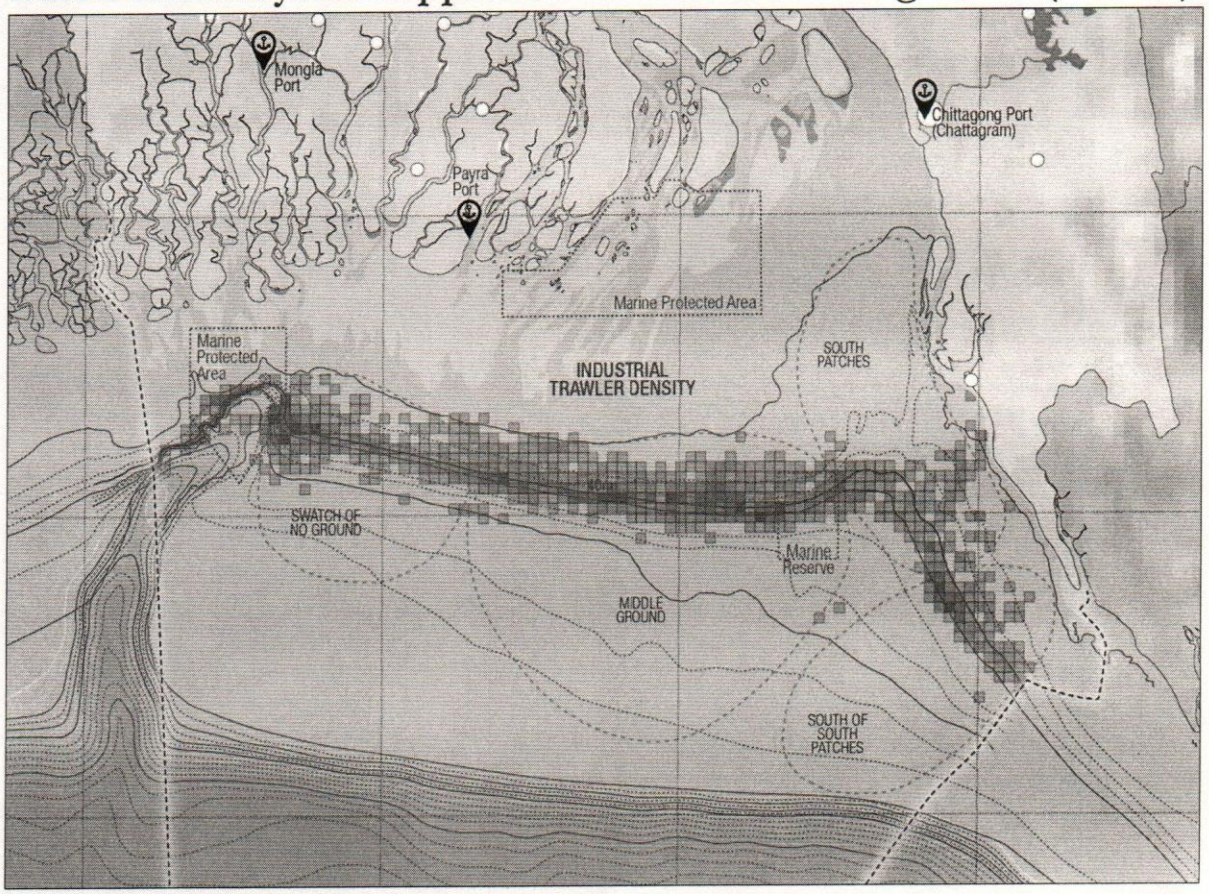
Draft

Bangladesh Industrial Marine Fisheries Management Plan

Based on Ecosystem Approach to Fisheries Management (EAFM)



Department of Fisheries
Ministry of Fisheries and Livestock

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Abbreviations

ABNJ	Area beyond National Jurisdiction
AIS	Automatic Identification System
BCG	Bangladesh Coast Guard
BFDC	Bangladesh Fisheries Development Corporation
BFRI	Bangladesh Fisheries Research Institute
BMFA	Bangladesh Marine Fisheries Association
BN	Bangladesh Navy
BOA	Boat Owners Association
BRD	Bycatch Reduction Device
BWFTOA	Bangladesh White Fish Trawler Owners Association
CMC	Co-Management Committee
CPA	Chittagong Port Authority
CPUE	Catch per Unit Effort
DoF	Department of Fisheries, Bangladesh
DoS	Department of Shipping
EAFM	Ecosystem Approach to Fisheries Management
ECDIS	Electronic Chart Display Information System
ECA	Ecologically Critical Area
EEZ	Exclusive Economic Zone
ESBN	Estuarine Set Bag Net
EU	European Union
FAB	Fisheries Advisory Body
FMP	Fisheries Management Plan
FPI	Fisheries Performance Indicator
GoB	Government of Bangladesh
HACCP	Hazard Analysis Critical Control Point
HCR	Harvest Control Rule
HFMP	Hilsa Fisheries Management Plan
IPOA	International Plan of Action
IUU	Illegal, Unregulated and Unreported
JMC	Joint Monitoring Centre
JMC-CC	Joint Monitoring Centre Coordination Committee
KPI	Key Performance Indicator
MCS	Monitoring, Control and Surveillance
MFO	Marine Fisheries Office
MFOrd	Marine Fisheries Ordinance

MFR	Marine Fisheries Rules
MFSCP	Marine Fisheries Surveillance Check Post
MFSMU	Marine Fisheries Survey Management Unit of DoF
MMO	Mercantile Marine Office
MoFL	Ministry of Fisheries and Live stock
MPA	Marine Protected Area
MR	Marine Reserve
MSY	Maximum Sustainable Yield
NPOA	National Plan of Action
PSO	Principal Scientific Officer
SDG	Sustainable Development Goal
SOP	Standard Operating Procedure
SP	Sailing Permission
TAE	Total Allowable Catch
TED	Turtle Excluder Device
VMS	Vessel Monitoring System

Vision and main objectives

The marine fisheries of Bangladesh are providing economic benefits and decent livelihoods through sustainable management of fisheries resources and conservation of ecosystem health.

Management of marine fisheries under the ecosystem approach to fisheries includes due consideration of human well-being, ecosystem health, and good governance through a comprehensive co-management planning process. In Bangladesh marine fisheries this will include sector specific plans for the artisanal marine and industrial marine fisheries.

This document presents the industrial marine sector Fisheries Management Plan (FMP) based on the ecosystem approach for the sustainable development and harvest of marine fisheries.

Introduction

Although Bangladesh has over 118 thousand square kilometres of sea area in the Bay of Bengal to a depth of about 2200 meters, its known marine fisheries resources are presently limited to the shallow shelf-sea, to a depth of about 80 m, which constitutes only about 36% of the Exclusive Economic Zone (EEZ). Within the shelf sea area, only about 14,600 km^2 (12%) are known to be fishing grounds of commercial significance. Only a small fraction of the several hundred known species of fishes, shrimps, crabs and other animals that are caught in this multi-species fishery are of economic and fishery significance.

Taking into account the Blue Economic Development aspiration of the nation, mandates to achieve Sustainable Development Goal (SDG)-14 targets as stipulated by the United Nations' SDGs and fulfilling other international obligations on one hand, and relatively small area and finite fisheries biomass on the other, striking a balance between fisheries resource economy and long-term marine fisheries sustainability will require carefully crafted fisheries policies, strategies and plans.

Research surveys in recent years by RV Meen Shandhani and commercial fish catch data collected over past years indicate that all of the commercially important marine fishes in Bangladesh have been overexploited for a long time and are currently depleted to varying degrees. None of the economically significant marine stocks appears to be capable of recovery under the current fishery regime. It is very likely that the already bad overfishing situation could turn worse in a matter of a few years' time unless effective and restrictive fisheries management is enforced now.

Total annual marine fish catches in recent years from Bangladesh waters are reported to be in the range of 500-650 thousand MT. The majority (~85% recently) comes from the large number of artisanal vessels predominantly operating in shallow waters (<40 m). The catch of about 250 industrial trawlers, which are allowed to operate in waters greater than 40m depth, makes up the remainder. Although the industrial sector currently takes less than 20% of the total catch, their share is growing and is likely to increase in the near future. Attempts to prevent industrial fleet growth have had limited success and the fleet is currently upgrading with larger trawls and improved fish-finding capability. A very new development (since 2016) is the large and growing quantity of Hilsa being taken at sea by the industrial trawlers. This threatens to undermine the successful rebuilding of the Hilsa stock under the Hilsa Fisheries Management Plan (HFMP), and all the co-management efforts supporting it, developed for the artisanal and riverine fisheries.

Key principles of the FMP

The following key principles were recognised and promoted in the development and establishment of the FMP. These principles lead to effective fisheries management plans with high compliance and which are reflective of, and adaptable to, the uncertainties that prevail in fisheries.

- Good governance that facilitates setting of rules and regulations and adequate resources and arrangements for compliance and enforcement;
- Fish stocks and communities are finite and biological production constrains the potential yield from a fishery-potential yield needs to be estimated.
- Biological production of a stock is a function of the size of the stock and it is also a function of the ecological environment. It is influenced by natural or human-induced changes in the environment. Management functions need to set target reference point through data collection and fisheries assessment and environmental impacts need to be monitored.
- A sense of ownership and a long-term stake in the resource for those (individuals, communities or groups) with access are most conducive to maintaining responsible fisheries. A system of effective and appropriate access rights must be established and enforced.
- Cooperation and coordination across different government agencies for oversight and to combat illegal activities in marine fisheries.
- Adaptive management that embraces change through learning and adapting;
- Precautionary approach that does not delay action because of lack of information and manages cautiously when uncertainty exists;
- Reorient sector performance towards "Volume to Value" reducing pressure on fishing;
- Effective participation in the management process by fully-informed users is consistent with the democratic principle, facilitates identification of acceptable management systems and encourages compliance with laws and regulations through communication.

It is stressed that the plan is a "living document" and will be annually updated to guide management of the fishery and should be responsive to fisheries management policy adjustments. It is proposed to be applied for an initial period not exceeding two years from implementation, at which time it will be evaluated and appropriate adjustments made.

Scope

This plan outlines the current rules, regulations and management measures governing the industrial trawl fishery. It is designed to be used by all stakeholders to inform on what, how and why management is being undertaken in relation to this fishery.

National Context

The marine fisheries of Bangladesh are made up of the industrial sector of about 250 large trawlers, and the artisanal sector of over 60,000 smaller vessels, of which at least half are mechanised to some degree. These two major marine sectors are managed separately

however fisheries management recognises that they share many of the same resources and are not independent. The Government of Bangladesh (GoB), in recognition that marine fisheries resources are a vital element in achieving SDG-14 (life below water) targets and for harnessing the potential from blue growth initiatives, has given major focus to sustainably managing and conserving marine fisheries resources.

This FMP applies to all marine capture fisheries conducted by the country's industrial fishing trawlers. This fishery is limited to the area beyond the 40 m depth contour out to the boundary of the EEZ, and may in future include fisheries conducted in Area beyond National Jurisdiction (ABNJ) waters. The FMP covers the full range of all target pelagic, demersal and shrimp species, along with non-target and dependent species (endangered and threatened) fished by industrial trawlers.

Implementation of the FMP

Although this FMP covers the years 2021 to 2024 inclusive it will be reviewed annually, based on best scientific information available and on the performance of the fishery achieving stipulated targets against indicators and benchmarks set in the plan. The plan will be amended as required, based on the annual reviews. Department of Fisheries (DoF) and other concerned agencies will implement the measures specified in the plan and, where required, develop the required rules and regulations in support of these measures. Annual review, and consequent amendments will be presented to stakeholders through the consultative process and the plan revised accordingly.

Description of the fishery

Marine fisheries resources

There are four major fishing grounds identified in the marine water of Bangladesh comprised a total area of 14,600 sq. km. (Figure 1). Species composition on the different grounds varies somewhat (Table 1).

Table 1 Major species composition from marine fishing grounds (Hussain, 1982) Locations are as given in Figure 1

Name	Location	Major commercial species
South Patches	90°10' - 90°50'E 21°10' - 21°40'N	Indian salmon, Hilsa, Pomfret, Ribbon fish, Bombay duck, Eel, Croaker, Catfish
South of South Patches	90°30' - 90°40'E 20°45' - 21°10'N	Pomfret, Red snapper, Croaker, Carangids, Grunter, Ribbon fish, Shrimp
Middle Ground	90°00' - 90°40'E 21°00' - 21°25'N	Snapper, Grouper, Croaker, Shrimp
Swatch of No Ground	89°00' - 89°50'E 21°00' - 21°40'N	Hilsa, Pomfret, Ribbon fish, Bombay duck, Croaker, Shrimp

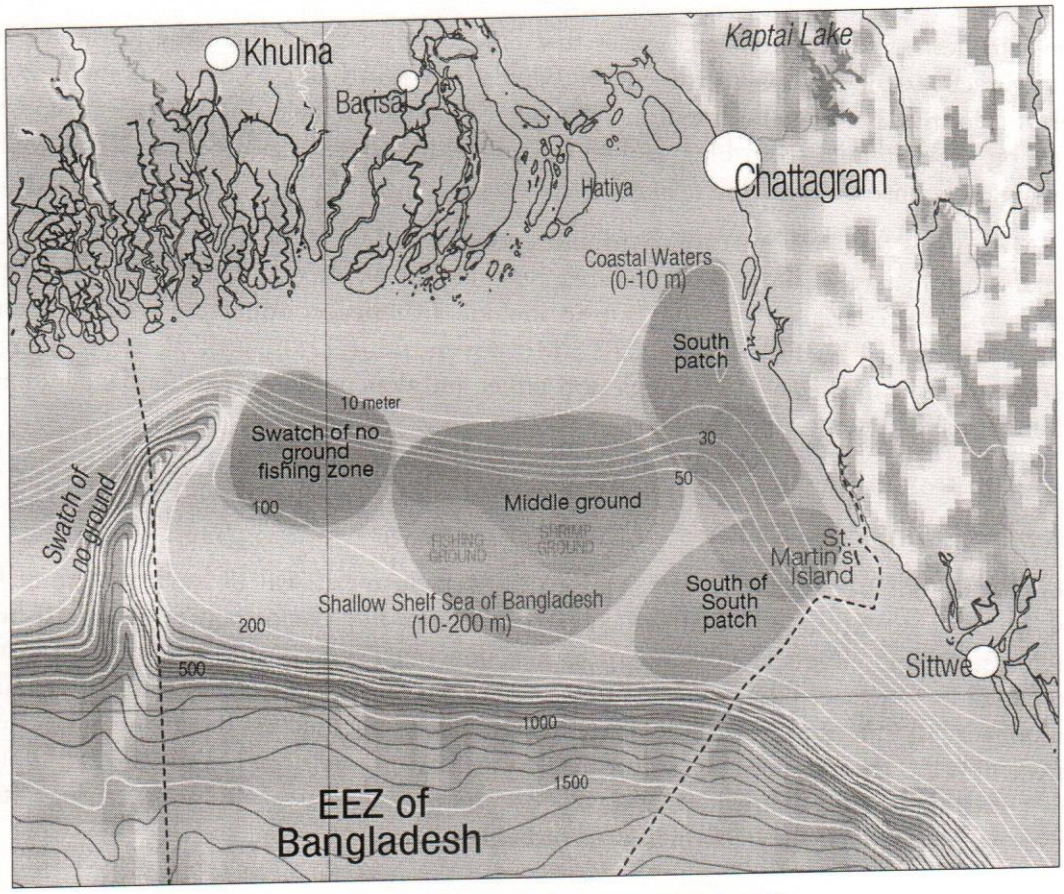

Figure 1 Named fishing grounds on the Bangladesh continental shelf.

The industrial sector, limited to operating in waters greater than 40 m in depth, and operate primarily in less than 100 m depth. There, main resource stocks can be classified into shrimp groups, groundfish groups, and small pelagics. Nominally, shrimp trawlers target shrimp, bottom trawlers target groundfish, and midwater trawlers target small pelagics. However, when bycatch is considered, there is very significant overlap in the species composition of all three fleet sectors.

Scientific advice

Recent stock assessment analyses have provided guidance on the state of the marine fisheries resources however, these analyses are known to be uncertain and specific quantitative estimates are not provided. They do provide strong and consistent indications that the marine fisheries are all generally overfished and the present trend of increasing total landings is reducing economic value overall and is unsustainable in the long-term. This advice is formulated under the new consensus view that what has sustained fisheries is less prescriptive, but more process oriented and adaptive.

The analyses indicated mixed trends for different finfish groups, with increased catches of small pelagics, especially sardines, offsetting to some degree the depletion and overfishing of larger sized and more valued species groups. Mortality estimates for sardines suggest the group is being overexploited and is somewhat depleted. The increase in catches of shrimp by the midwater trawlers reveal they are being operated on bottom, negating the potential selectivity benefits of that gear type. The overall shrimp biomass trend has been consistently downward over the last 30 years. More detailed information on species mix in the industrial

shrimp catches since 2005 show the catch rates for tiger shrimp (most valuable) and brown shrimp are declining steadily.

The overall observation from the most recent stock assessment work was that marine fisheries resources are heavily exploited with some species severely depleted and in urgent need of rebuilding. The most heavily overexploited species groups include many of the larger and more valuable species such as Indian salmon and large croakers. The results for Indian salmon (*Leptomelanosoma indicus*), the most valuable finfish species in Bangladesh, showed it was severely depleted and overfishing was ongoing. Species in this condition are at significant risk of commercial extinction and may in fact be extirpated without specific management protection.

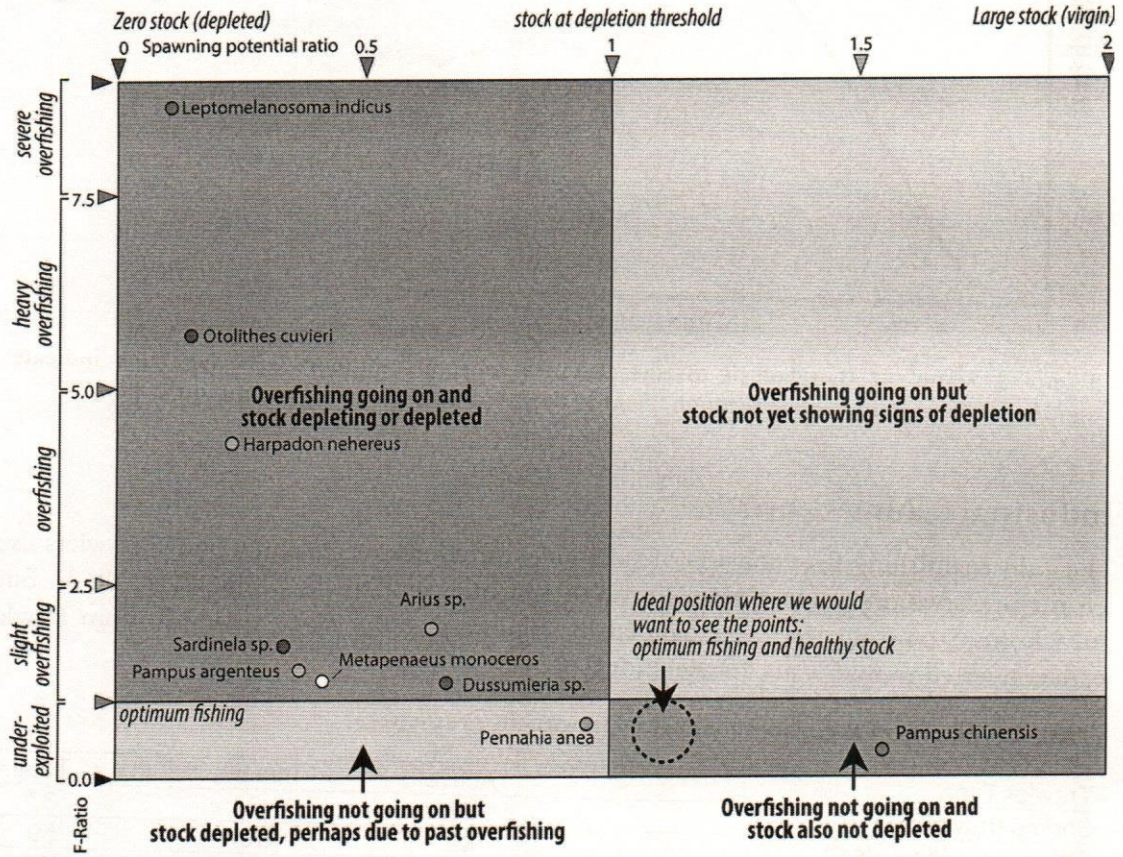

Figure 2 Phase plot ('Kobe plot') summarising the status in 2019 of selected fish and shrimp stocks indicating that almost all stocks are depleted, some severely, and almost all stocks continue to experience ongoing over-fishing.

In the management considerations stemming from the stock assessment work it was clearly noted that the present management practice is permitting excessive and increasing fishing effort and recommends that measures to stop fleet growth and to responsibly begin reducing industrial fleet capacity are urgently required. Even with strong management intervention it is going to require some years of consistent and effective control to start seeing the resulting benefits.

Ecosystem considerations

The increasing catches over the last two decades for the marine fisheries, and particularly the industrial sector, have actually seen substantial declines in catches of high valued and large demersal species such as jewfishes, grunters, snappers, pomfrets, and catfishes against increasing catches for less valuable small species such as sardines, bombay duck, and

threadfins. This pattern of serial depletion of high-value and slow-growing species has been described in many overfished ecosystems and is referred to as fishing down the food web (or food chain). As far back as 2008 this had been noted in Bangladesh fisheries (Huntington et al, 2008; reproduced in Figure 3)

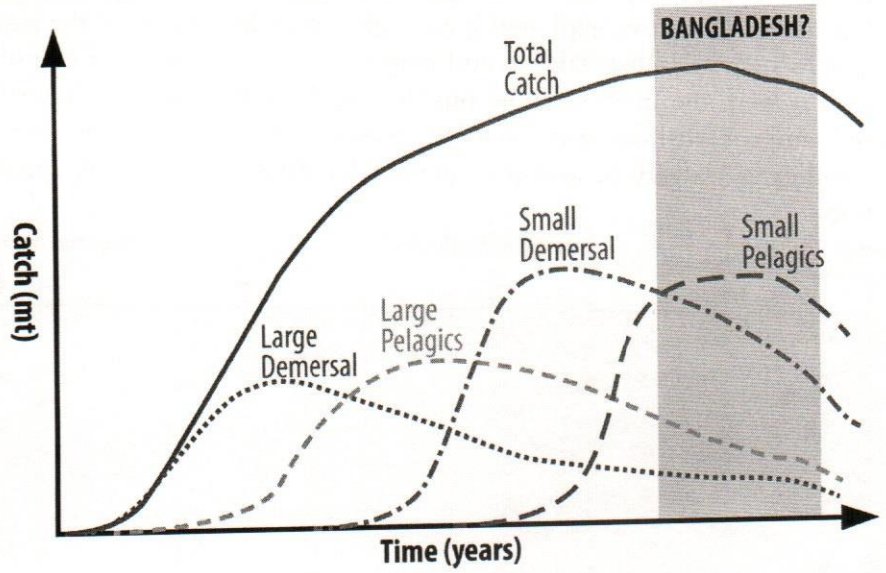

Figure 3 Status of Bangladesh marine fisheries in terms of food web dynamics indicates significant ecosystem change through "fishing down the food chain" (Huntington, 2008).

Industrial fishing fleet

The industrial fishing fleet consists of steel-hulled freezer trawlers and wooden trawlers using ice for preservation, using shrimp, bottom, and midwater trawls (Table 2, Table 3). Since 2014 bottom trawling has been banned by ministerial order and existing bottom trawlers were converted to mid-water trawlers for fishing pelagic species.

Table 2 Numbers of Bangladesh industrial trawlers by gear type

Trawler Type	Active	Inactive	Total
Shrimp trawler	35	2	37
Fish trawler (demersal)	49	10	59
Fish trawler (mid-water)	122	0	122
On trial trip (demersal)	29	10	39
Total	235	22	257

Source: MFO, May 2020

Table 3 Construction characteristics of Bangladesh industrial trawlers

Construction	Preservation	Gross tonnage	Length Overall (M)	Horsepower	Max. trip length
Wooden	Ice	56 – 148	18.5 – 26.5	420 – 600	14 days
Steel	Freezer	251 – 668	34 - 54	716 - 1850	30 days

Almost all the trawlers are equipped with modern navigation, communication, and fish finding equipment including sonar, trawl monitors, and echo-sounders.

Production trends

The industrial marine sector accounts for less than 20% of the marine fisheries production and about 3% of national fish production (Table 4). The proportion of marine production by the industrial sector has been increasing since at least 2010 (Table 5).

Table 4 Reported national and marine fisheries production in Bangladesh in 2017-18.

Fisheries Sector	Production (MT)	Percent of total production	Percent of marine production
Inland fisheries total (capture & culture)	3,621,954	84.70%	
Industrial marine fisheries	120,087	2.80%	18.3%
Artisanal marine fisheries	534,600	12.50%	81.7%
Marine fisheries total	654,687	15.30%	
National total	4,276,641		

Table 5 Marine fisheries production (MT) historical summary and recent trends in Bangladesh

Time frame	1983-84	1993-94	2003-04	2013-14	2015-16	2016-17	2017-18
Industrial	14,500	12,454	32,606	76,885	105,348	108,479	120,087
Artisanal	150,382	240,590	422,601	518,500	521,180	528,997	534,600
Total	164,882	253,044	455,207	595,385	626,528	637,476	654,687

Although the gross production (absolute tonnage landed) of marine capture fisheries continues to increase as a result of a decades long expansion of the fishing fleet, the catch rates (catch per unit effort, CPUE) have not.

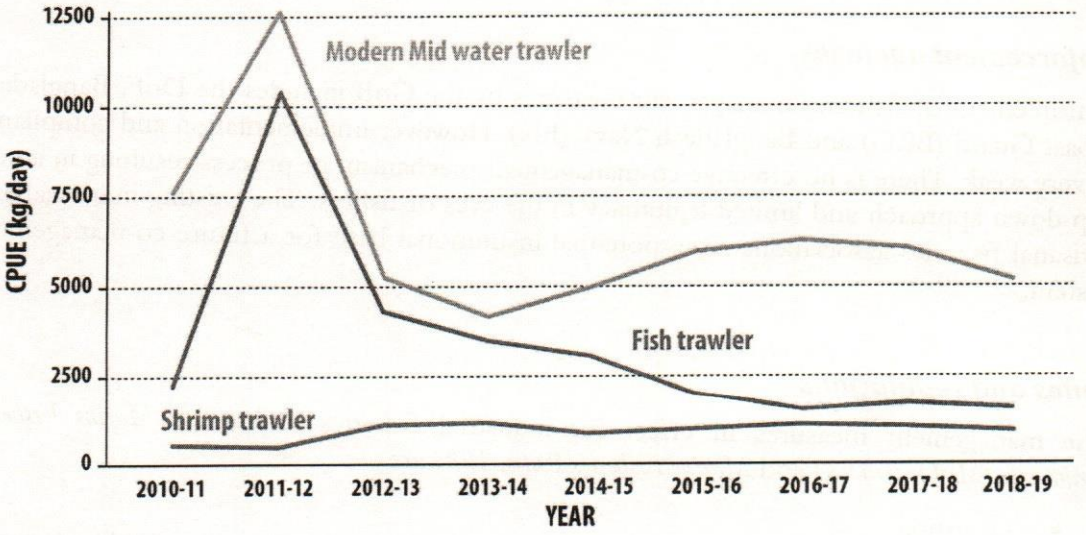

Figure 4 Industrial trawler catch rates (CPUE kg/day) for the three trawler types.

The species composition of the trawler catch (Table 6) is mostly unidentified with over 50,000 t (out of 120,000 t) being classified as "Other Marine Fish" a category that is generally made up of low valued, small species. This group and sardines, another small low-valued species, make up over ¾ of the total industrial catch.

Table 6 Species group breakdown of recent industrial trawl catches as reported in Yearbook of Fisheries Statistics of Bangladesh (2018).

Type of Fishing	No. of Trawler	No. of Unit (Trawl Net)	Catch in Metric Ton			
			Shrimp	Hilsa	Other Fish	Total
Shrimp Trawler	37	11	2,621	0	2,749	5,370
Fish Trawler	216	648	1,061	11,060	102,596	114,717
Total	253	759	3,682	11,060	105,345	120,087

Species group breakdown of other fish category (MT)								
Sardine	Bombay Duck	Indian Salmon	Pomfret	Jewfish	Catfish	Sharks Skates Rays	Other Marine Fish	Total
40,936	6,050	0	849	3,862	2,735	549	50,364	105,345

Current management measures and arrangements

Licensing

A valid fishing license, issued by the Marine Fisheries Office (MFO), is required for industrial marine fishing vessels. Licenses are renewed annually and require possession of vessel registration and valid inspection certificates from Mercantile Marine Office (MMO).

Over the next five years the total number of Industrial sector licenses is to be reduced through a process of vessel and license replacement. Bringing any new vessel into the industrial fleet will require retirement of two existing licenses before issuing of a single new license. The intention is to reduce over-capacity while encouraging modernisation of the industrial trawler fleet. Extension or changing of this provision will be reviewed annually.

Enforcement agencies

Enforcement of fisheries management measures by the GoB includes the DoF, Bangladesh Coast Guard (BCG) and Bangladesh Navy (BN). However implementation and compliance is very weak. There is no effective co-management mechanism or process resulting in a very top-down approach and limited legitimacy in the eyes of fishers. The existing industrial and artisanal fisheries associations are a potential institutional base for a future co-management system.

Rules and regulations

The management measures in effect for industrial fisheries under the *Marine Fisheries Ordinance (MFOrd), 1983* and *Marine Fisheries Rules, 1983* are:

- Licensing
  - All industrial trawlers and mechanized fishing boats are required to have an industrial fishing vessel license which is to be renewed annually
  - All industrial trawlers and mechanized fishing boats are required to have vessel registration and sea worthiness certificate (CoL) from MMO before applying for a fishing license or annual renewal.
- Area of operations
  - All industrial vessels must carry and operate Automatic Identification System (AIS) throughout entire fishing trips

- From the start of the 2021/22 fishing season, vessels must carry and operate Vessel Monitoring System (VMS) throughout entire fishing trips
- Vessels fishing under an industrial fishing vessel license are required to fish beyond (seaward of) the inshore limit line defined by the coordinates given below

Point	E Long (DMS)	N Lat (DMS)	E Long (DD)	N Lat (DD)
1	89°13'30"	21°11'00"	89.225°	21.183°
2	89°32'00"	21°25'00"	89.533°	21.417°
3	89°40'00"	21°25'00"	89.667°	21.417°
4	89°40'00"	21°18'00"	89.667°	21.300°
5	90°30'00"	21°06'00"	90.500°	21.100°
6	91°16'30"	21°00'00"	91.275°	21.000°
7	91°32'00"	21°06'00"	91.533°	21.100°
8	91°45'00"	21°06'00"	91.750°	21.100°
9	92°09'00"	20°25'30"	92.150°	20.425°

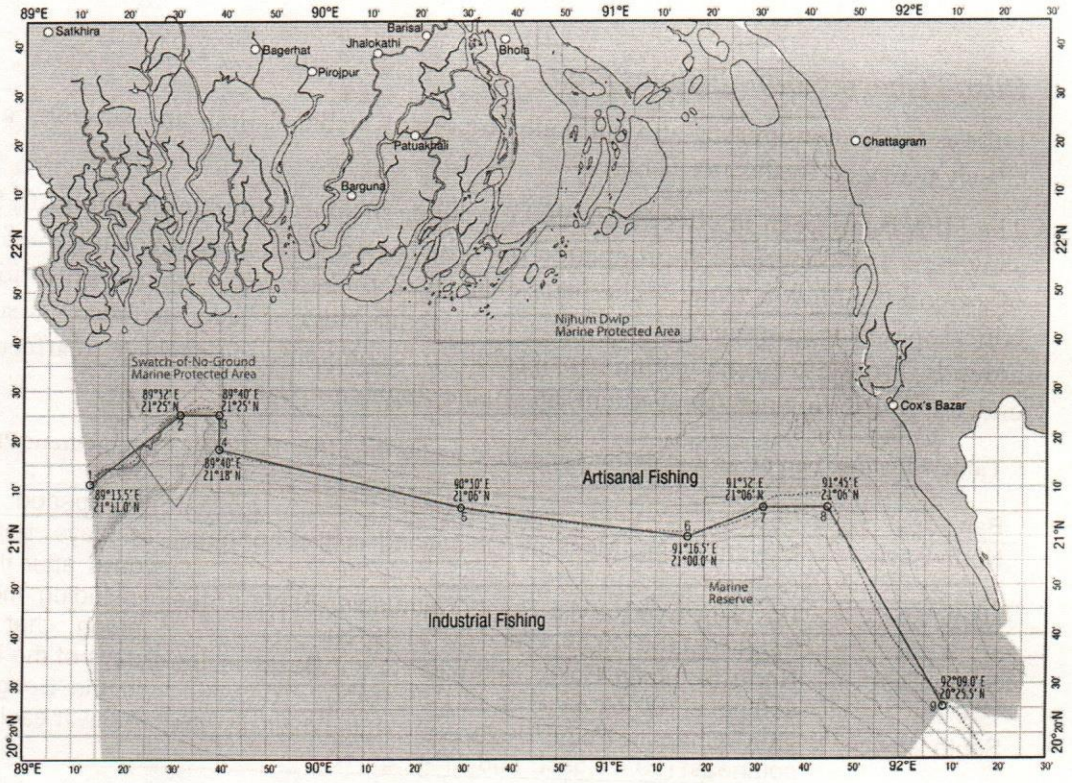

Figure 5 Spatial restrictions for industrial trawling

- GoB has declared a continental shelf Marine Reserve between Middle Ground and South Patches encompassing 698 sq. km. (204 sq. nm.) to protect spawning nursery habitat for marine shrimp and fish.
- GoB has declared 3188 sq. km. of Marine Protected Area (MPA) south of Nijhum Island to conserve marine and coastal fisheries resources.
- GoB has restricted collection of fry of fish, or PL of shrimp and prawns of any kind in the estuary and coastal waters of Bangladesh since 2000.
- GoB encourages industrial fishing fleet to conduct exploratory and/or developmental fishing outside 500 m isobaths within EEZ.

- Closed season
  - Fishing by all types of fishing vessels is banned from 20 May to 23 July each year to promote the conservation of marine fisheries resources within the EEZ of Bangladesh.
- Trip duration
  - Freezer trawlers are permitted a maximum trip duration of 30 days
  - Non-freezer trawlers are permitted a maximum trip duration of 14 days
- By-catch
  - Shrimp trawlers must land, not discard, finfish
  - Shrimp trawlers must have at least 30% fin-fish in the total catch
  - Control of mesh size:
    - cod-end of shrimp trawl nets must be 45 mm or larger;
    - cod-end of fin-fish trawler net must be 60 mm or larger;
  - Shrimp trawlers must use Turtle Excluder Device (TEDs)
  - All trawlers must use specified Bycatch Reduction Devices (BRDs), including TEDs

Hilsa Fisheries Management Plans

Hilsa is both economically and culturally important in Bangladesh and supports a vital and closely managed freshwater fishery.

The HFMP has been in effect since 2003 resulting in successful conservation of Hilsa while allowing a 100% increase in production over the last 16 years and supporting the livelihoods of around 0.5 million fishers. The main element of the strategy is spatial protection of four critical spawning grounds and five Hilsa and juvenile Hilsa or 'jatka' sanctuary areas/nursery grounds through seasonal fishing bans (Table 7). A compensation package to affected fishers under a GoB safety net arrangement encourages high compliance.

Table 7 Fishing ban areas and periods specified under the Hilsa Fisheries Management Plan

Ban Area	Locality	Ban period
North East	Mayani Point, Mirsarai, Chittagong in the northeast (91°32.15' E and 22°42.59' N)	4 days before and 17 days after the full moon, including the day of full moon, that is, total 22 days of the first full moon in the Bengali month of Ashwin each year
North West	Paschim Syed Awlia Point, Tajmuddin, Bhola in the northwest (90°40.58' E and 22°31.16' N)	
South East	North Kutubdia Point, Kutubdia, Cox's Bazar in the southeast (90°52.51' E and 21°55.19' N)	
South West	Lata Chapali Point, Kalapara, Patuakhali in the southeast (90°12.59' E and 21°47.56' N)	

The successful implementation of the HFMP demonstrates the feasibility and effectiveness of this fisheries management plan, underpinned by scientific information, in establishing appropriate catch and/or effort limitations, preventing overfishing, and rebuilding the Hilsa stock. It is clear that an unregulated expansion of Hilsa fishing in marine waters is underway leading to the growing marine catch of Hilsa, particularly by midwater trawlers.

To ensure the continued successful management of this stock, based on the existing HFMP, it is critical that targeted industrial trawling for Hilsa is to be eliminated and measures must be included to ensure Hilsa bycatch is kept to the minimum possible level in the industrial sector (Table 8).

Table 8 Management measures to limit Hilsa catch in Industrial fisheries

Measure	Notes
BRD	Midwater trawlers must use trawl BRD sized to exclude Hilsa, in addition to TED
"Move-on" rule	When Hilsa catch exceeds 5% of the catch in a tow by weight, the vessel must relocate a minimum of 5 km from the previous tow location for at least 24 hours
Fishing closures	Time and area closures may be introduced when specific areas are affected by high bycatches of Hilsa.
Bycatch limit	Hilsa landings are limited to a maximum bycatch of 5% by weight of total catch, for all industrial trawlers.

Monitoring, control and surveillance

Overview of fisheries MCS

The ultimate goal of fisheries management is to maximize the sustainable benefits and economic return from the country's territorial waters and exclusive economic zone. The success of a FMP depends on it being based on adequate information and sound decision-making, and being implemented through a strong and cost-effective Monitoring, Control and Surveillance (MCS) system. Such a system is an integrated information collation, rule-making and enforcement system providing tools for implementation of policies, strategies and frameworks for fisheries management and other aspects of ocean and environmental governance. MCS is critical for the implementation of a successful fisheries management strategy and plan that renders a fisheries management regime effective and sustainable.

Implementation of MCS

Bangladesh currently has the following MCS processes:

- Industrial vessels must land catch at designated ports in the presence of MFO officials authorized to perform inspections and verifying paper based daily fish log with landed catch;
- Industrial vessels must use only fishing gears meeting the regulated specifications
- Industrial vessels require sailing permission (SP) from MFO before departing for fishing after submitting
    - proof of valid license
    - stipulated fee
    - catch log sheet of previous trip
- Vessels are inspected regularly or randomly by authorized personnel of Marine Fisheries Office of DoF before and after trip at port or as shore based inspection at Marine Fisheries Surveillance Checkposts (MFSCs).
- At-sea monitoring of industrial fishing vessels is carried out by patrolling vessels of Bangladesh Navy and Coast Guard.
    - Patrolling vessels may carry DoF Officers as observers or in joint operations
    - Coast Guard conducts patrols including MCS actions within the 40 m depth contour
    - Bangladesh Navy conducts patrols including MCS actions in offshore EEZ waters (seaward of 40 m depth contour)
- Catch export certification for traceability issued by MFO for compliance with EU requirements.

New management measures and MCS activities

Many of the above measures and regulations are not implemented effectively or comprehensively, primarily due to limited human and logistical resources within MFO. During the span of this plan it is intended to implement a number of new capabilities and activities.

- Establish a Joint Monitoring Centre (JMC) in the Chattogram port area interagency coordination in MCS under Standard Operating Procedures (SOP) for implementation of the Marine Fisheries Act and rules in the EEZ of Bangladesh.
- Establish operational electronic fishing vessel registration and fishing vessel licensing system including IT infrastructure, training, capacity building & reporting.
- Establish infrastructure for data collection by at-sea observers with required mobile application, virtual server, database, and back-end data management software, with user manuals and training, to support monitoring fisheries activities and reporting to competent authority.
- Establish new MFSC at strategic locations in coastal districts, including facilities for high speed patrol vessels to conduct joint monitoring and surveillance program with maritime cooperating agencies.
- Establish a new VMS through a VMS provider and require VMS installation as a condition of license for all industrial fishing vessels. VMS will support recording and displaying vessel position and track data, pattern of fishing activities, use of legitimate gear, catch transhipment at sea, and e-log fish catch report. VMS will integrate with AIS and establish connection with JMC for strengthening MCS activities through communication & coordination with participating marine domains for inspection and enforcement. But the legal regime requires provision by vessel owners for installing VMS transponder and borne airtime fees for satellite for sustainability question.
- Establish an electronic catch documentation scheme through e-reporting of catch and e-logbooks to increase transparency of fish moving through the supply chain.

Major threats and high priority challenges

Conflicts between artisanal and industrial operators

The industrial and artisanal fishers share the same fisheries resources in many cases. Overcapacity and intense fishing pressure in both artisanal and industrial sectors has led to increasing competition and conflicts for the depleted resources. Although regulations to separate the sectors at the 40 m contour are in place for many years, there is extensive infringement of inshore fishing zones by industrial trawlers and to a lesser extent by artisanal into offshore fishing areas (Figure 6). This is expected to worsen as the uncontrolled and unabated increase in numbers of artisanal boats increases the pressure on fish resources in marine waters.

Improvements in tracking and patrol capacity, introduction of AIS and VMS more widely, and various other MCS efforts, can help to reduce incidence of conflicts. However, until there is the means in fisheries law and regulations to control new construction of artisanal fishing boats this issue will likely remain.

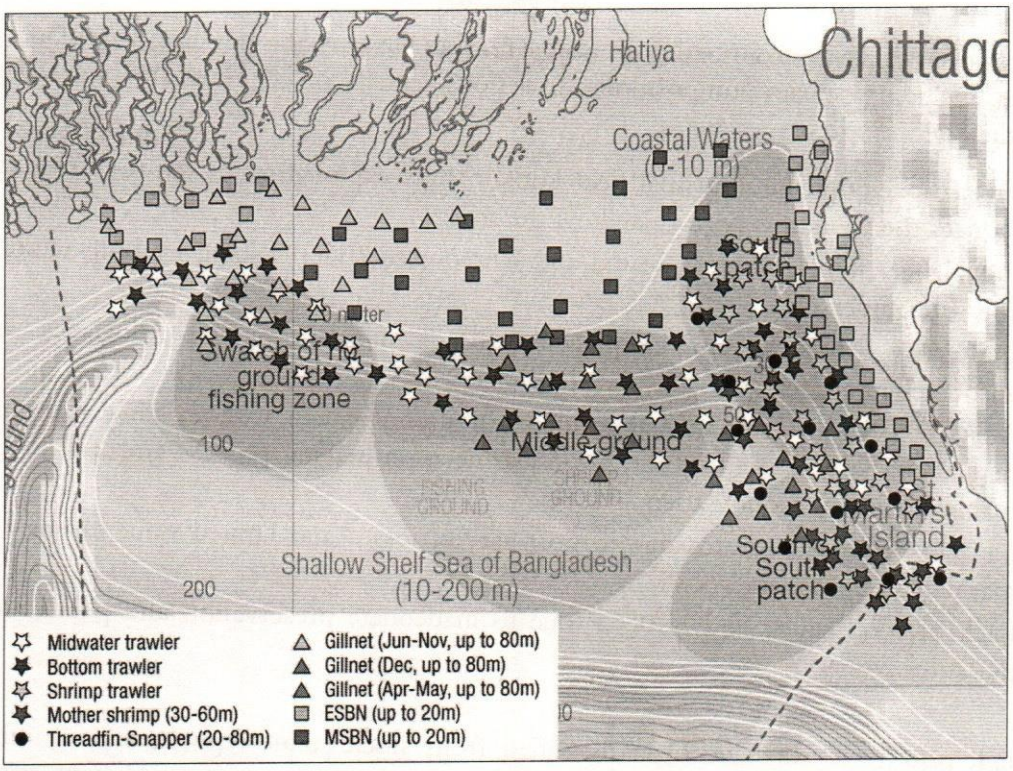

Figure 6 Fishing grounds of various gear sectors operating from Chattogram and Cox's Bazar showing overlap areas of potential conflict.

Ecosystem considerations

There is major concern over the non-selective over-exploitation of fishery resources by the multitude of fishing gears being used, especially the bottom trawlers in the industrial sector and the estuarine set bag nets (ESBN) in the artisanal sector. There is limited or no regulation to control bycatch and the mesh size regulations are widely ignored, resulting in large catches of juveniles in many cases.

The threat to resources near St. Martin's Islands stemming from many vessels, both industrial and artisanal, fishing within easily damaged coral reef and sea grass ecosystems is another concern.

Ecosystem considerations raised in the survey reports from RV Meen Shandhani (Fanning et al 2019) noted that there has been a replacement of larger, slower-growing and slower-reproducing groups such as Indian salmon with small-sized, fast-growing and fast-reproducing species such as sardines and scads. In a healthy ecosystem, these species are the forage base supporting the larger predatory species. Thus the increase of small species reflects a significant alteration to the ecosystem structure which may or may not be reversible in a reasonable time period. The ability to rebuild the stocks of larger and more valuable species can be significantly impaired if such an ecosystem shift has become well established. The bycatch of demersal species juveniles in the growing industrial fishery on small pelagic species will further impair the ability to rebuild the high-values stocks.

High-priority issues

There exists many challenges confronting the marine fisheries but given the prevailing state of marine fish catch, including species composition and serious scarcity of economically high valued species, the high priority issues are:

- Over-capacity in the industrial fleet leads to over-exploitation of the resources and reduces the economic performance of the sector
- Prevalence of Illegal, Unregulated and Unreported (IUU) fishing by both national and foreign vessels
- Ineffective MCS system in place-dearth of human resources, logistics and enforcement capacity
- Absence of good governance including non-compliance with existing rules and regulations, exacerbated by the top-down decision-making process and lack of co-management by resource users
- Lack of economic returns due to post-harvest losses and limited value chains and marketing opportunities
- Lack of food safety and HACCP due to inadequate preservation and postharvest measures.

These high priority issues have been identified from stock status reports, various other reports of DoF, and were expressed in the opinions and recommendations from consultations with industrial fishing vessel owners, associations, skippers & crews, and concerned stakeholders of both public and private sector. They reflect the prevailing gaps in enforcement capacity, inadequate rules and regulations, lack of systematic and historical data. Addressing these issues means addressing the underlying causes (Table 9), including the lack of both human logistical capacity.

Table 9 Issues affecting the industrial trawling sector of Bangladesh

High priority issues	Cause of Issues
Overfishing and overcapacity of industrial FVs seriously impact on marine fisheries stocks.	• Large number of industrial vessel capturing marine resources without knowing stock size; • Weak control to maintain size or number of fishing gears being operated; • High intensity of both growth and recruitment overfishing with non-compliance of marine fisheries rules and regulations; • Ineffective enforcement of marine existing fisheries Acts and regulations; • Degradation of habitat and ecology due to indiscriminate fishing and pollution;
Ineffective MCS procedure impedes in controlling IUU fishing.	• Inadequate coordination among agencies involved in MCS procedure; • Absence of effective monitoring and surveillance schemes in place (monitoring & inspection at sea and port, no observer scheme); • Lack of communications systems to share monitoring information among maritime domains for joint operation; • Inadequate authority and deterrence in dealing with entry of foreign fishing vessels with records of IUU fishing;
Other threats and issues	
Destructive fishing practices	• Use of small mesh sizes in fishing gears both at cod-end and beyond- most trawler also use bag net over cod-end; • Destroy large quantities of juveniles of high valued larger commercial species • Destruction of jatka (juvenile hilsa) at high intensity in recent yrs. by mid-water trawlers mostly operated in low depth >40 m; • Demand for low value/trash fish for drying/fish meal
Conflicts between artisanal and commercial fishers'	• Overcapacity & intense fishing effort leads to competition for depleted resources; • Infringement of fishing zones by industrial trawlers & non-compliance of legal regulations; • No control to build artisanal boats and engaging to fish;
Inadequate or absence of good governance	• Complete absence of co-management arrangement in the management of common pool resources; • No consultation and agreed decision among various marine fisheries associations for sustainability of resources; • Insufficient institutional research and development activities on marine fisheries; • Lack of coordination among different marine domain for proper enforcement; • DoF does not have any enforcement unit to oversight MCS;
Loss of food quality and value of landed catch due to lack of due on-board post-harvest handling and preservation technology.	• Quality deteriorates of landed catch on-board exposed to sun; • Majority of industrial trawlers do not have provision to use refrigerated sea/chilled water to maintain cool chain during sorting and bagging or kept in trays or basket; • More than 80% catch by all Industrial FVs kept in polyethylene bag as lump before transfer to freezer for preservation that takes more than 24 hrs. to freeze whole product; • Proper hygiene and sanitation and HACCP implementation is not maintained by most of the FVs; as a result quality deteriorates and price become less during auction. • Crews of FVs are not well trained to maintain personnel hygiene facing occupational hazards.
Asymmetry and Inadequate fisheries data & information	• Inadequate human capacity of technical and scientific • staff involved in data collection and analyses; • Inadequate time and effort allocated to collect and analyse data and information required for Key KPIs to monitor FMP;
Inadequate fisheries management capacity	• Lack of an effective fisheries management & enforcement unit in DOF; • Insufficient logistics e.g. patrol boats, vehicles etc. to strengthen management measures;

Objectives and Management Measures

Taking consideration of the resource status and the identified challenges facing the industrial marine fisheries sector the following objectives, and requisite management measures are adopted. The suite of key performance indicators (KPIs) with agreed targets and time line to targets are identified to track management progress toward meeting the major challenges issues to be addressed in this FMP

Challenge: Overfishing and overcapacity

The significantly depleted state of the marine resources makes addressing fleet over-capacity, and consequent over-fishing, a critical and time-sensitive requirement. Fishing effort by the industrial fleet has increased annually, most significantly in the modern midwater freezer trawlers, the group with most fishing power.

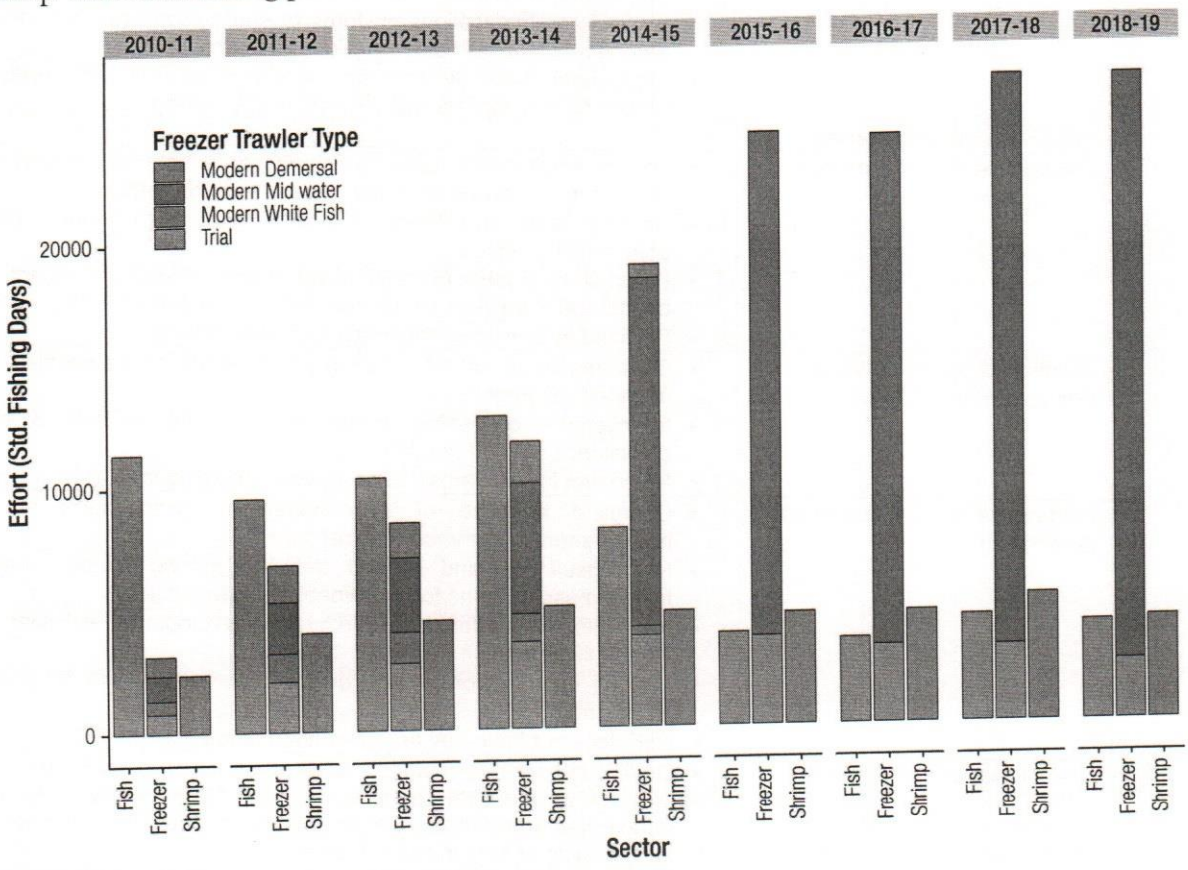

Figure 7 Fishing days per year for each industrial fishing sector.

Harvest Control Rue and Total Allowable Effort

The main strategy to address this will be to regulate Total Allowable Effort (TAE) based on catch rate trends in recent years. The Harvest Control Rule (HCR) defines the allowable change in Total Allowable Effort from one year to the next. The HCR is designed to adjust effort in proportion to trend in stock abundance, as determined from standardised catch per unit effort. It will be implemented with a variety of management measures to ensure suitable tracking of fishing effort in season. Data limitations and the multi-species nature of these fisheries do not allow support Maximum Sustainable Yield (MSY) management and there is no MSY reference point available. It is therefore appropriate to adapt management measures based on the CPUE trends. This HCR has been simulation tested and shown to be robust to likely changes in the

fishery over the next 5 years, but it will nevertheless need to be kept under careful review during this period

The fish and shrimp trawler effort has been relatively stable over the last five years while the modern freezer trawler effort has doubled in the same time period. Thus the HCR medium-term objective is to reduce the fishing effort by freezer trawlers (Modern Mid-water trawlers and Trial trawler) back to 2014/15 levels i.e. 70% of 2018/19 effort. The rate of reduction in fishing effort by this fleet should be related to changes in standardised catch rate, particularly of sardines which are a major component of the catch. The rate of reduction is capped to allow fleets to adapt. This cap will be no lower than 5%,(7 years to reduce to target of 70% of current levels) while a 10% reduction may be applied which would reduce to the required level in 4 years.

Table 10 Harvest Control Rule for effort reduction in 2020/21 fishing season

Trawler Type	Species Type	Previous CPUE	Recent CPUE	Relative CPUE (δ)	Reduction in CPUE	HCR effort reduction
Fish	Fish	1.617485	1.544532	0.9548972	-5%	0.95
Modern	Fish	2.258360	1.967432	0.8711775	-13%	0.90
Shrimp	Shrimp	1.591619	1.112634	0.6990584	-30%	0.90

Table 11 Total Allowable Effort (fishing days per sector) for 2020/21 fishing season

Trawler Type	Total Effort 2018/19	HCR effort reduction	TAE 2020/21
Fish	5937	0.95	5640
Modern	20,626	0.90	18,563
Shrimp	4189	0.90	3770

Implementation

To implement the TAE management strategy requires the following specific management measures and tools.

Long-term Objective : Minimising or eliminating over-capacity and over-fishing		
Target: Elimination of excess fishing effort within 5 years for industrial trawlers Fish trawler: -5% per year Modern (Mid-Water) trawler: -10% per year Shrimp trawler: -10% per year		
Management Measures	Actions	Timeline
All fishing vessels registered, licensed, and all relevant information available in online licensing and registration database(s)	Develop new electronic fishing registration and license system for all FVs	2021
	Electronic database fully populated for industrial fleet including history of entry of vessel into the fleet via cabinet decision, court verdict or otherwise.	Mid-2021
Revoke all inactive licenses to prevent re-entry of inactive effort	Complete inventory of active fishing vessels- with all details with registered, unregistered and licensed Separate list of non-active fishing vessel over last 3 yrs. List of active and non-active fishing vessels in operation under trial trip	Mid-2021
	Electronic fishing license system awareness campaigns program planned and implemented.	Early 2021

Precautionary moratorium on entry of new vessels during transitional period pending scientific advice review	Stop new vessel registration for fishing Stop issuing new fishing license Complete restrict on replacement of trawlers in place	2020 and 2021
	Establish vessel replacement policy intended to ensure fleet size is reduced to sustainable size while still allowing for upgraded vessel replacements to improve fish quality and reduce environmental impact	2022
Reduce number of fishing days	Allocate TAE for each vessel and monitor fishing days by logbook, VMS and inspection	2021

Challenge: Ineffective MCS procedures

The successful implementation of any fisheries management plan depends on a credible and effective MCS capability. The known ability of fisheries authorities to detect and stop illegal fishing practices is one of the most important factors leading to compliance by fishing fleets, and in contrast, a lack of MCS capability leads to complete disregard of management restrictions.

Long-term Objective : Minimize level of IUU fishing through effective MCS		
Target: Reduce IUU fishing to negligible levels		
Management Measures	Actions	Timeline
Develop and implement a NPOA to combat IUU fishing.	Complete and approve NPOA	Early 2021
	Execute the action plan defined in NPOA with coordinating partners	2021 onward
Establish MoU amongst DOF, BN, BCG, CPA, MMO, Customs to strengthen coordination and exchange information needed to enforce fisheries regulations and FMP provisions	MoU signed and in force for interagency information exchange and collaboration	2021
Establish Fisheries JMC for coordinated MCS measures.	Joint Monitoring Centre operational	Mid-2021
Create fishery monitoring database integrating registry and license information with ID information on operators, skippers and crew and fishery infringements.	Fishing information database is developed Capacity building to all parties related to MCS procedure.	
Extend integrated database system with BN, BCG and DoF	Exchange of all relevant information developed and functional.	
Enhance the operational monitoring of fishing vessel operations, departures and arrivals.	Computerised issuing and recording of departure and arrival permissions for FVs	
	Marine fisheries surveillance check posts established and effective.	
	Patrol vessels perform at-sea inspections and checks of FVs.	
Mandatory Vessel Monitoring System (VMS)/AIS on all licensed industrial FV.	100% coverage of industrial FVs – AIS 100% coverage of industrial FVs – VMS	2020 2021
	Vessel owners, operators and association members trained on VMS.	Late 2020
Implement on-board observer program.	On-board observer program mandated in FMP and procedures established	Late 2020
	Observer database and infrastructure operational	Late 2020
	Training program for on-board observers	Late 2020
	At-sea observers operational	2021
Amendment of Marine Fisheries Act	Effective enforcement and impose penalties	

and active enforcement and legal prosecution	as per country's Act, Rules and Regulation	
	All arrested cases are documented, prosecuted, and followed up.	
Raise awareness and support for combatting IUU among fishing crews, skippers and driver of FVs.	Effective awareness campaigns designed and implemented.	

Challenge: Inadequate or absence of effective and efficient fisheries management capacity (Weak governance)

A well-structured governance environment ensures that decision-making is transparent, informed (evidence-based), representative, and non-arbitrary. When this is achieved, compliance with management decisions is higher, success in meeting management objectives is more likely, and the costs of regulation are lower.

Objective : Strengthen marine fisheries governance		
Target : An effective co-management process for fisheries management decision-making built within 2 years		
Management Measures	Actions	Timeline
Establish credible and comprehensive co-management processes for marine fisheries	Define the mandate for an inclusive Fisheries Advisory Body (FAB) and process with representation from all marine fisheries sectors, affected fisheries stakeholders, environmental and social NGOs, and scientific community	2020
	Ensure mandate for FAB is established in new Marine Fisheries legislation	??
	FAB to conduct stakeholder consultations on draft FMPs as they are developed and review scientific and operational assessments of FMP performance	2021
Build fisheries management planning capacity in DoF under a co-management approach.	Required structure of the unit with required human and logistics established.	2020
	Train and deploy necessary human resources to district and upazila levels to implement the co-management approach to FMP	2021 -
Develop human capacity in the industrial fisheries sector for effective co-management participation	Training, financial and logistic support to build awareness and capacity in the industrial sector to participate in co-management process.	2020
Develop human capacity in the coastal districts and communities for effective co-management participation	Training, financial and logistic support to build awareness and capacity in the coastal districts and communities to participate in co-management process.	2020 - 2023

Challenge: Halt destructive fishing practices and discarding

Destructive fishing practices lead to excessive by-catches and discarding, as well as causing habitat damage. This imposes significant and wasteful mortalities on juveniles, as well as endangered or threatened species, and imposes major economic losses on fisheries.

Objective : Eliminate destructive fishing practices Target: Reduce or eliminate discarding at sea Reduce the proportion of under-sized (juvenile) caught below 50% of current levels in 2 years Reduce or eliminate catches of endangered or threatened species Reduce or eliminate trawling in sensitive habitats		
Management Measures	Actions	Timeline
Regulate trawl selectivity to reduce or eliminate retention of under-size fish	Regulate the minimum mesh sizes in trawl cod-end Fish trawls - ?? mm stretched mesh mid-water trawls - ?? mm stretched mesh shrimp trawls - ?? mm stretched mesh	
	Regulate use of chafing gear (extra bag on cod-end) Mid-water trawlers not allowed any chafing gear Fish and shrimp trawls may use chafers only under bottom 1/2 of cod-end and mesh size must be 2x larger than cod-end mesh	
	Require the use of Bycatch Reduction Devices in all trawls Acceptable BRDs to be investigated with industry	
Regulate size, type and number of trawls allowed in each sector	Restrict size of fishing gear (trawl net)	
Specific regulation to control destruction of Jatka (juvenile hilsa) in trawl fisheries	Surveillance at sea enhanced by joint effort of DoF and BCG and impose stringent measure as per law- even suspend sailing order. VMS record with evidence be executed to restrict fishing <40 m. Joint inspection of catch landed at port by mid-water trawler.	No. by yrs. be mentioned
	"Move-on" rule: When Hilsa catch exceeds 5% of the catch in a tow by weight, the vessel must relocate a minimum of 5 km from the previous tow location for at least 24 hours	
	Fishing closures: Time and area closures may be introduced when specific areas are affected by high bycatches of Hilsa.	
	Bycatch limit: Hilsa landings are limited to a maximum bycatch of 5% by weight of total catch, for all industrial trawlers.	
Introduce more seasonal and spatial closures based on research on times and areas to protect juvenile nursery and spawning stocks of important spp.	Restrict/prohibit fishing in Marine Reserves and protected areas. No. of seasonal and spatial closure area increased on research findings	
Protect areas of unique or vulnerable habitat	Identify areas of unique or vulnerable habitat and establish spatial management to protect them	

Challenge: Conflicts between artisanal and commercial fishing operations

The primary operational means of preventing conflict between industrial and artisanal sectors has been a spatial division based on the 40 m depth contour. This strategy is retained however the dividing line is now specified as a geographically defined line (geo-fence). Industrial vessels must fish on the seaward side of the industrial fishing limit line. Co-management processes to engage both industrial and artisanal sectors are also implemented to address areas of conflict.

Objective : Resolving conflicts between artisanal and industrial fishing operation		
Target: Identify and minimise sources of artisanal-industrial sector conflicts.		
Management Measures	Actions	Timeline
Cross-sectoral fisheries co-management process in place for industrial fisheries	Co-management approach mandated in National Marine Fisheries Policy (currently as draft) and Fisheries Co-Management Committee (CMC) formed for industrial fisheries	2020
	CMC meeting at least twice a year to review conflicting issues, co-management progress, and recommend on implementation strategies to avoid inter-sectoral conflict	2020-
Establish geo-fence industrial fishing limit line to delimit fishing zone for industrial FVs.	Define geographical coordinates and clarify fishing rights and restrictions in each spatial zone	2020
	Define MPA and Marine Reserve fishing regulations for each fisheries sector	2020
	Awareness-raising and training to vessel owners and Captains regarding spatial management system	2020-21
Develop a VMS warning system to alert vessels and fisheries managers of entry into restricted geo-fenced fishing zones	VMS system working effectively and warning system developed. Report to enforcement agencies to take action on non-compliances.	2021

Challenge: Asymmetry and inadequate fisheries data and information

Although the data captured from the industrial fishery meets some minimum requirements it is largely based on manual processes and is subject to delays and errors as a result. Because of manual aggregation of data, very little of the detailed data that was recorded can actually be analysed. Comprehensive, near-real-time, and accurate fisheries data are required from both industrial and artisanal fisheries to support MCS, scientific advice and stakeholder involvement.

More comprehensive data on marine fisheries such as data on the quality of the fish, the ex-vessel price of fish, prices at different stages in the value chain, costs of fishing, employment etc. are needed to assess the economic and social contributions of the fisheries.

Objective: Improving fisheries data and information		
Target: Improve data collection and information dissemination systems to a level that can be used to monitor the performance of this FMP in ** years		
Management Measures	Actions	Timeline
Establish portal, database and applications system that links different sources of data for use in stock assessment, fisheries management and for stakeholder information	Integrated database system is operational and Web-portal accessing is operational. Incorporates requirements for both industrial and artisanal management	
Establish data quality assurance by cross validation of data from different sources.	Automated data validation systems is in place and functional.	

Establish biological sampling databases such as species composition, size composition	Database and application developed and integrated into fisheries information portal	
	At-sea sampling from observers operational and data available online	
	Shore-based sampling operational and data available online (coupled with artisanal catch sampling program)	
Establish economic and employment data collection for marine fisheries	Monitor market prices at landing centres, export permits and wholesale/retail distribution	
Key fisheries management data of marine fisheries publicly accessible.	Stakeholder Web-portal data access is operational.	
	FMP available online and status of specific limits and regulations updated regularly	
	Documentation of fisheries management data prepared and published on regular interval.	

Challenge: Loss of food quality and value of landed catch

Post-harvest losses, along with the ecosystem-level shifts in the availability of high-value species, combine to undercut the value of marine fish landings. Ensuring that all fish captured reach the market as safe, high-quality food products is essential to improving the economic performance of the sector.

Objective: Good post-harvest and value addition and good prices for fishes		
Target: 25% reduction in the fish wastage and 25% increase in the price of trawl catch through improved on-board post-harvest measures by 202* from present level.		
Management Measures	Actions	Timeline
Strengthen on-board post-harvest practice to retain quality of catch to fetch more price;	Trained crew and technical persons of FVs on post-harvest handling and preservation; Maintained cool chain with chilled water starts from landing catch on-board;	
Introduce use of plastic trays, baskets or other improved device instead of bagging to keep and preserve catch in freezer;	Used plastic trays, baskets or other appliances and kept in freezer; Ensured enough stowage space for circulating cold air around baskets or trays in freezer & cold storage;	
Establish well equipped required number of fish landing centers with hygiene, sanitation, chilled room, potable water supply facilities.	Developed fish landing centers hygiene, sanitation, chilled room, potable water supply facilities; Trained workers and staffs on hygiene, sanitation and good handling;	
Develop shore based cold storage and processing facilities established by association in leased out facilities in public land.	Established shore based cold storage and processing units by association in leased public lands; Trained workers and staffs on hygiene, sanitation and good handling;	

Review and Update of FMP

The FMP recognizes the importance of generating better data and information to support management and policy decision making and proposes to undertake research and studies and adaptive changes in future management measures. Annual review and adaptation of the FMP will be based on progress against the objectives as measured by scientific and management information on fisheries performance, stock assessment and biomass estimation of important

marine fishes, and results of survey cruises carried out by RV Meen Shandhani. The revised measures are finalised after broader stakeholder consultations.

Multi-year (biannual) reviews of the FMP will take a more in-depth consideration of the FMP to identify limitations or lessons learned which need to be considered for revision of the FMP or the National fisheries strategy. Biannual reviews will be prepared by a committee of selected academics, scientists, researchers, and concerned stakeholders to address new issues, revise strategic goal s and objectives and evaluate management measures. Proposals for revised FMP and strategies are finalised after broader stakeholder consultations.

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Annex 1. Fisheries institutions, organisations and stakeholders

Fisheries Administration	
Ministry of Fisheries and Livestock (MoFL)	The administrative ministry with oversight and policy making responsibility for fisheries through its' various departments and agencies. MoFL is responsible the policy regulations for management and conservation of fisheries resources in Bangladesh. It has the authority to frame fisheries policy, strategies, Acts, Rules and regulations for administering the sector.
Department of Fisheries (DoF)	DoF is the principal agency of MoFL, responsible for managing Bangladesh's fisheries resources. The Marine Fisheries Office, based in Chattogram, is responsible for licensing, fishing operation regulations, catch certification, and monitoring, control and enforcement (MCS) activities. DoF has responsibility to draft fisheries policy, Acts, strategies, rules and regulation, for approval from MoFL.
Marine Fisheries Office (MFO)	The Director/Marine is responsible for implementing the management, conservation, exploitation and development of marine fisheries. This includes making rules covering issuance of license, catch reporting, implementation of FAO/CCRF, and MCS, in industrial marine fisheries.
Mercantile Marine Office (MMO)	MMD, based in Chattogram, is a subordinate office of the Department of Shipping under the Ministry of Shipping. In addition to merchant shipping responsibilities, with respect to fishing vessels MMD is primarily responsible for registration, survey and inspection of coastal fishing vessels; issuing Safety Equipment certificates and Seaworthiness certificates
Department of Shipping (DoS)	DoS is a regulatory agency under the Ministry of Shipping, mandated as maritime safety administration of Bangladesh responsible for the formulation and implementation of the national policies and legislation to ensure the safety of life and ships at sea, coastal and inland waters. To ensure safety of the inland, coastal and ocean going vessels including FVs, department of shipping performs approval of the design of the ships, oversee the construction of the vessels and conducting regular surveys as well as register the ships. The Department of Shipping performs ship safety duty in accordance with the two main laws: The Merchant Shipping ordinance (MSO) 1983.
Bangladesh Fisheries Development Corporation (BFDC)	BFDC is responsible for supporting processing, fisheries product development and distribution through management of harvesting of fishery resources and developing marketing facilities.
Planning Commission (PC)	Planning Commission has the responsibility for national planning and overall coordination of all development activities. The Fisheries Section of the Agriculture Division is the main functional unit for fishery-related activities with a mandate to formulate strategies and programs for fisheries development; assist in preparation and approval development programs and projects for fisheries; technical evaluation of all fishery projects- of both internal and external origin; field inspection to monitor and evaluate project implementation; periodical review of on-going projects, and inter-sectoral and intra-sectoral coordination in fisheries sector.

Bangladesh Coast Guard (BCG)	BCG of the Ministry of Home, is mandated is to protect the marine economy and environment, to defend maritime borders, to save those in peril, to preserve the national interest at sea and to prevent pollution, smuggling and trafficking. One of the agency's principal tasks is to protect marine fisheries resources through policing and enforcement against illegal fishing against prescribed Acts and Rules under DoF. Bangladesh Coast Guard and Bangladesh Navy conduct MCS activities and involved in inspection and patrols within the EEZ to promote compliance and protect the fisheries interest at-sea.
Bangladesh Navy	
Fisheries Institutions and associations	
Marine Fisheries Academy (MFA)	Government training institution under MoFL for training personnel for fishing vessels and provides four-year training programs leads to graduation on Navigation, Engineering and Fish Processing.
Bangladesh Fisheries Research Institute (BFRI)	BFRI under MoFL is the primary fishery, aquatic resource and aquaculture research agency of the GoB. It conducts and coordinates nationwide research efforts, standardizing techniques to maximize production and improve resource management. The institute also provides courses for dissemination of new skills and technologies within the fishery sector.
Technical Universities	Currently, twelve universities in Bangladesh are providing honours Bachelor and Masters degrees in the fields marine science and fisheries, oceanography, aquaculture, marine biology and other allied fields relevant to the fisheries sector.
Bangladesh Marine Fisheries Association (BMFA)	BMFA represents the interests of the freezer-equipped, steel-hulled industrial fishing fleet
Bangladesh White Fish Trawlers' Association (BWFTA)	BWFTA represents the interests of the non-freezer, wooden-hulled industrial fishing fleet.
Boat Owners Associations (BOA)	Artisanal vessel owners are represented through the Mechanized Boats Owners' Association or the Traditional Boats Owners' Association, depending on size, engine power, and degree of mechanisation.