



ANNUAL REPORT 2016

of

Department of Fisheries Bangladesh



Department of Fisheries Bangladesh

www.fisheries.gov.bd

Ministry of Fisheries and livestock

Annual Report 2016

Annual Report 2016



Department of Fisheries Bangladesh
Ministry of Fisheries and Livestock



Annual Report 2016

Chief Editor

Syed Arif Azad

Director General

Department of Fisheries Bangladesh

Editorial Panel

M I Golder

Director (Marine)

President

Md. Goljar Hossain

Deputy Director (Aquaculture)

Member Secretary

Md. Aminul Islam

Deputy Director (Finance & Planning)

Member

Dr. Md. Sainar Alam

District Fisheries Officer (Reserve)

Member

Kaisir Mohammad Moinul Hasan

Assistant Director (Admin-1)

Member

Ayesha Siddiq

Assistant Director

Member

Mohammod Kamruzzaman Hossain

Chief Fisheries Extension Officer

Member

Muhammad Badrul Alam Shaheen

Assistant Chief

Member

Published by

Department of Fisheries Bangladesh

Design and composed by

Syed Rakibul Moin Rumi

Senior Photo Artist

Printed by

IKON

4, Dilkusha, BSS Bhaban, Dhaka



Director General
Department of Fisheries
Bangladesh

May 2016

Preface

Bangladesh is one of the world's leading fish producing countries with a total production of 3.88 million MT, where aquaculture accounts almost 57 percent of the total production. Last 10 years average growth performance of this sector is 5.24 percent. Aquaculture shows a sturdy and consistent growth, almost average 10 percent during the same timeframe. 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.

This sector is contributing significantly in food security through consistently providing safer and good quality animal protein. It contributes 3.65 percent to national GDP and around one-fourth (23.81 percent) to the agricultural GDP. More than 11 percent of the total population of Bangladesh are engaged with this sector on full time and part-time basis for their livelihoods. Bangladesh earns a considerable amount of foreign currencies by exporting fish, shrimps and other fishery products.

This annual report provides a very brief impression on the ongoing interventions, extension activities, innovations in fisheries, food safety and quality control measures, implementation of regulatory framework, survey of inland and marine fisheries resources, gender perspectives, HRD, etc. being implemented by the Department of Fisheries and the progress so far achievement in 2016.

I congratulate and thank to my colleagues who have contributed their energy, thoughts and invaluable time to fashioning this report.

I believe and hope that this report will be helpful to all relevant stakeholders involved with the fast-growing fisheries sector of Bangladesh.

Syed Arif Azad

Sl. no.	Subject	Page #
1.0 Introduction		01
1.1	History of the Department of Fisheries (DoF)	01
1.2	Vision, Mission and Mandate of the DoF	02
1.3	Organizational Setup	03
1.3.1	Manpower Under Revenue	03
1.3.2	Manpower Under Development Projects	04
1.4.	Budget Allocation	04
1.4.1	Revenue Budget	04
1.4.2	Development Budget	04
1.5	Revenue Earnings	06
2.0 Fisheries Resource Management		07
2.1	Aquaculture Extension Activities	07
2.1.1	Demonstration of Aquaculture Technology	07
2.1.2	Problem solving advices in the office	07
2.1.3	Use of Fisheries Information & Community Centre	07
2.1.4	Farm visit and advise	07
2.1.5	Farmers Training	07
2.2	Fish Seeds & Post Larvae (PL) Production	07
2.2.1	Fish Seeds Produced in Hatchery/farms	08
2.2.2	Fish Spawn/fry collected from natural sources	09
2.2.3	Shrimp/Prawn PL Produced in hatchery	10
2.3	Fresh Water Aquaculture	10
2.3.1	Fresh water fish culture in ponds	10
2.3.2	Fresh water fish culture in paddy field	11
2.3.3	Fish culture in borrow-pit and Khal	11
2.3.4	Fish culture in baor (Ox-bow Lake)	12
2.3.5	Cage Culture	12
2.3.6	Pen culture	13
2.3.7	Fresh water mud eel culture	13
2.4	Coastal Aquaculture	14
2.4.1	Shrimp (Bagda) Culture	14
2.4.2	Prawn (Golda) Culture	15
2.4.3	Introduction of SPF Black Tiger Shrimp	16
2.4.4	Crab Culture and Crab Fattening	17
2.5	Inland Open Water Fisheries Resources Management	18
2.5.1	Community based fisheries management	18
2.5.2	Integrated natural resources management	19
2.5.3	Fingerling stocking	19
2.5.4	Establishment of Beel nursery	20
2.5.5	Establishment of fish sanctuary	21

Sl. no.	Subject	Page #
2.6 Marine Fisheries Resources management		21
2.6.1	Bangladesh Maritime Boundary	21
2.6.2	Marine Fisheries Resources Conservation and Management	22
2.6.3	Enacting Acts, Rules and Policies	23
2.6.4	Hilsa Fishery Conservation, Exploitation and Management	24
2.6.5	Licensing Activities of Mechanized Fishing Boats	24
2.6.6	Licensing Activities of Industrial Fishing Vessel/Trawler	25
2.6.7	Inspection and Catch Monitoring of Trawlers and Mechanized boats	25
2.6.8	Issuance Of Illegal, Unprotected and Unregulated (IUU) Catch Certificate	26
2.6.10	Extension, Monitoring and Development Activities	26
2.6.11	Disaster Management Activities	27
3.0 Fisheries Regulatory Activities		28
3.1 Fish Feed & Animal Feed Act 2010 and Fish Feed Rules 2011		28
3.2 Fish Hatchery Act 2010 and Fish Hatchery Rules 2011		29
3.3 Enforcement of Fish Act		30
3.4 Enforcement of Piranha Fish prohibition		31
3.5 Control of Formalin use in Fish Preservation and Mass Awareness		32
4.0 Fish Inspection and Quality Control		32
4.1 Quality Assurance of Fish Products		32
4.1.1	Laboratory services	34
4.1.2	Analytical services and supporting Laboratories	34
4.1.3	Licensing of Fish Processing Establishments	35
4.1.4	Routine Monitoring of Quality Assurance Program (QAP)	36
4.2 Fish Products Inspection		37
4.2.1	Export of Fishery Products	37
4.2.2	Import of Fishery Products	37
4.3 Quality Assurance of Fish Products		38
4.3.1	Microbiological test	38
4.3.2	Chemical tests	38
4.3.4	Water, Ice and Swab tests	38
4.4 Residues monitoring through NRCP		38
4.4.1	Planned NRCP-2017 for Shrimp and Finfish	40
4.4.2	NRCP-2016 –Test details	40
4.4.3	NRCP Findings in last five years	40
4.5 Export condition of Fish and Fishery products		41
4.5.1	Export performance in recent years	42
4.5.2	New Entrepreneurship in Fish processing	42
4.5.3	Traceability	42
4.5.4	Hazard Analysis and Critical Control Point (HACCP) implementation	42
4.5.5	Surveillance and mobile court to prevent fish adulteration	42

Sl. no.	Subject	Page #
	4.5.6 Task Force Committee	43
	4.5.7 FIQC training activities	43
	4.6 Laws, Policies and Documents	43
	4.7 Rapid Alert System for Food and Feed (RASFF)	44
	4.8 Conclusion	45
5.0	Human Resource Development (HRD)	46
6.0	APA	47
7.0	Promotion of Integrity Technique	47
8.0	Gender perspectives	48
	8.1 Employment	48
	8.2 Supports for rural women	48
	8.3 Agenda for sustainable development	49
9.0	Diploma in Fisheries	49
10	Community Based Aquaculture Management (CBAM) through Neemgachi Project	50
11	National Fish Week 2016	51
12.	Great Victory Day Display	52
13.	Implementation of Development Projects	53
14.	Information and Communication Technology (ICT) in Fisheries	53
	14.1 Introduction	53
	14.2 ICT in Fisheries	53
	14.3 Door step Services	54
	14.4 Success Story of ICT Section	56
	14.5 Digital Innovation Fair	57
	14.6 Innovation of Department of Fisheries	
15.	Conclusion	63

List of Tables

Sl. no.	Title	Page #
1.	Manpower under revenue budget and manpower in position	03
2.	Manpower under development project and manpower in position	04
3.	Non-development budget of DoF	04
4.	Development budget of DoF	04
5.	Non tax revenues earned in last five years	05
6.	Production of Carp hatchlings in 2012- 2016	08
7.	Production of fry in 2012- 2016	09
8.	Carp Hatchlings collection from natural sources	09
9.	Production of golda and bagda PL in 2012- 2016	10
10.	Status of pond fish culture in 2012- 2016	11
11.	Different types of water body renovated through FCDI project	12

Annual Report 2016

12. Shrimp farming and production	15
13. Prawn farming and production	16
14. Stocking of fish fingerling in open water bodies and flood plains	20
15. Gear wise fish harvest (MT) from 12 selected Landing Centers during 2015-16	23
16. Licensing activities of machanized fishing boats	25
17. Amount of Fish exploitation by the Industrial trawlers	25
18. Inspection and catch monitoring of Industrial and Artisanal vessels	25
19. Enforcement status of Fish feed and animal feed Act, 2010	29
20. Enforcement of the Fish Hatchery Act 2010 in 2015-2016	30
21. Revenues earned from mechanized fishing boats licensing activities	31
22. Enforcement of Piranha fish of prohibition activities in 2015-2016	31
23. Number of different establishments involved in fish export value chain	36
24. Export earnings in last five years	41
25. Progress of training activities	46

List of Figures

Sl. no.	Title	Page #
1.	Development and Non-Development budgetary allocation of last five years	05
2	Fish Production in last five years	06
3.	Year-wise production of golda (Prawn)	16
4.	Flow diagram of issuance of health certificate	37
5.	Number of non-compliant samples under NRCP activities in last five years	40
6	Number of rapid alerts concerning fish and fishery products exported to EU from 2005 to 2016	45

List of Annexures

Sl. no.	Title	Page #
1.	List of the winners for National Fish Award, 2016	61
2.	Year-wise fish production during last 10 years	62
3.	Comparison of Annual Fish Production between 2014-15 and 2015-16	63
4(a)	Annual Carp Hatchling Production in 2016	64
4(b)	Hatchling Production from Govt. Hatchery in 2016	64
4(c)	Hatchling Production from Private Hatchery in 2016	65
4(d)	Annual PL (Post Larva) Production in 2016	65
5.	Annual Catch from Marine Fisheries in 2015-16	66
6.	Species-wise Catch of Marine Fisheries in 2015-16	67
7.	NRCP-2016 –Test details	68
8.	Year-wise Annual Export of Fish and Fish Product during 1999-2000 to 2015-2016	69
9.	List of On going Development Projects in 2016-17	70

1.0 Introduction

Bangladesh, a riverine country blessed with many rivers-canals, depressions, oxbow lakes, ponds and floodplains, cover 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 1,18,813 sq.km. Since time immemorial, these inland, coastal and marine waters are the main sources of fish. As agro-based country, the contribution of fisheries sector to national economy has always been important as it provides major (60%) share of animal protein, employment opportunities, food and nutritional security, foreign earnings, aquatic biodiversity conservation and socio-economic development. Fisheries sub-sector contributes 3.65% to GDP and 23.81% to agricultural GDP (Bangladesh Economic Review). About 11% of the population are dependents directly and indirectly on the fisheries for their livelihood.

Extension programs of sustainable aquaculture technologies for fish and shrimp, conservation and management of the fresh water 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 up to achieve the much desired targets. As a part of the 'Digital Bangladesh' program, the Government initiated e-Extension services of fish/shrimp culture and extension programs to provide appropriate services at the door steps of the farmers. In addition to these, existing laws and acts related to fisheries have been promulgated/amended and updated to ensure quality fish/shrimp production and availability of 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 expedite that goal. Initiation of good practices in environment friendly fish/shrimp farming for promotion of export, biological management of jalmohals, establishing of easy access of real fishers to the open water capture fisheries, creation of employment opportunities and other various pragmatic programs have been taken up by the DoF to facilitate achievement of 'Vision-2021'. It is expected that all these programs will contribute to reduce present poverty level from 6.5 crores to 2.2 crores by the year 2021.

1.1 History of the Department of Fisheries (DoF)

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 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 was merged with the DoF as Marine Fisheries wing.

1.2 Vision, Mission and Mandate of the DoF

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 and 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 7th Five Year Plan (FYP)

Followings are the targets under the 7th FYP in comparison with the base year 2012-13:

- 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
- g. Creation of more (25%) employment opportunity for unemployed youths
- h. Raised Fish farmers/ fishers income by 20% by 2020.
- i. Increased Participation of women in aquaculture production, fisheries CBOs and fish/ shrimp processing industries 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 of the DoF

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 database 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 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

Table 1: Manpower under revenue budget and manpower in position

Heads	Category		Number of Posts	In position	Number of Vacant Posts
Revenue	Class-I	Cadre	1285	676	609
		Non-Cadre	355	214	141
	Class-II		655	381	274
	Class-III		2079	1660	419
	Class-IV		1479	1236	243
	Total		5853	4167	1686

1.3.2 Manpower under Development Projects

Table 2: Manpower approved under development project and manpower in position

Heads	Category	Numbers of posts	In position	Numbers of vacant posts
Development Projects (26 Nos)	Class-I	39	31	8
	Class-II	30	18	12
	Class-III	677	613	64
	Class-IV	164	156	8
2015-2016	Total	910	818	92

1.4 Budget Allocation

The Departmental Budget is a comprehensive blueprint of the annual activities expressed in financial terms. It authorizes the department to make expenditure in order to perform its functions and to implement its policy to achieve the desired objectives as stated in mission's statement. 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 the revenue budget. During the last five years, non-development budget of DoF is shown in Table-3.

Table 3: Non-development budget of DoF (Taka in lakh)

Code No.	Description	2011-12	2012-13	2013-14	2014-15	2015-16
4500	Pay of Officer	2548.46	2367.58	2463.72	2671.00	4869.27
4600	Pay of Staff	2181.19	2986.11	2597.12	2871.55	5771.53
4700	Allowances	3606.10	3632.19	4823.82	4855.35	5670.38
4800	Supplies and Services	3197.12	4027.43	4952.35	4394.08	4738.57
4900	Repair-Maintenance	467.00	604.76	674.01	722.00	754.70
7000	Civil Works	0	0	383.00	283.25	390.00
6800	Assets Procurement	210.00	246.95	247.00	371.38	349.00
Total		11283.13	13865.02	16141.02	16168.61	22543.45

1.4.2 Development Budget

Development budget includes all expenditures under Annual Development Program (ADP).

Table 4: Development budget of DoF (Taka in lakh)

Financial Year	Number of Project	Development budget						Achievement
		Allocation			Expenditure			
		Total	LC	PA	Total	LC	PA	
2011-12	28	19410.00			19410.00	-	-	100%
2012-13	27	15337.00	9331.00	6006.00	15618.06	9282.99	6335.07	102%
2013-14	26	21761.00	14979.00	6782.00	23407.57	14932.23	8475.34	107%
2014-15	21	30906.00	24390.00	6516.00	31035.11	23536.45	7498.66	100%
2015-16	26	38252.00	30222.00	8030.00	38285.53	30123.84	8161.69	100%

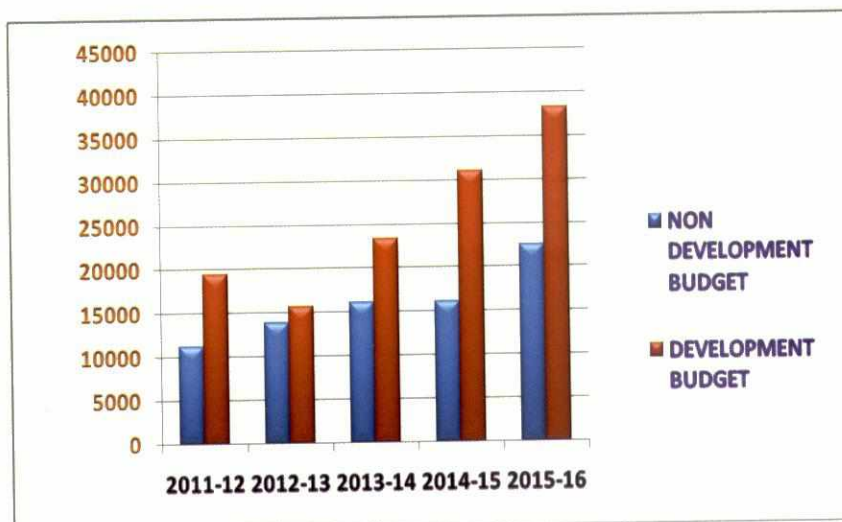


Figure 1: Development and Non-Development budgetary allocation in last five years

1.5 Revenue Earnings

There are two major sources for government revenue earning:

Tax Revenues (TR)

Non-tax Revenues (NTR)

All revenue earnings earned by the DoF is Non-tax Revenues. During last five years, non tax revenues earned by the DoF is shown in Table 5.

Table 5: Non tax revenues earned in last five years (Taka in Thousand)

Economic Code	Description	Financial Year				
		2011-12	2012-13	2013-14	2014-15	2015-16
1901	Punishment	0	0	2830	2556	7171
2037	Rent of Govt. Vehicles	80	80	67	52	18
2047	Fish hunting fee	250	450	35	1438	3256
2071	Other service fee	0	0	183	17744	16922
2101	Rent of non residence	-	-	168	265	122
2111	Rent of Residences	40	200	1784	869	1707
2326	Fish and fisheries product	88737	140000	63782	62947	124242
2366	Tenders and other documents	6000	3260	1031	1812	1104
2371	Non usable materials and scrap etc.	250	300	2332	3	94
2376	Miscellaneous non commercial sale	1750	2370	163	138	531
2671	Refund of extra payment	5860	10000	30	9	191
2681	Miscellaneous revenue earning	15548	20000	21380	4012	3941
	Total	118477	176660	94590	98298	159299

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 have high potential of 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



Fishing trawlers at Chittagong

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, covering an area of 28.10 lakh ha, offer tremendous scope and potentials for augmenting fish production by adopting aquaculture- based enhancement techniques The country has huge potential for the development of brackish water aquaculture boosting shrimp production that can earn substantial amount of foreign currencies. Production of shrimp from both 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 lakh ha of land by 2013 from 1.4 lakh ha in 1980. It is expected that with the introduction of improved scientific method of shrimp culture, the present production level will be increased substantially. The country has limited access to marine fisheries resources in the Bay of Bengal. Only demersal 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 increase the national fisheries production as well as the growth rate in

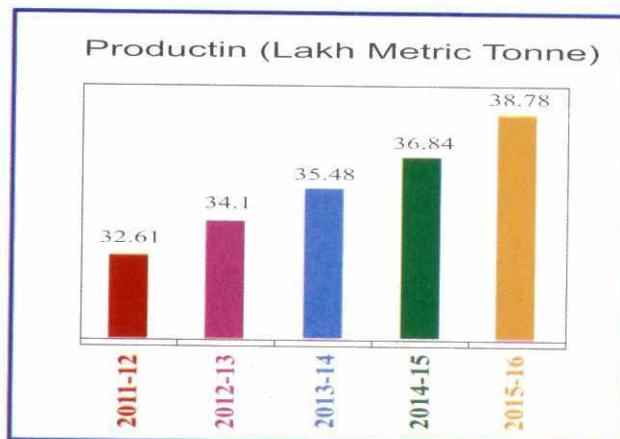


Figure 2 : Fish Production in last 5 years

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 30.62 lakh MT in 2010-11 to 38.78 lakh MT in 2015-16.

2.1 Aquaculture Extension Activities

The following aquaculture extension approaches are usually used by the DoF extension workers to provide the services to the farmers for both dissemination of aquaculture technology and over all development of aquaculture in the country.

2.1.1 Demonstration of Aquaculture Technology

Under the development project of DoF, the tested aquaculture technology packages are usually disseminated through establishment of demonstration plots/ponds at suitable well communicated sites.

2.1.2 Problem solving advices in the office

The farmers usually get advices on the problems encountered by them from Fisheries Extension workers both at office and in the field round the year. But the fish farmers and related stakeholders notified earlier are specially allocated time for the problem solving advices once in a month and that day Upazila Fisheries Officers and other Extension Workers stay in the office whole day.

2.1.3 Use of Fisheries Information & Community Centre

There are Union Information and Communication Centre(UICC) in each Union of each Upazila and some Fisheries Information and Communication Centre (FICC) in selected Upazila to provide technical information and advices for the fish farmers and interested stakeholders.

2.1.4 Farm visit and advise

The Extension Workers usually pay visit to the farmers on demand and also for monitoring and evaluation of farming activities that also help dissemination of fish farming and rendering advisory services to the farmers.

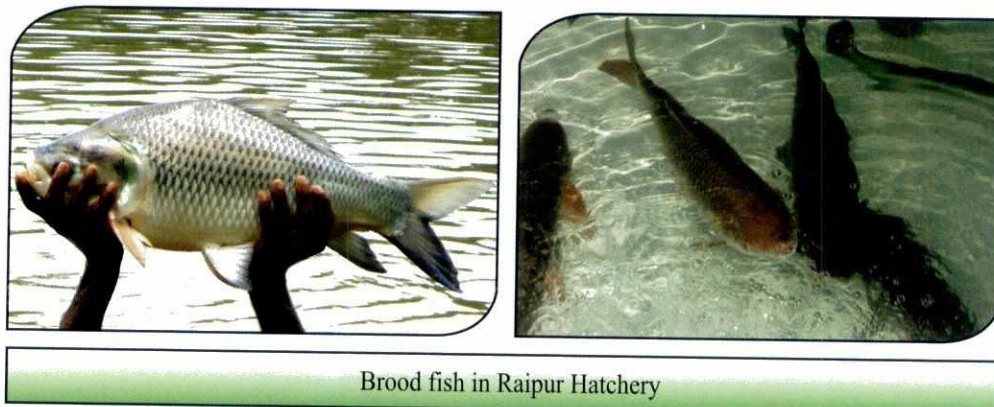
2.1.5 Farmers Training

The DoF generally conduct need based training programmes on various aquaculture and fisheries technology for the farmers and related stakeholders. Training budget is usually provided from the revenue and development budget at both upazila and District level offices.

2.2 Fish Seeds & Post Larvae (PL) Production

2.2.1 Fish Seeds Produced in Hatchery/farms

During 1961-62 to 1974-75, the government has established Fish Seed Multiplication Farms (FSMFs) to supply required quantity of quality fish seeds to the fish farmers. During that period, mostly wild fish seeds collected from the rivers use to be reared in the FSMFs and supplied to the fish farmers. In addition, fish farmers were provided practical hands on training on fry rearing and production of carp seeds in these Fish Seed Multiplication Farms. In the mid 60s, due to reduced availability of wild carp seeds in the rivers, the DoF initiated research and studies on artificial propagation of carps and their seed rearing techniques. In seventies, fisheries scientists have succeeded in it and developed sustainable technology of artificial carp seed production. Consequently, the increased fish culture



efforts has increased demand of carp seeds production. At the same time, as the available natural fish seeds were unable to meet the demand of the fish farmers, the Govt. has established fish hatcheries to produce quality fish seed through dissemination of induced breeding technology. 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 introduced Fish Hatchery Act, 2010 to ensure production of quality spawn and fingerlings from the registered private hatchery and farm. 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 produced quality brood for the production of quality hatchlings and fingerlings. Information regarding seed production both from Government and private hatcheries shown in Annexure-4(a,b and c).

Table 6: Production of carp hatchlings in 2012-2016

Source of Production	Year-2012		Year-2013		Year-2014		Year-2015		Year-2016	
	No of hatchery	Production (kg)	No of hatchery	Production (kg)	No of hatchery	Production (kg)	No of hatchery	Production (kg)	No of hatchery	Production (kg)
Government fish farm	81	9222.00	76	9944	81	9222.00	76	9944	89	14775
Private hatchery	866	59858	852	477393	866	59858	852	477393	902	614433
Total	947	69080	928	486439	947	69080	928	486439	991	629208



Carp induced breeding in a hatchery of Mymensingh

Table 7: Production of fish fry in 2012-2016

Source	Year 2012		Year 2013		Year 2014		Year 2015		Year 2016	
	No. of nursery	Production (in lakh)	No. of nursery	Production (in lakh)	No. of nursery	Production (in lakh)	No. of nursery	Production (in lakh)	No. of nursery	Production (in lakh)
Govt. fish farm	124	217.00	124	222.00	136	207.115	136	427.86	137	278
Private nursery	10298	81821.00	10450	99653.00	10814	99769.00	13475	79731.33	13600	82847.00
Total	10422	82038.00	10422	99875.00	10950	99976.12	13611	80159.19	13737	83125.00

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 only from the river Halda of Chittagong and other natural sources during the monsoon (April- August). Availability of hatchlings from natural sources has been declined due to habitat destruction, current changed climatic situation and other factors. The hatchlings from natural sources during 2011 to 2016 period is shown in the following Table 8. The hatchery production from natural sources contribute only 0.75 % to the total production of hatchlings (2016) that depict the extent of environmental degradation.

Table 8: Carp hatchlings collected from natural sources

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

2.2.3 Shrimp/Prawn PL Producted in hatchery

With the extension of breeding technology of golda and bagda, many private entrepreneurs have established shrimp hatcheries for shrimp post larvae (PL) production. About 34 Galda and 49 Bagda hatcheries have been established by both Govt. and private sector which produced 1314.20 Crore bagda and 4.65 Crore golda PL in the country in 2016 (Table 9).



Shrimp hatchery at Cox's Bazar

Table 9: Production of golda and bagda PL in 2012-2016

Name	Year-2012		Year-2013		Year-2014		Year-2015		Year-2016	
	No. of hatchery	Production (PL in lakh)	No. of hatchery	Production (PL in lakh)	No. of hatchery	Production (PL in lakh)	No. of hatchery	Production (PL in lakh)	No. of hatchery	Production (PL in lakh)
Golda	80	82000	21	331	27	270	34	4.13	36	4.65
Bagda	59	125000	60	92392	55	115880	49	1244.05	49	1314.20
Total	139	207000	81	92723	82	116150	83	1248.18	85	1318.85

2.3 Fresh Water Aquaculture

2.3.1 Fresh water fish culture in Ponds

Currently pond aquaculture has been practiced in a total area of about 3.78 lakh ha which is 7.4 % of total inland water. Pond aquaculture produces about 17.19 lakh MT fish which accounts 52.87% of total inland production in 2015-16. The pond production involves mainly composite culture that produces an average 4332 kg/ha. There are records of 90 mt/ha production of pangas under intensive farming.



Fish farming in pond at Chandina, Comilla

Table 10: Status of pond culture in 2015-16 (in MT)

SI NO	Farming System	Area (Ha)	Production
1	Extensive	60089	80252
2	Semi intensive	222986	751900
3	Intensive	83402	496807
4	Highly intensive	11491	281916
Total		377968	1610875

2.3.2 Fish culture in paddy field

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 lakh ha floodplains remain under water for 4-5 months. Previously Government has taken initiative to increase fish production from these flood plains through stocking of 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 paddy fields extending the coverage area.

If 10% of paddy field falls under this culture system where paddy field go under water, then near about 85 lakh MT more fish will grow annually at 300 kg fish per Ha production level.



Fish and Shrimp culture in Paddy fields at Dumuria, Khulna

2.3.3 Fish culture in borrow-pit and khal/Ditch

Different types of water bodies improved under Integrated Fisheries and Livestock Development Project in Flood Control, Drainage and Irrigation (FCDI) project area and other water bodies are also included in the aquaculture systems. Information of developed water body and its area are shown in Table 11.



Aquaculture in borrow-pit at Feni

Table 11: Different types of water body renovated through FCDI project

Types of water body	2 nd phase (2000-07)	3 rd phase (2006-10)	4 th phase (2011-14)	Total developed water body (ha)
	Developed water body in hectare	Developed water body in hectare	Developed water body in hectare	
Borrow-pit	207.965	230.277	271.584	1846.062
Close Khal	105.632	54.138	34.842	406.950
Dead river	75.49	47.393	154.465	415.493
Ponds	58.052	122.762	150.167	397.729
Total	447.139	454.570	611.058	3066.234

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. The total water area of baors have been developed and brought under improved aquaculture through fingerling stocking and management practices. Six baors of Jessore district are now under disposal of Department of Fisheries according to the MoU signed between Ministry of Land and Ministry of Livestock and Fisheries for next 6 years.



Aquaculture in borrow-pit at baors at Jessore

Besides this, 30 baors are being managed by the fishers group organised by IFAD funded OLP-2 project of DoF. These baors covered area of 5488 Ha and fish production has been increased from 80 kg to 1408 kg/Ha (DoF 2016). Local fisher communities are being involved in the baor management and improved their livelihood.

2.3.5 Cage culture

Several decades ago, attempts have been made to raise fish in cages under different development projects by several institutions/organizations of the country. Northwest Fisheries Extension Project (NFEP) in Parbatipur, Dinajpur and Patuakhali-Barguna Aquaculture Extension Project (PBAEP) demonstrated cage aquaculture as on pilot basis. The production achieved through cage culture was encouraging and satisfactory but the activities were discontinued due to socio-economic condition of the farmers and some constraints. As practiced in other countries, the cage culture is now becoming popular in our country also. At least 2 Govt. projects and a number of NGOs have been working with cage culture using different materials like bamboo, steel rod, net and feed and feed ingredients like rice bran, fish meal, green grass etc. Different fish species like monosex tilapia, pangas, koi, singh, magur, rui, GIFT, thai sopunti etc are being cultured in cages.



Cage Aquaculture in the Mahananda river at Chapainawabganj

Cage aquaculture has been identified as a means of livelihoods support for the landless people. Monosex tilapia is widely being used in cages in Chandpur, Laxmipur Faridpur, Barishal, Mymensingh, Dhaka, Munshigonj, Gopalganj, Chapainawabganj, Pabna and other regions of Bangladesh. In 2016, about 2062 MT fish were produced from 5874 cages with a volume of 102635 cubic meter .

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 kinds of materials like bamboo, net, iron-meshed, wooden pillar etc. The area of pen also varies in size from half a hecter to few hectares. 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 owners are found to operate pen fish culture management. Culture period also varies from



Pen culture in a canal, Jessore.

June to December depending on availability of water. Pen culture is becoming popular in and around Dhaka and Narayanganj and continue to expand every year. In 2016, 13364 MT fish was produced from 7553 Ha of water. the productivity was 1.769 MT/Ha.

2.3.7 Fresh water mud eel culture

Monopterus albus, mud eel 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 *cuchia* was abundant throughout the Bangladesh, plenty in mud holes in shallow "beels" and 'boro' paddy field particularly in greater Sylhet, Mymensingh and Tangail Districts. But now a days, this fish is hardly found in the open water area. The biodiversity, in natural water bodies are being decreased due to global

Annual Report 2016

warming and climate change. *M.cuchia* is exported to many countries of south East Asia and Europe. Cuchia is an important fish for the livelihood of Adivasi people in terms of both for home consumption and trade. The tribal people belonging to the Garo, Hajong, Shawtali and Koch-Rajbongshi community believes that this fish is to be therapeutic one and traditionally used for treatment of various ailments, Viz. weakness, anaemia, asthma, hemorrhoids and diabetes. Direct consumption of fresh blood of Cuchia is reported to cure weakness, anemia and asthma. Considering the importance of this species in nutritional, medicinary, economic and biodiversity point of view, Department of Fisheries began to popularise its culture system by a development project. It is being developed by aquaculture method and open water management method. The status of Cuchia production during 2015-16 is given bellow-



Eel culture at Noakhali

Continuing mud eel culture practice.

Year	No.Stakeholder	Area (Ha)	Cuchia production (MT)	Remarks
2015-16	1190	48.3	35.80	Continuing mud eel culture practice.

2.4 Coastal Aquaculture

2.4.1 Shrimp (bagda) culture

Black tiger shrimp (*Penaeus monodon*) in Bangladesh is known as Bagda. It 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



Shrimp culture in Satkhira

demand of shrimp and prawn in the international market rapid expansion of shrimp farming was observed in dyke elevated rice fields traditionally known as gher.

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 began to expand rapidly. By 2016, over 275509 ha of land were brought under bagda culture and till it is increasing. The major shrimp culture area are situated 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 Sundarbans 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 2015-16 bagda production in Bangladesh was 68217.00 MT and crab production was 13160 MT.

Year	Area farmed (ha)	Shrimp production (MT)	Remarks
2009-2010	186145	43154	Paddy and salt are produced in very near To coast as alternative crops. White fish And crabs are also produced in some places
2010-2011	213617	56569	
2011-2012	209456	57785	
2012-2013	210053	68948	
2013-2014	215305	71430	
2014-2015	214468	75274	
2015-2016	206763	68217	

2.4.2 Prawn (Golda) Culture

The Giant fresh water prawn (*Macrobrachium rosenbergii*), called as Golda 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, flood plains 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



Prawn culture in Sathkhira

monoculture, poly- culture of prawn with other fishes and aquaculture in paddy fields along with paddy are being practiced. The unit production of Golda under the different systems ranged from 375 kg/ ha to 750 kg / ha. The highest production was observed in monoculture (750 kg / ha). Currently golda farming in gher, pond and paddy field cover an area of about 0.63 lakh ha. About additional 0.60 lakh MT fish are produced along with golda.

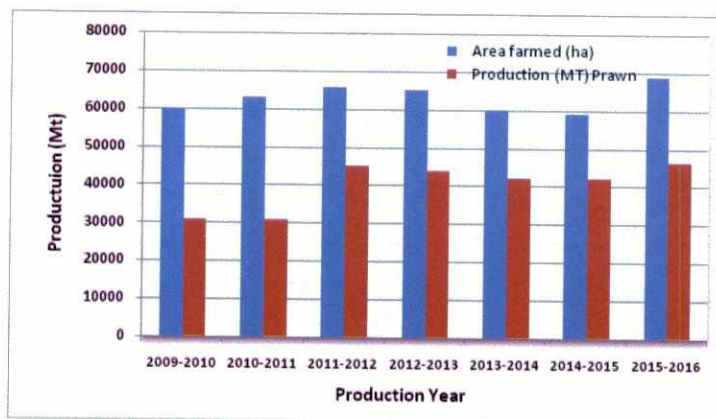


Figure 3: Year-wise production of golda

Year	Area farmed (ha)	Production (MT) Prawn
2009-2010	60052	30636
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

2.4.3 Introduction of SPF Black Tiger Shrimp

Shrimp aquaculture is an important sector for earning foreign currency of Bangladesh. Besides, over a million of coastal people depend for 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 hatcheries are operating in Bangladesh to produce post larvae (PL) for shrimp farming. These shrimp hatcheries produce about 1314.20 crore shrimp PL in the year 2015-16. The wild broodstock often contaminated with microbial pathogens from the Bay of Bengal that are used by these hatcheries. Since the broods are collected in batches of 100 or more from fishing trawlers, it is practically impossible to screen out the broods from known pathogens through PCR tests. Besides, the shrimp hatcheries use many



SPF Shrimp (*P. monodon*)

shrimp farming. These shrimp hatcheries produce about 1314.20 crore shrimp PL in the year 2015-16. The wild broodstock often contaminated with microbial pathogens from the Bay of Bengal that are used by these hatcheries. Since the broods are collected in batches of 100 or more from 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 been performing better in terms of disease resistance, survival, growth and FCR. The domesticated broods are known to be produced in Hawii, Mosambique and Thailand. The SPF broods have been successfully introduced in Vietnam, Malaysia and the Philliphines. In the year 2014, Bangladesh imported and introduced SPF broods first time from Hawii of USA.



SPF Shrimp PL at Cox's Bazar

As per the government Fish Hatchery Act 2010 and Fish Hatchery Rules 2011, it is mandatory for the 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 continue to produce SPF PL from the 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 farming in greater Khulna, Barisal and Chittagong regions. Mud crabs are less susceptible to disease and more resistant to adverse environmental conditions and climate change. Many shrimp farmers are switching to mud crab farming. Two types of crabs are available in the coastal

region of Bangladesh- *Scylla serrata* and *Scylla olivacea*. The mud crab (*Scylla serrata*) is suitable cultured in Bangladesh.

Based on the increased demand of gravid female in the South-East Asian countries, a sustainable aquaculture technology has been developed. Culture of juvenile crab in pen and cages are now practiced in some selected areas of Bangladesh. The performance of this production technology has being changed the socio-economic condition of the farm-



Crab culture at Satkhira

ers. Stakeholders and the fellow farmers also become interested to practice this kind of crab culture system. Department of Fisheries is implementing a project for the improvement of culture and management technique of crab in the selected areas of coastal region.

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 help generate income and employment and enhance export earnings in future.

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.

Source: Fisheries statistical year book of Bangladesh 2015-2016, FRSS, DoF

2.5 Inland Open Water Fisheries Resources Management

Bangladesh has potential of inland open water resources, with 853,863 Ha of rivers and estuaries, about 177,700 Ha of Sundarbans, 114,161 Ha of natural depressions or beels, 68,800 Ha of reservoir (Kapti Lake) and about 2704084 Ha of floodplains. During the rainy season annual flood generally inundates up to 60% of the total land surfaces. Bangladesh as one of the top 10 fish production country in the world is ranked the 5th position in aquaculture and 4th in inland fisheries production. 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 by aquaculture, due mainly to decline and degradation of resources. The priority is given to improve biological management to enhance 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

Community based fisheries management of resources is a time-derived 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 26 ongoing development projects is under implementation includes community based fisheries management and more than 0.20 million people are enjoying the benefits.



Community based Fish culture
Training in Sylhet

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 bringing users group in the decision making process. 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. Floodplains comprises the area of about 70% of the total inland water resources. Among these floodplains, which remain 4-6 months under water were mostly unused Aquaculture activities have been established for generating income of stakeholders of surrounding areas of the floodplains.

2.5.2 Integrated natural resource management

Department of Fisheries is also involved in implementing Integrated Natural Resource Management Systems (INRMS) by the local users that contributes to conserving the biodiversity and livelihoods in the selected wetlands and floodplains of the Jamuna- Padma delta region through Wetland Biodiversity Rehabilitation Project. The activity of this project may be replicated in other suitable areas of the country in due course of time.

2.5.3 Fingerling stocking



Left: Fingerling release by the Hon'ble President Mr. Md Abdul Hamid

Right: Fingerling release by the Hon'ble Prime Minister Sheikh Hasina



Natural recruitment of carp spawn and fingerling have been declining due to human interferences and environmental degradation that 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 budget to release fingerlings of major carps in open water bodies, floodplains and selected closed water bodies throughout the country. Stocking of fish fingerling into beels and floodplains is a temporary mitigation measure to address the quick declination of fish production in open water. DoF implements its fingerling-stocking program both under the development projects and revenue program.

Table 14: Stocking of fish fingerling in open waterbodies and floodplains

Financial Year	Fund allotted Tk. (crore)	Water area (hectare)	Fingerling released		No. of beneficiaries	Remarks
			number (million)	weight (MT)		
2009-10	3.37	103,567	14.4	200.45	530347	About 40% of the stocked fingerling attain to table fish
2010-11	4.00	123,092	123.92	241.12	2363631	
2011-12	8.86	109,070	152.26	570.19	2365631	
2012-13	8.74	142053	171.39	480.24	1012000	
2013-14	7.16	114516	189.50	385.52	974186	
2014-15	7.15	13679	155.42	317.72	1054100	
2015-16	7.23	84746	293.37	320.38	1387300	

2:5.4 Establishment of Beel nursery

Beel nursery has been proved to be a significant tool for increased fish production from the natural water bodies. DoF has continued to establish nursery program in various dead rivers, beels, haor and government/non-government water bodies from 2009-10 financial year. During last year, 254 beel nurseries were successfully established in 25478874 ha water area which produced 308673.17 kg fingerlings. DoF has taken up the beel nurseries program in suitable water bodies as regular activity from the revenue budget to increase natural fish production in beel areas and the surrounding water bodies i.e.; low lying rice field, floodplain, other beels, canals, rivers etc.



Beel nursery activities in Sylhet

2.5.5 Establishment of fish sanctuary

To retard the degradation of aquatic biodiversity specially species diversity of fish and other aquatic species in open water, 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 fish stock, protecting biodiversity and increasing fish production. The present democratic Government established 534 fish sanctuaries in different water bodies during last five years. As a result, a substantial increase in fish production was found in those water bodies. At the same time, there have been found abundance of endangered species like Chital, Foli, Kalibaosh, Aior, Tengra, Meni, Rani, Sarputi, Pabda, Kajoli, Gojar, Tara baim etc. These efforts continue also restore to the aquatic bio-diversity in one hand, 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 to improve the fish Habitats. Besides, for the conservation and development of Hilsa 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.



Fish Sanctuary, Kansunabil

2.6 Marine Fisheries Resources management

2.6.1 Bangladesh Maritime Boundary

The maritime boundary of Bangladesh was agreed with Myanmar in an equitable manner by the International Tribunal for the Law of the Seas (ITLOS) in Hamburg on 14 March, 2012.



Commissioning of RV Meen shandhani at Chittagong

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.

Our great national leader Sheikh Mujibur Rahman led our country during the Liberation War and his meritorious daughter, Prime Minister Sheikh Hasina has now led our country to have success in winning our maritime boundary case against Myanmar, and under her righteous leadership, Bangladesh has won another great victory.

Bangladesh can now establish 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 Marine Fisheries Resources Conservation and Management

The Marine fisheries resources conservation and managements activities are maily done by the Marine Fisheries Office based at Chittagong. This office maily deals with the implimentation of regulatory measures. Marine Fisheries Survey Management Unit office is involved with the survey work and scientific data analysis and play advisory role for the conservation and management of fisheries resources in the Bay of Bengal.

After liberation, some survey work was done with the assistance of foreign experts working for the UNDP. Two survey vessels -R.V. Anushandhani and R.V. Machranga under Marine Fisheries Survey and Management Unit are out of commission and are waiting to be disposed of as scrap. Eighty three survey cruises were undertaken by RV. Machranga up to 1996. The pre and post liberation surveys detected four fishing grounds, estimated fish and shrimp stock and MSY (Maximum sustainable yield) and identified two peak breeding seasons of shrimp. In 2000, as a precautionary management measure, the government declared 698 km² in the Bay of Bengal to be a Marine Reserve. However, the benefits of the reserve would be greatly enhanced by more effective implementation of MCS procedures. The Marine Fisheries Ordinance 1983 and Marine Fisheries Rules limited fishing areas for mechanized and non-mechanized fishing boats within the 40 m depth contour during the high tide. Proper and effective MCS procedure require a comprehensive and concerted effort by our Guardians at Sea - the Bangladesh Navy and Bangladesh Coast Guard to permanently protect our maritime boundary.



Fish landing center at Gohira, Chittagong

Land based survey work is currently being conducted by technical staff and scientists of the Marine Fisheries Survey and Management Unit in 12 fish landing centers in the coastal regions of Chittagong and Cox's Bazar districts.

Data generated from the land base survey, will make it possible to estimate the amount of harvested fish/shrimp in the region's artisanal sector, and will include valuable information on species composition, the catch composition of ESN catch, length frequency, landed boats, used and destructive gear, which are essential for the planning process.

Table 15: Gear-wise fish harvest (MT) from 12 selected landing centers during 2015-16

Month	Production (MT)							Total
	ESBN	MSBN	SMD	LMD	Tong Jal	RogJal	PakuaJal	
Jan,16	37.63	1205.03	175.3	255.02	0	30.03	69.09	1772.1
Feb,16	30.13	2841.64	180	274.56	0	33.11	46.29	3405.73
Mar,16	58.45	1537.42	69.22	300	0	101.2	0.36	2066.65
Apr,16	33.73	3214	100	160.04	0	103.75	8.82	3620.34
May,16	32.96	870.26	150.35	164.67	0	35.96	0	1254.2
Jun,16	70.06	176.11	62	74.29	4.07	64.5	0	451.03
July,16	37.68	252.63	47.5	0	22.49	52.92	0	413.22
Aug,16	18.65	1602.14	155.1	0	189.35	455.6	0	2420.84
Sep,16	20.12	1665.53	550.48	0	234.03	34.32	0	2504.48
Oct,16	14.72	1171.6	262.02	0	52.79	11.41	6	1518.54
Nov,16	45.36	2415.58	320.2	0	0	66.64	28.72	2876.5
Dec,16	27.14	2469.3	567.22	0	0	57.4	10.82	3131.88
Total MT)	426.63	19421.24	2639.39	1228.58	502.73	1046.84	170.1	25435.51
Percentage (%)	1.68	76.35	10.38	4.83	1.98	4.12	0.07	100

2.6.3 Enacting Acts, Rules and Policies

The Fish and Fishery Products (Fish Inspection and Quality Control Rules) 1997 provide guidelines for the production of safe seafood. 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. Export to European Union nations is currently restricted as these are not yet HACCP certified. But fish and shrimp of marine origin are being exported to EU nations under EU Regulations 2005/2008 through the issuance of the mandatory IUU-catch certificate. Standard Hygiene and Sanitation conditions of trawlers are regularly monitored by FIQC and MFO personnel during inspections. Non-compliance issues are dealt with using punitive measures specified under the Marine Fisheries Ordinance, 1983 and the FIQC Ordinance, 1997. Commercial vessels and artisanal fishing boats are also advised to improve the quality and post harvest preservation techniques. The mechanized boats engaged in small scale and artisanal fisheries are checked for navigational aids, life-saving appliances and fire-fighting equipment from a sea safety perspective. There is still no Bangladesh legislation to ensure the quality of imported fisheries products, except for the checking of the presence of formalin. 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. Due to the current prevailing situation, the Marine Fisheries Ordinance, 1983 requires further amendment to better align it with the compliance requirements of the FAO-CCRF. Enactment of the Marine Fisheries Act, 2016 is also underway.

2.6.4 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 accounts about 12% of the total fish 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 unabated 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 through reducing over-fishing and facilitating recruitment.

During the ban period the jatka fishers receive (February to May) an annual allowance of 40 kg of food-grain per household per month. The Government also provides financial incentives and distributes trade materials to the enlisted jatka fishers as Alternative Income Generation (AIG) activity. Under this arrangement, about 65% of Bangladesh's total catch of hilsa currently originates from the marine environment.

2.6.5 Licensing Activities of Mechanized Fishing Boats

The land based survey report of Bangladesh Marine Fisheries Capacity Building project estimated 32,859 mechanized and 34,810 non-mechanized fishing boats are currently engaged in fishing in the marine and coastal waters of Bangladesh. Before they can commence fishing in the marine and coastal waters of Bangladesh, industrial fishing trawlers and mechanized boats must obtain mandatory registration and a certificate of inspection from the Mercantile Marine Department under the Ministry of Ports and Shipping. They also require Fishing License from Department of Fisheries under the Ministry of Fisheries and Livestock. Under Article 388 of part IX of the Bangladesh Merchant Shipping Ordinance, 1983, every fishing vessel to which this Chapter applies must be registered in accordance with the provisions of this section. After receiving registration and the COI (Certificate of Inspection) from MMD (Marine Mercantile Department), the Marine Fisheries Office is authorized to issue fishing license, consistent with Section 17 and 18 of Marine Fisheries Ordinance 1983, subject to the payment of fees which are set by the government based on the gross tonnage of the vessel. Registration, COI and fishing license have been also issued as one stop service at combined camps at important fishing sites supported by personnel from MMD and MFD. But unfortunately due to lack of manpower it is proving increasingly difficult to organize combined camps and this is hindering compliance.

Table: 16 Licensing activities of machanized fishing boats

Year	Licences Issues(Nos.)			Revenue (Lakh taka)
	New	Renew	Total	
2013-2014	614	1226	1840	29.74
2014-2015	319	1167	1486	45.81
2015-2016	273	1269	1642	40.89

2.6.6 Licensing Activities of Industrial Fishing Vessel/Trawler

During 2015-16, a total of 204 industrial trawlers in the fleet were engaged in fishing into the Bangladesh EEZ. The fleet comprised 31 shrimp and 175 fishing trawlers engaged fishing mid-water, demersal, bottom water, white fish and a modern trawler, together with trawlers per mitted to fish on trial trip basis by the Honorable High Court. These vessels require the same registration, fitness and fishing license as mechanized fishing boats. Based on the gross tonnage approved by the government, fees are deposited through treasury chalan prior to the fishing license being issued. All fishing vessel licenses are issued or renewed on 31 December each year..

Table 17: Amount of fish exploitation by the Industrial Trawlers

Year	No. of trawlers engaged in fishing			Amount exploited(mt)		
	Shrimp	Fish	Total	shrimp	Fish	Total
2012-2013	32	152	184	3083	69947	73030
2013-2014	30	169	199	3799	73086	76885
2014-2015	32	175	207	2733	82113	84846
2015-2016	29	160	189	2985	100060	103045

2.6.7 Inspection and Catch Monitoring of Trawlers and Mechanized boats

No fishing trawler is permitted to go to the sea without prior permission from the Marine Fisheries Office (MFO). MFO issues sailing permissions (SP) for up to 13 or 14 days for non-freezer trawlers and 30 days for freezer trawlers consistent with the Marine Fisheries Rules, 1983. MFO officers check the fishing appliances and gear prior to each trip, and fishing trawlers submit their fishing logs to the MFO on the completion of each voyage. MFO officers also observe the unloading of catches and collect relevant information. Inspectors randomly inspected as follows Industrial & Machanized Boats as given below:

Table:18 Inspection and carch monitoring of Inductrial and artisanal vessels

Year	Industrial Trawlers			Mechanized boats		
	Inspection (No.)	Fine	(Lakh Tak)	Inspection (No.)	Fine	(Lakh Taka)
2014	258	42	15.30	622	18	1.15
2015	393	57	32.50	419	35	2.50
2016	296	44	32.75	503	71	5.07

Table: 16 Licensing activities of machanized fishing boats

Year	Licences Issues(Nos.)			Revenue (Lakh taka)
	New	Renew	Total	
2013-2014	614	1226	1840	29.74
2014-2015	319	1167	1486	45.81
2015-2016	273	1269	1642	40.89

2.6.6 Licensing Activities of Industrial Fishing Vessel/Trawler

During 2015-16, a total of 204 industrial trawlers in the fleet were engaged in fishing into the Bangladesh EEZ. The fleet comprised 31 shrimp and 175 fishing trawlers engaged fishing mid-water, demersal, bottom water, white fish and a modern trawler, together with trawlers per mitted to fish on trial trip basis by the Honorable High Court. These vessels require the same registration, fitness and fishing license as mechanized fishing boats. Based on the gross tonnage approved by the government, fees are deposited through treasury chalan prior to the fishing license being issued. All fishing vessel licenses are issued or renewed on 31 December each year..

Table 17: Amount of fish expplotation by the Industrial Trawlers

Year	No. of trawlers engaged in fishing			Amount exploited(mt)		
	Shrimp	Fish	Total	shrimp	Fish	Total
2012-2013	32	152	184	3083	69947	73030
2013-2014	30	169	199	3799	73086	76885
2014-2015	32	175	207	2733	82113	84846
2015-2016	29	160	189	2985	100060	103045

2.6.7 Inspection and Catch Monitoring of Trawlers and Mechanized boats

No fishing trawler is permitted to go to the sea without prior permission from the Marine Fisheries Office (MFO). MFO issues sailing permissions (SP) for up to 13 or 14 days for non-freezer trawlers and 30 days for freezer trawlers consistent with the Marine Fisheries Rules, 1983. MFO officers check the fishing appliances and gear prior to each trip, and fishing trawlers submit their fishing logs to the MFO on the completion of each voyage. MFO officers also observe the unloading of catches and collect relevant information. Inspectors randomly inspected as follows Industrial & Machanized Boats as given below:

Table:18 Inspection and carch monitoring of Inductrial and artisanal vessels

Year	Industrial Trawlers			Mechanized boats		
	Inspection (No.)	Fine	(Lakh Tak)	Inspection (No.)	Fine	(Lakh Taka)
2014	258	42	15.30	622	18	1.15
2015	393	57	32.50	419	35	2.50
2016	296	44	32.75	503	71	5.07

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.

C. Establishment of Vessel Tracking Monitoring System (VTMS) :

- Vessel Tracking Monitoring System has been established in the Project Field Office in Chittagong. This system (VTMS) will be used for tracking fishing vessels that are operating in the Bangladesh territory of the Bay of Bengal. The VTMS equipment has been installed successfully by the project in 133 industrial trawlers.

Skipper, Crews of Industrial trawler and 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. In addition to training, a regular bi-monthly meeting has been arranged with representatives from the Bangladesh Navy, Bangladesh Coast Guard, RAB, Police, MMD, BGB, BMFA, Mechanized boats owner associations, DFOs of coastal districts. Issues of non-compliance by fishers with Marine Fisheries Ordinance and Rules, and mitigation measures to help them to comply with rules and regulations for the conservation of marine resources are discussed at these meetings. Contemporary issues, like piracy on fishing boats, boat registration and issuances of fishing license, sea safety of sails and fishers, regular checking of fishing boats and trawlers etc. are dealt with in a strategic manner to ensure sustainable use of marine resources. According to Marine fisheries Ordinance, 1983, a fishing license is mandatory for all mechanized fishing boats, and annual registration and fitness certificates are issued by the Marine Mercantile Department (MMD).

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 local people are motivated to show respect to Acts and Rules promulgated to restore biodiversity and protect the resilience of the marine environment. 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 EEZ waters of Bangladesh. In addition, catch and compliance issues are regularly monitored at the only marine fisheries surveillance check post at Patenga, Chittagong. More of these facilities need to be established at strategic locations to ensure stringent implementation of the MCS.

2.6.10 Disaster Management Activities

Disaster management is a process or strategy that is implemented before, during, or after, any type of catastrophic event, to ensure that appropriate lessons are learned, and to avoid, remedy or mitigate the impact of future disasters. Disaster management can be initiated whenever anything threatens to disrupt normal operations or puts peoples' lives at risk. All levels of government, and many businesses and non-governmental organizations, create their own

disaster plans to help them overcome various catastrophes and return to normality as quickly as possible. These plans should be reviewed on an annual basis.

There are four essential elements to disaster management: prevention, preparation, relief and recovery. Inevitably, not all catastrophes can be prevented, but many can be avoided, and the effects of others can be mitigated. Preparation might include long-term plans for readiness as well as processes that can be implemented quickly when a disaster seems imminent, such as when a hurricane is expected to make land-fall. Relief involves taking appropriate action during and after a catastrophe has taken place. Recovery includes, where possible, repairing, rebuilding, restoring, or replacing whatever was damaged, injured or lost because of the disaster.

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^{iv} 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

Fish feed is one of the most important input for commercial aquaculture. There were no rules and regulations to maintain the quality of the fish feed and feed ingredients for the farmers before 2010. But the present democratic fisheries friendly government has taken the initiative to formulate the acts and rules. Fish feed and animal feed act 2010 and Fish feed rules 2011 are Promulgated. At present, it is being implemented all over the country. The enforcement status of the fish feed and animal feed act 2010 and fish feed rules 2011 are given in the table-19 below:

Table 19 Enforcement status of the fish feed and animal feed act 2010

Serial No.	Division	Types of fish feed company/ agency				Total revenue earn (lakh 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	0.71
7	Rangpur	8	2	169	179	0.84
8	Mymensingh	26	20	356	402	3.45
Total		202	138	3067	3407	20.93



Fish feed factory at Gazipur



Feed factory Lab at Rupgonj



Inspection of feed factory at Manikgonj

3.2 Fish Hatchery act 2010 and fish hatchery rule 2011

Aquaculture will be benefited with the good quality fish seed supply from public and private hatcheries. The quality of fish seeds in Bangladesh 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. Further more, hybridization and cross breeding are threatening the genetic diversity of indigenous wild stocks of Indian Major Carps. To protect these undesirable practices, Bangladesh government declared the hatchery act and rules for keeping the quality of artificial seed production in both public and private hatcheries. Under the act and rules, every hatchery must have to be registered from the competent

authority of DoF. The enforcement status of the fish hatchery act 2010 and fish hatchery rules, 2011 are given the table-20 below:

Table 20: Enforcement status of the fish hatchery act 2010 during 2015-2016

Division	Total Hatchery (No.)	Registered (No.)	Unregistered (No.)	Total revenue earn (Lakh Tk)
Dhaka	51	41	10	0.065
Chittagong	226	224	2	0.085
Rajshahi	175	173	2	0.58
Khulna	129	125	4	0.408
Sylhet	22	22	0	0.00
Barisal	44	41	3	0.05
Rangpur	88	75	13	0.08
Mymensingh	215	35	180	0.11
Total =	950	736	214	1.378



Carp fish hatchery in Jessore



Shrimp hatchery in Cox's Bazar

3.3 Enforcement of Fish Act

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 are always chalked out and implemented by the DoF at District Fisheries office and Upajila level during observance of National Fish Week. Different awareness materials like posters, leaflets, booklets etc. are printed and distributed. TV spot prepared and road-casted, street drama staged, workshops/seminars organized to create mass awareness. Appropriate measures are being taken to implement the Fish Act-1950 with assistance from local administration and police. Mobile courts are conducted throughout the country and seized and forfeited illegal fishes and nets. Offenders are also penalized on the spot.

Table 21: Enforcement status of Fish Acts and Rules during 2015-16

Division	No. of Undisposed case	Cumulative no. of cases filed (No)	Cumulative no. of case disposed (No)	Penalty imposed by the mobile court		
				No. of Current Jal seized	Jail	Fine (Lakh Tk)
Barisal	25	1074	1049	434210	690	41.00
Khulna	0	88	88	53140	01	18.00
Rajshahi	6	125	119	5257	85	0.859
Dhaka	04	1458	1454	16755	741	6.00
Sylhet	23	18	5	8559	08	9.062
Chittagong	02	358	356	22613	358	9.3
Rangpur	0	05	5	17420	01	4.00
Mymensingh	30	04	26	344129	01	0.89
Total	90	3130	3102	125173	1885	89.11



Enforcement of Fish Act at Goaland, Rajbari.

3.4 Enforcement status of Piranha Fish prohibition

Piranha, called caribe or piraya, any of more than 60 species of razor-toothed carnivorous fish of South American rivers and lakes, with a somewhat exaggerated reputation for ferocity. Piranha (1978), the piranha has been depicted as a ravenous indiscriminate killer. Most species, however, are scavengers or feed on plant material. Most species of piranha never grow larger than 60 cm (2 feet) long. Colours vary from silvery with orange undersides to almost completely black. These common fishes have deep bodies, saw-edged bellies, and large, generally blunt heads with strong jaws bearing sharp, triangular teeth that meet in a scissor like bite. Piranha fish is prohibited by the gazette notification in February' 2008 due to their dangerous carnivorous nature. According this act, any kind of Pirhana group fish import, transport, breeding, culture, sale etc are completely band in Bangladesh. First time if someone breaks the act, he will be given 6 month imprisonment and Tk. 10,000 penalties and second time it will be double.

Table: 22 Enforcement Piranha fish status of prohibition activities 2015-16

Awareness meeting	No of Inspections	Number of Mobile Court/cases	Fine (BDT)
1485	7434	220/16	2200

3.5 Control of Formalin use in Fish Preservation and Mass Awareness

Formalin preserved fish is very detrimental for human health due to its toxic and volatile nature and there are more harmful effects of formalin abuse in foods for human body. It may cause various diseases like skin disease, diarrhoea, asthma, blindness, kidney diseases etc and even cancer. The abuse of formalin as fish preservative will create health hazards and it might have negative impact on aquaculture production in Bangladesh. However, it is necessary to protect abuse of formalin to save human health. At the same time, it is necessary to create awareness for fish traders and other stakeholders regarding the toxic and injurious effect of formalin abuse in fish. In this circumstance, the present democratic government has taken an initiative to stop abuse of formalin in fish. As part of its initiative, Department of Fisheries has implemented a project namely 'Control of Formalin use in Fish Preservation and Mass awareness Campaign'. Department of Fisheries distributed formalin detecting digital kitbox and each district has got one kit box under this project. After supplying of 80 digital kitbox, a total of 576 mobile courts have been operated at district and upazila level including Dhaka city.



Mobile Court Operation in Dhaka

A total of 2499 awareness meetings at district and upazila level and 33 workshops at district level have been organized. A workshop was organised by Department of Fisheries and Planning Commission jointly at NEC Bhaban of Planning Commission on "Indiscriminate use of Chemicals on Fish and Fruits: What Can We Do About It?" High officials from different organizations, Teachers from different Universities, Researchers and other related stakeholders participated. Besides, 31,450 representatives from fish traders and other concern stakeholders received training. Due to different activities of the project, rampant formalin abuse in fish has significantly decreased in the country.

4. Fish Inspection and Quality Control Activities

4.1 Quality Assurance of Fish Products

Fish and fish products are one of the major exportable commodities of Bangladesh. Fish Inspection and Quality Control deals with the production and export of safe and quality

fish and fish products. The importance of exportable fisheries products' quality was realized in tandem with the expansion of export market vis-à-vis consumer's demand for quality and safe food. 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' (NFIQC) project at Matsya Bhaban. Without having own laboratory, the initial activities under FIQC, Dhaka were restricted to inspection of fish processing establishments and infrastructure, 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, Dhaka by reshaping construction design, on the 11th floor of Matsya Bhaban building in 1994. In the year 2014, it has been shifted at new premises at Savar, Dhaka. The honorable Minister for the Ministry of Fisheries and Livestock has inaugurated the newly built Fish Inspection and Quality Control Laboratory at Savar, Dhaka in February, 2015. Besides FIQC Laboratory in Dhaka, two more modern laboratories having chemical and microbiological divisions have been established at Chittagong and Khulna with 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. Moreover, these laboratories started testing of harmful chemical residue analysis of fish and fishery products since 2007.

To address EU requirements, the DoF has installed six LC-MS-MS machines at Quality Control (QC) (formerly FIQC) laboratory, Dhaka, Chittagong and Khulna to check the contamination of residues of Prohibited antibiotics, dyes and anthelmintics in fishery product. Confirmatory test of the residues of chloramphenicol, nitrofurantol metabolites, 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 two LC-MS-MS machines at QC laboratory, Khulna. Method validation of testing nitrofurantol metabolites through two 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 system have been added to each of QC laboratory, Chittagong and Khulna for screening tests of the residues of chloramphenicol, nitrofurantol metabolites, oxy-tetracycline, tetracycline, chlor-tetracycline, metronidazole, malachite green, leuco-malachite green, crystal violet, leuco-crystal violet, histamine etc. of fishery products. Moreover, one GC-MS(TOF) machine was

installed at each of FIQC laboratory, Dhaka and Chittagong.; two UPLC machines were installed at FIQC laboratory, Chittagong and Khulna in 2014. One ICP-MS machines have been installed at QC laboratory, Dhaka & another one at QC laboratory, Chittagong with the financial assistance of BEST-BFQ project. Besides these, for nutritional analysis of feed and feed ingredients, new equipments like Kjeldahl Digesters, Distiller; DUMAS Nitrogen Analyzer, Fat Extractor and Near Infra-red Spectroscopy (NIR) have been installed at QC laboratory, Dhaka with the financial assistance by the same project. The analysts of the laboratories were trained both locally and abroad to operate the machines as well as performing tests maintaining international standard as well as requirements of the importing countries.

4.1.1 Laboratory services

Testing as per requirements of EU (DG-SANTE), Russia (Rosselkhoznadzor), USA (FDA & FSIS) and other importing countries for fish and fishery products as well as for residue monitoring program (RMP) are fulfilled by the three QC laboratories. Most of the test scopes of three QC laboratories are accredited according to ISO 17025: 2005 by Bangladesh Accreditation Board (BAB).

There are two supporting laboratories (out sourcing). They are-

- Institute of Food Science and Technology (IFST) Laboratory of Bangladesh Council for Scientific and Industrial Research (BCSIR), Dhaka
- Pesticide Laboratory of Bangladesh Agriculture Research Institute (BARI), Gazipur

International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B), Dhaka is the reference laboratory for microbiological test.

4.1.2 Analytical services provided in QC and supporting Laboratories

Laboratories render analytical services through testing of pre-export samples, National Residue Control Plan (NRCP) & Factory Residue Control Plan (FRCP) samples. With the requirement of the importing countries and direction of the competent authorities, QC laboratories carry out method validation and testing of new parameters. Regarding analytical capacity of three QC laboratories, the overall comments of EU-FVO Audit report-2015 was depicted as “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”. According to the recommendations of EU-FVO Audit Report-2015, the QC laboratories have validated new methods of testing of metronidazole, histamine, fenbendazole, mebendazole etc. and method validation for testing of pesticides and PCBs through GC-MS(TOF); micotoxins and phosphate is underway. In addition to test of fishery products, testing of proximate composition of fish feed and feed ingredients is being carried out at QC laboratory, Dhaka..

Name of Lab	Test parameters
Quality Control Laboratory (QC), Dhaka	Microbiological: Aerobic Plate Count, Total <i>Coliforms</i> , Presumptive <i>E.coli</i> , <i>Vibrio cholerae</i> , <i>Vibrio parahaemolyticus</i> , <i>Salmonella</i> spp. <ul style="list-style-type: none"> Antibiotics-Nitrofurantol metabolites, Chloramphenicol Dyes (Crystal violet, Leucocrystal violet, Malachite green, Leucomalachite green) Anthelmintics (Flubendazole, Febendazole, Mebendazole) Proximate test of feed and feed ingredients (Protein, Non-protein nitrogen, fat, fibre, ash and moisture)
Quality Control Laboratory (QC), Khulna and Chittagong	Microbiological: 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. <ul style="list-style-type: none"> Antibiotics-Nitrofurantol metabolites, 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, TVBN/TMA, Filth, Formalin Di-sodium di-phosphate/Total Phosphate
Laboratory of Institute of Food Science and Technology (IFST), BCSIR, Dhaka	Antibiotics (Tetracycline, Oxy-tetracycline, Chlortetracycline) Mycotoxin
Pesticide Laboratory of Bangladesh Agricultural Research Institute (BARI), Gazipur	Pesticides (DDT, Aldrin, Heptachlor, Endrin, Dieldrin)
International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B), Dhaka	Microbiological tests for reference

With a view to ensure external quality control, each QC Laboratory participates in international proficiency tests (PT) offered by world renowned PT provider organization on regular basis. In the year 2016, three QC Laboratories participated in proficiency tests organized by different world renowned PT provider organizations which 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	Nitrofurantol metabolites	Z Score: -4.5
QC Laboratory, Chittagong	TEST VERITAS, Italy	April, 2016	ELISA Screening Test of Chloramphenicol (CAP)	Passed
		September, 2016	ELISA Screening Test of Histamine, Tetracyclines (OTC, TTC, CTC), Nitrofurantol Metabolites (AOZ, AMOZ, AHD, SEM)	Passed
	Livsmedelsverket, National Food Agency, Sweden.	January, 2016	Aerobic colony count, <i>Salmonella</i> , <i>Salmonella</i> spp., pathogenic <i>Vibrio</i> spp. (<i>Vibrio cholerae</i> & <i>Vibrio parahaemolyticus</i>), <i>Listeria monocytogenes</i> .	Passed
		October, 2016	Coagulase positive <i>Staphylococcus aureus</i>	Passed
QC Laboratory, Khulna	National Food Agency, Sweden	January/2016	Microbiological: Aerobic Plate Count, Pathogenic <i>Vibrio</i> <i>Salmonella</i> spp and <i>Listeria monocytogenes</i>	Satisfactory

4.1.3 Licensing of Fish Processing Establishments

Licenses are issued or renewed annually considering overall condition of Fish processing plants, Non-packer exporters, Fish packing centers, Cold stores, Ice plants, Fish drying

yards, Factory trawlers, Fish suppliers and Depots according to Fish and Fish Product (Inspection and Quality Control) Rules, 1997 (amended in 2008 & 2014). The checklist used for evaluation of fish processing plants have been revised and rearranged in 2014. The numbers of Fish processing plants, Non-packer exporters, Factory trawlers, Fish packing centres etc. are presented in Table no. 23

Table 23 Number of different establishments involved in fish export value chain of fish

Sl.No.	Type of Establishment	Number	Remarks
1.	Fish Processing plants	104	68 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	

4.1.4 Routine Monitoring of Quality Assurance Program (QAP)

To ensure HACCP (Hazard Analysis and Critical Control) system of Fish processing plants, factory trawlers, packing centres and other establishments involved in fish processing activities are regularly inspected and monitored as per provisions of Fish and Fish Product (Inspection and Quality Control) Rules 1997 (amended in 2008 & 2014). During routine inspection, emphases are given on:

- Hygiene and sanitation of the establishment concerned
- Personal hygiene of working personnel
- Monitoring of the activities involved in fish process line
- Monitoring and verification of own-check systems of the establishment concerned
- Verifications of traceability documents
- Evaluate GMP and verification of HACCP documents

In 2016, number of routine inspection of fish processing plants carried out by three FIQC offices was 693. Besides this, fish processing establishments intended to export fish and fishery products are inspected through a set of criteria by a team formed by Central Competent Authority (CCA) at the beginning of each year as a pre-requisite for renewal of licenses. During inspection, if any short coming is identified, the concerned fish processing establishment is notified for necessary measures and action is taken according to Fish and Fish Product (Inspection & Quality Control) Rules-1997 (amended in 2008 & 2014). In 2016, in total 28,86,500 Taka was fined from different fish processing establishments due to breach of Fish and Fish Product (Inspection & Quality Control) Rules-1997 (amended in 2008 & 2014). In 2016, 289 ice-plants and 437 quality improvement and traceability documents of depots/arots were also inspected.

4.2 Fish Products Inspection

4.2.1 Export of Fishery Products

DoF competent authority inspect a declared consignment of exporter after getting an application along with commercial invoice, packing list, purchase contract or L/C copy for pre-shipment inspection and application fees. Assigned Inspector verifies traceability documents, stock, storage condition, packing, labelling and relevant documents of processed products during inspection. Then Inspectors check organoleptic quality of randomly selected samples. Having satisfactory organoleptic assessment and product documentation the assigned Inspector draws samples as per sampling plans for bacteriological and chemical analysis as required by importing countries. Finally, Inspector submits report on products, processing practice and relevant documentation process to the competent authority for pre-export test and certification. In 2016, total 5,532 declared consignments of fish and fish products were inspected as a part of pre-export inspection by three FIQC offices. A flow diagram for issuance of health certificate is presented in Fig. 4

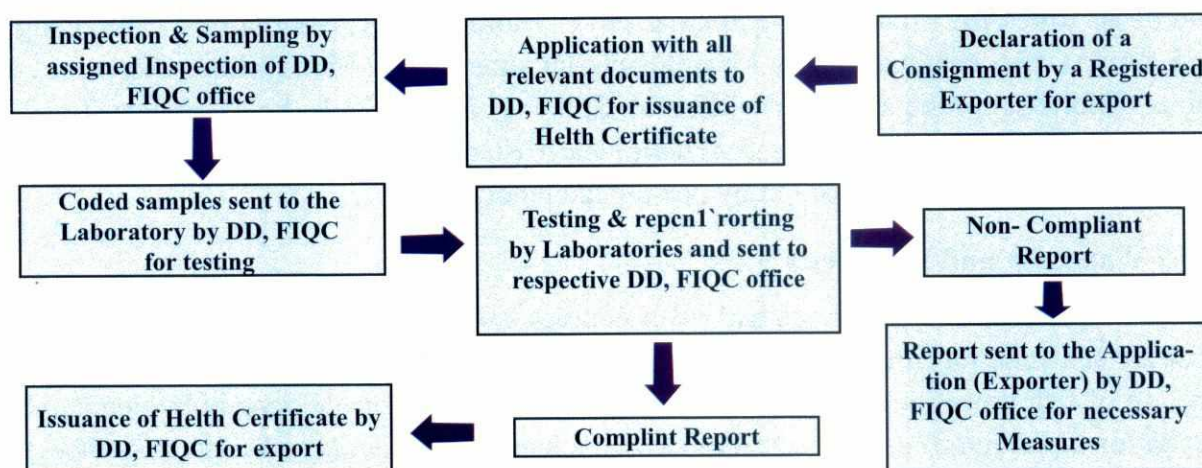


Fig. 4 Flow diagram for issuance of health certificate

4.2.2 Imports of Fishery Products

Upon request of Customs authority, representatives of the DoF inspect the quality of imported fish through checking the presence of formalin and physical condition for each exported consignments. Moreover, under regular monitoring program, DoF is also checking the presence of heavy metal like Cd, Pb & Hg of one consignment randomly chosen from every ten consignments of imported frozen marine fish; and the presence of heavy metal like Cr & As; chloramphenicol, nitrofurantol metabolites and oxytetracycline of one consignment randomly chosen from every ten consignments of imported frozen freshwater fish. In case of testing of each sample, fees according Fish and Fish Product (Inspection & Quality Control) 1997 (amended in 2008 & 2014) will be charged from the respective importer. If the test result is compliant, the imported consignment will be released for selling among the consumers of the country.

4.3 Quality Assurance of Fish Products

4.3.1 Microbiological tests

Samples drawn by Inspectors are tested at microbiological laboratory under respective FIQC office for assessment of *Salmonella* sp, *Vibrio cholerae*, *Vibrio parahaemolyticus*, Total and Faecal coliforms and to estimate Standard Plate Count (SPC). Reports of microbial tests are evaluated for compliances with microbiological standards stated in ISO/ICMSF for issuing Salubrity certificates.

4.3.2 Chemical tests

Presence of prohibited antibiotics especially Chloramphenicol (CAP) and Nitrofurantoin (NF) metabolites in shrimp has become the major concern for EU countries in the recent years. QC laboratories, Dhaka, Chittagong and Khulna conducts tests for analysing residues of CAP and NF metabolites (AMOX, AOZ, AHD & SEM), Crystal violet (CV) and Malachite green (MG) and their metabolites (LCV & LMG) as well as Anthelmintics (Flubendazole, Fenbendazole & Mebendazole) by LC-MS-MS and ELISA screening as per EU regulation and FIQC Rules 1997 (amended in 2008 & 2014). Moreover, QC laboratories, Chittagong and Khulna also conducted tests for antibacterial substances (Tetracycline, Oxytetracycline, Chlortetracycline and Metronidazole), Stilbenes and Steroids, heavy metals (Lead, Cadmium, Mercury, Chromium and Arsenic) and Histamine. Tests concerning Mycotoxins and Pesticides were carried out by outsourced laboratories.

4.3.3 Water, Ice and Swab tests

Monitoring samples of water, ice and swab samples collected from fish processing industries are analyzed for SPC and total/faecal coliforms in order to assess the quality of water and ice of fish processing industries, and swab tests results indicate general hygienic and sanitation condition of contact surfaces (workers hand surface and food contact surfaces). Any non-compliance situation if detected by test is soon reported to concerned factory authorities for taking corrective measures as per Fish and Fish Product (Inspection and Quality control) Rules 1997 (Amended in 2008).

4.4 Residues monitoring through NRCP

Residue Monitoring Program of DoF (NRCP), Bangladesh is a program to monitor fish and fishery products at different levels of production in regard to residues of undesirable substances. The aim of the control on fish and fishery program is to assess the compliance with the tolerance limits (for contaminants), maximum residue limits (MRLs for permitted substances), 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). 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. Department of Fisheries of Ministry of Fisheries and Livestock operates NRCP, meeting the following requirements:

There is a well designed residue monitoring plan place centrally coordinated by the Central Competent Authority (CCA).

CCA is assisted by a NRCP Coordination Committee to monitor the progress of implementation of NRCP. The committee has representatives from each Regional Competent Authority (RCA) and one approved laboratory.

RCA acts as facilitator in organizing NRCP while sampling is carried out by Local Competent Authority (LCA).

The program is as per the national legislation governing the use of veterinary medicinal products in fishery products and aquaculture.

It is as per the stipulated sampling strategies (levels and frequencies) stated in this document.

It prohibits exporting fish and fishery products containing unauthorized veterinary medicinal products, environmental contaminants, permitted substances beyond MRLs and other substances having anabolic effects.

Department of Fisheries has enough financial resources to carry out NRCP as planned.

Compound Groups	Test parameters	Remarks
A ₁	Stilbenes (Diethylstilbestrol)	
A ₃	Steroids (Methyl Testosterone)	
A ₆	Banned Antibiotics (Chloramphenicol (CAP), Nitrofurans (NF) metabolites (AHD, AMOZ, AOZ, SEM), Metronidazole (MNZ))	Metronidazole was included in NRCP-2016 as per recommendations of EU-FVO Audit Report-2015
B ₁	Antibacterial substances (Tetracycline, Oxytetracycline, Chlortetracycline (TC, OTC, CTC))	
B _{2a}	Anthelmintics (Fenbendazole, Mebendazole)	Mebendazole and Fenbendazol has been included in NRCP-2017 as per recommendations of EU-FVO Audit Report-2015
B _{3(a)}	Pesticides (Organochlorine / Organophosphorus) (DDT, Aldrin, Heptachlor, Endrin and Dieldrin) and PCBs	PCBs has been included in NRCP-2017 as per recommendations of EU-FVO Audit Report-2015
B _{3(c)}	Chemical elements (As, Cd, Cr, Hg, Pb)	
B _{3(d)}	Mycotoxin (Aflatoxin (B1, B2, G1, & G2))	
B _{3(e)}	Dyes (Malachite Green (MG), Leucomalachite Green (LMG), Crystal Violet (CV) & Leucocrystal Violet (LCV)	

4.4.1 Planned NRCP-2017 for Shrimp and Fin fish

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

Test Parameter	National Plan					Khulna Zone				Chittagong Zone					Dhaka Zone		
	<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

4.4.2 NRCP-2016 –Test details

Result of NRCP-2016 is shown in Annexure 7

4.4.3 NRCP Findings in last five years

The total number of NRCP samples and number of non-compliant samples is presented in the following table and Fig. 5. 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

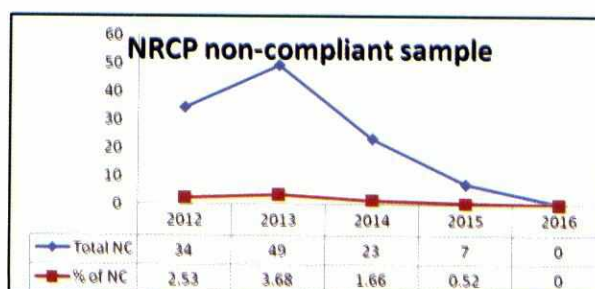


Fig.5 Number of non-compliant samples under NRCP activities in last five years

4.5 Export condition of Fish and Fishery products

4.5.1 Export performance in recent years

Bangladesh exports frozen shrimp and other fish and fisheries products to EU member countries, USA, Japan, Russia, Hong Kong, Saudi Arabia, Singapore and other developed countries by properly addressing international food safety regulations throughout the supply chain. The quality of exported shrimp is properly processed following HACCP and traceability system according to requirement of EU and USA. Fisheries sector is contributing a lot of national foreign exchange earnings and often this sector holds the second highest position. Bangladesh exports frozen shrimp eg. Golda, Bagda, Horina etc. and other fish such as Koral, Datina, Kamila, Lakha, Poa, Rui, Catla, Pabda, Chapila, Sorputi, Air, Koi, Pangas, Sol, Gazar etc. Two fish processing plants- (i) Virgo Fish and Agro Process Ltd. and (ii) Seven Oceans Fish Processing Ltd. located at Trishal, Mymensingh have started production and export of fillets of pangas. Besides this, a noticeable amount of live crab and cuchia (eel) are also exported.

Export statistics of Fish and Fishery Products of the last four fiscal years are presented below. The present government has extended help and co-operations for the export including 10% cost incentives, reduced interest rate etc. to sustain continuous growth providing which reflected through increasing the export of high valued shrimp. Bangladesh earned foreign currencies equivalent to about 4,282.82 crore taka (546.28 million USD) during 2015-16 by exporting 75,337.93 MT of fish and fishery products (Table-24).

Table: 24 Export earnings in last five years

SL. No	Fiscal Year	Exported Quantity (MT)	Value in Million USD	Value in Crore BDT
1.	2011-12	92,479.18	598.00	4703.94
2.	2012-13	84,904.50	534.92	4158.97
3.	2013-14	77,328.86	630.29	4898.22
4.	2014-15	83,524.37	599.05	4,660.60
5.	2015-16	75,337.93	546.28	4282.82

4.5.2 New Entrepreneurship in Fish Processing

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 days, exporters are focusing more on production and export of value added products of shrimp and fish. As for example, in order to cope up with the requirements of competitive global seafood market two fish processing factories named as mentioned earlier Virgo Fish and Agro Process Ltd. and Seven Oceans Fish Processing Ltd., Trishal, Mymensingh have started production and export of fish fillet with 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 another fin fish filleting factory named Earth Agro Farms Ltd. at Gazipur is 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. for local market. 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.

4.5.3 Traceability

To ensure the traceability of shrimp value chain rule-23 has been incorporated in the Fish and Fish Product (Inspection and Quality Control) rules 1997 (amended in 2008). Upazilla Fisheries Officers as well as shrimp farmers of the coastal belt were trained up about the implementation of traceability. About 2.07 lakh shrimp farms and 9,624 fin fish farms were registered for implementing traceability. About 22,000 number of officers, shrimp farmers and other stakeholders who are directly involved in this sector were trained on HACCP system and traceability for strengthening fisheries quality control program. Piloting on e-traceability has been started through EU-funded BEST-BFQ Project of DoF.

4.5.4 Hazard Analysis and Critical Control Point (HACCP) implementation

Safe and reliable production of quality seafood for global market is a recent challenge for Bangladesh. Previously quality issues were mainly dealt with decomposition, filth content and pathogenic bacteria contamination from post harvest chain. Recently, environmental aspects, human rights, i.e. child labor, gender issues, etc. have gained prominence. To ensure safe fish and fish products for the markets, the government has undertaken stringent measures to improve QAP and strong compliances of HACCP guidelines and to ensure them, all fish processing establishments follow HACCP principles mandatorily. Department of Fisheries has imparted training to the relevant manpower on HACCP system. Sanitary and phyto-sanitary measures are followed as per WTO agreement. Transportation network was developed. Waste water treatment plants (ETP) were installed. Awareness building training on traceability as well as Eco-leveling Act is given to the processors and suppliers.

4.5.5 Surveillance and mobile court to prevent fish adulteration

Regular inspection and mobile court was operating at landing centres, depot and processing plants to control adulteration (pushing water, gel etc.) of fish and shrimp. Numbers of accused establishments and persons were taken under punitive measures with the help of law enforcing agencies and adulterated fish and shrimps were destroyed on regular basis. In 2016, FIQC moved 278 mobile court, imposed fine Tk. 25,29,000; and destroyed 13,963 kg Shrimp and 1,500 kg white fish. Seventeen persons were sentenced to jail for breach of Fish and Fish Product (Inspection and Quality Control) Rules 1997 (amended in 2008 and 2014).

4.5.6 Task Force Committee

In shrimp production and processing areas Task Force Committee was formed mainly in Khulna and Chittagong to control the unhygienic systems in every stages of the production, transportation and processing of shrimp. District level Task Force Committee was formed headed by respective Deputy Commissioner with member Secretary of respective District Fisheries Officer. Their activities are to develop depot, landing centres and registration of Shrimp hatchery, nursery and shrimp farm /gher etc. Ensure establishment of sanitary latrine removing unhygienic kacha latrine in the adjacent shrimp farming area. According to HACCP system, shrimp production and processing should be ensured by task force committee.

4.5.7 FIQC 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. Some FIQC officers were trained from abroad both on Laboratory (microbiological and chemical aspects) and Inspection side.

4.6 Laws, Policies and Documents

Proposed Fish and Fish Product (Inspection and Quality Control) Act-2016 has been submitted to the Ministry of Fisheries and Livestock for approval of the Parliament. Proposals for amendment of present Fish and Fish Product (Inspection and Quality Control) Rules has already been sent to the Ministry. 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)
- 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

The following rules and regulations of different importing countries are applicable for exporting Fish and Fish Product to different countries-

- The Public Health Security and Bioterrorism Preparedness and Response Act, commonly known as The Bioterrorism Act of 2002 of FDA
- US Anti Dumping Act of different exporting countries
- Food Safety Modernization Act 2011
- Mandatory Inspection of Fish of the Order Siluriformes and Products Derived From Such Fish-2016
- Commission Decision 2015/2260
- Commission Regulation 188/2008; 488/2014
- Regulations (EC) No. 178/2002; 852/2004; 853/2004; 854/2004; 2073/2005
- EU Directive 96/23/EC
- Russian Sanitary Rules and Norms SanPiN 2.3.2.1078-01 & 2.3.4.050-96 etc.

4.7 Rapid Alert System for Food and Feed (RASFF):

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 (Fig. 6). However, the no. of RASFF in 2015 was only 01 caused not to maintain due cold chain during transportation. For ensuring

properly maintaining cold chain in processing plants, data logger has been installed and monitored in each processing plants. In 2016, the no. of RASFF notifications was 4 out of which 1 was due to improper health certificate; another 1 was due to detection of Malachite Green and rest 2 were due to detection of SEM.

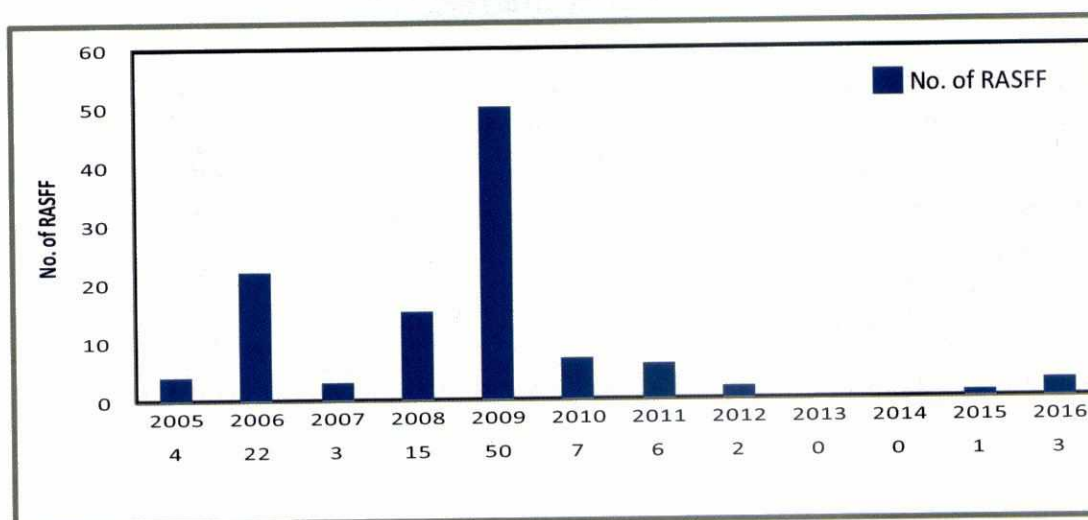


Fig. 6 Number of rapid alerts concerning fish and fishery products exported to EU from 2005 to 2016.

4.8 Conclusion

Increasing population in Bangladesh has exerted pressure on the natural fish resources resulting in renewed impetus towards farming of fish and shrimp like other countries. Growth promoters and other drugs and gene manipulation practice is being used to increase the production in aquaculture. Additionally the indiscriminate use of pesticides in agriculture and pollution from industrial effluents has increased the contamination in fish. To ensure the market share in the global trade we need to produce products free from contamination and safe for human consumption through the implementation of HACCP and Traceability. 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. Human Resource Development

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 with 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, distressed women, landless and marginal farmers etc. For the continues budgetary support for 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 in Table 25.

Table 25: Progress of training activities

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

6.0 APA

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 1st party and all other ministries/divisions as the 2nd parties.



APA Signing program between DG, DoF and Divisional Deputy Directors of DoF

Main purposes of introducing APA are: (a) moving the focus of the ministry from process-orientation 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 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, 2016-17 was duly signed and DoF shows a visible progress in achieving the set targets. From the begging DoF field level offices implementing identified interventions and providing necessary information, which was praiseworthy. Credible performance of DoF also highly appreciated from all relevant corners, including Cabinet Division.

In this connection APA for the financial year 2017-18 was signed on 20 June 2017 between the Director General, DoF and Secretary, MoFL. Moreover, APA between Divisional Deputy Director (DD) and DG, DoF; and agreement between District Fisheries Officer (DFO) and DD; and between Senior/Upazila Fisheries Officer (S/UFO) and DFO were also signed within scheduled timeframe.

7.0 Promotion of Integrity Technique

In 2015-16 fiscal year 102 DoF officials were received awareness training on integrity service. Three video conference were arranged between Ministry of Fisheries, DoF Head Quarter and DoF Field offices. All procurement of the DoF head quarter was accomplished by e-tendering method. On line Feed licensing method was started. One innovative idea on mobile fish advice system was replicated in field level. In order to mitigate audit objections of DoF officials 8 bipartite and tripartite meeting was arranged. Four lakh and thirty three thousand taka was allocated for the implementation National Integrity Service program in 2016-17.

8.0 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 affected in 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 and nutritional status.



Women participation in fish culture

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 and rural women have also been provided with various supports through different development projects of DoF.

8.1. 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 between 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, thus DoF is trying to improve their leadership quality which is one of the important indicators of women empowerment and gender equality.

8.2. 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 a development project 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 of aquaculture.

In 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.area. A total of 100 community saving groups (CGS) have been formed involving around 3,100 women with a saving of BDT 28,41,370 in the 9 coastal districts.

8.3. 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.

9. Diploma in Fisheries

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 productivity, livelihoods security and equitable distribu-

tion 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 Seventh five years 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 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.



Fisheries Diploma Institute, Gopalganj

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.

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 will be furnished with necessary furniture, equipments, chemicals, computers and others within 31 December 2017 and academic activities will be started from 2018-19 academic years.

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 not only help to increase fish production in the country but also help to create a proper environment to increase food production like protection of all reproduction places, bringing under natural system, using of modern technology, etc.

10. Community Based Aquaculture Management (CBAM) through Neemgachi Project

The Community Based Aquaculture Management activities are implemented by the Neemgachi Project. Neemgachi project area involving poor people residing surrounding the ponds situated in four upazilas of Sirajgonj and Pabna districts, covering 4119 bighas of 783 ponds. But this project along with all moveble and non moveble assets have been leased out to the Grameen Fish foundation of Grameen Bank for long 25 years. It has been observed with serious concerned that the communities involved fish culture have had no savings and their livelihood have not been developed at a minimal level, that's why DoF again took over the management control of the project to uplift the socioeconomic condition of the concerned communities through improved aquaculture practices. Neemgachi project is again handed over to DoF for six years through signing a MoU on 1st January 2012 between Ministry of Land and Ministry of Fisheries and Livestock. This project will be

running under the guideline of Neemgachi Community Based Fisheries policy, through which the community will solely avail the ownership of ponds by paying only lease money. DoF will provide all technical and management supports for aquaculture and group management under the guidance of Upazila and district level committee according to the policy.



Fish culture activities at Neemgachi project area

In this year, 546 ponds, covering area of 3224 bighas, was taken under community based fisheries management. Revenue earnings 42.19 lakh taka has been deposited to Government fund in 2012. DoF also distributed 4.05 lakh taka as small loan and 10.00 lakh taka as fish feed as grant, which will create revolving fund for the beneficiaries. DoF has a hatchery and nursery for seed production in the project area to meetup the demended of the quality for the area. The hatchery has been running under direct control of DoF. During last year, 400 kg hatchling and 7 lakh fingerlings was produced in the Neemgachi hatchery and nursery. DoF have taken initiative for the development of ponds and hatchery complex of Neemgachi through a this project.

11. National Fish Week 2016

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 nation to create mass awareness to impart in the harnessing the potential from fisheries sector for economic growth of the country since 1993. National Fish Week 2016 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 2016 was “Jal ache jekhane Mach chash sekhane”. At the 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" has been the direct participation of the

head of the state, the President; head of the government, the Prime Minister; Speakers of the National Parliament; Cabinet Ministers. The Honorable Prime Minister of Bangladesh



Inauguration of the National Fish Week 2016, Dhaka.

has inaugurated the national event on 18 July 2016 in the Krishibidh Institution Bangladesh (KIB) Auditorium, Farm gate, Dhaka. Before the inauguration a grand Road Rally was arranged where the Hon'able Minister and respected Secretary MoFL, DG, DoF and BFRI, Chairman, BFDC and officials from MoFL, DoF, BFRI, BFDC, DLS, NGO representatives and other sections of peoples were present. In the inaugural day, special supplements were published in four national dailies- The Daily Star; The Daily Ittefaq, The Daily Janokontha and The Daily Samokal. A press briefing was also arranged on 18 July 2016 to disseminate the significance of the national Fish week. Four seminars were organized on various topics of fisheries importance.

Various events like discussion and awareness meeting, fish fair, organized training for unemployed youths, essay competition for school and college students, art competition, execution of Fish Acts and mobile courts were also arranged

12. Great Victory day Display

Department of Fisheries (DoF) under the Ministry of Fisheries and Livestock organize a truck-lorry display at the National Parade-ground every year to give a salute for the freedom



Display of DoF activities at National parade ground, Dhaka

fighters in liberation war 1971 on 16th December. A present among the top ten fish producing countries in the world, Bangladesh secured the 5th position by adopting improved technical management through the extension services of 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 for achieving target of vision 2021.

13 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 30906.00 lakh has been allocated for 26 development projects in the financial year 2015-16 under the annual development program of DoF. The actual expenditure and achievements were 31035.11 lakh and 100% respectively. Some programs are also submitted to the ministry for budget allocation under revenue head. The list with allocation and expenditure of DoF development projects and programs for vision 2021 are shown in Annexure 9 .

14. Information and Communication Technology (ICT) in Fisheries

14.1 Introduction

ICT is the backbone of any digital initiative and covers the vast area of information technology, communication technology and the telecommunication technology. Computer systems, network machineries, software, wire and wireless connectivity systems, broadcast hardware and many other hardware and accessories are the physical backbone. The trained human behind the backbone are the intellect. Digital Bangladesh is an Idea that includes the IT use for management, administration and governance to ensure transparency, accountability and answerability at all levels of society and state. To materialize the idea of digital Bangladesh, development of countrywide backbone and expected number of human resources are the basic needs.

Despite having 50 years of history the government has only from 1997 started the process of developing a national ICT strategy. In 2002 Bangladesh identified ICT as a "thrust sector" as it represents potential for quick wins in reforms, job creation, industry growth, improving governance and facilitating inclusion, and it has high spillover effects to other sectors.

14.2 ICT in Fisheries

While Awami League's Charter for Change announced the concept of Digital Bangladesh as an integral Component of Vision 2021, The 6th Five Year Plan places an equal importance to Digital Bangladesh as part of the nation's development strategy. The Information and Communication Technology (ICT) Policy 2009, ICT Act 2009, Right to Information Act 2009, various local government acts promulgated in 2009 laid the foundation for identifying the Digital Bangladesh priorities for the government. As such, a strategy document

'Setting Digital Bangladesh Priorities' is being drafted to integrate the goals of Digital Bangladesh with those of key development sectors to harmonize top level priority setting through a participatory and inclusive approach. Digital Bangladesh is an Idea that includes the IT use for management, administration and governance to ensure transparency, accountability and answerability at all levels of society and state.

“Digital Bangladesh” does not only mean the broad use of computers, perhaps it means the modern philosophy of effective and useful use of technology in terms of implementing the promises in education, health, job placement, poverty reduction etc. Therefore, the government underscores a changing attitude, positive thinking and innovative ideas for the success of “Digital Bangladesh”.

14.3 Door step Services

This the service are used for solving the fish farmers 'problem for taking services to citizens in specially bisadvantaged areas.

DoF Head quarters has been connected to District level office under E-mail connectivity for quick service since 2011. In 2013 fisheries mail system have been modernized to improve service quality. Mail has been converted into group mail system. As a result, if the group address write in the address bar and send the mail, all member of that group get mail in a moment. which increase the quality of office work and also save much time?

Why we choose doorstep service

- Save travel time
- Save parking hassle
- Avoid long queue
- Uninterrupted service

At your convenient and comfort and location

What are the services?

- Information exchange / Fisheries Information service through internet.
- Fish farm registration
- Licensing fish Hatchery
- Licensing fish feed retailer, producers and Importer.
- E-mail service in the office of internal service
- Vessel Tracking and Monitoring etc.

How to get services?

- In order to receive service one must log in to Fisheries Website. For receiving domestic servicej, click on the following links -Office orders, transfers, budget allocation, webmail, Activities, training, Tender Notice etc taken to the service.
- Fish farmers and other stakeholders for taking fisheries consultancy services can be clicked on e-books, publications, laws and policies, etc links. You can get information on that links;

- Fish hatcheries and fish feed import licensing; production and sales in order to receive the license, stakeholders must be a member of DoF ERP. Beneficiaries will apply for licenses online, and after the specified time, he will get a license online.

- Fish and shrimp farm Registration stockholder must be a member of FoF ERP.

Basic requirement:

Service charges:

- All services are provided free of charge, only the license fees payable by the recipients.

Requirement to receive service:

- If the service recipient has a computer and internet lines across her, well, if there is no problem, the government established information service center can receive the service.

Activities of Fisheries Information and Communication Center (FICC)

The philosophy of “Digital Bangladesh” comprises ensuring people’s democracy and rights, transparency, accountability, establishing justice and ensuring delivery of government services in each door through maximum use of technology-with the ultimate goal to improve the daily lifestyle of general people. Government’s “Digital Bangladesh” includes all classes of people and does not discriminate people in terms of technology. Hence, government have emphasized on the four elements of “Digital Bangladesh Vision” which are human resource development, people involvement, civil services and use of information technology in business. In this section e-Extension Services for Need Based Aquaculture Extension' is an on-going pilot program of DoF. The fish farmers can receive the following services:

- Fish farmer will get support in solution of their problem from e-LEAF (e- Local Extsi Agent for Fisheries). If the e-LEAF is cannot solve the problem or unable to solve any problem, the (e-LEAF) would immediately contact with the Senior/Upazila Fisheries Officer or District Fisheries Officer through mobile phone/teleconference or videoconference and discuss the particular problem with them for getting suitable suggestions of the problem.
- Successful implementation of this FICC program will ensure and provide quick and on spot solutions to fish farmers.
- Information regarding fish culture/aquaculture will be easily reachable to general mass through this program. FICC will be enriched with extension videos, audios and other extension materials and tools regarding fish farming.
- As per demand of fish farmer e-LEAF will visit fish farmers' pond/farm/gher and suggest on spot to solve the problems.
- This program will augment mass awareness among those who wants to go for fish farming or those who are engaged in fish farming.

- Fish farmers will get hand-on practical and technical knowledge regarding fish farming.
- e-LEAF can provide easy and door steps service delivery on fish farming and extension to fish farmers using IT equipments and related accessories.
- Selected e-LEAF will serve on honorary basis (with no salary) without affecting the aims and objectives of the FICC. It may support to his livelihood using the IT tools.
- For unknown and special problems SUFOs/UFOs and the DFOs have to consult with respective personnel of DoF HQ through video conferencing to get quick solution of the problem. A video conference team is already formed by DG of DoF to provide services immediate solution of farmer's problem.
- “We may not reap immediately the benefits of the programme, we undertook in the past years . . . as we had to start everything afresh. for Successfully implement e-Leaf program, two projects Department of Fisheries.
 - a) Expansion of Aquaculture Technology Services Up to Union Level Project and
 - b) The National Agricultural Technology Project (DoF Part) appointed e-Leaf in almost all upazila in the country.

14.4 Success Story of ICT Section of DoF

ICT is the backbone of any digital initiative. ICT covers the vast area of information technology, communication technology and the telecommunication technology. ICT is also a combination of physical backbone and intellect. Computer systems, network machineries, software, wire and wireless connectivity systems, broadcast hardware and many other hardware and accessories are the physical backbone. The trained human behind the backbone is the intellect. Digital Bangladesh is an idea that includes the IT use for management, administration and governance to ensure transparency, accountability and answerability at all levels of society and state. To materialize the idea of digital Bangladesh, development of countrywide network and expected number of human resources are the basic needs. Since the ICT Section, Department of Fisheries began to express itself as a separate Section in the year 2011.

The success of the ICT section is given below:

- Web-based fish advice system: Fish farmer get information service when he come to fisheries officers, similar service that he can get through this software. The software supports mobile and Tab also. Farmer also receives services from the data center near to his house.
- FAQs: When a Fish farmer came to office, and asked some general question, that answer also given in this link. That content supports mobile and Tab also.
- DoF PDS: DoF Officers / staff employment aimed at obtaining the necessary information quickly and accurately has been made this software. This has been successfully running.

- Automation services are aimed to report automated (On line job System, Fish Feed licensing, Fish Hatchery Registration system etc), which is managed by DoF ERP. Reports from the field level activities of the Directorate of Fisheries to come. The reports are extremely difficult to integrate. Field reports have been made to integrate this software for the creation of Headquarters report. All reports will be in the process of fisheries in the next two years.
- DoF update mail system: DoF was before Web mail, updates have been added to the mail as group mail. Mail message to everyone in the group if the group goes to an single address. It is an innovation in the ICT Section.
- LAN Connection: With the Directorate of Fisheries to the field office there is no direct connection to the Internet. Field offices are connected to different service provider, or accepts the connection BTCL is offering. But the Head office has its own LAN connection. In addition to exchanges of officials via the LAN, resources via the Internet are being exchanged. LAN Topography Department of Fisheries are given below.

14.5 Digital innovation fair

Under the supervision of prime minister's office, A2I project organized digital innovation fair for 3 days from 19/10/16 to 21/10/16 to encourage the ICT innovation among the people.



DoF participation in Digital Innovation Fair 2016

Innovation team, Department of fisheries alongside with other government and non ernment organizations took part in the fair Initiation showcasing workshop, with the help of A2i Program and Cabinet Division (Cabinets Division), the incoming investors from the field stage, the relevant officials and assisted officers create a large field of exchange for the council. As a result, the Innovators get the opportunity to demonstrate their pilot imple-mentation challenges in the field workplace by offering them a larger range of activities. Innovators seek help from the authorities in order to address their challenges.

government organizations took part in the fair with “Non-stop Bangladesh” motto the fair was arranged in Bosundhara 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 indications 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.

14.6. Innovation of Department of fisheries

- Help desk has been placed for service receiver in the Department of fisheries Head office.
- Digital car parking is being used to accommodate large number of cars in small space.
- E-recruitment process is now running effectively.
- DoF ERP (Enterprise Resource Planner) The ict section has created DoF ERP a common platform for database management. Users can use the database and software like PDS, E- recruitment, Fish food licensing with their individual ID and Password.
- By the order of Office of prime minister 14 service process map has been prepared out of which 2 has been used to provide online services to the provide licenses to Fish food producers and sellers. The software for this process was finished on 30 June 2016.
- Group email is another innovative process by which email is being sent to field level office whose individual e-Mail account is about 800.
- In order to provide services to fish farmers a website Fish advise system and a cell phone application names Fish advised technique was made in 2016.
- An efficient and easy way for office management called DoF PDS has been made by order of Ministry of fisheries.

showcasing workshop, with the help of A2i Program and Cabinet Division (Cabinets Division), the incoming investors from the field stage, the relevant officials and assisted officers create a large field of exchange for the council. As a result, the Innovators get the opportunity to demonstrate their pilot implementation challenges in the field workplace by offering them a larger range of activities. Innovators seek help from the authorities in order to address their challenges.

The discussion took place in the workshop on how various innovators have faced various challenges and how to solve these problems in relation to specific backgrounds and strategies that will play an important role in creating guidelines for future implementation of the

project. Department of Fisheries officials feel that the challenges are in the initial stage of implementation of the project are easy to deal with. Therefore, the investors can accelerate the implementation of the project by sharing their thoughts with the higher authority, while simplifying the service process. Therefore, this innovation program will now play an active role in implementing the government's vision 2021.

International cooperation and liaison with development partner Agencies. To intensify the enhancement fisheries development of the country DoF has joined the international Fisheries Cooperation. DoF maintain a close liaison with a member of donors for technical and financial assistance for implementation of diversified activities under the sector. DoF recognizes the assistance receipt from the donors with great pleasure and importance. DoF welcomed more involvement of donors for manages the diversified fisheries resources of the country to obtain the enefits for her population. At present UNDP, FAO, World Bank, USAID, GiZ, IFAD,, EU, DANIDA, IDB, The World Fish Center etc. are the development partners of the different ongoing projects.

15. Conclusion:

Bangladesh is one of the world's leading fish producing country with a total production of 38.78 lakh MT in the last financial year 2015-16. The overall growth performance from inland aquaculture shows a moderate increased trend due to dissemination of improved technology packages and supportive/ need-based extension services at farmer's level. A slight growth in the production from both inland capture and marine fisheries was also noticed during the last two and half decades with some exceptions. Beside these, this sector created around 6 lakh employment opprotunities per year in the last 8 financial years and will be able to create 32.71 lakh additional employment by 2020-21. The declaration of Honorable Prime Minister Shiekh Hasina for food security, government has undertaken massive activities to 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 targets of vision 2021 as wel as sustainable development goals. It will help support to create huge employment opportunity, poverty alleviation and to ensure food security and thus, the Sonar Bangla, the dream of the Father of the nation, "Bangabandhu Sheikh Mujibur Rahman" will be materialized.

Annexure

Annexure-1: List of the winners of National Fish Award, 2016

Area of Field	Name of the Person/Organization	Award
Spawn Production	Shahsultan Shahjalal Rupali Matshya Hatchery Propr.: Md. Abdul Halim, Village: Bashati Moddho Para, Post Office: Ramvodropur, Upazila: Muktagacha, District: Mymensingh.	Gold Medal, 50,000/- cash and a Certificate
Fish Production	Husain Aqua Fish Farm Propr.: Md. Obaidur Rahman Village: Chachra, Chachra More, Upazila: Jessore Sadar, District: Jessore.	Gold Medal, 50,000/- cash and a Certificate
Fish Production	Md. Hafizur Rahman Tuku Village: Godkhali babupara, Post Office: Godkhali, Upazila: Jhikorgacha, District: Jessore.	Gold Medal, 50,000/- cash and a Certificate
Role of Person/ Institute to Fisheries Development	Erawan Trading Propr.: Angchin Village: Enderson road, Post Office: Cox'bazar, Upazila: Cox'bazar Sadar, District: Cox'bazar.	Gold Medal, 50,000/- cash and a Certificate
Role of Person/ Institute to Fisheries Development	Sohel Md. Jillur Rahman Rigan Senior Upazila Fisheries Officer (own salary) Vedorgonj, Shariotpur	Gold Medal, 50,000/- cash and a Certificate
Spawn Production	Maizvandari Matshya Khamar Propr.: Hamidul Islam Village: Bagmara, Post Office: Mirzapur, Upazila: Sherpur, District: Bogra	Silver Medal, 30,000/- cash and a Certificate
Fish Fry/Fingerling Production	Md. Tomkinur Rahman Village: Shikarpur Prothanpara, Post Office: Sakoya, Upazila: Boda, District: Panchogor	Silver Medal, 30,000/- cash and a Certificate
Fish Production	Mohammad Jahangir Hosen Village: Andari (himchori), Post Office: Soroi, Upazila: Lama, District: Banderban	Silver Medal, 30,000/- cash and a Certificate
Fish Production	Md. Samsul Haque Sarker Village: Katalia Para, Post Office: Sar Karkhana, Upazila: Palash, District: Narsingdi.	Silver Medal, 30,000/- cash and a Certificate
Fish Production	Khairul Islam Village: Vatgaon, Post Office: Brahmmonkochuri, Upazila: Kishoregonj Sadar, District: Kishoregonj.	Silver Medal, 30,000/- cash and a Certificate
Fish Production	M/S Saiful Matshya Khamar Propr.: Md. Saiful Islam Village: Molagari hat, Post Office: Molagari hat, Upazila: Kalai, District: Joypurhat.	Silver Medal, 30,000/- cash and a Certificate
Fish Production	Chitkibari Matshya Utpadon Samiti Propr.: Kenedi Biswas Village: Chitkibari, Post Office: Chitkibari, Upazila: Kotalipara, District: Gopalganj.	Silver Medal, 30,000/- cash and a Certificate
Fish Production	Md. Motiur Rahman Village: Rajarpur, Post Office: Rajarpur, Upazila: Chapainawabgonj Sadar, District: Chapainawabgonj.	Silver Medal, 30,000/- cash and a Certificate
Fish Production	Motiur Rahman Village: Shrinagar Pachbag, Post Office: Pachdona, Upazila: Narsingdi Sadar, District: Narsingdi.	Silver Medal, 30,000/- cash and a Certificate
Bagda Shrimp Production	Profullo Rai Village: Ghola, Post Office: Koiya bazar, Upazila: Botiaghata, District: Khulna.	Silver Medal, 30,000/- cash and a Certificate
Export of Fish Products (Frozen shrimp/fish/dried fish)	Jemini Sea Food Ltd. Propr.: Colonel Kazi Sahed Ahmed (Rtr.) Village: Jabusa, Post Office and Upazila: Rupsa, District: Khulna.	Silver Medal, 30,000/- cash and a Certificate
Role of Community based organization to Fisheries Development	Beel Ruhul Biodiversity Management Organization President: Md. Mobarok Hosen Village: Patulipara, Post Office: Veramara, Upazila: Vangura, District: Pabna.	Silver Medal, 30,000/- cash and a Certificate
Role of Person/ Institute to Fisheries Development	Upazila Parisad, Birgonj, Dinajpur Md. Aminul Islam Upazila Chairman Upazila Parisad, Birgonj, Dinajpur	Silver Medal, 30,000/- cash and a Certificate
Role of Community based organization to Fisheries Development	Kashimpur Adorso Matsya Khamar General Secretary: Md. Anwar Hosen Village: West Bamon, Post Office: Kashimpur, Upazila: Gazipur Sadar, District: Gazipur.	Silver Medal, 30,000/- cash and a Certificate
Role of Person to Fisheries Development	Shadhon Chandra Sarker Senior Upazila Fisheries Officer Noakhali Sadar, Noakhali.	Silver Medal, 30,000/- cash and a Certificate

Annexure 2: Year-wise fish production in Bangladesh during last 10 years

(Unit: Metric ton)

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
A. INLAND FISHERIES	1,952,573	2,065,723	2381917	2,381,916	25,15354	26,83162	28,21266	29,52730	30,85048	3251796
(a) Inland Openwater (Capture)	1,006,761	1,060,181	1029937	1,029,937	10,54585	957095	961458	995805	10,23991	1048242
(1) River and Estuaries	136,958	136,812	153695	153,695	144566	145613	147264	167373	174878	178458
(2) Sundarbans	17,751	18,151	8109	8,109	22451	21610	15945	18366	17580	16810
(3) Beel (Depression)	75,137	77,524	70209	70,209	81564	85208	87902	88911	92678	95453
(4) Kaptai Lake	8,085	8,248	7117	7,117	8980	8537	9017	8179	8645	9589
(5) Flood Plain	768,830	819,446	790807	790,807	797024	696127	701330	712976	730210	147872
(b) Inland Closewater (Culture)	945,812	1,005,542	1351980	1,351,979	1460769	1726067	1859808	1956925	2061057	2203554
(1) Pond and Ditch	811,954	866,049	1140485	1140484	1270966	1392412	1446594	1526160	1610875	1719783
(2) Semi-Closed	0	0	0	46,902	51230	132163	200833	193303	201280	207658
(3) Baor (Ox-bow Lake)	4,698	4,778	8727	8727	4868	5186	6146	6514	7267	7729
(4) Shrimp/Prawn Farm	129,160	134,715	145,585	155866	184939	196306	206235	216447	223582	239798
(5) Pen culture	-	-	-	-	-	-	-	13054	16084	13364
(6) Cage culture	-	-	-	-	-	-	-	1447	1969	2062
B. MARINE FISHERIES	487,438	497,573	517282	517,282	546333	578620	588988	595385	599846	6265
(a) Industrial	35,391	34,159	34182	34,182	41665	73386	73030	76885	84846	105348
(b) Artisanal	452,047	463,414	483100	483,100	504668	505234	515958	518500	515000	521180
COUNTRY TOTAL (A+B)	2,440,011	2,563,296	2899199	2,899,198	3061687	3261782	3410254	3548115	3684894	3818324
ANNUAL GROWTH RATE (%)	4.79	5.05	5.39	7.32	5.6	6.5	4.55	4.04	3.85	5.00

Annexure-3. Comparison of Annual Fish Production between 2014-15 and 2015-16

Sector of Fisheries	2015-16			2014-15			Prod. increase	Growth Rate %
	Water Area (Ha)	Prod. (MT)	(Kg/ Ha)	Water Area (Ha)	Prod. (MT)	(Kg/ Ha)		
i) Inland Open Water (Capture)								
1. River and Estuary	853863	178458	209	853863	174878	205	3580	2.05
2. Sundarbans	177700	16870	94	177700	17580	99	-710	-4.03
3. Beel								
(a) Natural	101492	81338	801	101621	79358	781	1980	2.50
(b) Beel Nursery	12669	14115	1114	12540	13320	1062	795	5.96
Beel Total	114161	95453	836	114161	92676	812	2777	3.00
4. Kaptai Lake	68800	9589	139	68800	8645	126	944	10.92
5. Floodplain								
(a) Subsistence Fisheries	2317175	611334	264	2317175	600876	259	10458	1.74
(b) Fry Released Program	158086	43121	273	145912	40478	277	2643	6.53
(c) Haor	228823	93417	408	228823	88856	388	4561	5.13
Floodplain Total	2704084	747872	277	2691910	730210	271	17662	2.42
ii) Inland Close Water (Culture)								
6. Pond	372405	1719783	4618	372397	1613240	4332	106543	6.61
7. Seasonal cultured waterbody								
(a) Paddy Field/Floodplain	126329	193191	1529	124868	187073	1498	6118	3.27
(b) Boropit	8547	14467	1692	8462	14207	1679	260	1.83
Seasonal waterbody Total	134876	207658	1539	133330	201280	1510	6378	3.17
8. Baor	5488	7729	1408	5488	7267	1324	462	6.36
9. Shrimp/Prawn Farm								
(a) Shrimp/Prawn Production		125699	456		126077	457	(-) 378	(-) 0.30
(b) Fish Production		114099	414		97505	354	16594	17.02
Shrimp Farm Total	275509	239798	870	275583	223582	811	16216	7.25
(c) Crab	19408	13160	678	--	--	--	--	--
10. Pen Culture	7553	13364	1769	7553	13070	1730	294	2.24
11. Cage Culture	10	2062	21	10	1969	20	93	4.72
iii) Marine Fisheries			kg/cum			kg/cum		
12. Industrial		105348			84846		20502	24.16
13. Artisanal		521180			515000		6180	1.20
Total Fish Production		3878324			3684245		194079	5.27

Item	2015-16	2014-15	Prod. Increase	Growth Rate (%)
Hilsa Production (MT)	394951	387211	7740	2.01
Shrimp/Prawn Production (MT)	234188	230244	3944	1.71
Hatchling Production (Kg)	614433	551910	62523	11.33
PL Production (Core)	1318.85	1248.18	70.67	5.66

Annual Report 2016

Annexure-4(a). Annual Carp Hatchling Production in 2016

Source of Production	No of Hatchery	Hatchling Production (Kg)	%
1. Natural			
Jamuna River		1615	
Padma River		1984	
Arialkha River		241	
Brahmaputra River		110	
Garai/Madhumati River		543	
Surma		6	
Halda River		320	
Natural Total		4819	0.78
2. Artificial			
Govt. Hatchery	89	14775	2.40
Private Hatchery	813	594839	96.81
Artificial Total	902	609614	99.22
COUNTRY TOTAL	902	614433	100.00

Note: Hatchling of 4-5 days old.

Annexure 4(b) . Hatchling Production from Govt. Hatchery in 2016

Name/Location of Hatchery	No. of Hatchery	Hatchling Production (Kg)								Total
		Major Carp	Exotic Carp	Pangas	Thai Punt	Bata	Koi	Shingi/ Magur	Other	
Fish Seed Multiplication Farm										
1. Dhaka Division	9	700	256	0	64	50	0	0	1	1071
2. Mymensingh Division	9	808	238	5	101	38	0	0	0	1190
3. Khulna Division	12	1425	861	0	16	22	0	0	0	2324
4. Barisal Division	10	326	86	60	10	20	0	0	0	502
5. Rangpur Division	12	584	564	0	104	136	0	0	0	1388
6. Rajshahi Division	15	1164	821	40	60	283	0	0	40	2408
7. Chittagong Division	11	1150	243	10	99	18	0	0	33	1553
8. Sylhet Division	6	566	35	0	128	0	0	0	16	745
Sub Total	84	6723	3104	115	582	567	0	0	90	11181
Other Govt. Hatchery										
1. Central Fish Breeding and Training Centre, Jhenaidah.	1	716	754	0	14	21	0	0	0	1505
2. Fish Breeding and Training Centre, Raipur Lakshmipur.	1	540	123	10	59	0	0	0	0	732
3. Fish Seed Multiplication Farm and Training Centre, Parbatipur, Dinajpur.	1	305	217	0	25	70	0	0	0	617
4. Hatchery of Bangladesh Fisheries Research Institute, Mymensingh.	1	360	180	0	0	0	0		150	690
5. Faridpur Traning and Extension Center, Faridpur	1	40	10	0	0	0	0	0		50
Sub Total	5	1961	1284	10	98	91	0	0	150	3594
TOTAL	89	8683.5	4387.5	125	681	658	0	0	240	14775

Annexure 4(c) . Hatchling Production from Private Hatchery in2016

Division	No. of Hatchery	Hatchling Production (Kg)								Total	Tilapia Juvenile (Lakh)
		Major Carp	Exotic Carp	Pangas	Thai Punti	Bata	Koi	Shingi/ Magur	Other		
Dhaka	40	14753	6314	0	2132	2138	245	735	555	26871	486
Mymensingh	196	47183	43981	25000	7950	2695	4035	10938	23560	165342	5739
Khulna	94	45146	27630	3508	1690	3308	1037	212	1940	84471	3282
Barisal	41	12852	4971	110	697	25	300	70	100	19125	163
Rangpur	71	15969	18642	4785	2655	5439	281	486	273	48530	62
Rajshahi	174	40104	35649	48395	4365	12176	1327	1772	2226	146014	4250
Chittagong	178	47505	24391	12665	3982	882	522	565	1012	91524	6759
Sylhet	19	8469	1685	70	2607	17	0	80	35	12963	756
TOTAL	813	231981	163262	94533	26077	26680	7747	14858	29700	594839	21497

Note : (1) About four lakh hatchlings contain in one kg spawn and one kg contains 1000-1200 Tilapia juvenile.

(2) Other Species: Ghonia, Chitol, Gulsa, Pabda etc.

(3) No. of Hatchery mentioned which is under operation only.

Annexure 4 (d). Annual PL (Post Larva) Production in 2016

Source of Production	Galda Hatchery		Bagda Hatchery		Total	
	No. of Hatchery	PL Production (Core)	No. of Hatchery	PL Production (Core)	No. of Hatchery	PL Production (Core)
Govt. Hatchery	17	0.55	0	0.00	17	0.55
Private Hatchery	19	4.10	49	1314.20	68	1318.30
TOTAL	36	4.65	49	1314.20	85	1318.85

Note: No. of hatchery mentioned which is under operation only.

Annexure 5. Annual Catch of Marine Fisheries in 2015-16

Type of Fishing	Number of Craft (Trawler/Boat)	Number of Unit (Gear/Net)	Catch in Metric Ton			
			Shrimp	Hilsa	Other Fish	Total
A. Industrial						
Trawl Fishing						
a) Shrimp Trawler	37	111	2309	0	2274	4583
b) Fish Trawler	210	630	274	3695	96796	100765
TOTAL INDUSTRIAL	247	729	2583	3695	99070	105348
B. Artisanal						
1. Gill Net Fishing						
a) Mechanized	23595	74443	0	230000	64280	294280
b) Non Mechanized	13820	40585	0	20500	21000	41500
SUB-TOTAL	37415	115028	0	250500	85280	335780
2. Set Bag Net Fishing						
a) Seasonal (MB)	7875	20799	31000	0	112300	143300
b) Seasonal (NMB)	6100	10000	9150	0	1500	10650
c) All Seasonal (NMB)	6550	10025	1600	0	500	2100
SUB-TOTAL	20525	40824	41750	0	114300	156050
3. Long Line Fishing						
a) Jew Fish Long Line						
Mechanized	2500	10191	0	0	17000	17000
Non Mechanized	400	900	0	0	700	700
b) Other Long Line (NMB)	325	772	0	0	300	300
SUB-TOTAL	3225	11863	0	0	18000	18000
4. Trammel Net Fishing (NMB)	131	422	1400	0	4600	6000
5. Other Gears Fishing (NMB)	6373	15640	1850	0	3500	5350
TOTAL ARTISANAL	67669	183777	45000	250500	225680	521180
GRAND TOTAL (A+B)	67916	184518	47583	254195	324750	626528

Trawler		Boat		Gear	
Type	No.	Type	No.	Type	No.
Shrimp Trawler	37	MB (Mechanized Boat)	32859	Gill Net	132142
Fish Trawler	210	NMB (Non-Mechanized Boat)	34810	Set Bag Net	48452
				Long Line	1799
				Trammel Net	471
				Other Gear	5843
Total	247		67669		183707

Annexure 6. Species-wise Catch of Marine Fisheries in 2015-16

Type of Fishing	Shrimp (A)	Hilsha (B)	Other Species								Total (C)	Grand Total (A+B+C)
			Sardine	Bombay Duck	Indian Salmon	Pom fret	Jew Fish	Cat Fish	Shark/ Skate/ Ray	Other Marine Fish		
A. Industrial Trawl Fishing	2583	3695	42576	0	0	293	2889	2245	622	50445	99070	105348
B. Artisanal												
1. Gill Net Fishing												
a) Mechanized	0	230000	1700	3250	800	1975	17000	1500	1900	36155	64280	294280
b) Non-mechanized	0	20500	0	80	0	0	2150	100	20	18650	21000	41500
SUB-TOTAL	0	250500	1700	3330	800	1975	19150	1600	1920	54805	85280	335780
2. Set Bag Net Fishing												
a) Seasonal	40150	0	70	54810	0	8325	1430	30	170	48965	113800	153950
b) All Seasonal	1600	0	0	190	0	0	0	20	35	255	500	2100
SUB-TOTAL	41750	0	70	55000	0	8325	1430	50	205	49220	114300	156050
3. Long Line Fishing												
a) Jew Fish Long Line												
Mechanized	0	0	0	0	75	0	5000	3800	1795	6330	17000	17000
Non Mechanized	0	0	0	0	20	0	250	55	60	315	700	700
b) Other Long Line	0	0	0	0	0	0	200	45	20	35	300	300
SUB-TOTAL	0	0	0	0	95	0	5450	3900	1875	6680	18000	18000
4. Trammel Net Fishing	1400	0	0	40	0	0	1675	700	0	2185	4600	6000
5. Other Gears' Fishing	1850	0	40	175	0	0	1300	200	0	1785	3500	5350
TOTAL ARTISANAL	45000	250500	1810	58545	895	10300	29005	6450	4000	114675	225680	521180
GRAND TOTAL (Industrial+Artisanal)	47583	254195	44386	58545	895	10593	31894	8695	4622	165120	324750	626528
%	7.94	40.57	7.08	9.34	0.14	1.69	5.09	1.39	0.74	26.35	51.83	100.00

Species-wise Annual Shrimp Catch from Marine Fisheries

Sector	Bagda (Tiger)	Harina (Brown)	Chaka (White)	Others	Total
Trawl Fishing	268	1554	72	689	2583
Artisanal Fishing	3150	28000	5000	8850	45000
Total	3418	29554	5072	9539	47583

Annexure 7 NRCP-2016 – Test details

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

Annexure 9: List of on going Development Projects (2016-17)

SL. No.	Name of the project and Implementation Period	Total PP Cost (Fig. in lakh)	Project Area	Objectives	Major Activities	Achievement (%)
1.	Bangladesh Marine Fisheries Capacity Building Project (IDB/GOB) (July, 2007-June, 2017)	16545.06	14 coastal districts, 49 upazilas	<ol style="list-style-type: none"> 1. Assess the standing stock and MSY of estuarine and coastal fisheries resources. 2. Assess the standing stock of pelagic and demersal stocks of aquatic resources. 3. Undertake census and establish data bank on different types of fishing crafts and gears. 4. Develop a catch assessment program for routine maintaining of the coastal and marine fisheries as to changes due to the dynamics of fishing. 5. Develop mechanism to implement MCS system to oversee and manage the resources. 	<ol style="list-style-type: none"> 1. Marine fisheries survey and development of management framework. 2. Staff training for HRD. 3. Procurement of Research/Survey Vessel. 4. Development of an integrated data base for MCS. 	96.06%
2.	Poverty reduction and livelihoods Security for the People of Economically Depressed Area (April, 2010-June, 2016)	8380.00	5 Divisions, 34 Districts, 185 Upazilas	<ol style="list-style-type: none"> 1. To create employment opportunities in fisheries sector through excavation and re-excavation of water bodies for the people below poverty line. 2. To develop the skill and knowledge of unemployed poor people through training and involve them in aquaculture and other income generating activities. 3. To reduce malnutrition in the poverty region through increase fish culture. 	<ol style="list-style-type: none"> 1. Training for AIG, Small Fish farmers, service provides. 2. Stocking of fish fingerlings. 3. Exchange visit. 4. Establishment of fish sanctuaries. 5. Excavation and re-excavation of pond/borrow pits & installation of spill way. 	99.70%
3.	Greater Faridpur Fisheries Development Project (January, 2010-June, 2016)	7884.89	28 Upazilas of the Greater Faridpur district	<ol style="list-style-type: none"> 1. To increase fish production from culture and capture fisheries of Faridpur region. 2. To create employment opportunities by various fish culture activities for the poor and landless one member in each family. 3. To protect fish bio-diversity through establishing fish sanctuary, stocking endangered fish fingerlings and creating awareness. 4. To improve fish habitat through development of water bodies and minor infrastructure development. 	<ol style="list-style-type: none"> 1. Development of boro-pits and Khas/private ponds/Canals & Pen culture/ Cage culture. 2. Establishment of sanctuaries, re-excavation of Beel Nursery pond/ Baors and dead rivers. 3. Construction of earthen dyke/ box/Pipe-culvert/ sluice gate. 4. Stocking of indigenous fish and carp fingerlings. 5. Implementation of Fish Conservation Act. 6. Group mobilization and facilitate AIGAs through livestock. 	97.22%

SL. No.	Name of the project and Implementation Period	Total PP Cost (Fig. in lakh)	Project Area	Objectives	Major Activities	Achievement (%)
4.	Aquaculture and Fisheries Management Project in Haor Area (October, 2010-June, 2016)	3726.00	3 Divisions, 7 Districts, 48 upazilas	<ol style="list-style-type: none"> 1. Increase fish production by Establishing beel nursery, fish sanctuary and stocking of fish fry. 2. Poverty alleviation of fishers and fish farmers through technology dissemination & employment generation. 3. Development of a sustainable community-based improved management framework for the selected water bodies. 4. Development of knowledge & skills of DoF, selected NGO employees & CBO members involved in the project. 5. Capacity building of DoF technical personnel for managing ICL resources along with CBO members & other stake holders. 	<ol style="list-style-type: none"> 1. Establishment fish sanctuary in haor and connecting river. 2. Stocking of fish fingerlings. 3. Community Based Fisheries Management. 4. Renovation of fish Hatchery in Haor areas. 5. Implementation of Fish act. 6. Group formation and community mobilization. 	97.29%
5.	Establishment of Fisheries Diploma Institute at Gopalganj, Kishorganj & Sirajganj Districts (July, 2011-December, 2017)	14383.37	Gopalganj Sadar, Kishorganj Sadar & Belkuchi, Sirajganj Districts.	<ol style="list-style-type: none"> 1. To develop skilled technical manpower for the fast growing fisheries sector through offering Fisheries Diploma Course to eligible candidates. 2. To establish a well equipped three diploma institutes with modern teaching facilities for the purpose of running Fisheries Diploma Course. 	<ol style="list-style-type: none"> 1. Construction of administrative, academic building, hostels, residence, dormitories, auditorium, prayer mosque, guard room, garage, sub-station & building hatchery building. 2. Construction of internal road, compound drainage system & boundary wall. 3. Pond excavation (1ha) & turfing constructions of pond water supply system & hatchery compounds. 4. Reconstruction of pond dyke with carted earth & pond protection work by RCC retaining wall. 	99.69%
6.	Rehabilitation & development of fisheries infrastructure to increase production of quality fish seed & fingerlings (Jan, 2012-June, 2018)	14603.00	All over Bangladesh (61 Districts, 147 Upazilas)	<ol style="list-style-type: none"> 1. To increase good quality seed & fingerlings production by controlling genetic decadence of carps. 2. To demonstrate and dissemination of modern aquaculture technologies among the farmers. 3. Increase production capacity of infrastructures through application of improved aquaculture technologies. 	<ol style="list-style-type: none"> 1. Land acquisition for new constructed DD, DFOs & UFOs office buildings. 2. Construction of DD, DFOs & UFOs offices buildings. 3. Repairing & renovation of FSMF -83, FBRTC-04 & DFTC-04 (Shrimp), DD/DFOs including the Savar academy Bhaban & all necessary civil works. 	99.99%

SL. No.	Name of the project and Implementation Period	Total PP Cost (Fig. in lakh)	Project Area	Objectives	Major Activities	Achievement (%)
7.	Fishermen Registration & Issuing of Identity Card Project (Jan, 2012- June, 2017)	7315.00	64 Districts, 482 Upazilas	<ol style="list-style-type: none"> To identify the genuine fishermen for registration & supply the identity card (ID). To develop the database of genuine fishermen for the better management & sustainable development of the fisheries resources. Financial support (as grant) to the family of decrease fishermen by natural disaster (storm, cyclone & tidal surge) and attack by pirate & crule animals (Tiger, Crocodile & Snake). 	<ol style="list-style-type: none"> Examination & verification of the primary list of the fishermen and finalization of the primary list of the genuine fishermen by concerned upazila committee. Installed Software support service and data entry (with photo) of fishermen's. Provides the one time grants to the family of deceased fishermen by natural calamities for the rehabilitation. 	100%
8.	Integrated Agricultural Productivity Project (IAPP), Fisheries Component. (July, 2011- Dec, 2016)	4682.35	8 Districts 54 Upazila	<ol style="list-style-type: none"> The overall objective of the IAPP is to enhance the productivity of Fisheries in specific agro-economically constrained and economically depressed areas of the 4 districts in the North and 4 districts in the south. The main objectives include productivity increase through develop brood and mass seed production techniques for pond fish culture and introducing adapting aquaculture technologies. 	<ol style="list-style-type: none"> Technology Packages, demonstration, adaptation. Training. Workshop. Module formation. Exchange visit. Printing project documents & materials. 	93%
9.	Fresh Water Prawn Culture extension Project (2 nd Phase) (July, 2012- June, 2017)	6247.13	7 Division, 61 Districts, 400 Upazilas	<ol style="list-style-type: none"> Establishment of one prawn culture demonstration farm cum training center in Eller Char, Satkhira and three training centers in Gopalganj, Barisal & khulna District. Renovation & operation of existing 19 small-scale demonstration hatcheries & nurseries. Establishment of 6 small-scale demonstration hatcheries & nurseries. Operation of Demonstration nursery ponds in potential upazilas of 61 Districts. Skill development training on prawn hatchery and farm management. Extension of GAP & GMP in prawn production & safe aquaculture food production. Prawn brood development in selected public & private farm. 	<ol style="list-style-type: none"> Establishment of Training Centers. Old hatchery renovation work. Galda brood development. Establishment of Prawn Hatchery. Management of Prawn Nursery. Prawn Demonstration Nursery Program. Training program. Extension material preparation. Data base preparation & conservation. Field tour for the beneficiaries (Exchange visit). 	95.42%

SL. No.	Name of the project and Implementation Period	Total PP Cost (Fig. in lakh)	Project Area	Objectives	Major Activities	Achievement (%)
10.	Aquaculture Development & Extension Project (3 rd Phase) in Chittagong Hill Tracts (July, 2012-June, 2017)	7259.05	All Upazilas in Rangamati, Khagrachari & Bandarban districts	<ol style="list-style-type: none"> To increase fish production, enhance income & fulfill the nutritional demand of the household of the hilly people. To develop hilly creeks/wetlands for aquaculture by making dam. To develop nursery for fish fry rearing. To provide training on aquaculture through different technology packages. 	<ol style="list-style-type: none"> Creek development. Nursery development. Establishment of Khagrachari mini hatchery. Spawns and fry production. Training for fish farmers. Repairing & renovation of existing mini hatchery. 	99.39%
11.	Establishment of Beel Nursery and Fingerling Stocking in Inland Open Waters (Feb, 2014-Dec, 2017)	10630.20	Suitable beel and open waters in 60 districts of the country	<ol style="list-style-type: none"> Increase fish production from the capture fisheries through establishment of beel nursery. Develop fish stock in the open water bodies through stocking fingerlings. Improve socio-economic condition of the open water dependent poor fishers. Restore aquatic bio diversity through stocking endangered fish species. Create awareness among the open water dependent people for its sustainable management. 	<ol style="list-style-type: none"> Stocking fingerlings. Training of fishers and fish farmers. Radio/TV advertisement. Workshop/Seminar. Establishment of beel nursery. Group mobilization. 	100%
12.	Neengachi Community Based Aquaculture Project (Sep, 2014-June, 2019)	3700.00	Raiganj and Tarash Upazila in Sirajgonj District and Chatmohar and Bhanura Upazila in Pabna District	<ol style="list-style-type: none"> Introduce community based aquaculture interventions in the public/khas ponds through community mobilization and increase fish production in the Neengachi and adjacent districts. Sustainable aquaculture production from different water-bodies by adopting suitable technologies. Management of good quality broods at hatchery complex ponds and supply to the private and private hatchery owners at affordable price. Produce good quality fish fry and fingerling by using genetically improved broods as well as avoiding inbreeding and maintaining other protocols of fish breeding. Create employment opportunities for the poor beneficiaries and to improve their livelihoods. Improve socio-economic condition and establishment of rights through group formation by involving ponds/water-body surrounding poor and marginal people. 	<ol style="list-style-type: none"> Construction, repair, and renovation of hatchery building. Pond/water-body development. Demonstration to transfer modern fish culture technology. Farmers rally/field day. Institutional capacity building. Empowerment and capacity building for sustainable management. 	99.03%

SL. No.	Name of the project and Implementation Period	Total PP Cost (Fig. in lakh)	Project Area	Objectives	Major Activities	Achievement (%)
10.	Aquaculture Development & Extension Project (3 rd Phase) in Chittagong Hill Tracts (July, 2012-June, 2017)	7259.05	All Upazilas in Rangamati, Khagrachari & Bandarban districts	<ol style="list-style-type: none"> To increase fish production, enhance income & fulfill the nutritional demand of the household of the hilly people. To develop hilly creeks/wetlands for aquaculture by making dam. To develop nursery for fish fry rearing. To provide training on aquaculture through different technology packages. 	<ol style="list-style-type: none"> Creek development. Nursery development. Establishment of Khagrachari mini hatchery. Spawns and fry production. Training for fish farmers. Repairing & renovation of existing mini hatchery. 	99.39%
11.	Establishment of Beel Nursery and Fingerling Stocking in Inland Open Waters (Feb, 2014-Dec, 2017)	10630.20	Suitable beel and open waters in 60 districts of the country	<ol style="list-style-type: none"> Increase fish production from the capture fisheries through establishment of beel nursery. Develop fish stock in the open water bodies through stocking fingerlings. Improve socio-economic condition of the open water dependent poor fishers. Restore aquatic bio diversity through stocking endangered fish species. Create awareness among the open water dependent people for its sustainable management. 	<ol style="list-style-type: none"> Stocking fingerlings. Training of fishers and fish farmers. Radio/TV advertisement. Workshop/Seminar. Establishment of beel nursery. Group mobilization. 	100%
12.	Neemgachi Community Based Aquaculture Project (Sep, 2014-June, 2019)	3700.00	Raiganj and Tarash Upazila in Sirajgonj District and Chatmohar and Bhanura Upazila in Pabna District	<ol style="list-style-type: none"> Introduce community based aquaculture interventions in the public/khas ponds through community mobilization and increase fish production in the Neemgachi and adjacent districts. Sustainable aquaculture production from different water-bodies by adopting suitable technologies. Management of good quality broods at hatchery complex ponds and supply to the private and private hatchery owners at affordable price. Produce good quality fish fry and fingerling by using genetically improved broods as well as avoiding inbreeding and maintaining other protocols of fish breeding. Create employment opportunities for the poor beneficiaries and to improve their livelihoods. Improve socio-economic condition and establishment of rights through group formation by involving ponds/water-body surrounding poor and marginal people. 	<ol style="list-style-type: none"> Construction, repair, and renovation of hatchery building. Pond/water-body development. Demonstration to transfer modern fish culture technology. Farmers rally/field day. Institutional capacity building. Empowerment and capacity building for sustainable management. 	99.03%

SL. No.	Name of the project and Implementation Period	Total PP Cost (Fig. in lakh)	Project Area	Objectives	Major Activities	Achievement (%)
13.	Fisheries Project in Rangpur Division (Jan, 2015-Dec, 2018)	5051.80	40 Upazila, 08 Districts in Rangpur Division	<ol style="list-style-type: none"> To increase fish production through development of degraded water bodies. To conserve biodiversity by establishing fish sanctuaries. To enhance fish production by establishing beel nursery and stocking fish species. To create employment through aquaculture. Skill development of relevant beneficiaries through local training and demonstration. To disseminate aquaculture technologies through local extension agent for fisheries (LEAF). To strengthen institutional capacity by aquaculture and fisheries development. 	<ol style="list-style-type: none"> Development of water bodies through re-excavation and minor infrastructure development. Establishment of fish sanctuaries. Establishment of Beel nursery in beels/flood plains. Aquaculture in unutilized semi open water water bodies (Beels, Canals, Dead River etc.) Construction of earthen Enclosure. Stocking of indigenous fish and fingerlings. Implementation of fish conservation Act. 	99.69%
14.	Brood Bank Establishment Project (3 RD Phase) (Sep, 2014-Dec, 2019)	5542.38	27 Upazilas, 23 Districts	<ol style="list-style-type: none"> Ensuring supply of quality brood and fingerling by addressing inbreeding and cross-breeding problems to the Government and Private Farms. Genetic improvement of broodstock of Carp and SIS species. Supply of quality fry/fingerling at farmers' level. Increase fish production. Employment generation. Poverty reduction. 	<ol style="list-style-type: none"> Modernization of hatchery. Pond development. Installation of water supply system. Construction of structures/repair/renovation. Repair/Construction of boundary wall. 	100%
15.	Culture of Cuchia and Crab in the selected areas of Bangladesh and Research project (July, 2015-June, 2018)	2238.25	Different parts of Bangladesh	<ol style="list-style-type: none"> To develop the techniques for Crab and Cuchia culture in ponds and rice field using habitat development approach To explore of indigenous knowledge on crab and cuchia, and its habitat as well as social aspects regarding community based management of resources To develop capacity of all stakeholders on crab and cuchia culture and management To create employment opportunity for the poor beneficiaries speciall "Adibashi" to improve their livelihoods To promote export of crab and cuchia; and To develop ecosystem healthy of the aquatic resources for better management techniques of crabs and cuchia by improving habitats through participatory method. 	<ol style="list-style-type: none"> Demonstration of Crab fattening and Cuchia culture Data collection and data bank development Construction of Crab Hatchery Development of private entrepreneurs Development of marketing system Exchange visit Training for DoF personnel and fish farmers Project beneficiaries and group mobilization 	99.99%

SL. No.	Name of the project and Implementation Period	Total PP Cost (Fig. in lakh)	Project Area	Objectives	Major Activities	Achievement (%)
16.	National Agricultural Technology Program (NATP-2): Preparation Facility-Fisheries Component (Jan 2015-Sep 2015)	22.70	270 Upazila, 57 Districts	<ol style="list-style-type: none"> 1. To prepare Development Project Proposal (DPP) for National Agricultural Technology Program: Phase-II (NATP-2). 2. To perform preparatory works, appraise the activities to research and extension staff and officials and other stakeholders for launching of NATP-2 with good understanding of stakeholders. 	<ol style="list-style-type: none"> 1. To prepare DPP and create awareness about this project in stakeholders level. 	87.33%
17	Expansion of Aquaculture Technology Services up to Union Level Project (Phase-II) (Mar 2015-Jun 2020)	24228.00	350 Upazilas in 61 Districts, covering 3000 Union of Bangladesh	<ol style="list-style-type: none"> 1. To enhance aquaculture production by introducing improved aquaculture technologies in selected unions ensuring participation of the local fish farmers 2. To create employment opportunities for rural people through expansion of aquaculture enterprises 3. To develop institutional capacity, knowledge and skills of the relevant stakeholders through adequate training and improved facilities 4. To ensure effective participation of local institutions (union parishad) for ration use of aquatic resources for fisheries development 5. To establish Union-based Aquaculture Extension (UAE) system with the joint efforts of the DoF, Union Parishad, LEAF and the local fish farmers for sustaining field level extension services. 	<ol style="list-style-type: none"> 1. Aquaculture extension through LEAF at Union level 2. Upgrading, establishment of training center with dormitory; Repair & renovation of existing DoF training centre 3. Result demonstration farm on different fish culture technology 4. Result demonstration of semi-intensive Carp polyculture technology 5. Result demonstration of mixed culture of galda/bagda with Carp 6. Result demonstration of paddy cum fish culture 7. Pangas culture 8. Monosex Tilapia culture 9. Koi, Shing, Magur culture 10. CBO management of Common Beneficiary Group (CBG) farm 11. Data base preparation & conservation 12. Exchange visit program for DoF/project staff & beneficiaries 	99.99%
18.	Greater Comilla District Fisheries development Project (Jul 2015-Jun 2020)	21823.84	33 Upazilas, 03 Districts, 01 Division	<ol style="list-style-type: none"> 1. To increase fish production utilizing local fisheries resources 2. To create employment opportunities 3. To develop rural economy through aquaculture and fisheries 4. To develop human resources through training 	<ol style="list-style-type: none"> 1. Excavation/re-excavation of Beel/water bodies 2. Excavation/re-excavation of govt. pond and other closed water bodies 3. Establishment of sanctuary 4. Exchange of fishing net 5. Enhance fish act implementation 6. Training on aquaculture 7. Support for alternate income generating activities (AIGAs) 8. Establishment of fish landing center 9. Establishment of pen and cage culture activities 10. Establishment of training center 11. Demonstration of koi, shing, magur etc. culture in pond 	96.99%

SL. No.	Name of the project and Implementation Period	Total PP Cost (Fig. in lakh)	Project Area	Objectives	Major Activities	Achievement (%)
19.	Enhancement of Fish Production through Restoration of Waterbodies Project (Oct 2015-Jun 2019)	25404.43	54 Districts and 231 Upazilas	<ol style="list-style-type: none"> To ensure food security and support to the government's poverty reduction efforts through increase of fish production at sustainable level To increase consumption of fish for the people of Bangladesh To increase income for the poor and marginal farmers through fish culture interventions To increase income and employment of small scale fish seed traders and producers To provide initial training and extension service and inputs for aquaculture interventions To ensure involvement of poor beneficiaries group in aquaculture practices with improved technology packages established by the Department of Fisheries To produce marketable fish. 	<ol style="list-style-type: none"> Re-excavation (Pond, dighi) Re-excavation (Silted Beel/Dead river/canal) Construction of pipe culvert 	96.13%
20.	Wetland Biodiversity Rehabilitation Project (Jul 2009-Jun 2016)	7835.50	9 upazilas in Pabna, Sirajganj and Natore districts	<ol style="list-style-type: none"> To improve the natural resource management system (NRMS) in the command area. To increase the income of wetland dependent families as well as fish production. To increase the populations and numbers of species present for key wetland dependent wildlife. To improve the biodiversity of the wetland. 	<ol style="list-style-type: none"> Excavation/ re-excavation of floodplain basin. Establishment of sanctuary & restoration of habitat. Community mobilization and training. Stocking of fingerlings and endangered species. Support for alternate income generating activities (AIGs). 	84.73%
21.	Strengthening of Fisheries and Aquaculture Food Safety & Quality Management System in Bangladesh (BEST project) (July 2010- Dec 2016)	10595.02	All over Bangladesh	<ol style="list-style-type: none"> To strengthen the national quality infrastructure for fish and fish products to meet safety and quality requirements in export markets, improve competitiveness and take advantage of global market opportunities, particular in EU market. 	<ol style="list-style-type: none"> Laboratory Accreditation fee & Assessors Training. Water/soil testing kit box (for QCW, Upazila office & Demo Farmers). Network installation. Construction of FIQC laboratory building. Creation of ice preservation facilities at depots (private owner). 	100%
22.	Climate Resilient Ecosystems and Livelihoods (DoF Part) Project (July 2013-Sep 2016)	10271.86	9 Districts and 27 Upazilas	<ol style="list-style-type: none"> Adapt and expand successful co-management models to conserve wetlands, ecological critical areas (ECAs), improve governance of wetland resources and biodiversity, and increase resilience to climate change through improved planning and livelihoods diversification. 	<ol style="list-style-type: none"> Survey (including image acquisition) Community grants/Landscape development Fish catch monitoring and migratory bird survey and monitoring Support to RUCs, CBOs and new group formation Value chain/Eco-tourism/AIG activities Carbon inventory including field survey/carbon pool estimation Study on participatory climate vulnerability Landscape level planning for wetlands and Protected Areas (PAs) Satellite-based land use change trend analysis (study for REED+) Survey on Financial Literacy training needs in CREL areas Eco-tourism management study at various wetlands/PAs Study on CMOs/CBOs sustainability Potential threat assessment in wetlands and ECAs Training to Enhanced knowledge and capacity of stakeholders Habitat Restoration/Swamp plantation 	100%



www.fisheries.gov.bd