4. Fish Inspection and Quality Control Activities

### 4.1 Quality Control Laboratory services

Fish and fishery products have been exported since the independence. At present, these products are one of the major export commodities of Bangladesh. One of the other important agenda for the department is to facilitate and maintain fish and fishery products' quality and safety to enhance export and Fish Inspection and Quality Control (FIQC) deals with this job. Envisaging this context, Government implemented the National Fish Inspection and Quality Control Project in 1976 establishing two regional offices located at Chittagong and Khulna. The office of Dhaka zone was established in 1980 under 'Establishment of National Fish Inspection and Quality

Control Service' project at Matsya Bhaban. Without having own laboratory, the initial activities under FIQC, Dhaka were restricted to inspection of fish processing establishments and infrastructure; and render advisory services for the developments of fish processing plants and processed products as well. Also, microbiological tests have been carried out with the assistance of microbiological laboratory of Bangabandhu Sheikh Mujibur Rahman Medical University (BSMRMU) former Institute of Post Graduate Medicine and Research (IPGMR), Dhaka. Department of Fisheries (DoF) had established FIQC Laboratory (presently Quality Control Laboratory), Dhaka by reshaping construction design, on the 11th floor of Matsya Bhaban building in 1994 which has been shifted at new premises at Savar, Dhaka in 2014. Besides FIQC Laboratory in Dhaka, two more modern laboratories having chemical and microbiological divisions have been established at Chittagong and Khulna by the financial assistance of UNIDO-SFIQC project during 2008-09. Since the creation of lab facilities, testing of microbial quality of exportable fish and fishery products has routinely been performed by the officials of three FIQC laboratories (presently Quality Control Laboratories). Moreover these laboratories started testing residues of harmful chemical residue analysis of fish and fishery products since 2007. From August, 2015, laboratory services were separated from Fish Inspection & Quality Control Services and since then 'Fish Inspection & Quality Control Laboratory' have been designated as 'Quality Control (QC) Laboratory'.

To address EU requirements, the Department of Fisheries (DoF) has installed six LC-MS-MS machines at Quality Control (QC) Laboratory, Dhaka, Chittagong and Khulna to check the contaminants and residues of prohibited antibiotics, dyes and anthelmintics in fishery product. Confirmatory test of the residues of chloramphenicol, nitrofurans metabolites (AMOZ, AOZ, AHD & SEM), metronidazole, malachite green, leuco-malachite green, crystal violet, leuco-crystal violet, anthelmintics (flubendazole, fenbendazole & mebendazole) etc. in fishery product are being tested through three LC-MS-MS machines at QC laboratory, Dhaka. Method of testing of chloramphenicol malachite green, leuco-malachite green, crystal violet and leuco-crystal violet has already been developed and validated through LC-MS-MS machine at QC laboratory, Khulna. Method validation of testing nitrofurans metabolites through LC-MS-MS machines is underway at this laboratory. Method development of testing different chemical residues through one LC-MS-MS machine at QC laboratory, Chittagong is under way. Furthermore, two ELISA systems have been added to each of QC laboratory, Chittagong and Khulna for screening tests of the residues of chloramphenicol, nitrofurans metabolites, oxy-tetracycline, tetracycline, chlor-tetracycline, metronidazole, malachite green, leuco-malachite green, crystal violet, leuco-crystal violet, histamine, methyl testosterone, diethyl stilbesterol etc. of fishery products. Testing method of pesticide residues like DDT, Aldrin, Heptachlor, Endrin and Dieldrin by GC-MS (TOF) machine has been developed at QC Laboratory, Dhaka in 2017. Most of the test scopes of three QC laboratories are accredited according to ISO 17025: 2005 by Bangladesh Accreditation Board (BAB). Following parameters are tested by the QC laboratories-

Name of Lab	Test parameters	
Quality Control (QC) Laboratory, Savar, Dhaka	<b>Fish &amp; Fish Products</b>	<b>Fish Feed &amp; Feed Ingredients</b>
	<p><b>Microbiological Parameters:</b> Aerobic Plate Count, Total <i>Coliforms</i>, Presumptive <i>E.coli</i>, <i>Vibrio cholerae</i>, <i>Vibrio parahaemolyticus</i>, <i>Salmonella</i> spp.</p> <p><b>Chemical Parameters:</b>Antibiotics-Nitrofurans metabolites (AMOZ, AOZ, AHD &amp; SEM), Chloramphenicol, Metronidazole; Dyes (Crystal violet, Leucocrystal violet, Malachite green, Leucomalachite green); Anthelmintics (Flubendazole, Febendazole, Mebendazole); Pesticides (DDT, Aldrin, Heptachlor, Endrin, Dieldrin); Formalin; Moisture; pH</p>	Antibiotics (Chloramphenicol); Proximate test of fish feed and feed ingredients (Crude Protein, Non-protein nitrogen, Fat, Fibre, Ash, Moisture); NIR Screening of fish feed
Quality Control (QC) Laboratory, 209 NM Khan Hill Road, Muradpur, Chittagong	<p><b>Microbiological Parameters:</b> Aerobic Plate Count, Total <i>Coliforms</i>, <i>E.coli</i>, <i>Vibrio cholerae</i>, <i>Vibrio parahaemolyticus</i>, <i>Salmonella</i> spp., <i>Staphylococcus aureus</i>, <i>Listeria monocytogenes</i>, <i>Shigella</i> spp., White Spot Syndrome Virus (WSSV) &amp; Yellow Head Virus (YHV)</p> <p><b>Chemical Parameters:</b> Antibiotics-Nitrofurans metabolites (AMOZ, AOZ, AHD &amp; SEM), Chloramphenicol, Tetracycline, Oxy-tetracycline, Chlortetracycline, Metronidazole; Dyes (Crystal violet, Leucocrystal violet, Malachite green, Leucomalachite green); Heavy metals (As, Hg, Pb, Cd, Cr); Methyltestosterone (MTS); Di-ethyl stilbestrol (DES); Histamine; Total Volatile Basic Nitrogen (TVBN)/Tri-methyl Amine (TMA); Di-sodium di-phosphate/Total Phosphate; Filth; Formalin; Moisture; pH</p>	Antibiotics-Nitrofurans metabolites (AMOZ, AOZ, AHD & SEM), Chloramphenicol, Tetracycline, Oxy-tetracycline, Chlortetracycline; Heavy Metals (Cr, Cd & Pb)
Quality Control (QC) Laboratory, Boyra, Khulna	<p><b>Microbiological Parameters:</b> Aerobic Plate Count, Total <i>Coliforms</i>, Presumptive <i>E.coli</i>, <i>Vibrio cholerae</i>, <i>Vibrio parahaemolyticus</i>, <i>Salmonella</i> spp., <i>Staphylococcus aureus</i>, <i>Listeria monocytogenes</i>, <i>Shigella</i> spp., White Spot Syndrome Virus (WSSV) &amp; Yellow Head Virus (YHV)</p> <p><b>Chemical Parameters:</b> Antibiotics-Nitrofurans metabolites (AMOZ, AOZ, AHD &amp; SEM), Chloramphenicol, Tetracycline, Oxy-tetracycline, Chlortetracycline, Metronidazole; Dyes</p>	Heavy Metals (Cd, Cr, Pb, Hg)

(Crystal violet, Leucocrystal violet, Malachite green, Leucomalachite green); Heavy metals (As, Hg, Pb, Cd, Cr); Histamine; Total Volatile Basic Nitrogen (TVBN)/Tri-methyl Amine (TMA); Di-sodium di-phosphate/Total Phosphate; Filth; Formalin; Moisture; pH	
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It is worthy to mention that testing method of Chloramphenicol and Nitrofurantoin metabolites (AHD, AOZ, AMOZ and SEM) for poultry meat matrix has been validated at QC laboratory, Dhaka in 2017. With a view to ensure external quality control, each QC Laboratory participated in international proficiency tests (PT) offered by world renowned PT provider organization on regular basis. In 2016-17 fiscal year, QC Laboratories participated in proficiency tests organized by different world renowned PT provider organizations is described below-

Name of QC Laboratory	Name and address of PT provider	Period of PT	Name of test parameters	Results/ Comments
QC Laboratory, Dhaka	FAPAS, UK	November-December, 2016	Nitrofurantoin metabolites	Z Score: -4.5
QC Laboratory, Chittagong	TEST VERITAS, Italy	September, 2016	ELISA Screening Test of Histamine, Tetracyclines (OTC, TTC, CTC), Nitrofurantoin Metabolites (AOZ, AMOZ, AHD, SEM)	Passed
	Livsmedelsverket, National Food Agency, Sweden.	October, 2016	Coagulase positive <i>Staphylococcus aureus</i>	Passed
QC Laboratory, Khulna	National Food Agency, Sweden	January/2017	Microbiological: Aerobic Plate Count, Pathogenic <i>Vibrio</i> , <i>Salmonella</i> spp and <i>Listeria monocytogenes</i>	Satisfactory

Analytical capacity of three QC laboratories was recognized through the overall comments in EU-FVO Audit Report-2015- “Significant improvements have also been noted in the performance of the laboratory network, accreditation of laboratories and validation of analytical methods and the competent authority can in general, have confidence in the reliability of analytical results”.

#### 4.2 Fish inspection & quality control services:

Mandate of FIQC is to ensure quality and safe fish and fishery product to global consumers. In order to maintain safety and quality of fish and fish products, following activities are carried out by three Regional FIQC offices located in Dhaka, Chittagong & Khulna.

1. Issuance of Licenses of fish processing establishments

2. Annual evaluation of establishments (instrumental & operational conditions) and renew of licenses
3. Regular monitoring of establishments' activities regarding HACCP, EU, USDA, Australia, GCC regulations etc. as per Fish and Fish Products (Inspection & Quality Control) Rules, 1997 (amended in 2008, 2014 & 2017) and Official Control Protocol.
4. Monitor water, ice and swab quality of processing establishments and ice factories
5. Plan and implementation of NRCP (National Residue Control Plan), FRCP (Factory Residue Control Plan) & MMP (Microbiological Monitoring Plan)
6. Product inspection and issuance of certificates for exportable fish and fish products
7. Surveillance and mobile court to ensure safety of fish and fish products
8. Implementation of activities under APA
9. Conduct awareness meeting
10. Training of stakeholders
11. Inspect imported consignments of fish and fish products on request of Customs Department

The summary activities conducted by three FIQC offices in 2017 is given below at a glance-

No.	Title of activities	Conducted
1	Fish Processing Establishments Inspection	
	(a) Number of declared consignments inspected	5427
	(b) Number of Fish Processing Establishments routinely inspected	667
	(c) Number of Fish Packing Centres routinely inspected	533
2	Quality assurance of Depot/Arats and inspection of traceability documents	492
3	Inspection of Ice Factories	281
4	Traceback of Salubrity Certificates issued	218
5	No. of NRCP (National Residue Control Plan) samples tested	1362
6	No. of NRCP non-compliance (Chemical)	1
7	No. of trainees regarding training concerning NRCP non-compliance (Chemical)	171
8	No. of fish feed/feed ingredient tested	270
9	Mobile court/raid	
	(a) Number of Mobile court conducted	150
	(b) Number of raid/campaigns conducted	314
	(c) Amount of money fined (Tk.)	2185700

	(d) Shrimp destroyed (kg)	11217
	(e) Fin fish destroyed (kg)	400
	(f) Number of persons sentenced to jail	9
	(g) Number of cases filed	9
10	Amount of money fined from the fish processing establishments	2297000
11	Number of fish transportation vehicles inspected	249

Number of different establishments involved in fish export value chain

Sl.No.	Type of Establishment	Number	Remarks
1.	Fish Processing plants	104	72 are EU-approved
2.	Factory Trawlers	48	
3.	Fish Packing Centres	41	
4.	Non Packer	106	
5.	Suppliers	213	
6.	Fish drying yards	30	
7.	Depots	1141	
8.	Service centre/Landing centres	48	

### 4.3 Export of fish and fishery products

Now a days, diversified fish and fishery products are produced and exported by Bangladesh to around 60 countries of the world. However, major export destinations of Bangladeshi fish and fishery products remain the member countries of the European Union (EU). Among others, USA, Russia, China, Japan, Canada, Australia, India, Saudi Arabia, Malaysia, Thailand, Vietnam etc. are also major importing countries of Bangladeshi seafood. The success of export is achieved by ensuring quality shrimp by introducing Quality Assurance Program through ‘Firm to Fork’ approach along with implementation of GAP at farm level, HACCP in production and traceability throughout the value chain. Around 50-60% of total export is composed of shrimp contributing about 75-85% of total value. Shrimp is the major exporting seafood item of the country most of which are of aquaculture origin and organic that grows naturally with minimal or no inputs. The exported item are-

- Shrimp/Prawn (processed, frozen, ready to cook and ready to eat)
- Finfish (whole, dressed, degutted, fillets; chilled, frozen)
- Dried fish
- Dehydrated fish
- Eels (live and frozen)
- Crabs (live and frozen)

- Shark fins
- Scales of finfish
- Shell of shrimp/prawn

Export statistics of Fish and Fishery Products of the last five fiscal years are presented below-

SL. No.	Fiscal year	Quantity of Shrimp exported (mt)	Value of Shrimp exported (Million USD)	Total quantity of fish and fishery products exported (mt)	Total value of fish and fishery products exported (Million USD)
1	2012-13	50,332.55	434.24	84,904.50	534.92
2	2013-14	47,635.41	530.57	77,328.86	630.29
3	2014-15	44,278.21	506.11	83,524.37	599.05
4	2015-16	40,726.14	459.01	75,337.93	546.28
5	2016-17	39,705.85	456.91	68,305.68	532.03

#### 4.4 Adoption of traceability

Traceability is the ability to track any food stuff through all stages of production, processing and distribution (including importation and at retail). When a potential food safety problem is identified, an effective traceability system can help isolate and prevent contaminated products from reaching consumers or recall if distributed into commerce and ensure corrective actions as well. Traceability should mean that movements can be traced one step backwards and one step forward at any point in the supply chain. To ensure traceability, about 207,000 shrimp and 9,624 fin fish farms of Bangladesh have been registered. Other establishments involved in supply chain of fish and fish products in the country are also registered or licensed to ensure traceability.

#### 4.5 On-line certification system

TRACES (Trade Control and Export System) are the European Commission's multilingual online tool for certification on sanitary requirements for intra-EU trade and importation of animals, semen and embryo, food, feed and plants. The network not only promotes a better cooperation between the competent authorities but also between the traders themselves and their competent authorities. TRACES allow the quick detection of fake certificates and therefore contribute to the enhancement of trust vis-à-vis its partners. In 2017, Bangladesh has introduced online certification through TRACES for consignments of fish and fish products intended to export to the EU countries.

#### 4.6 NRCP implementation

Residue Monitoring Program of DoF enforced as National Residue Control Plan (NRCP), is a program to monitor status of residue contamination of undesirable substances in farmed fish and shrimp to reveal the illegal use of banned or unauthorized substances as well as to determine the origin of residue contamination. For implementation of NRCP, 'NRCP Policy Guidelines 2011 (amended in 2012)' was formulated in line with the Fish and Fish Product (Inspection & Quality Control) Rules-1997 (amended in 2008, 2014 & 2017). The National Residue Control Plan is

based on measures to monitor certain substances and residues thereof in live animals and animal products and fixing the levels and frequencies of sampling provided the control of certain substances and residues thereof in certain animal products. A database on NRCP data has been developed by BEST-BFQ project support. Department of Fisheries has enough financial resources to carry out NRCP as planned.

#### 4.6.1 Planned NRCP-2017 for shrimp and finfish

Summary of NRCP -2017 for Aquaculture Crustaceans (Shrimp & Prawn) and Finfish is as follows:

National Plan						Khulna Zone				Chittagong Zone					Dhaka Zone		
Test Parameter	<i>M. rosenbergii</i>	<i>P. monodon</i>	<i>M. monoceros</i>	Fin-fish	Grand Total	<i>M. rosenbergii</i>	<i>P. monodon</i>	<i>M. monoceros</i>	Sub-Total	<i>M. rosenbergii</i>	<i>P. Monodon</i>	<i>M. monoceros</i>	Fin fish	Sub-Total	<i>M. rosenbergii</i>	Fin fish	Sub-Total
	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan
A1	0	0	0	16	16	0	0	0	0	0	0	0	12	12	0	4	4
A3	0	0	0	16	16	0	0	0	0	0	0	0	12	12	0	4	4
A6 (CAP)	60	82	7	6	155	58	69	5	132	1	13	2	4	20	1	2	3
A6 (NF)	67	92	10	8	177	65	77	7	149	1	15	3	6	25	1	2	3
A6 (MNZ)	22	31	3	2	58	21	26	2	49	0	5	1	1	7	1	1	2
A6 (Total)	149	205	20	16	390	144	172	14	330	2	33	6	11	52	3	5	8
B1	151	210	20	49	430	145	176	14	335	3	34	6	35	78	3	14	17
B2a	60	83	8	19	170	58	70	6	134	1	13	2	14	30	1	5	6
B3a	22	31	3	7	63	22	26	2	50	0	5	1	5	11	0	2	2
B3c	23	31	3	7	64	21	26	2	49	1	5	1	5	12	1	2	3
B3d	22	31	3	7	63	22	26	2	50	0	5	1	5	11	0	2	2
B3e	24	32	3	8	67	22	27	2	51	1	5	1	6	13	1	2	3
Total	451	623	60	145	1279	434	523	42	999	8	100	18	105	231	9	40	49

In addition, testing of different chemical residues of 270 samples of fish feed have been planned and carried out by three FIQC offices-

Sl. No.	Parameters to be tested	Number of feed samples			Total
		Dhaka Zone	Chittagong Zone	Khulna Zone	
1.	A <sub>6</sub> (CAP, AOZ, AMOZ, SEM & AHD)	10	22	28	60
2.	B <sub>1</sub> (TC, OTC & CTC)	10	22	28	60
3.	B <sub>3c</sub> (As, Cd, Pb, Cr & Hg)	32	26	32	90
4.	B <sub>3d</sub> (Aflatoxin B <sub>1</sub> , B <sub>2</sub> , G <sub>1</sub> , G <sub>2</sub> )	18	20	22	60
Total		70	90	110	270

## 4.6.2 NRCP 2016

Result of NRCP-2016 is as follows:

Group of Compounds	Test Parameters	Number of Samples tested			Total	No. of Non-compliant samples
		FIQC, Dhaka	FIQC, Khulna	FIQC, Chittagong		
A <sub>1</sub>	Stilbenes	4	0	12	16	0
A <sub>3</sub>	Steroids	4	0	12	16	0
A <sub>6</sub>	Antibiotics	8	345	65	418	0
B <sub>1</sub>	Antibacterial substances	16	350	91	457	0
B <sub>2a</sub>	Anthelmintics	6	140	36	182	0
B <sub>3a</sub>	Pesticides	2	51	12	65	0
B <sub>3c</sub>	Chemical elements	3	53	13	69	0
B <sub>3d</sub>	Mycotoxin	2	52	12	66	0
B <sub>3e</sub>	Dyes	3	55	16	74	0
Total		48	1046	269	1363	0

## 4.6.3 NRCP Findings in last five years

The total number of NRCP samples and number of non-compliant samples is presented in the following table. From the figure, it is clear that with the continuous effort and vigilance of the Department of Fisheries, Bangladesh the number of non-compliant samples was reduced remarkably.

Sl. No.	Year	Number of Sample Tested	Number of Non-compliance	Number of Non-compliance in substance
1	2016	1363	0	Not applicable
2	2015	1355	07	SEM-06, CV-01
3	2014	1388	23	CAP-02, SEM-19, AHD-01, As-01
4	2013	1332	49	CAP-08, SEM-33, AHD-02, CV-01, Pb-04, Afl-01
5	2012	1342	34	CAP-03, AOZ-1, SEM-20, AHD-10

## 4.6.4 Activities towards production of value added fish and fish products

The exporters are investigating more to produce value added products instead of traditional block products to meet the demands of the global market. Now a day, exporters are focusing more on production and export of value added products of shrimp and fish. As for example, in order to coup with the requirements of competitive global seafood market two fin fish processing factories- Virgo Fish and Agro Process Ltd. and Seven Oceans Fish Processing Ltd., Trishal, Mymensingh have started production and export of fish fillet of pangas. Installation of the facilities for preparing fish ball, fish nugget etc. is underway at Seven Oceans Fish Processing Ltd. Setting of facilities for extracting fish oil and preparation of fish meal at Virgo Fish and Agro Process Ltd. is underway. Construction of two other fin fish processing factory named

Earth Agro Farms Ltd. at Gazipur and Globe Fisheries Ltd. at Noakhali are underway. A company named Bangladesh-American Agro-process Ltd. located at Comilla has already started production of fish fillets from pangas and tilapia and other ready to cook value added products like fish finger, fish balls, fish nugget etc. of fish for local consumers. Construction of another fish processing plant named Alpha Accessories and Agro Export Ltd., Fakirhat, Bagerhat for production of 100% export oriented high value added products is underway.

Besides ensuring production, distribution and export of quality and safe fish and fish products, Department of Fisheries has organized hands on training on value added product development with fin fish specially tilapia and pangas and other seafood items at Virgo Fish & Agro Process Ltd., Trishal, Mymensingh with the support of intergovernmental organization, INFOFISH during 02-06 May, 2017. Participants from other fish industries like Seven Oceans Fish Processing Ltd. and Earth Agro Farms Ltd. also participated in the training. Initiatives have been taken to develop and commercial production of value added products like noodles, soup etc. of Hilsa with ECOFISH-BD Project support.

#### 4.7 Training activities

As training is essential tool for increasing skills and competence to provide quality services, the department provides training for the officers of FIQC on Food Safety, ISO standards, GMP, GAP and GLP, operation of LC-MS/MS machine, operation of GC-MS(TOF), Pesticide residue analysis, Proximate analysis of fish feed and feed ingredients and other Lab related activities and other necessary topics related to quality control. In 2017, FIQC officials and QC lab analysts participated in training programmes mentioned below-

Sl. No.	Title of the Training	Time table/Duration	Country
1.	Training on Understanding and Estimation of Measurement Uncertainty	29-03-2017 to 30-03-2017	Bangladesh
2.	In-house Hands on Training in Quality Control Laboratory on Test Procedure	26-04-2017 to 06-05-2017	Bangladesh
3.	Training on PPA and PPR 2008	7/05/170 To 13/05/17	Bangladesh
4.	Training on Proximate Analysis of Feed by Kjeldhal method and NPN by Dumas Nitrogen Analyzer	16/05/17 to 18/05/17	Bangladesh
5.	Training on Calibration and Verification of Analytical Equipments	05-06-2017 to 07-06-2017	Bangladesh
6.	Method Development and Verification of WSSV	08-08-2017 to 11-08-2017	Bangladesh

	and YHV		
7.	"Training of Trainers" course on TiLV Detection by PCR	26-09-2017 to 27-09-2017	Bangladesh
8.	PCR test method validation of WSSV & YHV	08/11/17 to 11/08/17	Bangladesh
9.	Training course on 'Antimicrobial resistance susceptibility testing in fishery and aquaculture products'	27-11-2017 to 29-12-2017	Thailand
10.	Anti-microbial Residues Analysis of Fish and Aquaculture products	05-12-2017 to 08-12-2017	Vietnam
11.	In-house Hands on Training in Quality Control Laboratory on Test Procedure (Training on Shrimp Pathogen detection by using PCR)	09-12-2017 to 16-12-2017	Bangladesh

#### 4.8 Laws and policies

A new amendment of present Fish and Fish Product (Inspection and Quality Control) Rules concerning test fees has been amended on 21 December, 2017. Proposed Fish and Fish Product (Inspection and Quality Control) Act-2017 has been submitted to the Ministry of Fisheries and Livestock for approval of the Parliament. Legal basis for production of safe Fish and Fish Product to ensure the safety and quality of exportable fish and fishery products from farm to fork are as follows-

##### Legal Framework

- The Fish and Fish Product (Inspection and Quality Control) Ordinance, 1983
- The Marine Fisheries Ordinance, 1983
- The Marine Fisheries Rules, 1983
- The Fish and Fish Product (Inspection and quality control) Rules, 1997 (amended in 2008, 2014 & 2017)
- The Fish Hatchery Act, 2010
- The Fish Feed and Animal Feed Act, 2010
- The Fish Feed Rules, 2011
- The Fish Hatchery Rules, 2011

In addition to the regulations, the following policies and guidelines are also in place for official control of fish products-

- National Fisheries Policy-1998
- National Residue Control Plan Policy Guidelines, 2011 (amended in 2012)
- National Shrimp Policy, 2014
- Fish and Fishery Products Official Control Protocol, 2015

- Guidelines for the Control of Aquaculture Medicinal Products-AMPs, 2015
- Manual on Good Aquaculture Practice- Trainer Manual
- Compliance Guidelines for Fish Feed Production, Import & Marketing
- Guidebook on Waste Management in Fish and Fishery Industries
- Good Aquaculture Practice – A Farmer’s Guide
- Compliance Guidelines for Shrimp Hatchery
- ISO/IEC 17025:2005 General Requirements for Competence of testing Laboratories

#### 4.9 Rapid alert system for food and feed

Shrimp of aquaculture origin of Bangladesh being contaminated by the NF metabolite evolved through repeated Rapid Alert System for food in the year 2009. Meanwhile substantial actions/ programs have been implemented for the total development of infra-structure, management and documentation. Motivational programs and training has been undertaken to increase the awareness about product quality and safety and to comply with HACCP and international obligations. Beside this, traceability system in aquaculture and processed products are being implemented and taskforce activities related to develop HACCP system in every stage from hatchery to processing of shrimp are also implemented according to EU requirements. Due to the repeated Rapid Alert System for Food and Feed (RASFF) from EU, National Working Committee was formed and that committee is working to mitigate the problem. With the continuous effort and progress achieved in residue analysis, the number of rapid alert has been reduced to zero in 2013 and 2014 from the highest number of 50 in the year 2009. In 2017, the no. of RASFF notifications was 4 out of which 2 were due to detection of SEM and two others were related to microbial contamination.

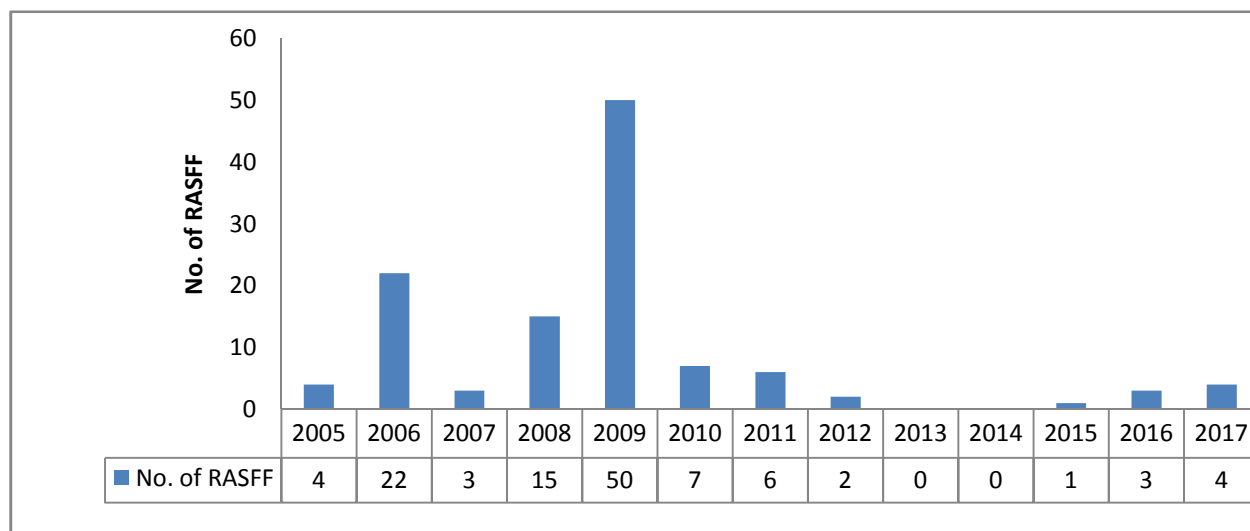


Fig. Number of rapid alerts concerning fish and fishery products exported to EU from 2005 to 2017.

## **Conclusion**

In the developed world, health consciousness is increasing day by day. So, currently safe food is the major issue in the developed countries. Significant efforts have been made for official control of fishery products & monitoring of residues in aquaculture towards ensuring export of fish and fishery products worldwide including EU countries, USA, Japan, Russia etc. Official protocol has been formulated & enforced. Capacity has been improved along with ISO accreditation of the Lab. With all this developments, Bangladesh is now on the way to achieve better standards in food safety. The continuous progress and effort of Bangladesh for ensuring safe fish and fish products for export has been approved through the comments of EU-FVO Audit Report-2015. Regarding public health of food safety of fisheries sector, the comments was as-

- Improvements have been made since last audit and in principle, the current organization of the CA and its documented operational procedures provide for an acceptable official control system for fishery products which is implemented in satisfactory way.
- The system in place for residues controls in aquaculture offers guarantees equivalent to EU requirements.
- The residue monitoring plan satisfies the minimum requirements laid down in EU legislation and both it and PET program are effectively implemented as evidenced by a significant decrease in the no. of N/C samples relative to previous years.

Considering the comments of EU-FVO Audit Report-2015 and on very low number of non-compliant consignments, the European Commission has repealed the EC's Decision No. EC/630/2008 and comments of EC regarding repeal of the decision was- "it appears unnecessary to require that consignments of the products imported into the Union from Bangladesh be accompanied by analytical tests" (Commission Decision no. 2015/2260)

## **5.0 Human Resource Development**

### **5.1 Training**

Human resource development is mandatory for DoF to enhance administrative, management and technological capacity in fisheries sector. The HRD activities meant to enhance capacity in the area of administrative, management, technological aspects and relevant cross cutting issues for conserving and managing the fisheries resources in sustainable manner. The ultimate objective is to augment productivity in fisheries sector, alleviate poverty, address gender issues, reduce unemployment and contribute balanced development having regard to goals and objectives of the national development plans. As a part of National Fisheries Policy implementation, DoF has developed a Human Resource

Development Sub-strategy. DoF has organized both in-country and overseas training as major tool for technology transfer and extension activities in order to disseminate new technologies at field level. For this purpose regular training programs are being conducted from both revenue and development budget of DoF for the skill development of concerned personnel including DoF officials, fishers, fish farmers, unemployed youths, women, landless and marginal farmers etc. For the continuation of fisheries training, Government already created a new sub-head named "training" in the revenue budget. The progress of training activities at a glance is shown below

Financial Year	In Country Training		Foreign Training	
	Government personnel	Fish Farmers/ Fishers/ NGO personnel	Government personnel	Fish Farmers/ Fishers/ NGO personnel
2008-2009	2801	51,761	118	06
2009-2010	3230	54,527	69	08
2010-2011	3500	60000	99	13
2011-2012	3750	65873	166	03
2012-2013	3995	275437	103	00
2013-2014	3154	298783	76	00
2014-2015	3143	76369	130	00
2015-2016	4379	185991	85	00
2016-2017	4379	185991	124	00

## 5.2 Development of mid level skilled manpower

The vision 2021 of the government has targeted to achieve self-sufficiency in food and increased food security. This requires achieving a dual objective of enhancing production and productivity, livelihoods security and equitable distribution of benefits side by side with the conservation of fisheries resources. Aquaculture and fisheries management in the suitable water-bodies is now becomes very popular job in rural areas. Moreover day-by-day fisheries entrepreneurship is increasing tremendously to meet-up the domestic as well as global demands. However, manpower involved in such fast-growing industry is almost non-professional, without having any fundamental technical know-how. Presently they are serving only on the basis of their working experiences and very little informal trainings. To ensure the sustainable aquaculture production and environment-friendly management of the water-bodies to achieve the Second Five Year Plan/Vision 2021 goals, it is essential to provide grassroots level skilled technical manpower for the sector.

As per desires of the Honorable Prime-minister, Government of the People's Republic of Bangladesh, the Department of Fisheries established one Fisheries Diploma Institute at Chandpur by the Fisheries Diploma Course Implementation project to produce mid level technically skilled manpower. In this Institute academic activities have been started from 2009-10 academic years and admitted 25 students in first batch. The first batch student completed their Diploma in Fisheries course in the year 2013. Diploma in Fisheries course consists of eight semesters, duration of each semester is six months. The total duration of the Fisheries Diploma Course is four years.



**Diploma Institute at Gopalganj**

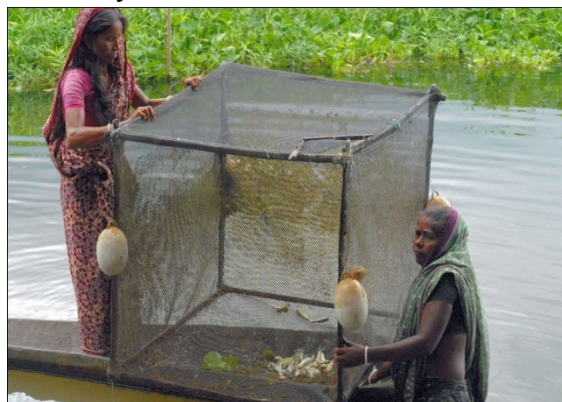
Considering the necessity of more skilled manpower at grassroots level, the government of Bangladesh has taken another pragmatic project named Establishment of Fisheries Diploma Institute at Gopalganj, Kishoregonj and Sirajgonj districts to establish additional three new Fisheries Diploma Institutes at Gopalganj Sadar, Kishorganj Sadar and Belkuchi, Sirajganj. The construction of administrative building, academic building, principal residence, instructor's dormitory, staff dormitory, Boy's hostels, Girl's hostel, Electrical substation, Guard room of each Institute have been completed. The hostels, classrooms and laboratories of each institute has been furnished with necessary furniture, equipments, chemicals, computers and academic activities will be started from 2018-19 academic calendar year.

Organizations like Department of Fisheries, Bangladesh Fisheries Research Institute, Bangladesh Fisheries Development Corporation, nationalized banks etc. will have the opportunity to utilize and appoint this sort of skilled manpower to progress the entire fisheries sector. Private sectors like fish processing plants, feed mills etc. and NGOs involving with this sector will also have the same opportunity. There also have some scope to utilize this sort of skilled manpower in the international labour market. So it will be easily possible to increase the total production of the sector, both qualitatively and quantitatively, by the efficient utilization of skilled manpower.

Finally, it is expected that the establishment of Fisheries Diploma Institutes will create skilled manpower at grassroots level that will help to increase fish production in the country.

### 5.3 Gender perspectives

Women constitute half of the total population in our country. The economic and social status of rural women remains very low due to economic and gender inequality. They are also suffering from malnutrition. Women's employment can play a significant role in the socio-economic development and gender equality. To attain sustainable development, women's active participation in income generating activities is urgently needed. Income generation have the potential to increase women's socio-economic



Women working on Fishing Sector

and nutritional status. Women's participation in aquaculture and fisheries activities is very crucial for the socio-economic development of Bangladesh. Considering these scenarios, the Department of Fisheries (DoF) has been working to create employment opportunity for women. In this regard the rural women have also been provided with various supports through different development projects of DoF.

#### 5.3.1 Employment

According to statistics of 2015-16, about 1.5 million of women are involved in fisheries sector in various ways. In fish processing plants, working women represent 46.7% of total permanent workers while casual female workers consists 56.75% of total casual workers. The wage range of women varies from BDT 5,000-15,000/month for permanent workers and BDT 4,500-13,000/month for casual workers. Apart from this, DoF creates scopes for income generation of rural women through nominating them as LEAF (Local Extension Agent for Fisheries). They are provided BDT 2,000/month. Besides income generation, DoF is trying to improve their leadership quality which is one of the important indicators of women empowerment and gender equality.

#### 5.3.2 Supports for rural women

A total of 37229 fisher women have been registered under DoF and provided with ID cards. They are getting various types of supports like VGF, AIGA etc. and their family are also getting BDT 50,000 in case of accidental death of fisherman. Rural women are also being involved in open water fisheries management through development projects of DoF. Till now 2676 rural women have been included in 543 CBO groups and getting training on open water fisheries

management. A total of 21,573 rural women have been trained on different aquaculture technologies.

In some of the development projects of DoF, there is a provision of Result Demonstrator (RD). There are about 470 RD women and 305 women as CBG members are working in different areas. A total of 100 community savings groups (CSG) have been formed involving around 3,100 women with a savings of BDT 28, 41,370 in the 9 coastal districts.

A total of 4,722 women fishers received different AIGA trainings like, aquaculture, goat rearing, bamboo craft making, tailoring and 15,000 households received different AIGA support/inputs including vegetables seeds, goat, poultry, sewing machine etc. from EcoFish<sup>BD</sup> project.

### **5.3.3 Agenda for sustainable development**

The on-going and proposed activities of DoF are aligned with the government development plan and SDG (Sustainable Development Goal) focusing gender issues in the following ways:

- Encouraging women participation through promoting small scale aqua-farming
- Scale-up of integrated homestead aqua-farming for ensuring nutrition security at household level

Development projects and programs are being implemented through DoF ensuring at least 25% women participation as project beneficiaries.

## **6.0 Implementation of Development Plans and Policies**

### **6.1 Annual performance agreement (APA)**

With a view to ensuring institutional transparency, accountability, proper utilization of resources and above all enhancing institutional efficiency the government has taken an initiative to introduce a Performance Management System (PMS) in public sector organizations. With the objective of introducing PMS across the Government, it has been decided to have the Annual Performance Agreements (APAs) between the Cabinet Division as the 1<sup>st</sup> party and all other ministries/division as the 2<sup>nd</sup> parties. Main purposes of introducing APA are: (a) moving the focus of the ministry from process or intention to result orientation and (b) providing an objective and fair basis to evaluate overall performance of the ministry/division at the end of the year. In the 2014-15 FY year total 48 ministries/division signed APA for the first time in Bangladesh.

To achieve vision, mission and strategic objectives of the Department of Fisheries (DoF) APA between the Director General (DG) of DoF and the Secretary of Ministry of Fisheries and Livestock (MOFL) for the FY 2014-15, 2015-16 and 2016-17 was duly signed and DoF showed a visible progress in achieving the targets. From the begging DoF implementing identified

interventions and providing necessary information, which was praiseworthy. Credible performance of DoF highly appreciated from all relevant corners including Cabinet Division. In this connection APA for the financial year 2017-18 was signed in June 2017 between the Director General, DoF and Secretary, MOFL.

### **6.2 7 FYP and SDGs**

A comprehensive action plan has been developed for the fisheries sector in line with the UN SDGs targets. A number of consultation with different stakeholder and field officials of DoF has been done to finalize the action plan to achieve the SDGs targets. Ongoing projects has been identified which are relevant and will contribute to achieve the 7<sup>th</sup> FYP and SDG targets. Moreover projects intervention has been identified for 2021-30 following the GED guideline. For the implementation monitoring of SDGs related activities data gap analysis is ongoing. Data provider identification will be finalized process. According to GED mapping MOFL has been identified as lead ministry for 14.2, 14.4, 14.5, 14.6, 14.7 and 14.C targets. DoF is the main stakeholder to achieve those targets. DoF needs strong collaboration with Markentile Marine Office (MMO), Bangladesh Police, NAVY, Coast Guard, Riverine Police, Department of Environment, Department of Forest, Water Development Board etc.

### **6.3 Master plan of Department of Fisheries**

The Fisheries Sector represents one of the most productive and dynamic sectors in Bangladesh. The Master Plan is being formulated to propose ways in which the policies and strategies can be implemented and support can be offered to guide the sector, recognizing that over the next 25 years the requirements of the sector are likely to change as development continues rapidly.

The Master Plan is intended to be used by the implementers and is therefore rather detailed in the line of the Vision 2021 and Seventh Five Year Plan of the Government, and the agenda 2030 of the United Nations, the Sustainable Development Goals. It is being directed to achieve the visionary goals of the present government to be the middle income country by 2021 and the developed country by 2041.

The Master Plan would be a static document, but to regularly reviewed, revised and updated as new developments take place, experience from its implementations is gained, and new innovation and knowledge developed. The revision of the Plan should be coordinated with the annual work planning in the Department of Fisheries. The Plan represents the compilation of five thematic areas which have been developed to give specific direction to their specific areas. These have all been prepared using a participatory approach with inputs from the key stakeholders such as the private sector, research organizations, and other governmental agencies working in similar fields, NGOs and fish farmers and fishers. The building block thematic areas of the Master Plan are –

- Aquaculture
- Inland Fisheries Management;
- Marine Fisheries Management;

- Fisheries Education, Research, Human Resources and Skill; and
- Promote Export Earning of Fish and Fishery Products.

Interventions and activities proposed in the master plan are to ensure and supply of additional 1.00 million metric tons of fish by 2021 and 1.9 million metric tons of fish by 2041 for the growing population considering the growth of 1.37% and as well as to enhance export earnings from fish and fishery products in a sustainable manner.

## 6.4 Observation of national day

### 6.4.1 National Fish Week 2017



Inauguration session of the National Fish Week 2017, Dhaka.

The Father of the Nation Bangabandhu Sheikh Mujibur Rahman inaugurated **More Fish Culture Movement in 1974** by releasing 20,000 carp fingerlings at Gonobhabon Lake. Following that movement, National Fish Campaign is being observed throughout the country to create mass awareness to impart in the process for harnessing the potential from fisheries sector for economic growth of the country since 1993. National Fish Week 2017 has been observed country wide from 18-24 July with due emphasis on fish culture for food safety. The commemorative slogan for National Fish Week 2017 was ***Machh Chase Gorbo Dhesh, Bodle Debo Bangladesh.*** As per instruction of the Prime Minister, the Ministry of Fisheries and Livestock through the Department of Fisheries took up a program to build up awareness for conservation of fisheries resources among the people and to motivate them for participation in technology based improved fish culture for increased production of fish and shrimp.

A distinctive character of the "National Fish Week" was the direct participation of the head of the state, the President; head of the government, the Prime Minister, Speaker of the National Parliament and Cabinet Ministers. The Honorable Prime Minister of Bangladesh has inaugurated the national event on 19 July 2017 in the Krishibid Institution Bangladesh Auditorium (KIB). In the inaugural day, special supplements were published in four national

dailies- The Daily Independent; The Daily Ittefaq, The Daily Janokontha and The Daily Samokal. A press briefing was also arranged on 18 July 2017 to disseminate the significance of the National Fish Week. A grand Road Rally arranged on 22 July 2017. A seminar was organized on the topics of fisheries importance. Various events like discussion and awareness meeting, fish fair, training for unemployed youths, essay competition for school and college students, art competition, execution of Fish Acts and mobile courts were also conducted.



Fingerling releasing by the Honorable Prime Minister Sheikh Hasina

### 6.4.2 Great victory day display



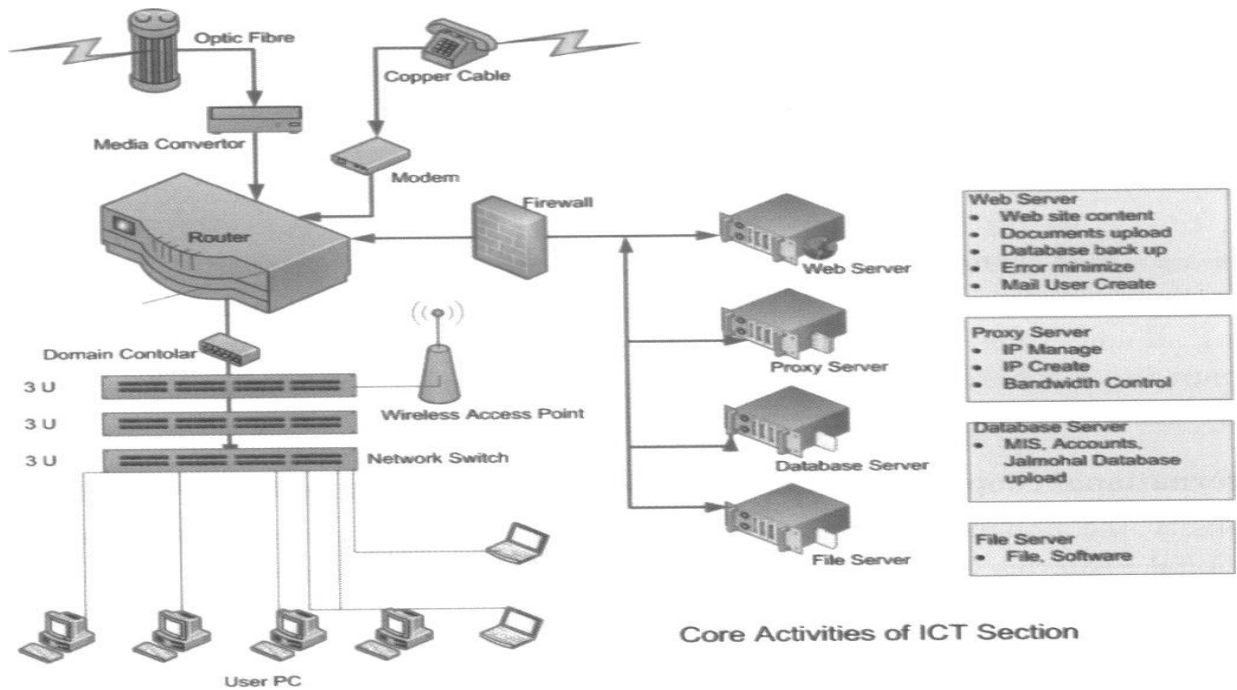
Display of DoF at National Pared Ground, Dhaka 16 December'2017

Department of Fisheries (DoF) under the Ministry of Fisheries and Livestock organize a truck-lorry display at the National Pared-Ground every year to give a salute for the freedom fighters in liberation war 1971 on 16<sup>th</sup> December. At present among the top ten fish producing countries in the world, Bangladesh secured the 5<sup>th</sup> position by adopting improved technical management through the Department of Fisheries (DoF). The model in the display reflected the aspiration of present Democratic Government under the leadership of our Honorable Prime Minister Sheikh Hasina toward the development of the fisheries sector by achieving target of vision 2021.

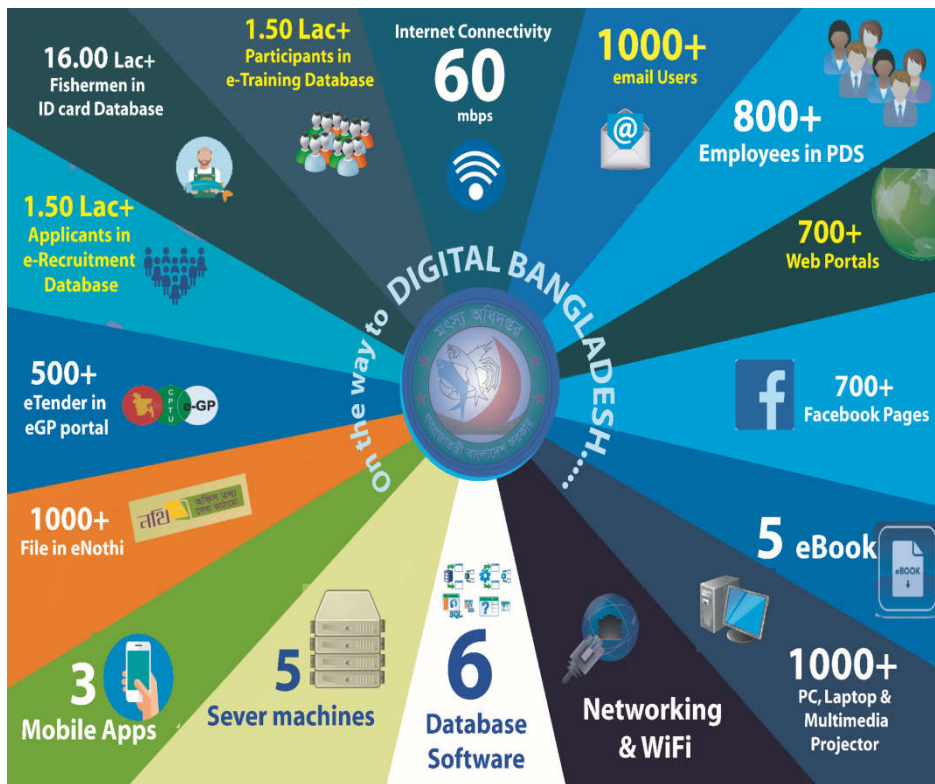
## 7.0 Information and Communication Technology (ICT) in Fisheries

### 7.1 On the way to Digital Bangladesh

It is mentionable that Honorable Prime Minister Sheikh Hasina dreamed for a Digital Bangladesh. Without ICT sector development the dream of a Digital Bangladesh would be only a dream. To achieve the objective of Digital Bangladesh, Department of Fisheries developed an ICT Infrastructure such as Computer Systems, Server Systems, Network Machineries, Software, Wire and Wireless Connectivity Systems, Broadcast Hardware and many other Hardware and Accessories and trained professional for operating this system.



High-speed Internet and networking systems are an important component for founding Digital Bangladesh. DoF has installed 60 Mbps internet connection through optical fiber. A strong and modern networking system already established in Matshyabhaban through server, router and manageable switch. All officers and employees of the DoF has access to internet for official work. Department of Fisheries launched Webmail service on its own domain name. There are thousand user including group mail in webmail.



Department of Fisheries already developed 5 database software. DoF-PDS is one of the effective database software for DoF. Personal, academic and official information of an employee were stored in this database. The Department of Fisheries provides training on the culture, preservation and management of fish and shrimps and fisheries resources for the development of human resources. e-Training management database software has been developed to ensure proper planning and implementation of the training program. It also prevents the duplicity of the trainees and prepares the customized report. e-Recruitment Management database software has been prepared for receiving application of a job offered by DoF. An applicant easily applying and receiving admit card through this software. e-Recruitment Management database software ensured transference and reduced time and cost to a recruitment process. Fishermen Registration and issuing ID card project developed a Fishermen MIS. Above 16 lac fishermen's information stored in this MIS. Fish Feed Licensing system and Fish Advice system are also developed by DoF for implementing e-service.

## 7.2 Digital innovation fair

Under the supervision of prime minister's office, a2i project organized digital innovation fair at national and regional level for 4 days from 6/12/17 to 9/10/17 to encourage the ICT innovation among the people. Innovation team of Department of Fisheries alongside with other government and non government organizations took part in the fair



**Fig: DoF attained Digital Innovation fair 2017 in Dhaka**

With “Non-stop Bangladesh” motto the fair was arranged in BangaBandhu International Convention Center. The fair was arranged for the third time with a goal to export software worth \$100 crore in 2018 & \$500 crore in 2021. The fair provided information about the goal & achievements of Bangladesh in the ICT sector. In this fair 12 seminars were held where 50 foreign speaker & 3 lakh visitors took part. For the 1<sup>st</sup> time this fair displayed Sofiya, digital artificial robot.

## 8. Implementation of Development Projects

Government has taken necessary initiatives at the very beginning to increase investment for expected development of fisheries sector. An amount of taka 34461.00 lakh has been allocated for 22 development projects in the financial year 2016-2017 under the annual development

program of DoF. The actual expenditure and achievements were 33187.07 lakh and 96.30% respectively. Some programs are also submitted to the ministry for budget allocation from revenue head. The list with allocation and expenditure of DoF development projects and programs for vision 2021 are shown in Annexure 7.

## **9.0 Conclusion:**

Bangladesh is one of the world's leading fish producing countries with a total production of 41.34 lac mt, where aquaculture contributes 56.41 percent to total production. Last 10 years average growth performance of this sector is almost 5.43 percent. Government is trying to sustain this growth performance, which eventually ensures to achieve the projected production target of 4.55 million MT by 2020-21. According to FAO statistics 2016, Bangladesh is ranked 5<sup>th</sup> in world aquaculture production. This sector contributes 3.61 percent to our national GDP and around one-fourth (24.41 percent) to the agricultural GDP. More than 11 percent of total population of Bangladesh are engaged with this sector on full time and part time basis for their livelihoods. This sector also has high potential for the perspective of economic development of the country. The declaration of Honorable Prime Minister Shiekh Hasina for food security, government has undertaken massive activities to obtain desired production of fish to meet the animal protein requirements up to 63% as well as crop production. It is believed that if the increasing trend of development activities of present democratic government continues, it will be possible to achieve the millennium development goal by 2021 with which the creation of huge employment opportunity, poverty alleviation and food security ultimately will ensure the dream of Sonar Bangla as dreamt by the Father of the Nation, "**Bangabandhu** Sheikh Mujibur Rahman".



[www.fisheries.gov.bd](http://www.fisheries.gov.bd)