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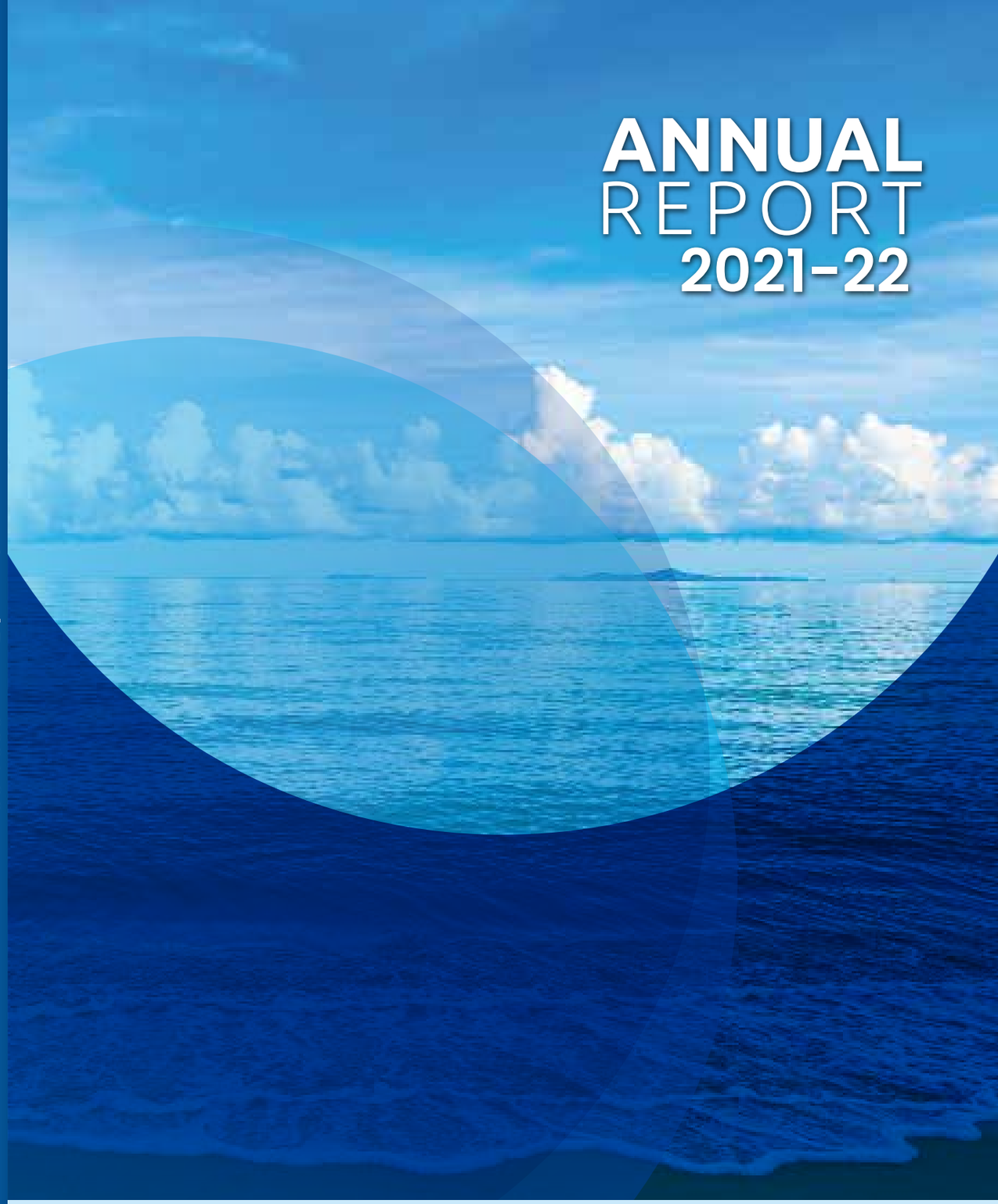
Annual Report 2021-22



ANNUAL REPORT 2021-22

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Ministry of Fisheries and Livestock

Annual Report 2021-22

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Annual Report 2021-22

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Preface

The fisheries sector of Bangladesh is contributing significantly in food and nutrition security through consistently providing safer and good quality animal protein, which eventually contributes to achieve the set targets of SDGs by 2030 and government vision 2041. Already Bangladesh became one of the world's leading fish producing countries with a total production of 4.76 million MT. Moreover, fisheries being economically more remunerative, have been identified as the major means of rural employment, poverty alleviation and foreign exchange earnings. On the other hand, the consumers increasing demand and preference as a safe animal protein source, the processed fish market in Bangladesh is gradually flourishing, and seems that canned, dried and smoked fish has enormous potentials.

To highlight the sector-wise production of fish is the main purpose of this annual report, with a specific focus on its potential and uplift the rural livelihood, economic development and of self-reliant Bangladesh. This report brought-out the ongoing interventions, extension activities, innovations in fisheries, food safety and quality control measures, implementation of regulatory framework, brief information on inland and marine fisheries resources, gender perspectives, etc. being implementing by the Department of Fisheries and the progress so far achievement in 2021-22.

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 useful to all concerned involved in fisheries development, extension, research and education. Scope for further improvement of this report in future is still remains, so feedback from valued readers is always welcomed.

(Kh. Mahbubul Haque)

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ABBREVIATIONS AND ACRONYMS

BARC	Bangladesh Agricultural Research Council
BBS	Bangladesh Bureau of Statistics
BFRI	Bangladesh Fisheries Research Institute
BFD	Bangladesh Forest Department
BFDC	Bangladesh Fisheries Development Corporation
CEGIS	Center for Environment and Geographic Information services
CWB	Cultured Water body
DoF	Department of Fisheries
FAO	Food and Agriculture Organization
FD	Forest Department
FY	Fiscal Year
FRSS	Fisheries Resources Survey System
GAP	Good Aquaculture Practice
GDP	Gross Domestic Product
GED	General Economics Division
GI	Geographical Indicator
GO	Government Organization
GoB	Government of Bangladesh
Ha	Hectare
HACCP	Hazard Analysis Critical Control Point
MoFL	Ministry of Fisheries and Livestock
MPA	Marine Protected Area
NFS	National Fisheries Strategy
NFP	National Fisheries Policy
NGO	Non Government Organization
NOC	No Objection Certificate
MT	Metric Ton
Kg	Kilogram
PL	Post Larvae
SPARRSO	Space Research and Remote Sensing Organization
SDG	Sustainable Development Goal

Chapter 1

Introduction

Fish has always been an integral part of Bengali culture and tradition. Bangladesh is one of the countries to have such a diversity of fish species. To keep conserving and producing these fisheries resources, the father of the nation Bangabandhu Sheikh Mujibur Rahman formally started fish farming into a social movement by releasing fish fry at Ganabhaban lake in 1973. Bangabandhu being a visionary leader predicted that fish would be the second major foreign currency earning resource of Bangladesh. The father of the nation's dream has been fulfilled due to various fish friendly programs and dynamic development strategies taken under Honorable Prime Minister Sheikh Hasina.

The water resources have driven Bangladesh to be one of the world's leading fish producing countries. The success of Bangladesh regarding fish production is now appreciated and recognized all over the world. In 2021-22, the fish production is 47.59 lakh MT whereas the set target was 46.64 lakh MT. Through this remarkable achievement, Bangladesh became self-sufficient country in fish production since 2016-17. The fisheries sector plays an important role of animal protein consumption, employment opportunity, foreign earnings, maintaining aquatic diversity and uplifting socio-economic development of Bangladesh. It contributes 2.08% to national GDP and 21.83% to agricultural GDP. Now, per capita fish consumption attains 63 grams/day against the set target of 60 grams/day. This sector provides more than 12% employment opportunity of the total population directly or indirectly.

The favorable geographical position of Bangladesh comes with a large number of aquatic species and provides plenty of resources to support fisheries potentials. The fish production has unfurled because of vast area of water. Bangladesh is named 'the land of rivers' because of its criss-crossed rivers and ponds, beels, haors, baors, lakes, ditches, flood plains and vast marine areas, which are the blessings for fisheries sector. Achievement of fisheries sector comes from three broad areas: inland capture fisheries (38,60,772 ha), inland aquaculture (8,45,399 ha) and vast marine fisheries of which inland aquaculture sub-sector is contributing more than 57.39%, capture 27.78% and marine 14.83% of the total production. According to the FAO report ***The state of world fisheries and aquaculture 2022***, Bangladesh ranked 3rd in inland open water capture production, 5th in world aquaculture production, 4th around the globe and 3rd within Asia in tilapia production. Bangladesh ranked 2nd position in terms of average growth rate of fish production during last ten years. Bangladesh ranked 1st among 11 vital Hilsa consuming countries.

Coastal aquaculture is comprised of both shrimp/prawn and finfish. Shrimp farming in ghers has been expanding in coastal belt. Presently farmers, following Good Aquaculture Practices(GAP) are becoming more interested to adopt eco-friendly shrimp farming system and cluster farming approach. Tiger shrimp/Bagda has achieved Geographical Indication Registration Certificate as 'Bangladesh Tiger Shrimp' in 2022. As Shrimp is one of the major export item, government of Bangladesh has taken up different programs to increase

shrimp production through dissemination of appropriate technology, promote business friendly supply chain ,strong monitoring in processing and export etc. With the government different intervention, total shrimp and prawn production including capture has been increased from 1.00 lakh MT in 2002-03 to 2.61 lakh MT in 2021-22.

Bangladesh is a role model for Hilsa production in the whole world. Hilsa is our national fish and it got GI (Geographical Indicator) certificate. For this prestigious GI certification, our national fish Hilsa is named as 'Bangladesh Ilish'. Bangladesh produces over two-thirds of total production of Hilsa in the world. We are known as Hilsa's country. In 2021-2022, the production of Hilsa is 5.67 lakh MT which contributes 11.91% of total fish production that is the highest as a single species. This contribution is estimated 1% percent to the country's GDP. Hilsa production is increased here about 89% during last 12 years.

Ensuring production of safe and quality fish and fish products is one of the mandates of the Department of Fisheries. To achieve this mandate, Department of Fisheries ensure implementation of Good Aquaculture Practice (GAP) and Hazard Analysis & Critical Control Point (HACCP) management systems at every steps of production of fish & shrimp. In order to ensure safe fish production in the light of international demand, The Fish and Fish Products (Inspection and Quality Control) Act, 2020 is implementing by the department. The Aquaculture Medicinal Products Control Guideline and National Residue Control Plan (NRCP) is implemented by the Department of Fisheries. As a result of the implementation of the mentioned activities, despite the financial recession in the world market. In 2021-22 fiscal year, Bangladesh earns 5191.76 crore taka against 74042.67 MT fish and fisheries products. Here only shrimp (Galda+Bagda) earns 3636.59 crore taka against 30571.4 MT. Frozen shrimp/ prawn, life fish, frozen fish, chilled fish, dry fish, salted/dehydrated fish, crab, sharp fin/fish maws and others were the export items of fish and fisheries product.

Promoting aquaculture and shrimp farming through extension services, management of wetlands, conservation of the freshwater and marine water fisheries, application of information technology in aquaculture and open water fisheries, optimization of fish inspection and quality control programs and acceleration of farm mechanization have been adopted to reach the target. Well-equipped DoF personnel has been rendering e-extension services through different apps to the root-level farmers in remote areas. Laws and acts have been formulated and amended for quality fish and shrimp production.

Bangladesh has achieved the visionary target of being middle income country in 2021 which is the golden jubilee year of our independence. The strategies and policies adopted and amended by the Department of Fisheries (DoF) targeted the 'Sustainable Development Goals (SDGs)' under the guidance and dynamic leadership of the honorable Prime Minister Sheikh Hasina and also the 'Vision 2041'has been adopted in line of 'Vision 2021' to provide stimulant to the development dream of the nation.

1.1 History of the Department of Fisheries

Department of Fisheries, Bangladesh was first established in the undivided Bengal of the

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

1.2 Vision, Mission and Mandate

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

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

Mandate

- Dissemination of improved aquaculture technologies through training and demonstration and to extend advisory services to the farmers;
- Enhancing fisheries resources through facilitating conservation and management measures;
- Assisting the administrative ministry in formulation of policies, acts etc;
- Enforcing quality control measures and issuance of health certificates for exportable fish and fish products;
- Conducting fisheries resources survey and assessment of stock to develop fisheries data base for proper planning;
- Facilitating arrangement for institutional credit for fish and shrimp farmers, fishers and fish traders;
- Facilitating alternative income generating activities for rural poor and unemployed people towards poverty alleviation; and
- Formulation and implementation of development projects towards sustainable utilization of fisheries resources to ensure food security.

8th Five Year Plan (FYP)

Strategic objectives of 8thFive Year Plan

The key objectives for the sector were established as:

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, combat climate change impact, conserve biodiversity and improve public health;
f. Resource management including manpower development for ensuring optimum productivity, sustainability of production and conservation of fisheries resources;
g. Marketing safe and quality fish in the domestic and international market;
h. Accelerate harvesting of fish commercially;
i. Establish and maintain fish and wetland sanctuaries which will comprise complete ban on fishing in certain eco-sensitive areas;
j. Strict implementation of the fish act, 1990;
k. Assist the fisher folk accessing social safety nets program like VGD and VGF and alternative livelihoods support;
l. To harness the potential of blue economy, stock assessment of marine fisheries and sustainable exploitation of marine fishes, especially tuna and tuna like other pelagic fishing;
m. Transformation of livelihood to reduce fishing pressure on sea.

Strategic objectives: The key objectives of the NFP (National Fisheries Policy), 1998 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; and
e. Maintain ecological balance, conserve bio-diversity and improve public health.

Development targets of the fisheries sector

The following targets to be achieved in the fisheries sector has determined in the 8th Five Year Plan align with perspective plan and SDGs :

- Increased 12.50% aquaculture and 11% fish production by 2025 from baseline year 2019-20;
- Increased 15% marine fisheries production by 2025 including Hilsa;
- Raise per capita fish intake available to 64 g/day from domestically produced fish and fisheries product by 2025;
- Raise export to 1.00 lakh MT by 2025 from frozen shrimp, fish and value added fish products.
- Ensure quality seed and feed at growers level;
- Replenishment at least 50% of endangered fish species in sanctuary areas by 2025;
- Creation of 20% employment opportunity for unemployed youths;
- Fish farmers/ fishers income raise to 30% by 2025;
- Harness the potential of blue economy, stock assessment of marine fisheries and promote sustainable exploitation of marine fishes, especially tuna and tuna like other pelagic fishing;
- Promote value chain in fish and fisheries products;
- Ensure safe and quality fish supplies in the domestic and international market;
- Value chain development of fish and fisheries products.

1.3 Organizational Setup

DoF has the following wings to render its services for the development of fisheries sector:

- Inland Fisheries
- Marine Fisheries
- Fisheries Resource Survey System (FRSS)
- Fish Inspection and Quality Control (FIQC and
- Training for Human Resource Development.

1.3.1 Manpower under revenue

In line with the Vision-2021 of the present democratic government in Bangladesh, the country is now well-prepared to succeed in its motive for a Digital Bangladesh. While Bangladesh is taking great strides towards holistic and sustainable development, Department of Fisheries has been working hard since its inception to render the services and responsibilities for sustainable fisheries production and socio-economic development by providing modern and effective aquaculture technologies and efficient fisheries management practices to the fishers. The organization holds 5960 positions under the Director General (DG) along with 1 Additional Director General (ADG), 8 Principal Scientific Officer/Directors. There are 25 Deputy Directors including 8 divisional Deputy

Directors, 64 District Fisheries Officers, 71 Senior Assistant Directors, 487 Senior/Upazila Fisheries Officers and other staff members. Regardless, there is insufficient number of staff and manpower with various crucial positions remaining vacant. Manpower structure/ sanctioned under revenue budget and manpower in position of DoF is shown in the following table.

Table 1.1. Manpower under revenue budget and manpower in position

Class		Sanctioned Posts	Posts in Position	Vacant Posts
1		2	3	4
Class-I	Cadre	1306	642	664
	Non-Cadre	333	265	68
Class-II		665	297	368
Class-III		2118	1673	445
Class-IV		1538	1313	225
Total		**5960**	**4190**	**1770**

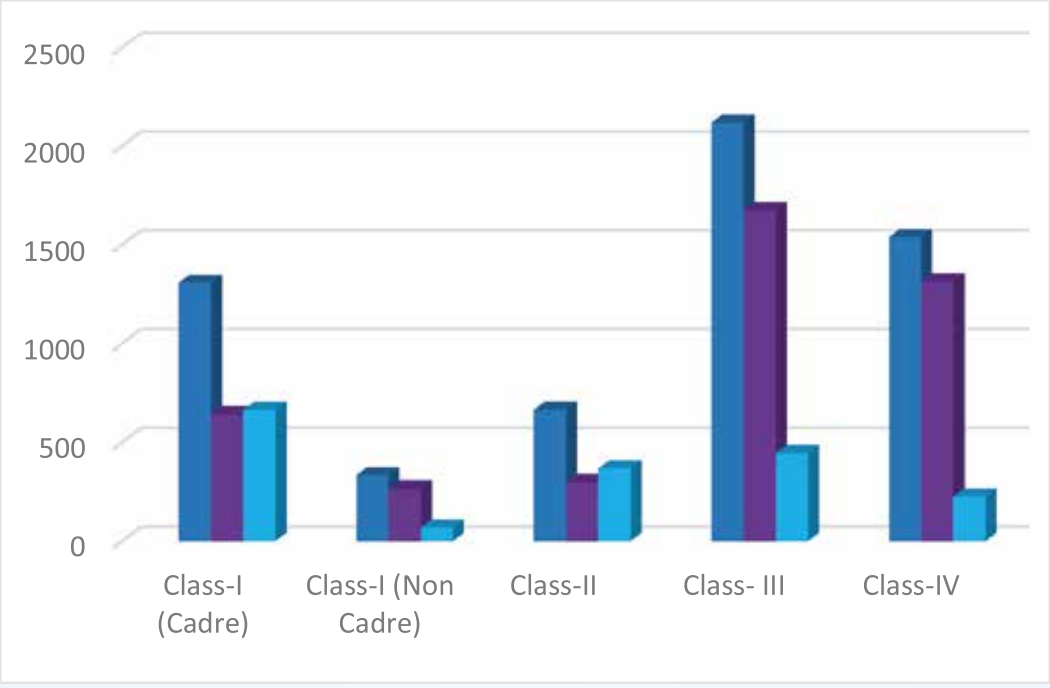
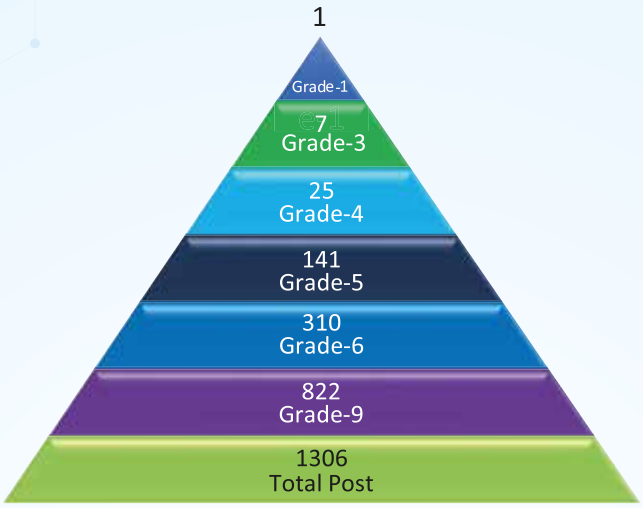


Fig. 1.1: Manpower under revenue budget and manpower in position

Appropriate institutional framework with adequate skilled manpower is indispensable to face future challenges for sustainable fisheries development. DoF is trying to strengthen its institutional capacity for ensuring prompt, trouble-free, people oriented and efficient service delivery system with adequate professionally committed manpower ,logistic supports and legal frameworks for efficient discharge of assigned duties and responsibilities.

A way forward to institutional capacity of DoF is mentioned below in brief:



Existing post

Fig. 1.2: Manpower status

1.4 Budget allocation

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

1.4.1 Revenue budget

Activities which include expenditures of pay and allowances, supplies and services, repair-maintenance and rehabilitation, miscellaneous, procurement of civil works and projects and program apart from Annual Development Program(ADP) fall under revenue budget. During the last five years, non-development budget of DoF is shown below.

Table 1.2 Non- Development budget of DoF (Taka in lakh)

Economic Group/Code	Description	2017-18	2018-19	2019-20	2020-21	2021-22
3111	Pay of Officer	5394.43	6591.23	7426.11	7194.50	6708.81
3111	Pay of Staff	4878.93	5431.40	5103.80	5318.18	5205.44
3111	Allowances	7324.56	8702.71	9222.04	9304.54	10872.80
3211-3257	Supplies and Services	6833.46	6212.16	7282.05	7114.05	7315.26
3258	Repair & Maintenance	761.62	546.82	768.74	754.06	894.77
4111	Civil Works	316.00	340.67	30.00	30.00	57.00
4112-4113	Assets Procurement	375.00	338.35	439.63	423.39	799.19
8113	Land	90.00	160.00	0.00	0.00	0.00
1200	Special Activities	0.00	180.00	180.00	240.00	480.01
	Total:	**25974.00**	**28503.34**	**30452.37**	**30378.72**	**32333.28**

1.4.2 Development budget

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

Table 1.3. Development budget of DoF (Taka in lakh)

Financial Year	Number of Project	Development budget						Achievement
		Allocation			Expenditure			
		Total	Local Currency	Project Aid	Total	Local Currency	Project Aid	
1	2	3	4	5	6	7	8	9
2017 -18	18	34961.00	25787.00	9174.00	33881.42	25064.48	8816.94	96.92%
2018 -19	14	35885.00	25993.00	9892.00	35464.59	25746.25	9718.34	98.83%
2019 -20	10	34648.00	26071.00	8577.00	24645.49	18544.30	6101.19	71.13%
2020 -21	13	47603.00	26208.00	21395.00	44858.45	24368.12	20490.33	94.23%
2021 -22	14	62983.00	26230.00	36753.00	54315.88	24767.42	29548.46	86.24%

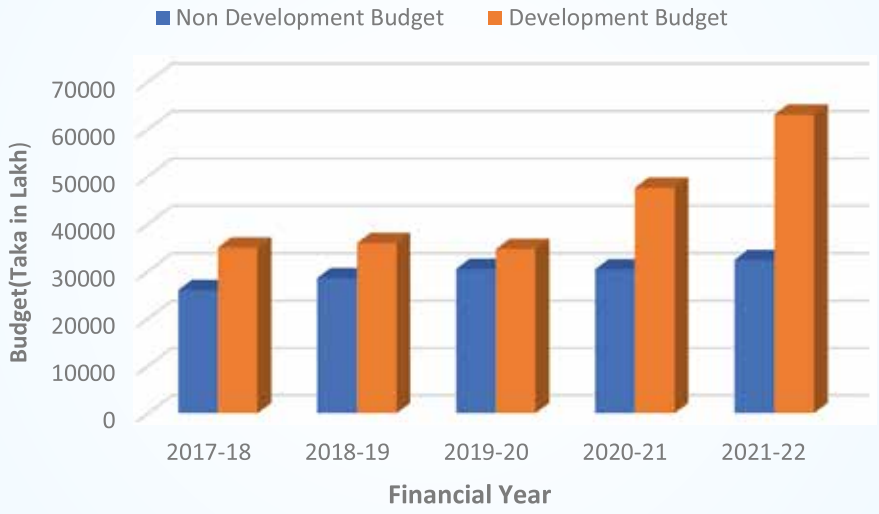


Fig. 1.3: Development and Non-Development budgetary allocation of last five years.

1.5 Revenue earnings

There are two major sources of government revenue earnings:

Tax Revenues (TR); and
Non tax Revenues (NTR)

All revenue earning by the DoF is non-tax revenues. During last five years, non -tax revenue earned by the DoF is shown below:

Table 1.4. Non tax revenue earned in last five years (Taka in Thousand)

Code No.	Description	2017-18	2018-19	2019-20	2020-21	2021-22
1421301	Rentals-non residential	85	512	365	283	563
1421302	Rentals-residential	1122	1825	2531	1655	1282
1422199	Other license fee	0	0	28659	26106	34388
1422202	Farms and companies registrationfee	0	0	1662	973	665
1422326	Examination fee	0	0	0	14797	0
1422328	Tender documents fee	23	116	677	20	176
1423204	Fee for using government vehicle	475	27	23	52	82
1423213	Sale of fish and fish products	31575	31344	93794	137718	127454
1423226	Sale of used paper and stationery	2943	242	1385	936	272
1431101	Penalty	5563	6030	3927	7602	8392
1431103	Forfeiture	0	0	7	1402	651
1441202	Recovery of over payment from prior years	51	440	87	1271	918
1441299	Other receipts	3201	2242	9282	24659	13594
	Total:	**45038**	**42778**	**142399**	**217474**	**188437**

Chapter 2

Fisheries Resource Management

Bangladesh is enriched with vast fisheries resources. Due to favorable natural conditions and geographical location, these fisheries resources have a high potential of increasing fisheries production. The fisheries resources of our country 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 occupy an area of 47.06 lakh ha and marine capture covers 1,18,813 sq.km along with 200 nautical miles of EEZ from the base line. The culture fisheries include ponds, ox-bow lakes and coastal shrimp farms. The flood-plains and the beels, which cover an area of 27.60 lakh ha, offering tremendous scope and potential for augmenting fish production by adopting aqua-ecosystem based enhancement techniques.

Fig. 2.1: Snapshot of a Haor in Kishoreganj Baor in Jashore

The country has huge opportunities for the development of brackish water aquaculture boosting shrimp production and earning substantial amount of foreign currencies. Production of shrimp from culture and capture fisheries increased to a great extent in the beginning of 1980's. Since then, shrimp farming has been expanded to over 2.63 lakh ha of land by 2021-22 from 1.4 lakh ha in 1980. It is expected that with the introduction of improved scientific method of shrimp culture, the present production of shrimp will be increased substantially. The country has limited access to marine fisheries resources in the Bay of Bengal. Only 14.83% of total fish production comes from marine capture fisheries and 85.17% from inland fisheries. The status of fisheries resources and fish production of the country is shown in

Fig. 2.2: Fish Production during the last five years

The present democratic government has undertaken new policy for sustainable aquaculture production; provide need based aquaculture extension services, implements fish conservation activities which increased the national fisheries production as well as the fisheries sector. Besides these, fisheries extension and conservation activities, AIGA and rehabilitation program for poor fishers were undertaken. Through the execution of Fisheries Friendly Policy of the present government, total fish production has been increased from 35.48 lakh MT in 2013-14 to 47.59 lakh MT in 2021-22.

2.1. Aquaculture extension approach

DoF is serving and carrying out its extension services with a good number of professionals at different hierarchies. DoF motivates and facilitates fish farmers and fishers for adopting eco-friendly management regimes in aquaculture and fisheries resource management to enhance production and productivity. It provides updated research findings and better farm techniques to farmers/growers for increasing production through establishing effective linkage between the various research institutes and the fish farmers. DoF also serves as liaison agency between both public and private organizations.

Different approaches and strategies of aquaculture have been adopted under different projects. Extension services include technical advice on all sorts of aquaculture and related activities, user-friendly mobile apps, publication and distribution of booklets, posters, leaflets etc.

In addition to regular revenue budget-led extension and advisory services, following approaches are also focusing aquaculture and fisheries extension:

Key interventions:

- Dissemination of improved aquaculture technologies through training and demonstration and render extension advisory services to the focal stakeholders;

- Production of quality seed and supply to other waterbodies for aquaculture including production of quality brood fishes and supply to other private hatcheries;
- Enhancement of fisheries resources through habitat restoration and enacting conservation and management measures;
- Establishment of demonstration farms, fish fair, exchange visit, supply of leaflet, posters and extension of new innovative technologies to the farmers;
- Establishment of fish sanctuaries to protect ecologically threatened and endangered fish species and conserve other aquatic species;
- Beel nursery establishments and fingerling stocking to recruit and augment indigenous fish species in the waterbodies;
- Fish feed and seed producer industries/hatcheries registration and quality control of it.
- Collection of shrimp/ fish samples to diagnose pathogens and reporting to World Organization for Animal Health (WOAH);
- Licensing of fishing trawler and vessel, mechanized and non-mechanized artisanal and commercial boats;
- monitoring, control and surveillance (MCS) of marine fishing and control on Illegal, unreported and unregulated (IUU) fishing;
- Socio-economic development of fishermen and giving VGF to them in the context of hilsa fishery development;
- Taking interventions regarding Alternative Income Generation Activities (AIGA) for fishermen.
- Enforcement regarding quality control measures and issuance of health certificates for exportable fish and fish products;
- Inspection of consignment for exportable fish and fishery products and implementation of National Residue Control Plan;
- Conducting fisheries resources survey and assessment of stock to develop fisheries database for proper planning;
- Facilitation of rural poor and unemployed people through alternative income generating activities towards poverty alleviation;
- Formulation and implementation of development projects /programs towards sustainable utilization of fisheries resources to ensure food security;
- Implementation of fisheries relation Act, Rules, Regulations, Guideline and policies regarding fisheries conservation, quality control of seed, feed and fish etc;
- Taking interventions regarding climate resilient aquaculture and fisheries development;
- Dissemination of improved aquaculture technologies through e-Extension service.

2.2 Fish seed & post larvae production

2.2.1 Fish seed produced in hatchery/farms

The Government of Bangladesh established Fish Seed Multiplication Farms (FSMFs) from the year 1961-62 to 1974-75 to supply required quantity of quality seeds to the fish farmers.

During that period, mostly wild fish seeds collected from the rivers were reared in the FSMFs and supplied to the fish farmers. Eventually, in the mid 60s, the availability of wild carp seeds tends to decline in the rivers and the natural fish seeds were not able to meet the growing demand of the fish farmers. The Govt. established fish hatcheries to produce quality fish seed and at the same time introduced the induced breeding technology and disseminated to the private sectors. At present the country is self-sufficient in carp seeds production, though quality fish seeds are produced in a limited scale. For that, DoF has promulgated Fish Hatchery Act, 2010 and Fish Hatchery Rules 2011 for the production of quality spawn and fingerlings for regulating fish hatchery and farms.

Table 2.1: Production of carp hatchling in last 5 (five) years

	2018		2019		2020		2021		2022	
Source of Production	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)
1	2	3	4	5	6	7	8	9	10	11
Government fish farm	102	12059	103	13485	102	14924	102	19460	103	15498
Private hatchery	824	674695	935	650535	1068	972910	1055	928570	874	611787
Total	**926**	**686754**	**1038**	**664020**	**1170**	**987834**	**1157**	**948030**	**977**	**627285**

Table 2.2: Production of fry in last 5 (five) years

Year	Govt. Nursery (Production in Lakh)	Private Nursery (Production in Lakh)
1	**2**	**3**
2018	277	82236
2019	338	82116
2020	441	95,726
2021	298	92051
2022	390	110635

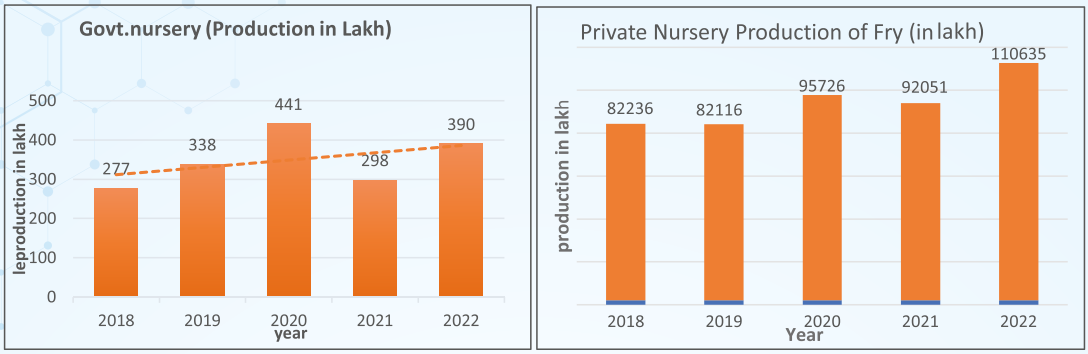


Fig. 2.3: Fry production during 2018-2022

DoF has taken initiative to produce quality brood fishes through Brood Bank Development Project which are free from genetic drifts and in-breeding problems. Both Government and private fish hatcheries are producing quality brood for the production of quality hatchlings and fingerlings.

Fig . 2.4: Induced breeding in carp hatchery

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 various rivers. In 2021-22, spawn are collected from the river Jamuna, Padma, Arial Khan, Gorai/Modhumati, Brahmaputra and Halda of Chattogram. Among these rivers, the river Halda is a unique natural breeding ground for the carp fishes. It is called the only one pure natural gene bank. On the occasion of Bangabandhu Sheikh Mujibur Rahman's birth centenary, the Halda river is declared by the government as the 'Bangabandhu Matsya Heritage'. Availability of hatchlings from natural sources is declining due to habitat destruction and change in ecological system and climate change. The natural sources of carp hatchling production during 2016 to 2022 is shown in the table below.

Table 2.3. Carp hatchlings collection from natural sources

Year	Fish hatchling (Kg)
2016	4819
2017	5067
2018	9274
2019	2496
2020	2606
2021	2152
2022	1855.10

Fig. 2.5: Fertilized eggs collection from Halda river

2.2.3 Shrimp and prawn PL production in hatchery

With the advanced breeding technology, many private entrepreneurs have started to establish shrimp/prawn hatcheries for PL production. About 50 shrimp and 39 prawn hatcheries are being run by both public and private sectors, producing 833 crores of Bagda and 6.72 crores of Galda PL in 2021-2022 fiscal year..

Table 2.4 :Production of Bagda and Galda PL in 2021-22

Year	Bagda hatchery		Galda hatchery		Remarks
	Hatchery Number	Production (crore)	Hatchery Number	Production (crore)	
2021-2022	50	833	39	6.72	Galda hatchery-39 [public (DoF)-27, public(BFRI-01),private-11]; Bagda hatchery 50 (all are private).

• Source: Yearbook of Fisheries Statistics of Bangladesh, 2021-2022.

Table 2.5: Production of Galda and Bagda PL over the last 05(five) years

Species		2018		2019		2020		2021		2022	
		Hatchery Number	Production (crore)	Hatchery Number	Production (crore)	Hatchery Number	Production (crore)	Hatchery Number	Production (crore)	Hatchery Number	Production (crore)
Galda		46	5.21	35	1.58	33	2.36	33	2.37	39	6.72
Bagda		49	1412.04	42	979.37	43	792.952	44	721.04	50	833
Total		95	1417.25	77	980.95	76	795.31	77	723.41	89	839.72

Source:. Yearbook of Fisheries Statistics of Bangladesh, 2021-2022.

2.3 Fresh water aquaculture

The country has immense natural potential for developing the fisheries sector. Aquaculture production contributes 57.39 % of the total fish production. Through this remarkable achievement, aquaculture is high priority and focused area during the recent past decades. Because of continuous deterioration of open water fisheries due to natural and man-made changes in the fish habitats and fish populations, the Government is trying hard to increase fish production through aquaculture. The development of long-term efficient and effective aquaculture training and extension support has contributed to the growth in aquaculture production in Bangladesh.

2.3.1 Fresh water fish culture in ponds

Currently pond aquaculture has been practiced in a total area of about 4.106 lakh ha and pond aquaculture is producing about 21.66 lakh MT fish in 2021-2022.

Table 2.5. Status of pond culture (2021-22)

Culture Method	Production Range	Number of Pond	Area (Ha)	Production (MT)
Extensive	*<1.5MT/Ha*	4,83,037	31,681	43,451
Semi-intensive	*1.5-4 MT/Ha*	14,05,302	2,39,129	8,91,921
Intensive	*>4 - 10MT/Ha*	5,35,945	1,20,889	8,79,565
Highly Intensive	*>10 MT/Ha*	77,904	18,984	3,51,778
Total		**25,02,188**	**4,10,683**	**21,66,715**

• Source: Yearbook of Fisheries Statistics of Bangladesh, 2021-2022.DoF

2.3.2 Aquaculture through Carp fattening method

Carp fattening aquaculture has drawn a special attraction to northern and north-western districts of the country. The method in which large size carp fry or fish (250 g to 02 kg) are stocked in ponds for 06 months to 01 year or more and relatively large fish (02 kg to 08 kg or more) are produced is called 'Carp Fattening'. Due to the optimal use of all nutrients and natural feed through ideal biological management, the production of mixed fish in this technology is high. Cultivation of this fish by Good Aquaculture Practices reduces the risk of farming, increases profitability and produces safer fish. The larger sized live fishes produced through carp fattening method are brought to Dhaka and other cities of countries, as a result fish farmers get a high price.

Fig. 2.7: A few shots of Carp fattening

2.3.3 Fish culture in baor (Ox-bow Lake)

There are 600 baors situated in the south west part of the country, occupying an area of 5,671 ha, produce fish in large scale. Fishermen who live surrounding the baors, culture fish and earn their livelihood from there. Update and appropriate training is being provided to the fishermen so they can culture fish skillfully. According to the Yearbook of Fisheries Statistics of Bangladesh 2021-22, average production of baors is 2060 kg per hectare and total production is 11685 MT.

Fish production in six baors of Jashore and Jhenaidah districts has been taken under an MoU between Ministry of Land and Ministry of Fisheries & Livestock. In 2021-22, 575.55 MT of carp fishes and 333 MT of Small Indigenous Species (SIS) were produced from six baors under DoF management. Local fisher communities are involved in the baor management and they have improved their livelihood. The six baors are running with the permanent revenue employee of DoF and structure in the name of Baor Fisheries Development Project. Six baors are playing an important role to produce fish naturally by applying no feed, fertilizer, lime, insecticides etc. but only stocking fish fingerlings to these waterbodies. DoF is involved with community development, fish act implementation, fish sanctuary maintenance, training, fish culture and management advice, biodiversity conservation etc. along with fish production. These baors have not only been carrying it role to produce fish and earn revenue but also acting as an effective means to maintain livelihood and reduce poverty of the 989 family members of the fishermen with developing their socio-economic status. These baors have been playing a vital role as reservoirs of local indigenous fish species nearly going to be extinct, threatened, vulnerable and critically endangered. Major carps, pangas, boal, shol, gazar, koi, shing, magur, tilapia, nilotica, shar puti/thai puti, cuchia, other indigenous fishes, different shrimps, various exotic carps are available in baors.

Socio-economic development of the fishermen of 6 baors with Baor Development Project (Rev) under DoF:

Fishermen of 6 baors with Baor Development Project (Rev) under DoF in Jhenaidah and Jashore districts maintain their livelihood depending on the baor fishery. Fishermen get 40% of carp fishes and 100% of Small Indigenous Species (SIS) that help directly maintaining their livelihood. The poor fishermen live on the bank of the baors having Fisherman Identity Card (FID) get their access to fish in the pertaining baors with paying nominal amount of license fee. According to the 'Guideline of production, marketing and management of fish seed and fish from fish seed multiplication farms and baors 2019'' all fishermen take part in the meeting arranged by group leaders and group leaders being a member of local baor management committee take part in the meeting at every month, explain their problems and get solution.

Fishermen and their family members consume more fish and can get more protein and minerals from fishes specially SIS. The children along with the family members of fishermen can boost up immunity to defend many diseases by eating more fishes. Fishermen jointly protect baor from poaching of fishes and they become committed to abide by the 'Fish Protection and Conservation Act 1950' and not to catch mother fish and juvenile fishes from baor. In this way, local indigenous fish species regenerate by getting time to reproduce, enough time to be reared up and get chance to survive in the dry season to reproduce for the next breeding season.

Fishermen produce fish naturally in the 06 baors and they do not apply any feed, fertilizer and detrimental chemicals to the carp fishes stocked. Various types of indigenous fish species are produced naturally. For that reasons, many indigenous even endangered and

critically endangered fish species are still now found in these baors. These baors are performing as a live gene bank of various indigenous fish species.

Fig.2.8: Fish harvesting in Baor in Jashore

2.3.4 Cage culture

Several decades ago, attempts were taken to raise fish in cages under different development projects by several institutions / organizations of the country. Nowadays, cage culture is very popular, interesting and attracting means of livelihood and people are engaging themselves day by day in this culture system with fish species like monosex tilapia/nilotica, pangas, koi, shing, magur, thai swarpunti etc. Cage culture is majorly being practiced in Chandpur, Laxmipur, Bhola, Dhaka, Faridpur,Madaripur, Narsingdi, Pabna, Sirajgonj and other regions of the country. In 2021-2022, about 5021 MT monosex tilapia/nilotica fishes were produced by cage culture in 1,75,000 cubic meters (total no of cages 9412), that means in per cubic meter, average production is 29 kg. There are maximum no. of cages 2440 was in Chandpur district.

Fig 2.9: Cage culture in open water in Faridpur district

2.3.5 Pen culture

Pen culture is also one of the potential means of producing fish from vast water body or canal .In recent years, pens are made with different materials like bamboo, net, iron-meshed, wooden pillar etc. The area of pen also varies size from half 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-owner are found in pen management. Culture period

also varies from June to December depending on availability of water. Pen culture is becoming popular in and around Dhaka and Narayangonj and expanding every year. In 2021-22, about 15063MT fish were produced from pen culture area of 7708 hectares.

Fig 2.10: Pen culture in Narayanganj

2.3.6 Fresh water mud eel (cuchia) culture

Monopterus cuchia 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 old Sylhet, Mymensingh and Tangail Districts. But nowadays, this fish is hardly found in the open water area. The biodiversity, ecosystem of natural water bodies are being decreased due to global warming and climate change. M. cuchia is exported to many countries of south East Asia and Europe. In 2021-22, 9488 MT cuchia is produced. In this financial year, 2871 MT cuchia was exported which earned 126.95 crores taka.

Cuchia is an important fish for the livelihood of Tribal people in terms of home consumption and trade. The tribal people belonging to the Garo, Hajong, Shawtali, Koch, Rajbongshi community believes this fish to be therapeutic one and traditional use for treatment of various ailments, viz. reported to cure weakness, anemia and asthma.

Considering the importance of this species in nutritional, medicinal, economic and biodiversity. DoF has been started cuchia culture through a project and 2021-2022,729 MT cuchia is produced through culture and 8759 MT is produced through capture which is in total 9524 MT

Fig 2.11: Fresh water mud eel (cuchia) culture

2.4 Coastal Aquaculture

2.4.1 Shrimp (Bagda) culture

The agro-climatic condition of Bangladesh offers the suitability of shrimp farming in the coastal areas, especially in the southern part including Bagerhat, Khulna, Satkhira and Cox,s bazar Districts of Bangladesh. Shrimp is called the "White Gold" since it has been proved to be one of the key export items of Bangladesh and makes up to 70% of total agricultural exports. A total of 56 species has been identified in Bangladesh of which 37 are sea water shrimps, 12 are brackish water shrimps and 7 are freshwater prawn and other species.

Black tiger shrimp (Penaeus monodon), locally known as the Bagda is one of the major species of shrimp farming in the coastal areas of Bangladesh, which comprises 60% of total national shrimp production. Instead of paddy cultivation, a growing number of people in the south-west region of Bangladesh started Bagda culture in early 1970s by converting agricultural land into Gher (shrimp culture pond). Additionally, a government order has been issued in 1994, declaring the coastal region as 'Open for brackish water shrimp farming' with a view to boost country's economy. Since then, Bangladesh has made a significant progress in brackish water shrimp farming. Moreover, the government of Bangladesh has declared the shrimp sector as an industry under the Second Five Year Plan (SFYP, 1980-1985) and taken a set of actions to keep the shrimp production on rising trend. However, most strikingly, from 2015 to the present day, shrimp production showed a sharp decline due to complete rely on wild-caught brood stocks, lack of improved technology, poor logistics, and low yielding species. The traditional extensive and semi-intensive culture system of Bagda are being practiced in Bangladesh. The coastal people used to collect shrimp larvae or juvenile from the natural sources like mangrove forest waters which were much more prone to infectious diseases caused by a variety of viruses. With the increasing demand of shrimp both in national and international markets, the shrimp farming has become a shrimp industry and Bangladesh government is now aiming to produce Specific Pathogen Free (SPF) shrimp post larvae (PL).

Fig 2.12: Bagda shrimp (P. monodon)

Approximately 191057 hectares of land were being used for the production of Bagda and the figure showed a slight decrease of 0.47% in the year of 2022. Around 117946 numbers of shrimp farms are now being operated in Bangladesh, from which 70219 MT of Bagda was produced in the fiscal year of 2021-2022. Bangladesh earned about 348 million US dollars by exporting 30,000 MT of Bagda shrimp in the fiscal year of 2019-2020. The contribution of frozen food export to national GDP is accounted for nearly 3.78 %, of which 3.03% came from shrimp farming (BBS, 2021).

Table 2.7 Shrimp (Bagda) farming and production

Fiscal year	Area (Ha)	Production (MT)	Remarks
2013-2014	215305	71430	Paddy and salt are being cultivated in the adjacent areas of the coastal waters as an alternative crop during the off season. White fish and crabs are also being produced along with the Bagda as a secondary species in some parts of coastal regions of Bangladesh.
2014-2015	216468	75274	
2015-2016	206763	68217	
2016-2017	205654	68272	
2017-2018	184821	61709	
2018-2019	185308	63171	
2019-2020	186275	64688	
2020-2021	191964	68704	
2021-2022	191057	70219	

Source: Yearbook of Fisheries Statistics of Bangladesh, 2021-2022.

2.4.2 Prawn (Galda) culture

The fresh water ecosystem provides a unique environment for the production of fresh water prawn of Bangladesh. There are 24 species of fresh water prawn in Bangladesh of which Macrobrachium rosenbergii, locally known as the Galda, is being cultured commercially in the south west part of Bangladesh since early 1970s. Furthermore, the southwest part have been identified as the most suitable zones for prawn culture, because prawn requires a brackish water environment in its early stage of life cycle. With the growing demand of prawn, Galda farming has become more common in the other parts, like Noakhali, Patuakhali and Mymensingh District of Bangladesh. The traditional extensive and semi-intensive culture technique of Galda is being practiced in Bangladesh. Nowadays, farmers in the coastal areas are practicing integrated rice and prawn farming along with other carp species. Around 121005 numbers of Galda farms are now in full operation countrywide, producing 54352 MT of Galda from an area of about 71923 ha in the last fiscal year of 2021-2022.

Fig 2.13: Galda shrimp (M.rosenbergii)

Table 2.8 Prawn (Galda) farming and production

Fiscal year	Area (Ha)	Production (MT)
2013-2014	59972.23	42097
2014-2015	59115	42053
2015-2016	68746	46189
2016-2017	67063	48574
2017-2018	73860	51571
2018-2019	73245	52197
2019-2020	71613	51096
2020-2021	71062	50750
2021-2022	71923	54352

- Source: Yearbook of Fisheries Statistics of Bangladesh, 2021-2022.

2.4.3 SPF Black tiger shrimp production

Shrimp farming is one of the most important export earning sector of Bangladesh. Almost hundreds of millions of coastal people depend on shrimp farming for their live and livelihood. Currently, 50 shrimp hatcheries are being operated across the country, producing quality PL used for shrimp farming. But the hatcheries still rely on wild-caught brood stocks collected from rivers, estuaries or even deep seas. These naturally collected broods might be infected with a number of pathogens, which in turn could pose potential threats to the growth as well as health of shrimp. Over the last decade, Bangladesh government is continuing to intensify its efforts in order to produce SPF shrimp, and with this view Bangladesh has

imported SPF broods from the Hawii of America in 2014. However, presently, there are four SPF shrimp hatcheries called MKA hatchery, Fishtech hatchery, Desh Bangla hatchery and Niribili hatchery, which are producing SPF shrimp PL to strengthen shrimp industry in Bangladesh. By 2022, around 74.62 crores of SPF Bagda PL (twenty four times greater than that of 2015, 3.1 crores) has been produced.

Fig.2.14: SPF Bagda hatchery and Bagda PL

2.4.4 Crab culture and crab fattening

Recently traditional mud crab (Scylla serrata) culture has been practiced in Bangladesh based on capture and fattening of juvenile from the wild. Now mud crab is recognized as a valuable export commodity. After shrimp, mud crabs have become the second-most exported crustacean from Bangladesh. Because of high prices in international markets, mud crab farming is gaining popularity in the coastal districts of Bangladesh. It has been harvested in greater Khulna, Barisal and Chittagong regions. Mud crabs are less susceptible to disease and more resistant to adverse environment conditions and climate change. Many shrimp farmers are switching to mud crab farming. Two types of crab are available in the coastal region of Bangladesh-Scylla serrata and Scylla olivacea. From this, only mud crab (Scylla serrata) is cultivable in Bangladesh.

Fig. 2.15: Mud Crab culture frame at Cox,s Bazar

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

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

Table: 2.9 Crab farming and production

Year	Area farmed (ha)	Crab production (MT)	Remarks
2016-2017	27010	14421	Nowadays, Crabs are cultured as main crop in coastal areas.
2017-2018	9854	11787	
2018-2019	9377	12084	
2019-2020	9535	12562	
2020-2021	9602	12337.13	
2021-2022	9353	13397	

• Sorce : Yearbook of Fisheries Statistics of Bangladesh, 2021-2022.

Crab seeds are not available in our country. At present Farmers are collecting seeds from nature. For this reason, crab seeds production technique should be developed for crab culture. In this context, a crab hatchery has been established in Kolatoli, Cox,s bazar in 2018 by DoF and crab seed production is trying under the supervision of a foreign consultant. In 2021-22, 7729.99 MT crabs are exported which worths 393.86 crore taka.

2.5 Inland open- water fisheries resource management

The open water body of Bangladesh looks like a vast sea as recognition of her large water body. It has potential as inland open water resources, including 8,53,863 ha of rivers and estuaries, about 1,77,700 ha of Sundarbans where in 2021-22 annual fish production was 24259 MT, 1,14,161 ha of natural depressions or beels where production was 1,05573 MT, 68,800 ha of Kaptai reservoir where in 2021-22 production was 17937 MT and about 26,46,248 ha of floodplains. Annual flooding during the rainy season inundates up to 60% of the total land surface. Bangladesh possesses the 3rd largest capture fisheries and 5th in world aquaculture production. After China and India, Bangladesh is the third largest country in the world of inland fisheries. The inland open water is inhabited by 260 species of fish and 24 species of shrimp. Despite the existence of huge resources the inland capture fisheries has over the years been replaced as top fish producing source by aquaculture, due mainly to

decline and degradation of resources. The priority is given to improve biological management that will restrict the declination of resources and production.The DoF has prepared a sub strategy on Inland Capture Fisheries based on the National Fisheries Strategy 2006 and National Fisheries Policy 1998.

2.5.1 Community based fisheries management (CBFM)

Bangladesh has achieved recognition for its inclusive fisheries management through local community engagement. Community based management of resources is a time-driven and successful activity initiated by DoF. Bangladesh is emerging as a country of having positive lessons from community based management of open water. The Community Based Fisheries Management (CBFM) started activities between 1995 and mid 1997 in Bangladesh to develop the inland open water fisheries in the country. Establishment of Community Based Organizations (CBOs) and village level sub committees has been recognized as the first and fundamental step in creating sustainable co-management of fisheries resources in the decision making process by user's group. In CBFM approach, community groups who are directly involve and also depend on surrounding resources, the progresses and benefits become more sustainable.

Nimgachi community based project is the only one pond culture community based fisheries project of department of fisheries under revenue budget. This project is comprised of 779 ponds/Dighis located in Tarash and Raigonj upazila of Sirajganj district, Bhangura and Chatmohor upazila of Pabna district. In case of 779 ponds, separate beneficiary groups were formed with poorer community including fisherman, fish farmers, unemployed youth, landless poor people, tribal fishers community etc and by giving lease value they use these water resources as community based aquaculture.

Noted that, Department of fisheries are implementing community based fisheries activities through MOU with Ministry of land. In 2012 when Department of fisheries first started its community based activities, the average production of fish per Hector in Nimgachi area were about 2.5 MT which has now increased to 5.52 MT. There are 10137 beneficiary families directly involved in community based program whose household incomes play an important role for poverty alleviation of this community. In addition to the beneficiaries, more than 50000 people are closely involved in the forward and backward linked sectors such as nursery farming, fish mongering, fish selling, transporting sector etc. Nimgachi project is playing a special role in empowering women. About 30% of the beneficiary members are women. The project plays a major role in achieving the MDG targets of the government in that area. Through this project, members are able to meet their nutrition and also uplift their socio economic status. Overall there has been positive change in communal harmony, leadership development, improvement of quality life of ethnic group in that area by this project.

Fig. 2.16: Distribution of dividend among the beneficiaries of Pratap Dighi Pond by local honorable MP.

2.5.2 Fingerling stocking

Natural recruitment of carp spawn and fingerling declining due to human interferences and environmental degradation hampered the productivity of open water capture fisheries resources. To improve the productivity of open water, the Ministry of Fisheries and Livestock through the Department of Fisheries initiated regular program from revenue and development budget to release fingerlings of major carp in open water bodies, floodplains and closed water bodies throughout the country. Stocking of fish fingerlings into beels and floodplains is a temporary measure to overcome the quick declination of fish production in open water. In 2021-22 fiscal year, under revenue budget 220.15 MT fingerlings are released in open water in 487 upazilas across the country, where 10.06 lakh people get benefit.

Fig. 2.17: Fingerling stocking

Table: 2.10 Stocking of fish fingerlings in open water bodies and floodplains

Financial Year	Fund allocated Tk (crore)	Fingerling released		No.of beneficiaries
		Number(million)	Weight(MT)	
2009 -10	3.37	14.40	200.45	530347
2010 -11	4.00	12.39	241.12	2363631
2011 -12	8.86	15.23	570.19	2365631
2012 -13	8.74	17.14	480.24	1012000
2013 -14	7.16	18.95	385.52	974186
2014 -15	7.15	15.54	317.72	1054100
2015 -16	7.23	29.33	320.38	1387300
2016 -17(P+R)	16.48	23.90	968.98	801135
2017 -18 (Revenue)	7.86	11.48	279.88	1076000
2018 -2019 (P+R)	7.3225	9.887	266.00	971488
2019 -20(P+R)	7.3976	7.308	270.82	843100
2020 -21(P+R)	6. 88183	6.780	242.815	1590 8519
2021 -22 (P+R)	7. 6371	32.274	266.81	1022691

2.5.3 Beel nursery

Beel nursery has been proved to be a significant tool for increasing fish production in natural waterbodies. DoF has continued the program as regular activity under revenue and development budget in various low lying rice field, floodplain, beel, haor, canal, river and government/non-government water bodies from 2009-10 fiscal year to increase natural production in these areas along with surrounding linked water bodies. During 2021-22 fiscal year,1001 beel nurseries were successfully established which allocated 3.198 crore taka from revenue budget and 751000 beneficiaries are involved. From 4 development projects,124 beel nurseries were established which allocated 150.10 lakh taka where 18502 beneficiaries are involved.

Fig.2.18: Beel nursery activities

2.5.4 Establishment and Management of fish sanctuary


Fig. 2.19 : Fish Sanctuary in Brahmanbaria

Fish sanctuary is a specific protected area in waters that is considered as effective management tool for protection, conservation and management of fisheries resources. To stop 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 technical and effective device for conserving fish stock, protecting biodiversity, breeding of endangered fish species and increasing fish production. Total numbers of 432 fish sanctuaries are being run under the management of beneficiaries. The number of sanctuaries in the different selected inland waterbodies is 426 with area of 848.73 hectares were established by DoF(including 547.61 ha Halda river sanctuary). There are 6 Hlisa sanctuaries which length 432 km.

In 2021-22 financial year, under revenue budget following sanctuaries are managed and repaired.

No. of sanctuary	Expenditure (taka)	No of beneficiaries (person)
406	159.90 lakh taka	2,38,000

In 2021-22 financial year, under development budget following sanctuaries are established.

No. of sanctuary	Expenditure (taka)	No of beneficiaries (person)
63	175.58 lakh taka	5751

Sanctuary management enhance and conserve aquatic biodiversity, protect and conserve endangered fish species from extinction. It ensures food security through fish production, increase fish stock, ensure flow of food chain and protect the genetic pollution. Fish sanctuary is the permanent shelter for protection of fish for natural propagation. By sanctuary management there are found abundance of endangered species like Chital, Foli, Kalibaosh, Aair, Tengra, Meni, Rani, Swarpunti, Madhu pabda, Kajoli, Gojar, Tara baim,Teri punti, Bamosh, Batasi, Kakila, Poya, Bata, Khoksha etc. In fact the advantage of sanctuary is infinite. From this point of view sanctuaries are managed regularly from 2015-16 fiscal year under revenue program. Besides this, different development projects establishing and restoring habitat as sanctuary.

2.6 Marine Fisheries Resource Management

By the virtue of Solemnity and sincere leadership of Honorable Prime Minister Sheikh Hasina, Bangladesh established her legitimate right in 1,18,813sq Km area of the Bay of Bangle resolving dispute over maritime boundary with neighbour countries Myanmar and India during 2012 and 2014 respectively settled by International Tribunal on the Law of the Sea (ITLOS) and International Court of Arbitration. This verdict ensures the sovereign right to explore, exploit, use, preserve, develop and manage the living and non-living resources in the EEZ of the Nation. This verdict also opens the opportunity for Bangladesh to fulfillment of animal protein, employment, poverty alleviation, export earnings and to harness the potential from the sea to promote and strengthen her blue economy for well-being of the nation. It is now very important to take effective initiatives for promotion and strength her blue economy keeping the Marine Bio-bank through proper conservation, management and ensuring scientific sustainable yield from the vast Marine ecosystem for the economic well-being for the Country.

2.6.1. Short term, Midterm and Long term "Plan of Action" according to Blue Economy

- In 2014 by the guidance of the Ministry of Fisheries and Livestock, Department of Fisheries has already taken short term, midterm and long term "Plan of Action" to rise up Bangladesh middle earning's country. The "Plan of Action" updated in 2018 according to SDG (2018-2030) of United Nations.

- **Short term Activities:**
  - Conduct assessment of fisheries stocks and finding of new fishing grounds;
  - Conservation of marine fisheries resources;
  - Development of handling of captured fish, as well as supply chain system to reduce the post-harvest loss;
  - Initiate commercial exploitation of Tuna and other large pelagic species from over 200 meter depth within EEZ and Area Beyond National Jurisdiction (ABNJ);
  - Initiative for participation and membership of international organization, as well as regional forums.

- **Midterm Activities:**
  - Determination of Maximum Sustainable Yield (MSY) and Maximum Economical Plan;
  - Strengthening of Monitoring, Control and Surveillance (MCS) system;
  - Combat to Illegal, Unreported and Unregulated (IUU) fishing;
  - Uplift of livelihood of coastal fishers;
  - Measures taken to conserve the aquatic biodiversity of the Sundarbans.

- **Long term Activities:**
  - Development of modern database for marine fisheries resources;
  - Integrated planning for the expansion of mariculture and coastal aquaculture;
  - Development of Monitoring, Control and Surveillance (MCS) system;
  - Introduce of Marine and Coastal Spatial Planning.

2.6.2. Conservation of Marine Fisheries Resources

- During 2000 the Government has declared 698 sq. km area in the Bay of Bengal as a "Marine Reserves" as a part of conservation and management measures. Now the reserves area is being protected;
- In 2019 the Government has declared 3,188 sq. km area at Nijhum Dwip and its adjacent area of Hatia, Noakhali coastal zone as "Nijhum Dwip Marine Protected Area". A management plan of the MPA is also developed and approved by the Ministry of Fisheries and Livestock;
- Since 2015 the Government has imposed a 65 days ban period from 20 May to 23 July in every year to ensure the breeding and protect of fish species in the Exclusive Economic Zone. During this ban period fishing of any kinds of fish and crustaceans by all type of vessels in the Bay of Bangle is prohibited;
- The Government has imposed a 22 days ban period during the peak breeding season of Hilsa in every year to ensure the breeding of Hilsa;
- The Government has prohibited"Jatka" (Below 25 cm size Hilsa) fishing 08 months (November to June) in every year in the coastal and marine water;
- To reduce the fishing pressure and ensure sustainable management of Marine fisheries resources ban has been imposed on fishing with destructive fishing gears like set bag net (Bahundi Jal), push net (Shrimp seed collection net) and others destructive gears in the coastal areas in the sea;
- As the bottom trawling harmful for the breeding and nursery ground of the sea, so the provision of new license for bottom trawler is being stopped as well as bottom trawler is converting into mid water trawler. In this regard till now 68 bottom trawlers have been converted into mid water trawler by the Ministry.

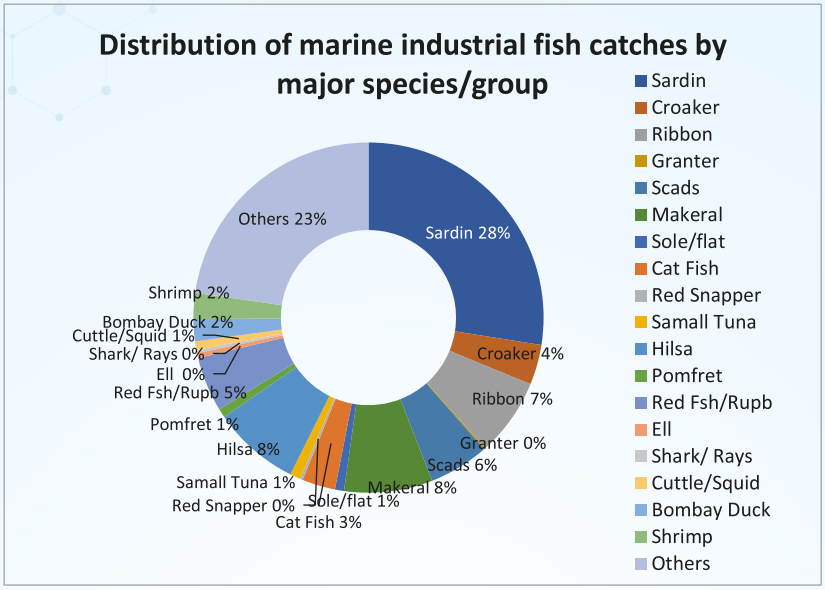


Fig. 2.20: Distribution of marine industrial fish catches by major species/group in 2021-22

Marine Fisheries Resources Survey (Stock Assessment)

❖ **Fishery Independent Survey (Research Vessel based):**

- The Fisheries Research and Survey vessel "R V Meen Shandhani" have already conducted 38 survey cruises till June 2022 in the Bay of Bengal. All the collected data by the survey vessel have been preserved for further biological analysis. The first Survey Report for 2016-17 to 2018-19 has been published (link:http://mfsmu.fisheries.gov.bd/site/download/03cb42dc-8a4f-4dd3-a089-43e5f5bcf61b). The report now being used for the development of Marine Fisheries Management Plan. In accordance with the report, from 24 survey Cruises, 457 fish and others species has been identified. Where 373 species of fish, 21 species of sharks & rays, 24 species of shrimps, 21 species of crabs, 03 species of lobsters, 01 species of mantis, 04 species of octopus, 05 species of squids and 05 species of cuttle fish have been recorded.

- According to The Ministry of Fisheries and Livestock approved Cruise Plan for the year 2022-2023, "R V Meen Shandhani" has been conducted 01 trial cruise 03 Shrimp cruises and the survey is ongoing by the financial assistance of "Sustainable Coastal and Marine Fisheries" project.

- With the assistance of Food and Agriculture Organization (FAO) of the United Nations and Institute of Marine Research (IMR) under the program of EAF_ Nansen, an acoustic survey cruise has been conducted in the Bay of Bengal with the Research Vessel R V Dr. Fridtjof Nansen during 02-17 August 2018 to collect data for stock of fish and shrimp and the survey report has been submitted

to the Ministry of Fisheries and Livestock.

- Ministry sent a request letter to FAO for 30 days survey cruise by R V Dr. Fridtjof Nansen in the EEZ of Bangladesh.

Fig-2.21: Fisheries Survey and Research Vessel R V Meen Shandhani

❖ **Fishery dependent survey:**

❖ **Land based Survey:**

- To Collect Catch and Effort data of artisanal fisheries for land base survey 212 landing centers have been selected in the coastal area by the assistance of "Sustainable Coastal and Marine Fisheries" project;
- System is going to be developed for on-line data collection of fishing boats and gears;
- Manual preparing for Collect Catch and Effort data of artisanal fisheries is ongoing.

❖ **Log book for industrial fishing vessels:**

- Log books data are collecting from industrial fishing vessels for fishery monitoring and stock assessment.

2.6.4. Enacting Acts, Rules and Policies

1. Marine fisheries sector is governed by "Marine Fisheries Act, 2020" (Previous The Marine Fisheries Ordinance, 1983);
2. "Marine Fisheries Act, 2020" has been enacted on 16 November 2020 in the 11th National Parliament and published to Govt. gazette on 26 November 2020;
3. Prepared a draft of "Marine Fisheries Rules 2022" and after completing dialogue with the relevant stakeholders and incorporate their comments, the draft of "Marine Fisheries Rules 2022" submitted to the Ministry of Fisheries and Livestock.
4. "Marine Fisheries Harvest Policy, 2022" has been approved by the Ministry of

Fisheries and Livestock and published to Govt. gazette on 06 September 2022;

5. All industrial fishing trawlers and mechanized fishing boats are required to have registration and license for fishing in Bangladesh marine waters;
6. Artisanal fishing boats have to require permission from Marine Fisheries Office or Local Fisheries Office to fish in Bangladesh marine waters;
7. It is mandatory for industrial fishing trawlers to take Sailing Permission (SP) from Marine Fisheries Office under the Department of Fisheries (DoF);
8. Trawlers are allowed to catch fish/shrimp in an area of not shallower than 40 meter depth zone. Artisanal and Mechanized fishing boats are allowed to fish below 40 meter depth zone.
9. By the assistance of "Sustainable Coastal and Marine Fisheries" project Marine Fisheries Management Plan-Part 1 (Industrial) has been developed by completing of policy dialogue with the concerned stakeholders and the Ministry of Fisheries and Livestock has already been approved the plan in 14 October, 2021.

2.6.5 Monitoring Control and Surveillance (MCS):

a. Establishment of Vessel Monitoring System (VMS) and Joint Monitoring Center (JMC) :

i. Vessel Monitoring System (VMS) software prepares and Fisheries Monitoring Centre (FMC) establishment work is ongoing under "Sustainable Coastal and Marine Fisheries (SCMF)" Project.;
ii. Satellite based Automatic Identification System (AIS) shall have to install in large mechanized fishing boats under the project (SCMF);
iii. Global System for Mobile (GSM) based AIS shall have to install in artisanal and small mechanized fishing boats under the project (SCMF);
iv. Joint Monitoring Center (JMC) approved by the Ministry of Fisheries and Livestock;
v. Memorandum of Understanding (MoU) for operation Joint Monitoring Center (JMC) is under processing for finalize;

b. Surveillance Check post and Landing centre:

i. DoF has a Marine Fisheries Surveillance check post at Patenga, Chattogram and 16 Marine Fisheries Surveillance check posts are going to be set up at coastal areas by "Sustainable Coastal and Marine Fisheries" Project;
ii. Primary site selection completed for establish of 16 Marine Fisheries Surveillance check posts;
iii. Procurement process is ongoing of 16 patrolled boats for 16 Marine Fisheries Surveillance check posts;
iv. Establishment process is ongoing of 65 fish landing centers under "Sustainable Coastal and Marine Fisheries" Project.

c. Training and Awareness Programs

i. Fishers are provided with training on the FAO-CCRF, compliance with various acts, regulations and rules emphasizing the importance of conservation for sustainable exploitation of marine and coastal resources;

ii. Regular meetings are arranged on various issues of non-compliances happen by fishers with the presence of representatives from the Bangladesh Navy (BN), Bangladesh Coast Guard (BCG), Rapid Action Battalion (RAB), Bangladesh Police, Mercantile Marine Department, Border Guard Bangladesh (BGB), Bangladesh Marine Fisheries Association, Mechanized Fishing Boat Owner's Association, District Fisheries Officers of costal districts to help mitigation measures and comply with rules and regulations;

iii. Mass awareness campaigns are organized in major fish landing centers and in fisher's villages to actively discourage the deleterious impacts of destructive fishing methods and gears. Fishers and the representatives of local people are motivated to show respect for Marine Fisheries Act and Rules promulgated to restore our biodiversity and protect the resilience of the marine environment;

iv. Strong Monitoring, Control and Surveillance (MCS) procedures are in place to increase boat registration and issuance of fishing licenses. The National Plan of Action (NPOA) to eliminate Illegal, Unregulated and Unreported (IUU) fishing in the Exclusive Economic Zone (EEZ) of Bangladesh in place.

2.6.6 Marine Fisheries Resource Management Approaches

I. Mesh size of trawl nets and gears are controlled for industrial fishing trawlers;

II. Minimum mesh size 45mm is mandatory at the cod end for shrimp trawl and 60mm for the fish trawl;

III. ESBN (Estuarine Set Bag Net) has been banned (Prohibition in operating illegal estuarine set beg net throughout the year has been declared on 7 April, 2013).

IV. To facilitate spawning and conservation of marine fisheries resources, fishing has been banned for 65 days from 20 May to 23 July in each year, for all types of vessels in the Bay of Bengal;

V. The Government has imposed a 22 days ban period during the peak breeding season of Hilsa in every year to ensure the breeding of Hilsa;

VI. The Government has prohibited "Jatka" (Below 25 cm size Hilsa) fishing for 08 months (November to June) in every year to coastal and marine water;

VII. Juvenile Hilsa (Jatka) Conservation Week has been observed in 36 Upazilla as a national program to protect Juvenile Hilsa to ensure their growth;

VIII. Under The "Marine Fisheries Act, 2020" (Previous The Marine Fisheries Ordinance, 1983) fishing area is demarcated for small-scale fisheries to minimize the conflict between industrial fishing vessels and artisanal fishing vessels;

IX. Harvesting provisions are made in three tiers: (1) up to 40 m depth artisanal and mechanized boats operate; (2) from 40 m to 200 m depth industrial trawlers operate; and (3) from 200 m depth to the end of the EEZ and ABNJ (Area Beyond National Jurisdiction) long-liner and purse seiner operate;

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

2.6.7 IUU Catch Monitoring

1. The Government has enacted the "Marine Fisheries Act, 2020" to incorporate FAO-CCRF to control, deter and eliminate Illegal, Unreported and Unregulated (IUU) fishing to conserve marine life;
2. The European Union through its Council Regulation EC 1005/2008 has laid down Catch Certificate Scheme (CCS) to combat IUU Fishing. Under this Scheme any company wanting to export marine fishes to European Union countries must have IUU-Catch Certificate (CC) approved by the flag state's Competent Authority;
3. The Marine Fisheries Ordinance 1983 was amended in 2010 to facilitate issuing IUU-Catch Certificates by the Director, Marine Fisheries Office as Competent Authority;
4. Every month five industrial fishing trawlers are inspected to monitor IUU catches in the Bay of Bengal;
5. The "National Plan of Action" (NPOA)- IUU Fishing has been developed with the assistance of Food and Agriculture Organization (FAO) of the United Nations and the draft "National Plan of Action" (NPOA)- IUU Fishing has been approved by the Ministry of Fisheries and Livestock on 2 May 2021;
6. Bangladesh has been signed the FAO Agreement on Port State Measures (PSMA) 2009 in December, 2019 to prevent, deter and eliminate Illegal, Unreported and Unregulated (IUU) fishing.

2.6.8 Marine Reserve/Protected Area (MR/MPA)

1. As a protective management measure, in the year 2000 the Government has declared 698 sq. km Marine Reserves (MR) area in the Bay of Bengal to protect and conserve marine fisheries resources.Marine Reserves area is protected from fishing.
2. In 2019 the Government has declared 3,188 sq. km area at NijhumDewip and its adjacent area of Hatia, Noakhali coastal zone as "NijhumDewip Marine Protected Area". A management plan of this MPA has been approve on 09 May 2021 by the Ministry of Fisheries and Livestock.

2.6.9 Fishing Fleet Operation

In Bangladesh, traditional fisheries exist side by side with commercial fisheries. About 236 industrial trawlers were active in fishing out of 262 industrial fishing trawlers in the fiscal year of 2021-22. At the same time 67,669 mechanized and artisanal boats were engaged in traditional fishing in the Bay of Bengal. These traditional mechanized and artisanal fishing boats are involved in use of relatively simpler gears such as gillnets, set bag nets, trammel nets by the array of boats. Artisanal boats are engaged in daily fishing by nature in a very low depth close to coastline involving 3-5 fishermen. Mechanized boats are used normally for fishing within 40 m depth of contour for 7 to 9 days carrying ice cubes in their boats. Number of fishermen varies from 15 to 30 based on size and gear used.

Based on freezing and preservation capacities, industrial trawlers are of two kinds; trawlers having still hulled (Categorized as freezer trawler) and wooden body trawlers

(Categorized as non- freezer/ice trawler). Based on fishing mode they are also different types like bottom fishing trawler, mid-water trawler and shrimp trawler. Gross tonnage capacity of industrial fishing fleet ranged between 56 to 148 MT for wooden body and 251 to 668 MT for steel hulled freezer trawlers.

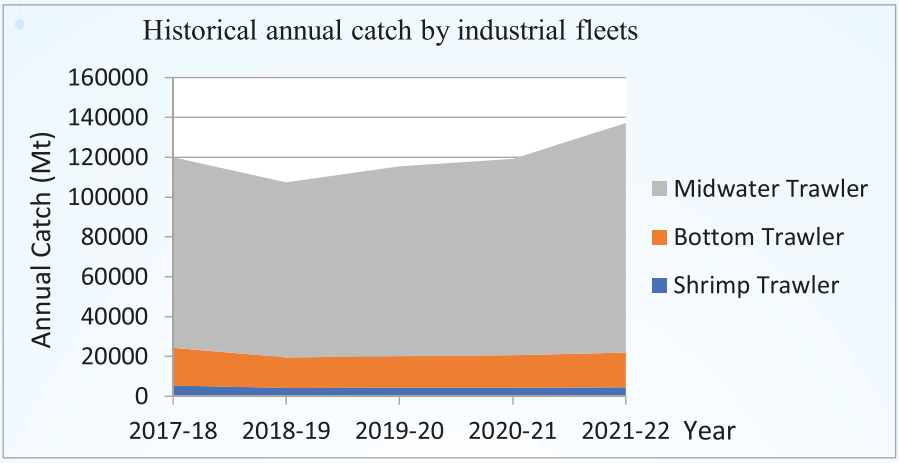


Fig. 2.22: Historical annual catch by industrial trawler fleet from 2017-18 to 2021-22.

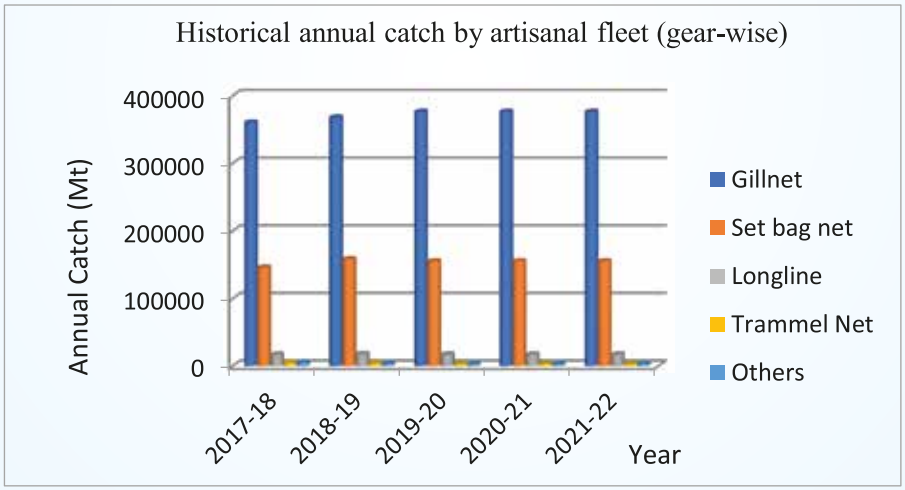


Fig. 2.23: Historical annual catch by artisanal fleet (gear-wise) from 2017-18 to 2021-22.

2.6.10 Licensing activities of mechanized fishing boats

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

Table: 2.11 Licensing activities of mechanized fishing boats

Year	License Issues (Nos.)			Revenue Collection (Lac taka)
	New	Renew	Total	
2017-2018	332	1229	1561	42.13
2018-2019	114	1186	1300	37.41
2019-2020	159	1295	1454	45.16
2020-2021	341	1061	1402	45.53
2021-2022	189	1219	1408	47.73

2.6.11 Licensing Activities of Industrial Fishing Vessel/Trawler

During 2021-22, a total number of 236 industrial trawlers were engaged in fishing into the EEZ. The fleet comprised of 34 shrimp trawlers, 46 bottom trawlers and 125 mid-water trawlers. 31trawlers are permitted to fish on trial trip basis by the order of High Court Division of Honorable Supreme Court. Fishing license for industrial fishing vessels also require prior registration and COI from MMO. They also require fishing license from MFO. Fishing license for mechanized boats are following the same procedure. All fishing licenses are subject to be renewed every year.

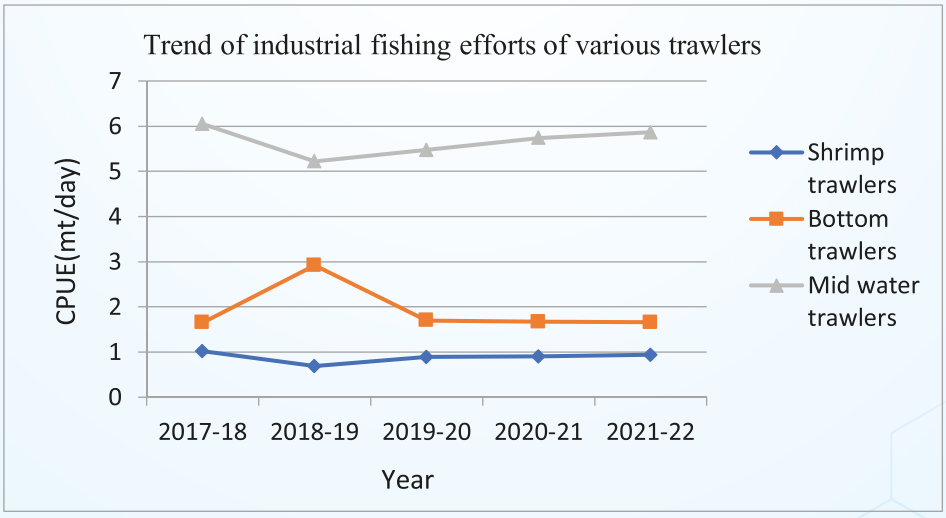


Fig. 2.24: Trend of industrial fishing efforts of various trawlers from 2017-18 to 2021-22.

2.6.12 Deep Sea Fishing

1. i) The Government has taken initiatives to exploit tuna and tuna like fishes and other large pelagic fishes from the deep sea Area Beyond National Jurisdiction (ABNJ). The Ministry of Fisheries and Livestock has issued permission against 10 long liner and 07 purse seiner vessels in April 2018. The awarded companies are in the effort to collect appropriate vessel and equipment.

ii) Ministry of Fisheries and Livestock have been permitted to import/bring 01 long liner type and 01 purse seiner type fishing boat by joint venture to exploit tuna and tuna like fishes and other large pelagic fishes from the deep sea area of international waters (Memo no. 33.00.0000.129.99.005.20-163 and 164; dated: 06 June 2021)

iii) Bangladesh has achieved her full membership that is the Contracting Party Status of Indian Ocean Tuna Commission (IOTC) on 24 April 2018 that would help us to build up tuna industry in near future.

iv) A pilot Project is implementing on "Tuna and Tuna like Fishing and other Pelagic Fishing at the Deep Sea". Project cost is GoB contribution 6,106.00 lakh taka and Project period is July 2020 to December 2023; By this project-

i) 03 long liner type fishing vessels (fishing boats including fishing gears) have to procure under processing;

ii) Have to conduct the abundance of tuna and tuna like fishes in the deep sea area of Bangladesh EEZ and international waters;

iii) Appreciate the private entrepreneurs to exploit tuna and tuna like pelagic fishes in the deep sea area beyond National Jurisdiction (ABJN);

iv) Achieve the knowledge and experience about exploit tuna and tuna like pelagic fishes in the deep sea and international waters;

v) There is provision to employ 44 number of crews including 07number foreign crews;

vi) Build up 100 numbers of experienced manpower to exploit tuna and tuna like fishes and other large pelagic fishes from the deep sea area;

vii) Explore opportunities of abroad training and study tour about abundance and exploit tuna and tuna like pelagic fishes in the deep sea area of 26 officers.

2.7 Hilsa Fisheries conservation, exploitation and management

Hilsa is the most popular fish for its taste and flavor to the southern people of Asia. It is indissolubly linked with our tradition and culture. Hilsa is also our national fish. Not only that, Hilsa has a great economic contribution to our national economy. In 2021-22, the production of Hilsa is 5.67 lakh MT which contributes 11.91% of total fish production. It is the highest as a single species and more than 1% of total GDP. About 6 lakh people are directly involved with Hilsa catch and about 25 lakh people are indirectly involved with the trade of Hilsa. Hilsa production is increased about 89% in previous 12 years.

Table. 2.12 Hilsa Production Scenario:

Yearly Hilsa Production

Fisc al Year	Hilsa Production (MT)			Growth Rate (%)
	Inland (MT)	Marine (MT)	Total	
2002 -03	62944	136088	199032	-9.77
2003 -04	71001	184837	255838	28.54
2004 -05	77499	198363	275862	7.83
2005 -06	78273	198850	277123	0.46
2006 -07	82445	196744	279189	0.75
2007 -08	89900	200100	290000	3.87
2008 -09	95970	202951	298921	3.08
2009 -10	115179	198574	313753	4.82
2010 -11	114520	225325	339845	8.46
2011 -12	114475	232037	346512	1.96
2012 -13	98648	252575	351223	1.36
2013 -14	127514	257626	385140	9.66
2014 -15	135396	251815	387211	0.54
2015 -16	140756	254195	394951	2.01
2016 -17	217469	278948	496417	25.69
2017 -18	232698	284500	517198	4.19
2018 -19	242479	290316	532795	3.02
2019 -20	245862	304566	550428	3.31
2020 -21	251590	313593	565183	2.68
2021 -22	244035	321871	566593	0.35

Growth Chart of Hilsa Production:

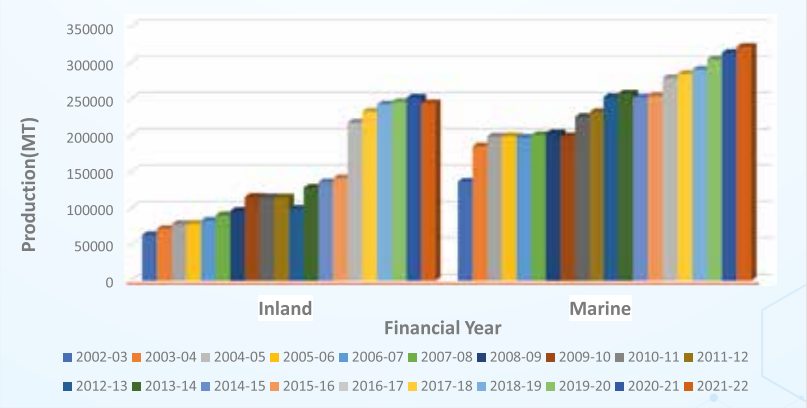


Fig.2.25: 20 years Hilsa production

Government took different initiatives to increase and sustain the Hilsa production. The major activities are

- Formulating and implementing "Hilsa Fisheries Management Action Plan";
- Identifying 7000 sq. km. major Hilsa breeding area in Bay of Bengal;
- Establishing 6 Hilsa sanctuaries; in which all types of fishing is ban for 2 months (March and April) in 5 sanctuaries and all types of fishing is ban for 3 months (November to February) in rest one;
- Declaring 3188 sq. km. Marine Reserve area adjacent to Nijhum dwip;
- Imposing 22 days ban on hilsa fishing at the peak spawning period of Hilsa;
- Imposing 8 months (November-June) ban on jatka fishing;
- Imposing 65 days ban on all kind of fishing in the Bay of Bengal;
- Developing the livelihood of Hilsa fishermen by giving VGF (Vulnerable Group Feeding) and AIG (Alternative Income Generating).

2.7.1 Brood Hilsa Conservation Activities:

In 2002, Department of Fisheries prepared the Hisha Fisheries Management action plan and Ministry of Fisheries and Livestock approved that, after giving approval according to the rule 13 (b) of the The Protection and Conservation of Fish Rules, 1985, brood Hilsa conservation activities had been started from 2006 in 7000 sq. km. of the Bay of Bengal for 10 days. In 2011, government amended the rule 13 of the The Protection and Conservation of Fish Rules, 1985 by a gazette notification. After that from 2011 to 2014 brood Hilsa conservation activities substantiated for 11 days. In 2015 government further amended the rule with the consultation of the hilsa researchers and other stakeholders, in that amendment the ban period on Hilsa fishing was increased from 11 days to 15 days. Then finally the hilsa ban period was ordained 22 days during the peak spawning season of hilsa by a gazette notification in 2017. By the direct guidance of Ministry of Fisheries and Livestock Department of Fisheries substantiate the brood Hilsa conservation operation and the civil administration, Bangladesh Navy, Bangladesh Air force, Bangladesh Police, River Police, RAB (Rapid Action Battalion), Coastguard, BGB (Border Guard Bangladesh) etc. cooperate to implement the operation during 22days ban period on hilsa fishing.

In 2022, "Brood Hilsa Conservation Operation-2022" was substantiated all over the country from 07-28 October. During this period 2062 mobile court and 10821 operations were conducted, by which about 31.41 MT brood Hilsa and 919.85 lakh meter fishing net were seized. Seized net were destroyed in the presence of executive magistrate and the fish were distributed to the orphanage. Through these operations fishermen were fined 47.32 lakh taka and 2107 fishermen were sentenced to imprisonment.

Table 2.13. Brood Hilsa Conservation Operation from 2016 to 2022:

Sl. No.	Year	Mobile Court	Operation	Hilsa (MT)	Net (Lakh M.)	Fine (T. tk)	Imprisoned
1	2016	2271	11530	33.94	170.15	5222	1156
2	2017	2658	13762	58.18	841.31	6214	2389
3	2018	2710	14614	72.11	438.35	5993	4127
4	2019	2682	13172	82.22	767.89	10875	5643
5	2020	2640	19818	45.41	1291.45	9083	5533
6	2021	2114	16855	33.01	950.4	6140	2644
7	2022	2062	10821	31.41	919.85	4732	2107

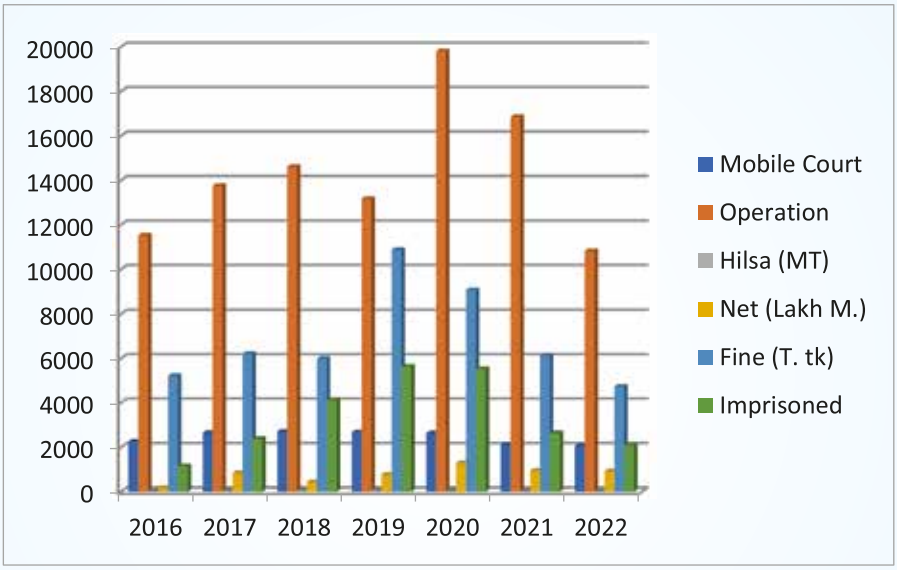


Fig.2.26 : Brood Hilsa conservation operation from2016-2022

2.7.2 Hindrance of Jatka fishing:

According to The Protection and Conservation of Fish Rule, 1985, 10 inch or less than 10 inch size Hilsa fish is called jatka. In The Protection and Conservation of Fish Rule, 1985, the size of jatka was 9 inch and ban on jatka fishing was November to April. At last in 2014, to

amend the existing rule, jatka size was ordained 10 inch and the ban period on jatka fishing had also been increased from November to June. In the ban period on jatka fishing DoF conducts operation in cooperation with the law enforcing agency like Bangladesh Police, River Police, Navy, Coastguard etc. In 2021-22, hindrance of Jatka fishing during ban period (November to June) 1981 mobile court

Fig.2.27 : Jatka fish

and 12139 operations were conducted, by which about 222.72 MT jatka and 1384.09 lakh meter current net were seized. Seized net were destroyed in the presence of executive magistrate and the fish were distributed to the orphanage. Through these operations fishermen were fined 80.82 lakh taka and 720 fishermen were sentenced to imprisonment. It also should be mentioned that, Government has fixed the mesh size 6.5 cm. (2.6 inch) of gill net to prevent the jatka fishing.

Table 2.14 The scenario of law enforcement on Jatka fishing from 2017-18 to 2021-22:

Fiscal Year	Mobile court	Operation	jatka (MT.)	Net (l.m.)	Fine (T.tk.)	Imprisoned
2017-18	1971	10534	250.23	1087.52	5935	1282
2018-19	1998	17964	308.44	1396.2	14173	1358
2019-20	1421	8811	263.91	1735.16	5694	669
2020-21	1779	10555	484.42	1689.68	6821	981
2021-22	1981	12139	222.72	1384.09	8082	720

2.7.3 Extirpating the illegal net through "Special Combing Operation":

From 2016 the "Special Combing Operation" had been started to extirpate the abuse of illegal net in fishing. In that time this activities were substantiated only three coastal districts (Bhola, Patuakhaki, Barguna). Over the next time working area of special combing operation was increased gradually and in 2021, 17 districts (Barishal, Bhola, Patuakhali, Barguna, Pirojpur, Jhalokathi, Laxmipur, Chandpur, Noakhali, Cox's Bazar, Chattagram, Khulna, Bagerhat, Satkhira, Shariatpur, Madaripur and Munhsiganj) were included.

Table 2.15 The Special Combing Operation scenario :

Year	No. of districts	Mobile court	operation	No. of Behundi net	Current net (L.m.)	Jatka (Mt.)	Fine (L. Tk.)	Jail
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
2016	3	225	433	1326	13.37	2.284	3.99	13
2017	5	265	489	833	30.69	4.92	4.13	44
2018	10	341	935	1442	34.04	3.85	3.35	2
2019	11	424	1235	1883	88.916	8.82	5.82	7
2020	13	387	1554	2267	716.18	19.46	10.02	61
2021	17	492	1681	2448	274.18	45.95	9.63	111
2022	17	884	3546	4217	469.52	76.51	24.36	175

Fig.2.28: Special Combing Operation scenario from 2016-2022

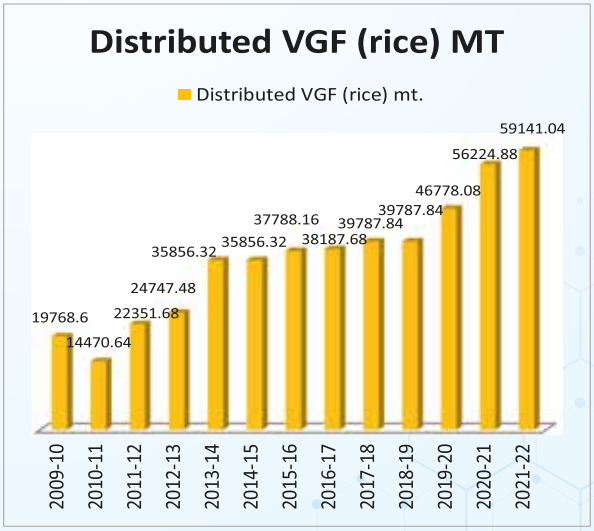
2.7.4 VGF (Vulnerable Group Feeding) activities:

At the beginning of this activity, Hilsa fishermen received only 10 kg food grains (rice) per family per year as an annual allowance. The Honorable Prime Minister Sheikh Hasina, M.P. daughter of Bangabandhu realized the poor condition of jatka fishermen during ban period of jatka fishing and increased the amount of VGF (rice) from 10kg to 40 kg per family per month. Under the humanitarian aid program in 2021-22 fiscal year 56224.88 MT food grains (rice) were distributed to 3,28,815 fisher family in 96 upazila of 20 districts.

Fig.2.29: VGF (Rice) distribution to fishermen

Table 2.16 The amount of VGF distributed to Jatka fishermen from 2009-10 to 2021-22:

Sl. no.	Fiscal Year	Distributed VGF (rice) MT.	No of family of beneficiary
1	2009-10	19768.60	164740
2	2010-11	14470.64	186264
3	2011-12	22351.68	186264
4	2012-13	24747.48	206229
5	2013-14	35856.32	224102
6	2014-15	35856.32	224102
7	2015-16	37788.16	236176
8	2016-17	38187.68	238673
9	2017-18	39787.84	248674
10	2018-19	39787.84	248674
11	2019-20	46778.08	301288
12	2020-21	56224.88	328815
13	2021-22	59141.04	390700

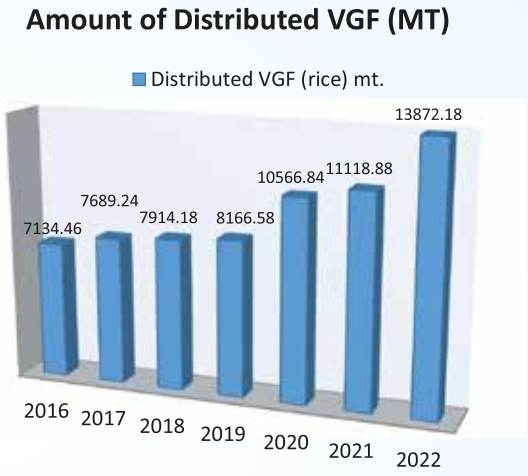


VGF has also been allocated for the Hilsa fishermen during the 22 days ban on Hilsa fishing from 2016. In 2021, 11118.88 MT food grains (rice) were distributed to 555944 fisher family at the rate of 20kg for 22 days in 151 upazillas of 37 districts.

By the desire of Honorable minister S M Rezaul Karim, MP, Ministry of Fisheries and Livestock, the amount of VGF distributed during Hilsa ban period had been increased to 25kg. In 2022, 13872.18 MT food grains (rice) were distributed to 554887 fisher family at the rate of 25kg for 22 days in 151 upazila of 37 districts.

Table 2.17 The amount of VGF distributed to Hilsa fishermen from 2016 to 2022:

Sl. no.	Year	Distributed VGF (rice) mt.	No of family of beneficiary
1	2016	7134.46	356723
2	2017	7689.24	384462
3	2018	7914.18	395703
4	2019	8166.58	408329
5	2020	10566.84	528342
6	2021	11118.88	555944
7	2022	13872.18	554887



To increase public awareness regarding the conservation and protection of brood Hilsa and jatka, DoF conducts different type of activities like poster, leaflet distribution, decoration of fish market, arot, fishery ghat with banner, festoon and arranging awareness program with the fishermen and other stakeholders. Since 2007, Jatka Conservation Week has been observed as a national program to protect Jatka and ensure both of its growth and production as an awareness program.

On 17 August 2017, Bangladesh has received the recognition on Hilsa as the product of Bangladesh. More than two third of Hilsa production of total produced Hilsa in the world is produced in Bangladesh mainly accounts for Geographical Indication (GI) of Hilsa as a product of Bangladesh. Bangladesh has become a role model for Hilsa conservation to other Hilsa producing countries.

Chapter 3

Fisheries Regulatory Activities

3.1 Enforcement of the 'Fish Feed and Animal Feed Act 2010' and 'Fish Feed Rules 2011'

Fish feed is one of the most important factor for commercial aquaculture. Before 2010, there were no relevant rules and regulation to maintain the quality of the feed and feed ingredients for the fish farmers. But the present fisheries sector-friendly government of the people's republic of Bangladesh has taken initiatives to formulate acts and rules to ensure safety and quality fish feed and feed ingredients. In consequence of those initiatives 'Fish Feed and Animal Feed Act 2010' and 'Fish Feed Rules 2011' were formulated. Currently, these act and rules are being implemented all over the country.

The activities that have been implemented under the 'Fish Feed and Animal Feed Act 2010' and 'Fish Feed Rules 2011' are given in the table below-

Table 3.1. Status of fish feed license under the 'Fish Feed and Animal Feed Act 2010' in fiscal year 2021-2022

Serial no.	Division office	Types of fish feed company (no.)				Total revenue income (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	70	100	911	1081	10.63
2.	Chattogram	45	63	705	813	5.53
3.	Rajshahi	60	56	779	895	7.88
4.	Khulna	18	69	1141	1228	6.55
5.	Barishal	4	3	193	200	0.33
6.	Sylhet	2	1	229	232	0.75
7.	Rangpur	9	15	340	364	2.29
8.	Mymensingh	35	49	895	979	5.53
Total		243	356	5193	5792	39.52

3.2. Enforcement of the 'Fish Hatchery Act 2010' and 'Fish Hatchery Rules 2011'

Commercial aquaculture in Bangladesh is flourishing with the rapid expansion of public and private hatcheries providing support for good quality fish seed. But with the growing demand for fish seed from expanding aquaculture sector and urge for earning immediate profit the quality of fish seeds produced in private hatcheries has declined over the years. There are many causes responsible for the low quality of hatchery produced fish seeds, for instance- inbreeding, inter-specific hybridization, negative selection, improper brood-stock management etc. Furthermore, hybridization and cross-breeding are threatening the genetic diversity of indigenous wild stocks of Indian Major Carps. To prevent these undesirable practices and to conserve the quality of fish seed produced from public and private hatcheries, the current government of Bangladesh promulgated the 'Fish Hatchery Act 2010' and 'Fish Hatchery Rules 2011'. Under the act and rules, every hatchery must take registration from competent authority of Department of Fisheries.

The number of registered private fish hatcheries and associated revenue earned under the 'Fish Hatchery Act 2010' and 'Fish Hatchery Rules 2011' are given in the table below-

Table 3.2. Status of private fish hatcheries registration under the 'Fish Hatchery Act 2010' and 'Fish Hatchery Rules 2011' in the fiscal year 2021-2022

Serial no.	Division Office	Carp Hatchery C1	Galda/ Bagda Hatchery C2	Other Native Fish Hatchery C3	Monosex Tilapia Hatchery C4	Ornamental Fish Hatchery C5	Hatchery Other than Fish and Shrimp (Crabs/Turtle) C6	No. of Total Private Hatcheries	Total revenue (lac Tk.)
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1.	Dhaka	31	0	13	8	2	0	54	0.46
2.	Chattogram	86	62	4	56	1	0	209	1.71
3.	Rajshahi	163	1	26	10	1	0	201	0.96
4.	Khulna	59	29	6	37	6	1	138	1.82
5.	Barishal	24	5	2	8	0	0	39	0.098
6.	Sylhet	21	0	1	7	0	0	29	0.16
7.	Rangpur	92	0	15	6	0	0	113	0.95
8.	Mymensingh	79	0	283	56	0	0	418	1.62
Total		555	97	350	188	10	1	1201	7.78

3.3 Enforcement of the 'Protection and Conservation of Fish Act 1950' and 'Protection and Conservation of Fish Rules 1985'

The 'Protection and Conservation of Fish Act 1950' and 'Protection and Conservation of Fish Rules 1985' safeguard uninterrupted breeding and growth of carps and other important fishes contributing to the sustainable increase of fish production in Bangladesh. Various public awareness programs including meetings, general campaigns have been organized and carried out round the year and during National Fish Week by the Upazila Fisheries Officer to create mass awareness about Fish Acts and Rules. Different awareness materials like- posters, leaflets, booklets etc. were printed and distributed by Department of Fisheries. In addition, TV program prepared and broadcasted, street dramas staged, workshops/seminars organized to create mass awareness. Appropriate measures like- raids, mobile courts were also carried out to implement the 'Protection and Conservation of Fish Act 1950' and 'Protection and Conservation of Fish Rules 1985' with assistance from local administration and law enforcement agencies like- Police, RAB, Coast guards, BGB, Navy etc.

Table 3.3 Enforcement of 'Protection and Conservation of Fish Act 1950' and 'Protection and Conservation of Fish Rules 1985' in fiscal year 2021-2022

Serial no.	Division	No. of Raids	No. of Mobile Courts	Amount of fish seized (MT)	Amount of Current Jal seized (Lac meter)	Case Filed	Jail	Penalty (Lac TK)
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1.	Dhaka	11485	1212	389.87	11434.26	2989	1810	539.99
2.	Chattogram	7067	621	55.79	646.87	407	227	11.22
3.	Rajshahi	4954	294	8.69	50.45	337	266	2.44
4.	Khulna	3512	420	3.15	65.70	113	5	5.88
5.	Barishal	7221	2260	6016.38	330.49	1926	1128	67.27
6.	Sylhet	1396	130	2.18	14.73	5	10	0.29
7.	Rangpur	2534	200	1.16	8.19	36	0	1.26
8.	Mymensingh	1725	95	5.73	7.58	30	0	1.26
Total		39894	5232	6482.94	12558.28	5843	3446	629.59

Chapter 4

Fish Inspection and Quality Control (FIQC) Activities

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

Besides inspection and certification of exported fish and fish products throughout the year, renewal of licenses is carried out by each FIQC offices covering the establishments under jurisdiction, like fish processing plants, depots/arots, ice factories, landing centers, packing centers, non-packer exporters etc. each year. Requests for enlistment of the fish processing establishments and exporters intended to export to EU countries and China are sent case to case basis. Competent authorities of other countries are communicated and their requirements are met to continue and enhance export of fish and fish products. In this relation, Bangladesh has updated health certificate for exporting live eels and crabs to China.. Residue monitoring of fish and fish products as well as fish feed is monitored throughout the year for ensuring safe and quality fish and fish products for consumers. Routine inspection of fish processing establishments and ice plants etc. and testing of swab, ice, water etc. are also carried out round the year for ensuring food safety.

This year two new processing plant namely Globe Fisheries Limited and Unipex Trade Coprporation Limited have been enlisted enlisted to the EU and one processing plant Deepa Seafoods Limited was delisted from the EU through TRACES-NT.The present number of Bangladeshi fish processing plants eligible for export to EU countries is 76.

The new Fish and Fisheries Products (Inspection and Quality Control), Act 2020 is approved by the national parliament and the formulation of rules is under process.

4.1 Quality Control Laboratories

Department of Fisheries (DoF) has three ISO 17025 accredited Quality Control (QC) laboratories (previously known as Fish Inspection and Quality Control (FIQC) laboratories) at Dhaka, Chattogram and Khulna for testing fish and fish products, ice, swabs, fish feed and feed ingredients.

Fig.4.1: Quality Control Lab at Savar

QC laboratory (formerly known as FIQC laboratory), Dhaka by reshaping construction design, on the 11th floor of Matsya Bhaban building in 1994 which has been shifted at new premises at Savar, Dhaka in 2014. Two more modern laboratories have been established at Chattogram and Khulna under DoF by the financial assistance of UNIDO-SFIQC project during 2008-09. These laboratories have facilities for testing microbiological and residues of harmful chemical required for fish and fishery products. From August, 2015, laboratory services were separated from Fish Inspection & Quality Control Services and since then `Fish Inspection & Quality Control Laboratory` have been designated as 'Quality Control (QC) Laboratory'.

To address requirements of EU and other importing countries, the DoF laboratories are equipped with LC-MS-MS, ICP-MS, AAS, Rt-PCR ELISA etc instruments. The analysts are also trained at local and abroad. With a view to ensure external quality control, each QC Laboratory participated in international proficiency tests (PT) offered by world renowned PT provider organization on regular basis.

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

List of parameters tested in the laboratories is given in the table below:

Name of Lab	Test parameters	
	Fish & Fish Products	**Fish Feed & Feed Ingredients**
Quality Control Laboratory, Savar, Dhaka	**Microbiological Parameters:** Aerobic Plate Count, Total *Coliforms*, Presumptive *E.coli*, *Vibrio cholerae*, *Vibrio parahaemolyticus*, *Salmonella* spp. **Chemical Parameters:** Antibiotics-Nitrofuran metabolites (AMOZ, AOZ, AHD & SEM), Chloramphenicol, Metronidazole; Dyes (Crystal violet, Leucocrystal violet, Malachite green, Leucomalachite green); Anthalmintics (Flubendazole, Febendazole, Mebendazole); Aflatoxin (B1, B2, G1 & G2), Moisture; pH; Gentamycin, Tylosin, Sulfonamides; Estradiol hormone;Oxolinic Acid	Antibiotics (Chloramphenicol); Proximate test of fish feed and feed ingredients (Crude Protein, Non-protein nitrogen, Fat, Fibre, Ash, Moisture); NIR Screening of fish feed
Quality Control Laboratory, 209 NM Khan Hill Road, Muradpur, Chattogram	**Microbiological Parameters:** Aerobic Plate Count, Total *Coliforms*,*E.coli*, *Vibrio cholerae*, *Vibrio parahaemolyticus*, *Salmonella* spp., *Staphylococcus aureus*, *Listeria monocytogenes*, *Shigella* spp., WSSV, YHV, AHPND, IHHNV, TSV, IMNV, MrNV **Chemical Parameters:** Antibiotics-Nitrofuran metabolites (AMOZ, AOZ, AHD & SEM), Chloramphenicol, Tetracycline, Oxy-tetracycline, Chlortetracycline, Metronidazole, Gentamycin, Tylosin, Sulfonamides, Amoxicillin; Dyes (Crystal violet, Leucocrystal violet, Malachite green, Leucomalachite green); Heavy metals (As, Hg, Pb, Cd, Cr); Methyltestosterone (MTS); Di-ethyl stilbesterol (DES); Histamine; Total Volatile Basic Nitrogen (TVBN)/Tri-methyl Amine (TMA); Di-sodium di-phosphate/Total Phosphate; Filth;Formalin; Moisture; pH	Antibiotics-Nitrofuran metabolities (AMOZ, AOZ, AHD & SEM), Chloramphenicol, Tetracycline, Oxy-tetracycline, Chlortetracycline; Heavy Metals (Cr, Cd & Pb)
Quality Control Laboratory, Boyra, Khulna	**Microbiological Parameters:** Aerobic Plate Count, Total *Coliforms*,Presumptive *E.coli*, *Vibrio cholerae*, *Vibrio parahaemolyticus*, *Salmonella* spp., *Staphylococcus aureus*, *Listeria monocytogenes*, *Shigella* spp., WSSV, YHV, TSV, IMNV, MrNV, AHPND, IHHNV, NHP-B **Chemical Parameters:** Antibiotics-Nitrofuran metabolites (AMOZ, AOZ, AHD & SEM), Chloramphenicol, Tetracyclines, Oxy-tetracycline, Chlortetracycline, Metronidazole, Tylosin, Gentamycin,	Heavy Metals (Cd, Cr, Pb, Hg)

Most of the test scopes of three QC laboratories are accredited according to ISO 17025: 2017 by Bangladesh Accreditation Board (BAB) except those very recently developed and validated. After having BAB verification audits to the QC laboratories and accreditation of these three laboratories has been renewed upto 2024.

BANGLADESH ACCREDITATION BOARD

ACCREDITATION CERTIFICATE

Issued under the authority of Bangladesh Accreditation Act, 2006
by Bangladesh Accreditation Board (BAB), Ministry of Industries to

Quality Control Laboratory(QCL)

Department of Fisheries, C & B More, Savar

Dhaka, Bangladesh

This is to certify that this

Testing Laboratory
is accredited in accordance with the international standard

ISO/IEC 17025:2017
in respect of the associated scope, subject to the terms and conditions governing the relevant conformity assessment body (CAB) accreditation.

Certificate Number	:	**01.005.13**
Accreditation Date	:	**28 May 2013**
Date of Issuance	:	**25 August 2022**
Date of Expiration	:	**27 May 2024**

CERT. NO. 01.005.13
BAB
BANGLADESH ACCREDITATION BOARD
Accredited for ISO/IEC 17025:2017

GLOBAL BAB ACCREDITED ACCEPTANCE

Md. Monwarul Islam
Director General

This certificate must be returned on request; reproduction must follow BAB guidelines. For the specific scopes to which this accreditation applies, please refer to the Directory of CABs at BAB website.

Fig.4.2 Accreditation certificate of Dhaka Lab

4.2 Fish Inspection & Quality Control Services:

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

i. Issuance of Licenses of fish processing establishments;
ii. Annual evaluation of establishments (instrumental & operational conditions) and renew of licenses;
iii. Regular monitoring of establishments' activities regarding HACCP, EU, USDA, Australia, GCC regulations etc. as per Fish and Fish Products (Inspection & Quality Control) Rules, 1997 (amended in 2008, 2014 & 2017) and Official Control Protocol;
iv. Monitor water, ice and swab quality of processing establishments and ice factories;
v. Plan and implementation of NRCP (National Residue Control Plan), FRCP (Factory Residue Control Plan) & MMP (Microbiological Monitoring Plan);
vi. Product inspection and issuance of certificates for exportable fish and fish products;
vii. Surveillance and mobile court to ensure safety of fish and fish products;
viii. Implementation of activities under APA;
ix. Conduct awareness meeting;
x. Training of stakeholders;
xi. Inspect imported consignments of fish and fish products on request of Customs Department.

The summary activities conducted by three FIQC offices in 2021-2022 is given below at a glance-

No.	Title of activities conducted	Achievement
1	Fish Processing Establishments Inspection	
	(a) Number of consignments inspected	9808
	(b) Number of Fish Processing Establishments routinely inspected	517
	(c) Number of Fish Packing Centres routinely inspected	3285
2	Quality assurance of Depot/Arats and inspection of traceability documents	383
3	Inspection of Ice Factories	196
4	No. of NRCP (National Residue Control Plan) samples tested	1458
5	No. of NRCP non-compliance (Chemical)	05
6	No. of fish feed/feed ingredient tested	289
7	Mobile court/raid	
	(a) Number of Mobile court conducted	28
	(b) Number of raid/campaigns conducted	281
	(c) Amount of money fined (Tk.)	5900000
	(d) Shrimp destroyed (kg)	41025
	(e) Fin fish destroyed (kg)	228
	(f) Number of persons sentenced to jail	8
	(g) Number of cases filed	7
10	Amount of money fined from the fish processing establishments	4,30,000

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

Sl.No.	Type of Establishment	Number	Remarks
1.	Fish/Shrimp Processing plants	107	(EU approved 78)
2.	Factory Trawlers	53	
3.	Fish Packing Centres	97	
4.	Non Packer	69	
5.	Suppliers	70	
6.	Fish drying yards	33	
7.	Depots	878	
8.	Service centre/Landing centres	41	

4.3 Export of Fish and Fishery Products

Nowadays, diversified fish and fishery products are produced and exported by Bangladesh to more than 50 countries of the world. However, major export destinations of Bangladeshi fish and fishery products remain the member countries of the European Union (EU). Among others, USA,UK, Russia, China, Japan, Canada, Australia, India, Saudi Arabia, Malaysia, Thailand, Vietnam, UAE, Hongkong, South Korea, Mayenmer, Kuait, Maldives, Oman, Singapur, Taiwan etc. are also major importing countries of Bangladeshi seafood.

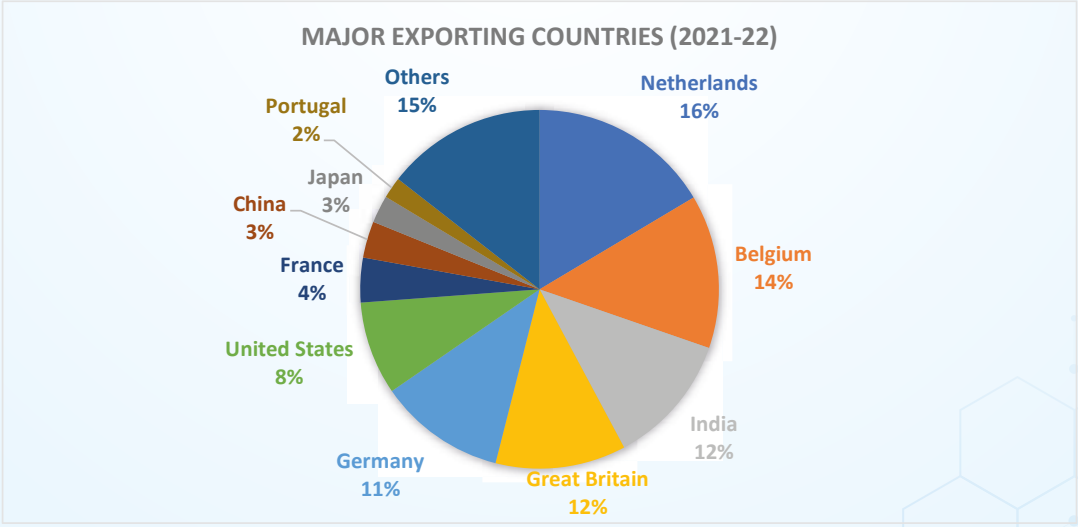


Fig.4.3 Major exporting countries of fish and fishery products

Around 50-60% of total export is composed of shrimp contributing about 75-85% of total value indicates that shrimp is the major exporting seafood item of the country most of which are of aquaculture origin and organic that grows naturally with minimal or no inputs. The exported items are-

- Shrimp/Prawn (processed, frozen,chilled, ready to cook and ready to eat)
- Finfish (whole, dressed, degutted, fillets, chilled, frozen)
- Dried fish
- Dehydrated fish
- Eels (live and frozen)
- Crabs (live and frozen)
- Shark fins
- Scales of finfish
- Shell of shrimp/prawn

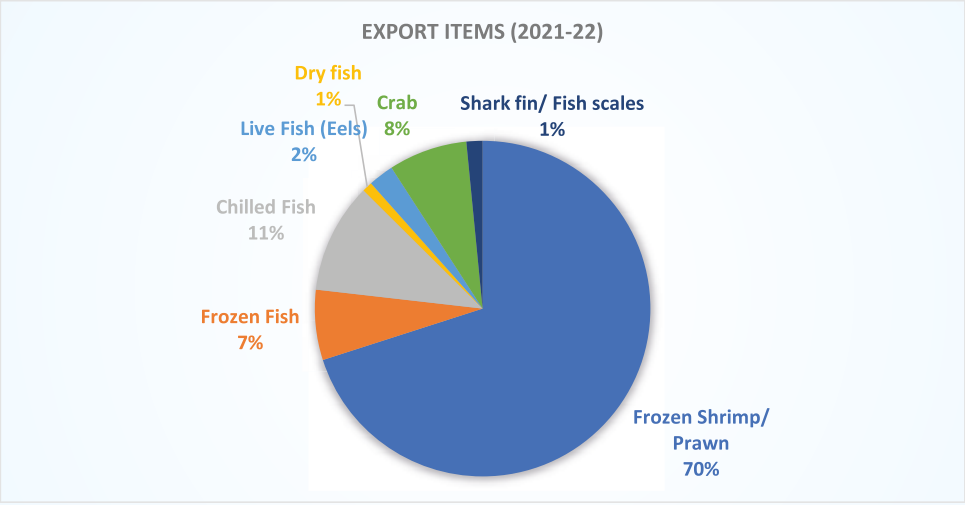


Fig.4.4: Export of Fish and Fishery products in 2021-22

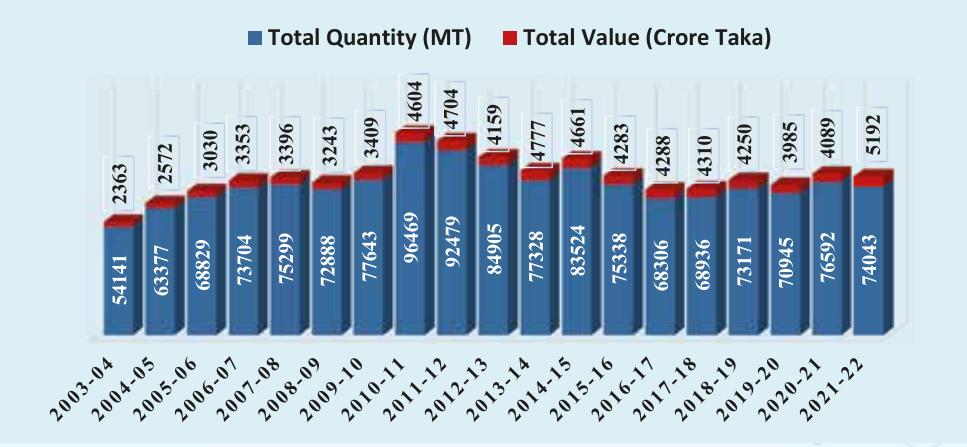


Fig.4.5: Export trend of fish and fishery products and foreign earning

4.4 Traceability

Traceability is the ability to track any food stuff through all stages of production, processing and distribution (including importation and at retail). When a potential food safety problem is identified, an effective traceability system can help isolate and prevent contaminated products from reaching consumers or recall if distributed into commerce and ensure corrective actions as well. Traceability should mean that movements can be traced one step backwards and one step forward at any point in the supply chain. To ensure traceability, about 207,000 shrimp and 9,651 fin fish farms of Bangladesh have been registered. Other establishments involved in supply chain of fish and fish products in the country are also registered or licensed to ensure traceability.

4.5 On-line Certification System, TRACES (Trade Control and Export System)

TRACES (Trade Control and Export System) is the European Commission's multilingual online tool for certification on sanitary requirements for intra-EU trade and importation of animals, semen and embryo, food, feed and plants. The network not only promotes a better cooperation between the competent authorities but also between the traders themselves and their competent authorities. TRACES allows the quick detection of fake certificates and therefore contributes to the enhancement of trust vis-à-vis its partners. In 2017, Bangladesh has introduced online certification through TRACES for consignments of fish and fish products intended to export to the EU countries. On 14 December, 2019, DG-SANTE has introduced improvised format of TRACES which is called TRACES-NT, i.e., TRACES New Technology. Officers of three FIQC offices have been already trained at Bangalore, India on TRACES-NT certification and Bangladesh has already started using TRACES-NT for ET certification in exporting fish and fish products to EU.

4.6 Aquaculture Residues monitoring through NRCP

Residue Monitoring Program of DoF enforced as National Residue Control Plan (NRCP), is a program to monitor status of residues and contaminant in farmed fish and shrimp to reveal the illegal use of banned or unauthorized substances as well as to determine the origin of residue contamination. For implementation of NRCP, 'NRCP Policy Guidelines 2011 (amended in 2012)' was formulated in line with the Fish and Fish Product (Inspection & Quality Control) Act-2020 and Fish and Fish Product (Inspection & Quality Control) Rules-1997 (amended in 2008, 2014 & 2017). The National Residue Control Plan is based on measures to monitor certain substances and residues thereof in live animals and animal products and fixing the levels and frequencies of sampling provided the control of certain substances and residues thereof in certain animal products.

4.6.1 Planned NRCP-2022 for Shrimp and Finfish

Table: 4.1 Summary of NRCP -2022 for Aquaculture Crustaceans (Shrimp & Prawn) and Finfish:

NRCP-2022 for Aquaculture Crustaceans (Shrimp & Prawn) and Finfish (Revised)																	
	National Plan					Khulna Zone				Chattogram Zone					Dhaka Zone		
Test Parameter	*M. rosenbergii*	*P. monodon*	*M. monoceros*	Fin fish	Grand Total	*M. rosenbergii*	*P. monodon*	*M. monoceros*	Sub Total	M. rossenbergii	*P. monodon*	*M. monoceros*	Fin fish	Sub Total	*M. rosenbergii*	Fin fish	Sub Total
	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan
A1 (DES)	0	0	0	12	12	0	0	0	0	0	0	0	9	9	0	3	3
A1 (HEXS)	0	0	0	5	5	0	0	0	0	0	0	0	3	3	0	2	2
A3	0	0	0	17	17	0	0	0	0	0	0	0	12	12	0	5	5
A6 (CAP)	68	92	11	7	178	66	75	8	149	1	17	3	6	27	1	1	2
A6 (NF)	68	92	11	7	178	66	75	7	148	1	17	4	6	28	1	1	2
A6 (MNZ)	28	38	3	2	71	26	32	2	60	1	6	1	1	9	1	1	2
A6 (DMDZ)	4	4	1	1	10	4	3	1	8	0	1	0	1	2	0	0	0
A6 (Sub-total)	168	226	26	17	437	162	185	18	365	3	41	8	14	66	3	3	6
B1 (Tetracyclines)	106	134	18	31	289	104	111	13	228	1	23	5	22	51	1	9	10
B1 (Amoxicillin)	16	24	2	5	47	14	19	1	34	1	5	1	4	11	1	1	2
B1 (Gentamycin)	16	24	2	5	47	14	19	1	34	1	5	1	4	11	1	1	2
B1 (Sulfonamides)	16	24	2	5	47	14	19	1	34	1	5	1	4	11	1	1	2
B1 (Tylosin)	16	24	2	5	47	14	19	1	34	1	5	1	4	11	1	1	2
B1 (Sub-total)	170	230	26	51	477	160	187	17	364	5	43	9	38	95	5	13	18
B2a	68	92	10	20	190	66	75	7	148	1	17	3	14	35	1	6	7
B3a	12	20	2	4	38	10	15	1	26	1	5	1	3	10	1	1	2
B3c (including PCBs)	36	50	6	11	103	34	40	4	78	1	10	2	7	20	1	4	5
B3d	18	22	2	4	46	16	17	1	34	1	5	1	3	10	1	1	2
B3e	36	47	5	11	99	34	38	3	75	1	9	2	7	19	1	4	5
NC-A6 (NF)	1	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0
NC-B3c (Cr)	2	1	0	0	3	2	0	0	2	0	1	0	0	1	0	0	0
NC-B3e (MG)	1	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0
Total	512	688	77	152	1429	486	557	51	1094	13	131	26	110	280	13	42	55

Remarks: A1 : DES=Dietylstilbestrol, HEXS= Hexesterol; **A3:**Methyl Testosteron; A6:CAP = Chloramphenicol, NF = Nitrofurans (AHD, AOZ, AMOZ, SEM), MNZ = Metronidazole, DMDZ= Dimetridazole; **B1:**Tetracycline, Oxytetracycline, Chlortetracycline, Amoxicillin, Gentamycin, Sulfonamides, Tylosin; **B2a:** Mebendazole, Fenbendazole; **B3a:** DDT, Aldrin, Heptachlor, Endrin, Dieldrin; **B3c:** Lead, Mercury, Cadmium, Chromium, Arsenic & PCB; **B3d:** Aflatoxin (B1, B2, G1, & G2); **B3e:** Malachite Green, Leucomelachite Green, Crystal Violet & Leucocrystal Violet

4.6.2 NRCP-2022 –Test details

Table: 4.2 Result of NRCP-2022

Substance category	Substance	Number of Sample Tested	Number of NC
A1	Diethylbestrol ,hexoestrol	**17**	**0**
A3	Methyl Testosterone	**17**	**0**
A6	CAP, AMOZ, AOZ, AHD, SEM,DMDZ	**707**	0
B1	TC, OTC & CTC, Amoxicillin, Gentamycin, Sulfonamaides, Tylosin	**180**	**0**
B2a	Mebendazole, Fenbendazole	**185**	**0**
B3a	Pesticides (DDT, Aldrin. Heptachlor, Endrin & Dieldrin)	**39**	**0**
B3c	Heavy metals (Pb, Cr, Cd, Hg & As)	**97**	**05**
B3d	Aflatoxin (B1, B2, G1, G2)	**46**	**0**
B3e	MG, LMG, CV & LCV	**96**	**0**
Total		**1384**	**0**

4.6.3 NRCP Findings in last ten years

The total number of NRCP samples and number of non-compliant samples in last seven years is presented in the following table. From the table, it is clear that, with the continuous effort and vigilance of the DoF, 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	2022	1429	05	Cr-04,Ar-01
2.	2021	1384	05	AHD-01,Cr-01,MG-03
3.	2020	1365	0	NA
4.	2019	1340	0	NA
5.	2018	1376	1	Heavy metal (Pb)
6.	2017	1279	1	Dye (LCV)
7.	2016	1363	0	Not applicable
8.	2015	1355	7	SEM-06, CV-01
9.	2014	1388	23	CAP-02, SEM-19, AHD-01, As-01
10.	2013	1332	49	CAP-08, SEM-33, AHD-02, CV-01, Pb-04, Afl-01

4.6.4 Feed residue testing

In addition, testing of different chemical residues of 300 samples of fish feed have been planned in 2022 for testing by three FIQC offices-

Testing Parameters	Number of Feed Samples			Total
	FIQC Office, Dhaka	FIQC Office, Chattogram	FIQC Office, Khulna	
A6 (CAP, AOZ, AMOZ, SEM & AHD)	12	22	26	60
B1 (TC, OTC & CTC)	10	22	28	60
B3c (As, Cd, Pb, Cr & Hg)	40	41	34	115
B3d (Aflatoxin B_1, B_2, G_1, G_2)	18	25	22	65
Total	80	110	110	300

4.7 Activities towards production of value added fish and fish products

The exporters are investigating more to produce value added products instead of traditional block products to meet the demands of the global market. Now a day, exporters are focusing more on production and export of value added products of shrimp and fish. As for example, in order to coup with the requirements of competitive global seafood market two fin fish processing factories- Virgo Fish and Agro Process Ltd. and Seven Oceans Fish Processing Ltd., Trishal, Mymensingh have started production and export of fish fillet of pangas. Installation of the facilities for preparing fish ball, fish nugget etc. is underway at Seven Oceans Fish Processing Ltd. Setting of facilities for extracting fish oil and preparation of fish meal at Virgo Fish and Agro Process Ltd. is underway. Construction of two other fin fish processing factory named Earth Agro Farms Ltd. at Gazipur and Globe Fisheries Ltd. at Noakhali are underway. A company named Bangladesh-American Agro-process Ltd. located at Cumilla has already started production of fish fillets from pangas and tilapia and other ready to cook value added products like fish finger, fish balls, fish nugget etc. of fish for local consumers. Construction of another fish processing plant named Alpha Accessories and Agro Export Ltd., Fakirhat, Bagerhat for production of 100% export oriented high value added products is underway.

4.7.1 Laws, Policies and Documents

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) Act,2020
- The Marine Fisheries Act, 2020
- The Marine Fisheries Rules, 1983
- The Fish and Fish Product (Inspection and quality control) Rules, 1997 (amended in

2008, 2014 & 2017)
- The Fish Hatchery Act, 2010
- The Fish Feed and Animal Feed Act, 2010
- The Fish Feed Rules, 2011
- The Fish Hatchery Rules, 2011
- The Fish Quarantine Act, 2018

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 17025:2017 General Requirements for Competence of testing Laboratories

4.8 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 from the highest number of 52 in the year 2009. In 2019, there were 4 RASSF notifications (one microbial and three chemical) for fish and fish products. In 2020 there was 01 RASSF notification, in 2021 there were -02 RASSF notification and in 2022 there were -06 notifications.

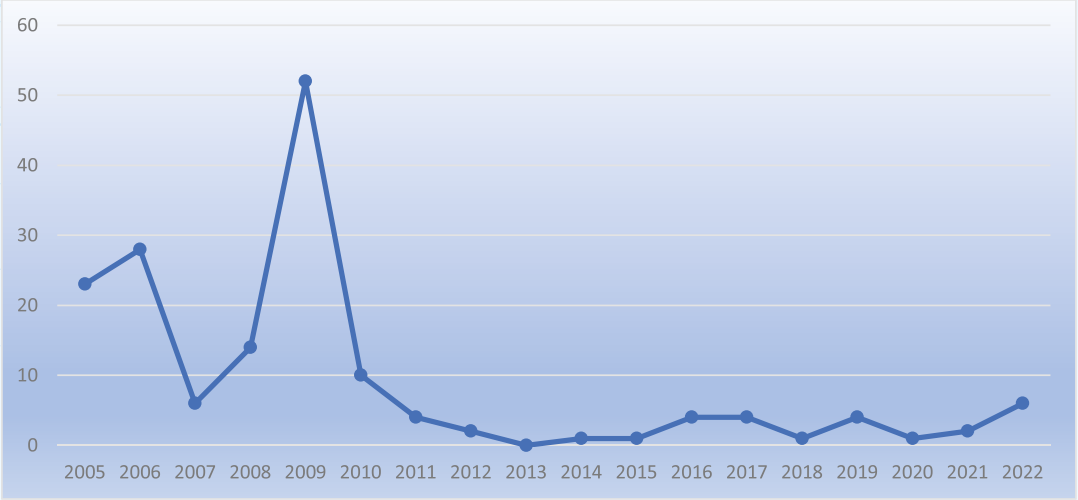


Fig.4.6: Number of rapid alerts concerning fish and fishery products exported to EU from 2005 to 2022.

4.9 Audit/exposure visit by delegates of competent authorities of importing countries

4.9.1 EU-FVO Audit-2015

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).

4.9.2 EU-FVO Audit-2018

EU-FVO Audit team consisted of three members visited from 5 to 17 November 2018 to

evaluate the control of residues and contaminants in live animals and animal products including controls on veterinary medical products. They visited shrimp farm at Bagerhat, and fin fish farm at Mymensingh, QC labs of Khulna, Dhaka and Chattogram,; RCA Offices in Khulna, AMP stores and EU approved Aquaculture processing establishments in Khulna and Chattogram and IFST lab of BCSIR. This audit concluded that the official control system for fishery products in Bangladesh is similar to the one in the EU, support the guarantees offered under Article 29 of Directive 96/23/EC.

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.

Chapter 5

Human Resource Development

5.1 Training

Human Resource Development (HRD) refers to the organization's plan to help employees development their abilities, skills, and knowledge. In return, this process enhances the organization's efficiency. Human Resource Development (HRD) is mandatory for DoF to enhance administrative, management and technological capacity in fisheries sector. The HRD activities meant to enhance capacity in the area of administrative, management, technological aspects and relevant cross cutting issues for conserving and managing the fisheries resources in sustainable manner. The ultimate objective is to augment productivity in fisheries sector, alleviate poverty, address gender issues, reduce unemployment and contribute balanced development having regard to goals and objectives of the national development plans. As a part of National Fisheries Policy implementation, DoF has developed a Human Resource Development Sub-strategy. DoF has organized both in-country and overseas training as major tool for technology transfer and extension activities in order to disseminate new technologies at field level. For this purpose regular training programs are being conducted from both revenue and development budget of DoF for the skill development of concerned personnel including DoF officials, fishers, fish farmers, unemployed youths, women, landless and marginal farmers etc. For the continuation of fisheries training, Government already created a new sub-head named "training "in the revenue budget. The progress of training activities at a glance is shown below-

Table 5.1. Training activities in last 10 (ten) years under revenue budget

Financial Year	In Country Training		Foreign Training	
	Government personnel	Fish Farmers/ Fishers/ NGO personnel	Government personnel	Fish Farmers/ Fishers/ NGO personnel
2012-2013	3995	275437	103	00
2013-2014	3154	298783	76	00
2014-2015	3143	76369	130	00
2015-2016	4379	185991	85	00
2016-2017	4379	185991	124	00
2017-2018	4522	200472	74	00
2018-2019	2521	36865	201	01
2019-2020	2702	35011	64	00
2020-2021	3593	38000	00	00
2021-2022	5360	35560	00	00

Table 5.2. Training activities with workshops, seminars of development projects (2021-22)

Sl no	Fish farmer/Fishers/NGOs workers(person)	Government personnel	No of participants		Allocated money (lakh taka)	Total expenditure (lakh taka)
1	128690	2326	86606 (male)	44414 (female)	1741.28	1572.69

5.2 Development of mid -level skilled manpower

The Bangladesh government has adopted Vision 2041 as a continuation of Digital Bangladesh Vision 2021, seeking to take the nation to the development path. Specifically, Vision 2041 seeks to eliminate extreme poverty. The vision 2041 has targeted to achieve self-sufficiency in food and increased food security. This requires achieving a dual objective of enhancing production and productivity, livelihoods security and equitable distribution of benefits side by side with the conservation of fisheries resources. In Bangladesh fisheries sector represents as one of the most productive and dynamic sector. This sector plays a significant role in food security, employment, and foreign exchange earnings in the economy. 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 some informal trainings. To ensure the sustainable aquaculture production and environmental friendly management of the water-bodies to achieve the Eighth Five Year Plan/Vision 2041 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 established one Fisheries Diploma Institute at Chandpur by the Fisheries Diploma Course Implementation project to build mid-level technically skilled manpower. In this Institute academic activities have been started from 2009-2010 academic years and admitted 25 students in first batch. The first batch student completed their Diploma in Fisheries course in the year 2013. A total of 228 students have passed from 2009-10 to 2017-18 sessions and 28 students were admitted in 2021-22 sessions. 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.

Fig. 5.1: Fisheries Diploma Institute in Sirajganj

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, Kishoreganj and Sirajganj districts to establish additional three new Fisheries Diploma Institutes at Gopalganj Sadar, Kishorganj Sadar and Belkuchi, Sirajganj. The academic activities of these diploma institutes has been started from 2018-2019 academic calendar year and already four batches students are studying in each institutions. A total of 101 students were admitted to these three Diploma Institute in the 2021-22 sessions.

Organizations like Department of Fisheries, Bangladesh Fisheries Research Institute, Bangladesh Fisheries Development Corporation, nationalized banks etc 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 also have the same opportunity. There also have some scope to utilize this sort of skilled manpower in the international labour market. So it will be easily possible to increase the total production of the sector, both qualitatively and quantitatively by the efficient utilization of skilled manpower.

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

5.3 Gender perspectives

The development of a country depends on men and women's participation in all sectors. The constitution of Bangladesh states that women have equal footing within all spheres of public life. It is said, recently women empowerment status has been changed and meaningful improvement has occurred in Bangladesh through their economic, social and political dimensions. But still now, due to various reasons, rural women are lagging behind than the urban women. The

Fig.5.2: Women engagement in fisheries sector

economic and social status of rural women remains extremely low due to economic and gender inequality. In this context, women education and employment, women's participation in income generating activities may change our socio-economic status of Bangladesh. Women's participation in aquaculture and fisheries activities is vital for the socio-economic development of Bangladesh. Considering all, ministry of fisheries and livestock, through the Department of Fisheries (DoF) has been working to create employment opportunity for women.

5.3.1 Employment and status of women in fisheries sector

In 2021-22 female officers and staffs provide services in different layers of the Department of Fisheries are 19.46% and 14.71% and out of the total population employed in the fisheries sector, about 14 lakh. From fish processing plants to casual work women are working in different ways. The wage range of women varies from BDT 5,000-15,000/month for permanent workers and BDT 4,500-13,000/month for casual workers. Apart from this, DoF creates scopes for income generation of rural women through nominating them as LEAF (Local Extension Agent for Fisheries). They are provided with BDT 2,000/month. There are 556 women out of 4190 LEAF in two development project . In 2021-22, at various development project of DoF, women participation 36.60%.

To ensure active participation of women in fish culture and management, DoF adopted various strategies:

- All development projects have taken priority based beneficiary selection specially for women, its target 25-30 percent. In 2021-22 fiscal year, women participation in development project 36.60%.

- Selected CIG women are almost 36%. Women are working 21% in training,fingerling releasing in open water, establishment of beel nursery, sanctuary establishment.etc.
- At present 80% women labour are working in fish processing factory.
- In 2021-22, among 2412 beneficiaries, 403 women beneficiaries got material assistance for fish culture.9824 women got training on fish culture and 29037 on alternative employment opportunity
- 99.56% women received micro credit assistance support from DoF. Using this credit today they are capable and successful fish farmers. Now they can meet up their protein demand and play important role in financially.
- Among CIG members 161 are being elected as a member of union parisad, so they can participate in development activities for the nation.

Women constitute half of the total population in our country. They are also suffering from malnutrition. Women's employment can play a significant role in the socio-economic development and gender equality. To attain sustainable development, women's active participation in income generating activities is urgently needed. Considering these scenarios, the Department of Fisheries (DoF) has been working to create employment opportunity for women. In this regard the rural women have also been provided with various supports through different development projects of DoF.

5.3.2 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 25-30% women participation as project beneficiaries.

Fig. 5.3: Women Beneficiaries of Development Project in 2017-18 to 2021-22

Chapter 6

Implementation and Development Plans and Policies

6.1 Annual Performance Agreement (APA)

With a view to ensure 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. The Prime Minister's Office (PMO) has pioneered this process by signing Performance Contracts. In that connection, Annual Performance Agreement (APA) has been introduced under the government performance management system to increase transparency and accountability in government activities, ensure proper use of resources and improve institutional capacity. This agreement sets out the Strategic Objectives of the concerned ministry/department, the activities undertaken to achieve these Strategic Objectives and the performance indicators and targets for measuring the results of these activities. At the end of financial year, the actual achievement of the concerned ministry/department will be evaluated against the targets set in the agreement. This document contains not only the agreed objectives, but also performance indicators and targets to measure progress in implementing them.

APA between the Director General (DG) of DoF and the Secretary of the Ministry of Fisheries and Livestock (MoFL) has been duly signed since from FY 2014-2015 to 2022-23to achieve the vision, mission and strategic objectives of DoF. For implementation of APA activities, DoF has taken different kinds of actions like APA team formation, monitoring team formation, nomination of APA focal point etc under the direction of APA guideline.

DoF has lifted its prestigious position for achieving APA targets according to DoF final evaluation report and the MoFL Budget Management Committee (BMC) meeting Minutes. Credible and sincere Performance of DoF highly appreciated from all relevant corners including Cabinet Division. DoF scored the 1st position in the implementation of APA in 2021-22 among the eight departments under the Ministry of Fisheries and Livestock. To that continuation, APA for the financial year 2022-23 signed in June 2022 between the Director General (DG) of DoF and the Secretary of the Ministry of Fisheries and Livestock (MoFL) with an aim to achieve 39 indicators under 4 broad field of 28 activities.

6.2 Sustainable Development Goals (SDGs)

The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by the United Nations in 2015 as a universal call to action to end poverty and hunger, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity. DoF as the extension department under the Ministry of Fisheries and Livestock (MoFL) is being implementing SDG aligning with its mandate, policy, projects and plans. MoFL in consultation with relevant stakeholders has already developed SDG Action Plan and Monitoring Framework through National Mid-Term and Long-Term Development Plans.

MoFL has taken necessary initiatives to review the progress of the planned interventions, which eventually contributes to achieve the specific SDG targets. As per GED Handbook on Mapping of Ministries by Targets in the Implementation SDGs aligned with 8FYP (2021-2025),MoFL has identified as Lead ministry for the SDG Targets- 14.2, 14.4, 14.5, 14.6, 14.7 and 14.b under the Goal 14.Conserve and sustainably use the oceans, seas and marine resources for sustainable development and co-lead the SDG Targets-2.1, 2.3 and 2.5 under the Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture. On the other hands, MoFL is associate ministry of SDG 29 indicators. Department of Fisheries (DoF) is the main stakeholder to achieve those targets of Goal 14. Total Marine Reserve area 7367sq. km that is 6.20% of total marine area which is the great achievement under goal 14.5. Under the supervision of MoFL, DoF is working to achieve the related goals and targets of the SDGs, 8th Five Year Plan, vision 2041, other perspective plan and global agenda.

A comprehensive action plan has been developed for the fisheries sector in line with the SDGs targets. DoF has taken different kinds of actions like as declaration and management of Marine Protected Area (MPA), Port State Measure Agreement (PSMA) signed with FAO, development of comprehensive sustainable coastal and marine fisheries management plan, National Plan of Action(NPOA), stock assessment for pelagic and demersal fishes and also for shrimp, licensing of fishing trawlers and vessels, introduction of TED, real time VMS/AIS, alternate income generation for the marine fishers through livelihoods transformation, proper implementation of 65 days seasonal banned period in marine water and 22 days mother hilsa conservation ,expansion of co-management program through CBFM.

Ongoing projects has been identified which are relevant and will contribute to achieve the 8th FYP and SDGs targets. Moreover projects intervention has been identified for 2021-2030 following the GED guideline. For the implementation monitoring of SDGs related activities data gap analysis is ongoing. Data provider identification will be finalized through this process. DoF needs strong collaboration with Mercantile Marine Department (MMD), Bangladesh Police, Bangladesh NAVY, Bangladesh Coast Guard, River Police, Department of Environment, Bangladesh Forest Department and Water Development Board etc.

6.3 Bangladesh Delta plan

The Bangladesh Delta plan (BDP) 2100 is a water centric, comprehensive, integrated, long-term and holistic plan for achieving safe, climate resilient and prosperous Delta' by 2100. In other words, 'BDP 2100 is the plan for moving Bangladesh forward towards the end of 21st Century.Deltas are geo-morphological dynamic landforms at the boundary of land and sea, involving intricate mazes of rivers and small waterways, wetlands, estuaries and coastal barrier islands. Deltas are also home to rich ecosystems, such as mangroves and marshes. The plentiful of rivers, fresh wetlands, and lakes provide ample scope for fisheries resources. Its rivers and floodplain, which make up 80% of the country, support life, livelihoods and the economy. The Delta six hotspots are (i) Haor and Flash Flood Area, (ii)

Coastal Zone, (iii) Chattogram Hill Tracts, (iv)Urban Areas, (v) Drought prone Areas, (vi) River Systems and Estuaries. For the first time in any development planning, BDP 2100 has taken the climate change issue as an exogenous variable in developing the macroeconomic framework of the plan. It is a techno-economic plan, which covers both technical and economic issues for the whole country. BDP 2100 is also an implementable plan having an investment program up to year 2030 linked with mobilization of financial resources. The Delta specific goals are in six of which all these goals are directly or indirectly related to the SDGs linking fully with SDG Goal 2,6,13 and 14 and partially with Goal 1,5,8,9,11 and 15. This linkage supported by appropriate interventions and policy will be continued in the upcoming with 8th Five Year Plan (FYP) as well as the 2nd perspective plan (2021-41) in achieving the Bangladesh's Vision for 2041. The Delta plan will create clear vision or grand design of upcoming future 2100. This comprehensive, techno-economic mega plan stretching period to the end of the current century is the best gift to the future generation by the present generation.

Chapter 7

Information and Communication Technology (ICT) in Department of Fisheries 2021-22

At present, Information and Communication Technologies (ICTs) are used in the fisheries sectors in Bangladesh. Department of Fisheries (DoF) is working hard to provide public services to citizens for improving the socio-economic condition of the people by increasing fish production. DoF is trying to digitalize the services so that people can get service quickly by reducing time, cost and visit.

Development sequence:

DoF has prepared Service Profile with 12 services with step identification for digitalization. ICT is incorporated to provide service more effectively. One can easily get various information from Fish Advice System, mobile app, SMS service, website and web portal. From Department of Fisheries website, one can get leaflets of fish culture, publication, annual report and e-books without any cost. E-training and e-recruitment systems have introduced already and running smoothly. Some internal services like webmail, group mail, and PDS introduced for better communication. PDS is playing a significant role to know the update information of officers which typically used for transfer and other purposes.

Fig.7.1:- Server System of Department of Fisheries

To send different types of reports and information to the head office, the system has digitalized. Various types of reports are digitalized. Besides these, e-gp, e-nothi, Digital attendance, CCTV introduced. Webmail is running by e-mail policy,2018 . To provide digital service 11 services selected for e-service under Digital Service Design lab (DSDL) and very soon it will be opened for use. Final demonstration has been completed of the softwares.

Key Developments within 2021 :

- ❖ Establishment of a call Centre to provide advisory services with a hotline number 16126 in office time. Two Call Centre Operators are working to provide information and advisory services.
- ❖ Development of five mobile apps for providing services;(Fish Advice Dr. Fish, Online Fish School, Motsho Chashi Barta, Shrimp Farming BD)
- ❖ Department of Fisheries headquarters covered with high configurable broadband connection with LAN, Wifi, 42 CCTV Cameras.
- ❖ DoF Conference room is equipped with high quality display screen.

Fig.7.2: Honorable Minister of Ministry of Fisheries and Livestock inaugurated the Call Centre of Department of Fisheries.

Future Planning:

To Provide ICT related activities, there is no alternative of high-speed internet and networking systems for digital Bangladesh. A robust infrastructure developed and all offices equipped with computers and other accessories. DOF installed internet connection with 300 Mbps speed through the optical fiber. In Matshya Bhaban, secure and effective internet connectivity established in combination with the server, router, and manageable switches.

Under the supervision of Cabinet division and a2i program, innovation activities are ongoing by the close supervision of innovation team. ICT section is supporting in ICT based innovations. Innovation corner is introduced on the website with plenty of Innovation information. DoF is encouraging the innovators by providing Innovation fund.

Service Process Simplification (SPS) is a continuous process. One SPS idea has been replicated in this fiscal year. The future plan of DoF regarding ICT is as follows:

- To introduce the 4IR technologies in farm automation for increasing fish production.
- To use the database developed from Coastal Project effectively.

- Effective use of Call Centre for providing advisory services.
- To provide services effectively through digital services.

To build smart Bangladesh, Department of Fisheries is working hard. ICT section is trying to implement ICT related activities associated with fish production as well as providing services by reducing time, cost and visit.

Chapter 8

Observation of National Fish Week 2022

Realizing the importance of fisheries sector, the Father of the Nation, Bangabandhu Sheikh Mujibur Rahman released 20,000 fish fingerlings in Ganabhaban Lake in 1973. The current democratic government is working tirelessly for the development of the sector with the aim of making the multifaceted activities of the fisheries sector more dynamic. Although the first National Fish Week program started in 1993, under the leadership of Hon'ble Prime Minister Sheikh Hasina, the National Fish Week is being celebrated in a grand manner across the country since 1996. Honourable Prime Minister Sheikh Hasina inaugurated the national fish week 2022 releasing fingerlings at Ganabhaban Lake. National Fish Week 2022 has been observed nationwide from 23-29 July with due emphasis on fish culture and conservation. The monumental slogan for National Fish Week 2022 was Nirapod Machhe Vhorbo Desh, Bangabandhur Bangladesh. As per instruction of the Prime Minister, the Ministry of Fisheries and Livestock through the Department of Fisheries took up various programs to promote sustainable fisheries development through mass public involvement, expansion of appropriate fisheries technologies as well as public awareness and spontaneous participation. During the celebration of National Fish Week,

Fig.8.1: Fingerlings releasing at the Bangabhaban and Jatio Sangsad Bhaban lake

various fisheries development activities are implemented along with creating and motivating public National Fish Week 2022awareness to increase the supply of animal protein, employment and ensure safe supply of fishes.The notable activities of National Fisheries Week are road rallies, press briefings, fish fairs, meetings/seminars; National Fisheries Award distribution by Honorable Prime Minister, documentaries on the success of the fisheries sector, release of fish fry, publication of crores in daily newspapers, discussions, campaigns on Bangladesh Television and Bangladesh Radio; Fisheries Law Enforcement Campaign, etc. To motivate the fish farmers, DoF distributed fish culture materials i.e. fish fingerlings, fish feed, lime etc. organized technology based improved fish culture training programs, tested various parameters of water quality etc under District and Upazila levels.

Chapter 9

Implementation of Development Projects

Present government is very much fisheries department friendly. Government has taken various initiatives from very beginning to increase investment for expected development of fisheries sector. An amount of taka 62983.00 lakh taka has been allocated for 14 development projects in the financial year 2021-2022 under the annual development program of DoF. The actual expenditure and achievements were 54315.88 lakh taka and 86.24 % respectively. The list with allocation and expenditure of DoF development projects and programs for vision 2021 are shown in Annexure 7.

Conclusion

Bangladesh has an impressive track record for growth and development in fisheries sector. Aquaculture has increasingly been playing a major role in total fish production of the country and presently more than half of the total production comes from aquaculture. If the available resources can manage more scientifically and mechanized way then the growth rate of fish production will create more employment opportunity, ensure food security that leads to the SDGs and vision 2041 respectively. In this way ,the fisheries resource of Bangladesh has ample scope of development to strengthen the national economy. To realize the potentials we need integrated collaboration resource management for conservation of fisheries resources. Ministry of Fisheries and Livestock (MoFL) and the Department of Fisheries (DoF) are aligned to implement all possible interventions using the limited resources to uplift the socio-economic status of Bangladesh. Since, the sector has been flourishing and now been accelerated by Honorable Prime Minister Sheikh Hasina, through the implementation of the dream of Bangabandhu to make a self-sufficient sovereign `Sonar Bangla'.

Annexure

Annexure-1: List of the winners of National Fish Week Awards 2022

Sl. No.	Field area	Name of the Person/Organization	Award
1.	**Fish spawn production**	**Bramhaputra Fish Seed Complex (Hatchery)** Propr. Mr.A K M Nurul Haque Father: Late Md. TahirUddin, Mother: Robila Khatun. Vill: Char Puliamari P.O: Shambhuganj bazar, Upazila: Mymensingh. District- Mymensingh, Division: Mymensingh.	**Gold Medal, 50000/- cash and a certificate**
2.	**Fish fingerling production**	**Taj Agro farm,** Propr. **Mr. Abu Saleh Md. Tarek** Father: A KM Shahjahan, Mother: Momotaj Begum. Vill: Birampur, P.O: Birampur, Upazila: Birampur. District- Dinajpur, Division: Rangpur.	**Gold Medal, 50000/- cash and a certificate**
3.	**Fish production**	**Savana Farm Products** **Ms. Farhan Rishta Binte Benjir.** Husband: Mr.Sayef Nazrul, Mother:JishanMirza. Pollice Bhaban, 6 Mintu Road, Ramna, Dhaka	**Gold Medal, 50000/- cash and a certificate**
4.	**Galda PL Production**	**Vai Vai Kuakata Hatchery,** Propr. Mr.Md Khalil Akanda,Father: Mr.Md Adam Ali Akanda, **Mother: Mst. Rijia Begum, Vill: Tulatuli, P.O: Kuakata,Upazila:Kalapara,District:Patuakhali**	**Gold Medal, 50000/- cash and a certificate**
5.	**Bagda production**	**Qoest Aquaculture Private Limited.** **Mr.Md Mahabubul Hanif MP** Father: Alhaj Afsar Ali, Mother: Rohima Afsar,Mo AA Rahim sarak, Court Para south Kushtia Sadar, Kushtia.	**Gold Medal, 50000/- cash and a certificate**
6.	**Fish and Fisheries Product production, processing, marketing, exporting and fisheries products diversification**	**ACI agro link Limited** **Managing Director Mr. AKM Faraejul Haque Ansari** **Father: Mr. Nazrul Islam, Mother Begum Nurjahan** **Road:104, Flat: 501, House:25,Gulsan, Dhaka**	**Gold Medal, 50000/- cash and a certificate**
7.	**Role of Department to Fisheries Development**	**Hilsa Resource Development District Taskforce, Barishal**.	**Gold Medal, 50000/- cash and a certificate**
8.	**Fish spawn production**	**Mushtakim Hatchery and Fisheries,Muktagachha,** Propr: Mr. Md. Monirul Islam Father: Md. Eunus Ali, Mother: Mst.Hajera Khatun, Vill: Kormullahpur, P.O: Char Adhpakhia, Upazila: Muktagachha. District- Mymensing, Division: Mymensing.	Silver Medal, 30000/- cash and a Certificate
9.	**Fish fingerling production**	**Fishteck Hachery Limited** **Managing Director, Mr. Md. Tarek Sarkar** Father: Abdul Motaleb Sarkar, Mother: Ayesha Aktar, House no-02, Road no-07, Sector -05, Uttara, Dhaka.	Silver Medal, 30000/- cash and a Certificate
10.	**Fish production**	**Moshiur Fisheries Farm,Paba, Rajshahi.** Propr: Mr. Md. Moshirudeen Father: Alhaj Md. Eunus Molla, Mother:Vadujan, Vill: Kormullahpur, P.O: Char Adhpakhia, Upazila:	Silver Medal, 30000/- cash and a Certificate

Sl. No.	Field area	Name of the Person/Organization	Award
1.	**Bagda P/L production**	**Balaka Hatchery,Ukhia, Cox,s Bazar** Propr: Mr. Md. Najibul Islam, Father: LateNurul Islam, Mother: Monoara Islam, Vill: North Rumalia Chhara, Upazila: Cox's bazar Sadar, District- Cox'sbazar, Division: Chittagong.	Silver Medal, 30000/- cash and a Certificate
2.	**Galda production**	**Farid Nine stars Agro (BD) Limited** Propr:Mr. Md. Belal Hossain Father: Father: Late Mofij, Mother: Momotaj Begum, House no: 218/219,Momotaj vila2nd Kandir Paar,Cumilla Adarsa Sadar,Cumilla..	Silver Medal, 30000/- cash and a Certificate
3.	**Fish and Fisheries Product production, processing, marketing, exporting and fisheries products diversification .**	**Salam Sea Foods Limited,Rupsha, Khulna** President : Mr. Md. Inul Haque Father: Alauddin Sheikh, Mother:Halima Begum, 43 Ahsan Ahmed Road, Khulna sadar, Khulna.	Silver Medal, 30000/- cash and a Certificate
4.	**Role in Fisheries Resource Development and Marine fisheries resource management**	**Halti Beel Biodiversity Management fisher Community,Naldanga, Natore. Chairman: Shishir Chandra Das,Father: Late Norottam Chandra Das,Mother: Late Ambala, Vill: Kaliganj, P.O: Dangapara, Upazila: Naldanga, Dist: Natore**	Silver Medal, 30000/- cash and a Certificate
15.	**Role of Department to Fisheries Development & Extension.**	**Mr. Maruf Hossain Minar** Senior Upazila Fisheries Officer, Charfation , Bhola Father: Md.Hossain,, Mother: Begum Shamsun Nahar, sebaloy Hajera Khatun School road, Barishal Sadar, Barishal.	Silver Medal, 30000/- cash and a Certificate
16	**Fish spawn production**	**Brac Fish Hatchery and Brood Fish Unnayon kendra Motiganj, Srimangal, Moulovibazar**	Bronze Medal, 20,000/cash and a Certificate
17	**Fish fingerling production**	**Joy Matsya Khamar, Propt: Mr. Binoy Malo, Father: Amal Chandra Malo, Mother: Dayali Rani Malo, Vil: Sonali Market , Jaduar char road, Borhamganj, Upazila:Shibchar,Dist: Madaripur, Division:Dhaka**	Bronze Medal, 20,000/cash and a Certificate
18	**Fish Production**	**M/S Norshingdi Agro, Propt: Mr.Md Hafizur Rahaman,Father : Md. Abdus Sattar, Mother: Mst. Foolnahar Begum, Vill: Bagpara, P.O: Polash, Dist : Norshindi, Division: Dhaka.**	Bronze Medal, 20,000/cash and a Certificate
19	**Fish and Fisheries Product production, processing, marketing, exporting and fisheries products diversification**	**Piam Fish Export Limited. Managing Director: Sheikh Md. Abdul Kader,Father: Alhaj Sheikh Md. Shafiuddin, Mother: Ms. Rokeya Begum, House no.49,Ishpahani 2nd lane,P.O Khulna city 9100, Upazila: Khulna sadar, Dist: Khulna, Division: Khulna**	Bronze Medal, 20,000/cash and a Certificate
20	**Contribution/Role of Officer/ Staff of DoF in Fisheries Resource**	**Mr. Md. Belal Hossain,District Fisheries Officer, Norsingdi**	Bronze Medal, 20,000/cash and a Certificate

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

[Unit: Metric Ton]

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
A. INLAND FISHERIES	**2821266**	**2952730**	**3085048**	**3251796**	**3496958**	**3621954**	**3724310**	**2583866**	**3939989**	**4052701**
(a) Inland Open water (Capture)	**961458**	**995805**	**10,23991**	**1048242**	**1163606**	**1216539**	**1235709**	**1248401**	**1301244**	**1321631**
(1) River and Estuaries	147264	167373	174878	178458	271639	320598	325478	331793	337051	342545
(2) Sundarbans	15945	18366	17580	16810	18086	18225	18282	21007	21544	24259
(3) Beel (Depression)	87902	88911	92678	95453	58117	99197	99890	103104	104871	105573
(4) Kaptai Lake	9017	8179	8645	9589	9982	10152	10578	12696	12345	17937
(5) Flood Plain	701330	712976	730210	147872	765782	768367	781481	779801	825433	831317
(b) Inland Close water (Culture)	**1859808**	**1956925**	**2061057**	**2203554**	**2333352**	**2405415**	**2488601**	**2583866**	**2638745**	**2731070**
(1) Pond and Ditch	1446594	1526160	1610875	1719783	1833114	1900298	1974632	2046258	2090787	2166715
(2) Semi-Closed	200833	193303	201280	207658	215547	216353	217340	225948	226608	231692
(3) Baor (Ox-bow Lake)	6146	6514	7267	7729	8002	8072	10343	10969	11319	11685
(4) Shrimp/Prawn Farm	206235	216447	223582	235758	246406	254367	258039	270114	278417	287497
(5) Crab's	-	-	-	-	140421	11787	12084	12562	12337	13397
(5) Pen culture		13054	16084	13364	13368	11015	12361	13425	14282	15063
(6) Cage culture		1447	1969	2062	2490	3523	3802	4590	4995	5021
B. MARINE FISHERIES	**588988**	**595385**	**599846**	**6265**	**637476**	**654687**	**659911**	**671104**	**681239**	**706030**
(a) Industrial	73030	76885	84846	105348	108479	120087	107236	115354	119121	137170
(b) Artisanal	515958	518500	515000	521180	528997	534600	552675	555750	562118	568860
COUNTRY TOTAL (A+B)	**34,10,254**	**35,48,115**	**36,84,894**	**38,18,324**	**41,34,434**	**42,76,641**	**4384221**	**4503371**	**4621228**	**4758731**
ANNUAL GROWTH RATE (%)	**4.55**	**4.04**	**3.85**	**5.27**	**6.60**	**3.44**	**2.52**	**2.72**	**2.62**	**2.98**

Annexure 3: Fish Production Trend (1983-84 to 2021-22)

Sector of Fisheries	Production (MT)										*Growth Rate % (2021-22)*
	1983-84	**1993-94**	**2003-04**	**2013-14**	**2016-17**	**2017-18**	**2018-19**	***2019-20***	***2020-21***	***2021-22***	
A. Inland Fisheries											
1. River and Estuary	207766	143425	137337	167373	271639	320598	325478	331793	337051	342545	1.63
2. Sundarbans	7783	7127	15242	18366	18086	18225	18282	21007	21544	24259	12.60
3. Beel	51373	55592	74328	88911	98117	99197	99890	103104	104871	105573	0.67
4. Kaptai Lake	4057	6635	7238	8179	9982	10152	10578	12696	12345	17937	45.30
5. Floodplain	200616	360597	497922	712976	765782	768367	781481	779801	825433	831317	0.71
Capture Total	**471595**	**573376**	**732067**	**995805**	**1163606**	**1216539**	**1235709**	**1248401**	**1301244**	**1321631**	**1.57**
6. Pond	107944	222542	795810	1526160	1833118	1900298	1974632	2046258	2090787	2166715	3.63
7. Seasonal cultured water body	0	0	0	193303	215547	216353	217340	225948	226608	231692	2.24
8. Baor	862	2201	4282	6514	8002	8072	10343	10969	11319	11685	3.23
9. Shrimp/Prawn Farm	8219	39447	114660	216447	246406	254367	258039	270114	278417	287497	3.26
10. Crab	0	0	0	0	14421	11787	12084	12562	12337	13397	8.59
11. Pen Culture	0	0	0	13054	13368	11015	12361	13425	14282	15063	5.47
12. Cage Culture	0	0	0	1447	2490	3523	3802	4590	4995	5021	0.52
Culture Total	**117025**	**264190**	**914752**	**1956925**	**2333352**	**2405415**	**2488601**	**2583866**	**2638745**	**2731070**	**3.50**
Inland Fisheries Total (A)	**588620**	**837566**	**1646819**	**2952730**	**3496958**	**3621954**	**3724310**	**3832267**	**3939989**	**4052701**	**2.86**
B. Marine Fisheries											
13. Industrial (Trawler Fishing)	14500	12454	32606	76885	108479	120087	107236	115354	119121	137170	15.15
14. Artisanal	150382	240590	422601	518500	528997	534600	552675	555750	562118	568860	1.20
Marine Fisheries Total (B)	**164882**	**253044**	**455207**	**595385**	**637476**	**654687**	**659911**	**671104**	**681239**	**706030**	**3.64**
TOTAL FISH PRODUCTION (A+B)	**753502**	**1090610**	**2102026**	**3548115**	**4134434**	**4276641**	**4384221**	**4503371**	**4621228**	**4758731**	**2.98**

Annexure 4(a): Annual Carp Hatchling Production in 2021-22

Source of Production	No. of Hatchery	Hatchling Production (Kg)	%
1) **Natural**			
Jamuna River	-	907	-
Padma River	-	575	-
Arialkha River	-	95	-
Brahmaputra River	-	7	-
Garai/Madhumati River	-	142	-
Surma	-	0	-
Halda River	-	129	-
Natural Total		**1855**	*0.29*
2) **Artificial**			
Govt. Hatchery	110	15799	*2.51*
Private Hatchery	874	611787	*97.20*
Artificial Total	**984**	**627586**	***99.71***
COUNTRY TOTAL	**984**	**629441**	*100*

Annexure 4(b): Hatchling Production of Govt. Hatchery in 2022

Name/Location of Hatchery	No. of Hatchery	Hatchling Production (Kg)									Tilapia Juvenile (lakh)
		Major Carp	Exotic Carp	Pangas	Thai Punti	Bata	Koi	Shingi/ Magur	Other	Total	
Division-wised Fish Seed Multiplication Farm											
1. Dhaka	13	812	409	0	100	130	5	48	28	1532	0.40
2. Mymensingh	9	1072	307	0	224	102	0	25	30	1760	0.00
3. Khulna	14	1498	1109	0	0	63	0	25	62	2757	1.00
4. Barishal	10	425	20	0	0	0	0	5	5	455	1.50
5. Rangpur	16	1085	732	0	190	287	10	45	28	2377	0.20
6. Rajshahi	17	1625	661	65	59	207	0	0	127	2744	1.60
7. Chattogram	17	1555	451	5	182	16	78	31	75	2393	2.77
8. Sylhet	6	690	103	0	148	15	0	30	34	1020	2.16
T O T A L	**102**	**8762**	**3792**	**70**	**903**	**820**	**93**	**209**	**389**	**15038**	**9.63**
* BFRI	8	493	64	12	26	6	3	3	154	761	5.15
COUNTRY TOTAL	**110**	**9255**	**3856**	**82**	**929**	**826**	**96**	**212**	**543**	**15799**	**14.78**

** Including BFRI substation's hatchery.*

Annexure 4(c): Hatchling Production of Private Hatchery in 2021-22

Division	No. of Hatchery	Hatchling Production (Kg)									Tilapia Juvenile (lakh)
		Major Carp	Exotic Carp	Pangas	Thai Punti	Bata	Koi	Shingi/ Magur	Other	Total	
1. Dhaka	44	10536	3066	485	1790	2322	742	340	1079	20360	553
2. Mymensingh	344	92522	32593	4700	15200	6075	3096	27238	9847	191271	1929
3. Khulna	93	48090	35070	424	1683	3097	346	414	4158	93282	19934
4. Barishal	28	11102	3836	319	2500	491	595	437	205	19485	1300
5. Rangpur	62	20746	19227	0	3762	8172	515	1900	965	55287	385
6. Rajshahi	191	69452	50625	12695	6497	13354	2348	9036	4837	168844	22650
7. Chattogram	96	28754	13168	5492	1037	283	179	65	3630	52608	865
8. Sylhet	16	6005	3046	0	1107	492	0	0	0	10650	755
TOTAL	**874**	**287207**	**160631**	**24115**	**33576**	**34286**	**7821**	**39430**	**24721**	**611787**	**48371**

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

(2) Other Species: Ghania, Chital, Gulsa, Pabda, etc.

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

Annexure 4(d): Annual PL (Post Larve) Production in 2021-22

Source of Production	Galda Hatchery		Bagda Hatchery		Total	
	No. of Hatchery	PL Production (Crore)	No. of Hatchery	PL Production (Crore)	No. of Hatchery	PL Production (Crore)
Govt. Hatchery (DoF)	27	0.32	0	0	27	0.32
Govt. Hatchery (BFRI)	1	3.40	0	0	1	3.40
Private Hatchery	11	3.00	50	833	61	836.00
TOTAL	**39**	**6.72**	**50**	**833**	**89**	**839.72**

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

Annexure 5: Annual Catch of Marine Fisheries in 2021-22

Type of Fishing	Number of Craft (Trawler/ Boat)	Number of Unit (Gear/Net)	Catch in Metric Ton				
			Shrimp	Hilsa	Tuna & Tuna Like Fish	Other Fish	Total
A. INDUSTRIAL Trawl Fishing							
a) Shrimp Trawler	32	90	2218	0	0	2390	4608
b) Fish Trawler	199	570	1083	11046	411	120022	132562
TOTAL INDUSTRIAL (A)	**231**	**660**	**3301**	**11046**	**411**	**122412**	**137170**
B. ARTISANAL							
1. Gill Net Fishing							
a) Mechanized	20359	77768	0	283700	5717	65505	354922
b) Non-mechanized	16831	40585	0	27125	0	10904	38029
SUB TOTAL	**37190**	**118353**	**0**	**310825**	**5717**	**76409**	**392951**
2. Set Bag Net Fishing							
a) Seasonal (MB)	10000	22404	40802	0	2560	106343	149705
b) Seasonal (NMB)	5200	10000	0	0	0	0	0
c) All Seasonal (NMB)	5550	10025	812	0	0	509	1321
SUB TOTAL	**20750**	**42429**	**41614**	**0**	**2560**	**106852**	**151026**
3. Long Line Fishing a) Jew Fish Long Line							
i. Mechanized	2500	10191	0	0	770	17479	18249
ii. Non- mechanized	400	900	0	0	0	350	350
b) Other Long Line (NMB)	325	772	0	0	0	258	258
SUB-TOTAL	**3225**	**11863**	**0**	**0**	**770**	**18087**	**18857**
4. Trammel Net Fishing (NMB)	131	422	991	0	0	2090	3081
5. Other Gears Fishing (NMB)	6373	15640	1700	0	0	1245	2945
TOTAL ARTISANAL (B)	**67669**	**188707**	**44305**	**310825**	**9047**	**204683**	**568860**
GRAND TOTAL (A+B)	**67900**	**189367**	**47606**	**321871**	**9458**	**327095**	**706030**

- Annual Growth Rate: 3.64%, (Hilsa: 2.64%; Shrimp: 2.83%, Tuna & Tuna Like Fish -57.26% and other species: -9.32%)
- Annual Growth Rate (Industrial): 15.15%; (Artisanal): 1.20%
- Tuna & Tuna Like Fish is incorporate separetly from 2020-21

Trawler		Boat		Gear	
Type	**Number**	**Type**	**Number**	**Type**	**Number**
Shrimp Trawler	32	**MB** *(Mechanized Boat)*	32859	Gill Net	118353
Fish Trawler	199	**NMB** *(Non-Mechanized Boat)*	34810	Set Bag Net	42429
				Long Line	11863
				Trammel Net	422
				Other Gear	15640
Total	**231**		**67669**		**188707**

Annexure 6: Species-wise Catch of Marine Fisheries in 2021-22

[Unit : Metric Ton]

Type of Fishing	Shrimp (A)	Hilsa (B)	Tuna & Tuna Like Fish (C)	Other Species									Grand Total (A+B+C +D)
				Sardine	Bombay Duck	Indian Salmon	Pom fret	Jew Fish	Cat Fish	Shark/ Skate/ Ray	Other Marine Fish	Total (D)	
A. INDUSTRIAL Trawl Fishing	**3301**	**11046**	**411**	**37720**	**2787**	**0**	**1137**	**5080**	**4198**	**3915**	**67574**	**122412**	**137170**
B. ARTISANAL													
1.Gill Net Fishing													
a) Mechanized	0	283700	5717	702	11400	150	4078	24507	3078	1670	19920	65505	**354922**
b) Non- mechanized	0	27125	0	0	70		256	2400	96	46	8036	10904	**38029**
SUB-TOTAL	**0**	**310825**	**5717**	**702**	**11470**	**150**	**4334**	**26907**	**3174**	**1716**	**27956**	**76409**	**392951**
2. Set Bag Net Fishing													
a) Seasonal	40802	0	2560	10	68120	0	5966	3512	60	113	28562	106343	**149705**
b) All Seasonal	812	0	0	0	125	0	43	0	24	23	294	509	**1321**
SUB-TOTAL	**41614**	**0**	**2560**	**10**	**68245**	**0**	**6009**	**3512**	**84**	**136**	**28856**	**106852**	**151026**
3. Long Line Fishing													
a) Jew Fish Long Line													
i. Mechanized	0	0	770	0	0	30	0	4759	6249	1204	5237	17479	**18249**
ii. Non Mechanized	0	0	0	0	0	19	0	115	114	32	70	350	**350**
b) Other Long Line	0	0	0	0	0	0	0	70	137	14	37	258	**258**
SUB-TOTAL	**0**	**0**	**770**	**0**	**0**	**49**	**0**	**4944**	**6500**	**1250**	**5344**	**18087**	**18857**
4.Trammel Net Fishing	991	0	0	0	30	0	0	753	450	0	857	2090	**3081**
5. Other Gears' Fishing	1700	0	0	0	128	0	0	160	160	0	797	1245	**2945**
TOTAL ARTISANAL	**44305**	**310825**	**9047**	**712**	**79873**	**199**	**10343**	**36276**	**10368**	**3102**	**63810**	**204683**	**568860**
GRAND TOTAL **(Industrial+ Artisanal)**	**47606**	**321871**	**9458**	**38432**	**82660**	**199**	**11480**	**41356**	**14566**	**7017**	**131384**	**327095**	**706030**
%	***6.74***	***45.59***	***1.34***	***5.44***	***11.71***	***0.03***	***1.63***	***5.86***	***2.06***	***0.99***	***18.61***	***46.33***	***100***

Species-wise Annual Shrimp Catch in Marine Fisheries

Sector	Bagda (Tiger)	Harina (Brown)	Chaka (White)	Others	Total	Growth Rate (%)
Trawl Fishing	251	1465	70	1515	**3301**	*7.56*
Artisanal Fishing	2081	3607	3520	35097	**44305**	*2.49*
TOTAL	**2332**	**5072**	**3590**	**36612**	**47606**	***2.83***

Annexure -7 List of ongoing development projects in 2021-22

SL. No.	Name of the project and Implementation Period	Total PP Cost (Fig. in lakh)	Project Area	Objectives	Major Activities	Achiev--ement (%)
1.	Expansion of Aquaculture Technology Services up to Union Level Project (Phase-II) (Mar 2015-Jun 2022)	37838.00	464 Upazilas in 61 Districts, covering 4300 Union of Bangladesh	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 fo r rural people though 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.	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	98.91
2.	Greater Comilla District Fisheries development Project (Jul, 2015-Jun, 2022)	20666.00	34 Upazilas, 03 Districts, 01 Division	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.	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	99.52

SL. No.	Name of the project and Implementation Period	Total PP Cost (Fig. in lakh)	Project Area	Objectives	Major Activities	Achiev--ement (%)
					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	
3.	Enhancement of Fish Production through Restoration of Waterbodies Project (Oct, 2015-Jun, 2022)	40900.00	61 Districts and 349Upazilas	1. To ensure food security and support to the government's poverty reduction efforts through increase of fish production at sustainable level 2. To increase consumption of fish for the people of Bangladesh 3. To increase income for the poor and marginal farmers through fish culture interventions 4. To increase income and employment of small scale fish seed traders and producers 5. To provide initial training and extension service and inputs for aquaculture interventions 6. To ensure involvement of poor beneficiaries group in aquaculture practices with improved technology packages established by the Department of Fisheries 7. To produce marketable fish.	1. Re-excavation (Pond, dighi) 2. Re-excavation (Silted Beel/Dead river/canal) 3. Construction of pipe culvert 4. Demonstration of farm on different fish culture technology	97.77
4.	National Agricultural Technology Programme Phase II Project (NATP-2) (Oct 2015-Jun 2023)	39826.23	270 selected Upazilas of 57 Districts	To increase agricultural productivity of smallholder farms and improve smallholder farmer's access to markets in selected districts.	1. CIG formation 2. Training 3. Dissemination of technology 4. Habitat restoration and conservation of endangered fish species	99.76

SL. No.	Name of the project and Implementation Period	Total PP Cost (Fig. in lakh)	Project Area	Objectives	Major Activities	Achiev--ement (%)
					5. 40 beel management through community based fisheri es management 6. Development of fish marketing system 7. Strengthening of District and Upazila Fisheries Office 8. Development of DoF training center	
5.	Sustainable Coastal and Marine Fisheries Project (July 2018- June 2023)	186886.55	4 Division, 16 District, 75 Upazila	The overall objective of the project is to explore greater opportunity from Coastal and Marine fisheries resources while promote sustainable management of fisheries stock and environment to reduce poverty and improve livelihood of the coastal community.	1. Enabling sustainable fisheries sector investments and growth 2. Improvement of infrastructure and production practices 3. Community empowerment and livelihood transformation 4. Project management and monitoring	77.78
6.	Fisheries Development Project in Rajshahi Division (Jan 2019-Dec 2023)	4747.00	8 Districts 65 Upazila In Rajshahi division	1. To enhance fish production and productivity from aquaculture and capture fisheries of Rajshahi division. 2. To protect fish biodiversity through establishing fish sanctuary, stocking endangered fish fingerlings and creating awareness. 3. To improve fish habitat for sustaining water ecosystem and productivity. 4. To improve socio-economic condition of the vulnerable fishers community and fish farmers. 5. To adopt climate smart tec hnologies to address climate change vulnerability in Rajshahi division. 6. To create more livelihood opportunities of marginal people of Rajshahi division.	1. Re-excavation of waterbodies 2. Establishment of sanctuary 3. Demonstration of farm on different fish culture technology 4. Support for alternate income generating activities (AIGAs) 5. Renovation of existing FSMF 6. Capacity development of different stakeholders 7. Farm registration and development of database.	95.16

SL. No.	Name of the project and Implementation Period	Total PP Cost (Fig. in lakh)	Project Area	Objectives	Major Activities	Achiev--ement (%)
7.	Chattogram Hill Tracts Fisheries Resources Development Project (March 2020-June 2024)	11827.50	3 Districts 26 Upazila of Chattogram Hill Tracts	1. To increase the production and productivity of fish through development of environment and ecology of creek/water reservoir 2. To ensure skill development of fishery related technology for creek related beneficiaries 3. To fulfill nutritional requirement and improve socio-economic condition of backward and marginal people of CHT 4. To strengthening capacity building of Department of Fisheries by infrastructure development 5. To increase income and employment of CHT people	1. Construction of embankment and drain for creek development 2. Repair and renovation of creek 3. Demonstration of farm on different fish culture technology 4. Establishment of fish sanctuary 5. Capacity development of different stakeholders 6. Support for alternate income generating activities (AIGAs) 7. Construction of office building and other infrastructure.	62.05
8.	Pilot Project on Tuna and Similar Pelagic Fishing in Deep Sea (July 2020-Dec 2023)	6106.00	Deep sea area of the Bay of Bengal near to Chattogram District under Chattogram Division	1. To assist in developing the capacity for capturing of tuna and tuna like fishes in the Bay of Bengal 2. To ensure food security through increasing capture of marine fishes in deep sea and supply of required nutrients for increasing population 3. To explore the opportunities through exporting high valued tuna and tuna like fishes and increase export earning, and 4. To increase the institutional capacity of DoF and coastal fishermen for tuna fishing.	1. Fishing of tuna and similar pelagic fish 2. Purchase and operation of three long liner fishing vessels 3. Develop deep sea fishing strategies and action plans.	98.61
9.	Hilsa Development and Management Project (July 2020-June 2024)	24627.53	29 District 134 Upazila	1. Increase Hilsa production through implementation of Conservation Act and creation of alternative employment opportunities for Hilsa fishermen	1. Support for alternate income generating activities (AIGAs) 2. Exchange of nets 3. Capacity development of different stakeholders	82.30

SL. No.	Name of the project and Implementation Period	Total PP Cost (Fig. in lakh)	Project Area	Objectives	Major Activities	Achiev--ement (%)
					4. Implementation of Fish Act 5. Awareness building 6. Strengthening the management of Hilsa sanctuary.	
10.	Conservation and Development of Indigenous Fish Species and Snail Project (July 2020- June 2024)	20798.51	3 Division 10 District 49 Upazila	1. To ensure sustainable production through conservation and development of indigenous fish species and non-conventional fisheries products snails and oysters 2. To create alternative employment through fish farming in cage and paddy field and expanding appropriate technology for different places and 3. To build skilled and trained manpower to increase safe fish production through good aquaculture practices.	1. Demonstration farm of indigenous fish 2. Demonstration of snail, mussel and pearl culture technology 3. Establishment of fish sanctuary 4. Establishment of beel nursery 5. Fish fingerlings Stocking 6. Fish Act Implementation 7. Support for alternate income generating activities (AIGAs) 8. Re-excavation of waterbodies for establishment of fish sanctuary and beel nursery 9. Exchange of nets 10. Distribution of van with insulated box (crate) 11. Exposure visit 12. Capacity development of different stakeholders 13. Fish farm registration.	85.94
11.	Climate Smart Agriculture and Water Management Project (DoF-Part) (Oct 2021-Sep 2025)	10625.00	18 District 29 Upazila	1. To increase 20% of fish production and productivity base year 2018-19 by introducing climate smart aquaculture technology. 2. To enhance market access of the relevant stakeholders through promoting business friendly supply chain and market network and 3. To ensure better livelihoods of the stakeholders and better understanding on suitable fisheries resources management through capacity development.	1. Establishment of 145 nos. beel nursery 2. Establishment of 49 nos. fish sanctuary 3. Established 14 nos. mini fish processing unit with value addition machineries 4. Procurement and supply of 58 nos. insulated van with icing facilities 5. Procurement and supply of 29 nos. wooden country boat	25.21

SL. No.	Name of the project and Implementation Period	Total PP Cost (Fig. in lakh)	Project Area	Objectives	Major Activities	Achiev--ement (%)
					6. Establishment of 1950 nos. Fish Demonstration of different climate smart technologies 7. Establishment of 29 nos. Fish Drying Demonstration 8. 7040 DoF officers, staff and beneficiaries training 9. AIGA inputs distributed among 600 fishers 10. Distributed 145 fish friendly fishingnet.	
12.	Feasibility Study of Development Projects to be Adopted by Department of Fisheries (15 March 2022-30 June 2022)	75.00	All over Bangladesh	1. Prepare and presentation of feasibility study report for each proposed project according to the prescribed format.	1. Feasibility study and report preparation of 6(six) proposed projects.	0
13.	Community-based Climate Resilient Fisheries and Aquaculture Development in Bangladesh (Jan 2020-Dec 2023)	4796.63	3 Division 6 District 9 Upazila	The Project will remove key barriers to effective adaptation to climate change in the fishery and aquaculture sector and build the resilience of the fishery sector through capacity development and policy reform. It will strengthen the awareness and knowledge of local communities, and enhance local adaptive capacity through transfer and adoption of appropriate site - specific climate resilient fisheries and aquaculture intervention technologies and approaches, which will be underpinned by effective knowledge management (e.g. use of ICT-based climate and disaster information services) ensuring wider dissemination of best practices and lessons learned.	1. Climate induced risks and vulnerability assessment of fisheries and aquaculture sub sector 2. Review of relevant national policies and strategies 3. Capacity need assessment of DoF, BFRI and other Fisheries related agencies 4. Report production on risk & vulnerability assessment in 9 Upazila 5. Awareness development/capacity enhancement of 70 communities 6. Development of collaborative early warning system & DRM	99.85

SL. No.	Name of the project and Implementation Period	Total PP Cost (Fig. in lakh)	Project Area	Objectives	Major Activities	Achiev--ement (%)
				Specific objectives: • *Reduce vulnerability of fisheries and aquaculture to the adverse impacts of climate change* • *Increase adaptive capacity of the fisheries and aquaculture communities and fisheries personnel to respond to the impacts of climate change* • *Promote transfer and adoption of adaptation technology*	7. Site specific climate resilient & gender differentiated technology development & adoption by the targeted communities 8. Technical support to run mud crab hatchery 9. Technical support to all Govt. & Private existing Galda hatcheries of South West region 10. Establishment of quality fish/shrimp seed market 11. Delivery of small equipment to 100 communities/CBOs for water quality monitoring & rental services to others 12. Agricultural tools for CBFM and Communities 13. Feed, seed, sapling & related inputs for CBFM 14. Relief works: Emergency & disaster management support 15. Exposure visits of Fisheries communities.	
14.	Technical Assistance to Reduce Food Loss in the Capture Fisheries Supply Chain Project (July 2020 - June 2022)	212.25	8 Division 17 District	1. Assess detailed post-harvest loss in capture fisheries in different locations and identify critical loss points, hot-spots for fish spoilage and assessing control zones for reducing PHFL in the capture fisheries supply chain 2. Assess status of fishery offal wastes production and management and determine their nutritive values for producing by-product 3. Develop capacity of DoF officials to identify the causes and implement measures of PHFL and develop capacity of Stakeholder through training, demonstrating and awareness campaigns to reduce PHFL 4. Enhancing empower of stakeholders by increasing market linkage connectivity and enhancing awareness to the local fish market actors about how to reduce PHFL	1. Capacity development of DoF officials on identification of the food loss in the capture fisheries value chain and how to reduce those loss. 2. Capacity development of stakeholders on best post harvest practice 3. Study on identification of critical loss points and actions to reduce PHFLs 4. Finalize the present status of Post-harvest loss reduction.	100

Table 2: Manpower under development project and manpower in position

Heads	Category	Numbers of posts	Numbers of vacant posts	In position
Development Projects (14 Nos)	Class-I	215	5	210
	Class-II	59	7	52
	Class-III	1033	86	947
	Class-IV	84	2	82
	Total	1391	100	1291

Table 3: Development Budget of DoF

(Taka in lakh)

Financial year	Number of Project	Development budget						Achievement (%)
		Expenditure			Allocation			
		Total	LC	PA	Total	LC	PA	
2021-22	14	54315.88	24767.42	29548.46	62983.00	26230.00	36753.00	86.24