REPUBLIC OF GHANA

Ministry of Fisheries and Aquaculture Development
Fisheries Commission

FISHERIES MANAGEMENT PLAN OF GHANA

A National Policy for the Management of the Marine Fisheries Sector

2022 - 2026




Cover page photograph

L to R: Fishing crafts along the Coastal Communities of Ghana

Inshore fishing craft

The Government is fully committed to implementing a robust Fisheries Management Plan to ensure long term conservation of its fish stocks whilst at the same time contributing to improved food and nutritional safety at a national level.

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Definitions

Maximum Economic Yield (MEY): The sustainable catch or effort level for a commercial fishery that allows net economic returns to be maximized. Note that for most practical discount rates and fishing costs, MEY will imply that the equilibrium stock of fish is larger than that associated with MSY. In this sense MEY is more environmentally conservative than MSY and should in principle help protect the fishery from unfavourable environmental impacts that may diminish the fish population.

Maximum Sustainable Yield (MSY): The maximum average annual catch that can be removed from a stock over an indefinite period without having any negative effect on resource potential under prevailing environmental conditions.

Fishing mortality/ effort (F_{MSY}): The Fishing mortality/ effort consistent with achieving Maximum Sustainable Yield (MSY)

Overfished: A stock with a biomass below the biomass limit reference point.

Overfishing: A stock is experiencing too much fishing and the removal rate from the stock is unsustainable.

Stock: A functionally discrete population of species that is largely distinct from other populations of the same species. Such a population may be regarded as a separate entity for management or assessment purposes.

Sustainable Yield: The average catch that can be removed from a stock over an indefinite period without causing a further reduction in the biomass of the stock or adversely affecting recruitment and reproduction of the stock. This could be either a constant yield from year to year, or a yield that fluctuates in response to the changes in abundance

ABBREVIATIONS

AU	African Union
AUSAID	Australian Agency for International Development
BET	Bigeye Tuna
BTA	Bowtie Analysis
CCRF	Code of Conduct for Responsible Fisheries
CEDA	Committee for Economic Development of Australia
CIC	Canoe Identification Card
CPUE	Catch Per Unit Effort
CSO	Civil Society Organizations
DANIDA	Danish International Development Agency
EAF	Ecosystem Approach to Fisheries
ECOWAS	Economic Community of West African States
EEZ	Exclusive Economic Zone
EU	European Union
EY	Equilibrium Yield
FAD	Fish Aggregating Device
FAO	Food and Agriculture Organization of the United Nations
FC	Fisheries Commission
FMP	Fisheries Management Plan
FSSD	Fisheries Scientific Survey Division
GDP	Gross Domestic Product
GIFA	Ghana Inshore Fishermen Association
GITA	Ghana Inshore Trawlers Association
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GNCFC	Ghana National Canoe Fishermen's Council
GRT	Gross Registered Tonnage
GSS	Ghana Statistical Service

GTA	Ghana Tuna Association
ICCAT	International Commission for the Conservation of Atlantic Tunas
IEZ	Inshore Exclusive Zone
IFMD	Inland Fisheries Management Division
IUU	Illegal, Unreported and Unregulated
JICA	Japan International Cooperation Agency
KOICA	Korean International Cooperation Agency
LOA	Length Overall
MEY	Maximum Economic Yield
MFMP	Marine Fisheries Management Plan
MOFAD	Ministry of Fisheries and Aquaculture Development
MSY	Maximum Sustainable Yield
F_{MSY}	Fishing Mortality/ Effort
NAFAG	National Fisheries Association of Ghana
NAFPTA	National Fish Processors and Traders Association
NGO	Non-governmental Organization
NHS	National Harvest Strategy
NORAD	Norwegian Agency for Development Cooperation
NUSPAW	National Union of Seamen, Ports & Allied Workers
QA	Quality Assurance
RFMO	Regional Fisheries Management Organization
SDG	Sustainable Development Goals
SFMP	Sustainable Fisheries Management Project
UKAID	United Kingdom Agency for International Development
UNCED	United Nations Conference on Environment and Development
USAID	United States Agency for International Development

VMS	Vessel Monitoring System

EXECUTIVE SUMMARY

The fisheries resources contribute significantly to ensuring food sufficiency in many countries globally. According to the FAO SOIFA (2020), in 2017, 65.8 percent of the fish stocks were within biological sustainable levels. The same report indicated that 78.7 percent of all marine fisheries landings come from biologically sustainable stocks, thus the urgent need to ensure fisheries are managed sustainably by replicating and re-adapting successful policy measures that would not threaten the contribution of the fisheries sector to food security and livelihoods.

The sector in Ghana, contributes significantly to the National Developmental agenda by providing food and nutrition security, employment, foreign exchange earning among others. The sector generates over US $ 1 billion in revenue and accounts for at least 0.9 percent of Ghana's Gross Domestic Product (GDP). The sustainable exploitation of the resources has faced a number of challenges over the years due to inefficient enforcement of the fisheries laws resulting from gaps in the existing Fisheries Act 625 (2002). For Ghana to ensure that fish food is secure for posterity, and to achieve inter alia the Sustainable Development Goal, (SDG) 14, putting in place robust policy measures, adaptable to evolving international trends is paramount.

The 2015 – 2019 Marine Fisheries Management Plan sought to guide the sustainable conservation of the fish stocks by reducing fishing effort among others. Out of this strategic plan, the Fisheries Enforcement Unit, (FEU), was established to ensure fishing compliance on our oceans and safe utilization and consumption of the fisheries resources. However, due to inconsistencies between the Fisheries Act 625 (2002), Amendment Act 880 and the Regulations as well as the inability to address emerging trends in the international fisheries management as a flag, port and coastal states, the objectives of the plan were not fully achieved.

The challenges, achievements, lessons learned from the review of the 2015 – 2019 Fisheries Management Plan formed the bases for the development of the 2022 – 2026 Marine Fisheries Management Plan. The importance of managing fisheries resources through evidence and science based approaches coupled with predicable and transparent regimes is now widely recognized and prioritized as minimum criteria for sustainability.

In this regard, the 2022 – 2026 MFMP presents updated and verified science based conservation measures which embraces a holistic ecosystem based approaches

to fisheries management and will for the next five years seek to achieve the following:

- align fishing effort with estimated annual sustainable levels
- improve data collection and enhance knowledge of the biology
- enforce Fisheries legislation more adequately
- enhance knowledge on fishing gear and develop gear regulations
- protecting Marine Habitat, Biodiversity and Mitigate Impacts of Climate Variability and Change
- improve the socio-economic wellbeing of fishers within the fisheries value chain

Ultimately, the successful implementation of the 2022 – 2026 MFMP will contribute to the attainment of agenda 2030 which calls to end poverty, protect the planet and ensure everyone enjoys peace and prosperity.

Hon. Mavis Hawa Koomson (MP)
Minister of Fisheries and Aquaculture Development
Republic of Ghana

CHAPTER 1

1.0 Background

1.1 Concept of Fisheries Management Plan

The Fisheries Commission is obliged by Section 2.2 (a) of the Fisheries Act, 2002 Act 625 to prepare and keep under continuous review a fisheries plan for the management and development of fisheries in waters under the jurisdiction of Ghana. It further in Section 42 (1) imposes on the Commission, the development of the plan based on the underlined principles:

a) Best scientific information available
b) Optimal utilization of the fishery resources; and
c) Good management practices

It is against this background that the current Marine Fisheries Management Plan (MFMP) (2022- 2026) is being developed to address management and conservation limitations that confronted the 2015-2019 MFMP.

1.2 Overview of the 2015-2019 Marine Fisheries Management Plan

The Marine Fisheries Management Plan (2015 – 2019) was developed as a multiphase, adaptable and continuous fisheries management programme to reduce the fast-declining fisheries resources. The Goal of the Management Plan was to rebuild fish stocks to enhance the socio-economic conditions of fishing communities, create employment within national and international frameworks and standards and improve food security as well as contribute to GDP and foreign exchange earnings.

The Plan theory of change was derived from the constraints and issues identified in the fisheries sector prevailing prior to the development. These constraints informed the development of a policy strategy of sustainable fisheries governance to reverse the trend of fish stock depletion. The strategy developed were to be achieved through the following medium to long term outcomes by;

i. reducing excessive effort and capacity of vessels,
ii. building the institutional capacity of relevant law enforcement agencies to enforce the fisheries laws,
iii. protect marine habitat and conservation of biodiversity
iv. reducing post-harvest losses

1.2.3 Outcomes of FMP 2015 – 2019

In line with the management objectives, the key outcomes of the MFMP (2015 – 2019) are enumerated below:

Outcome 1: Reducing Fishing Effort and Capacity (Canoe, Trawl Fishery and Tuna Fleet)

For the effective implementation of effort reduction strategies:

(i) A remarkable achievement was observed in the trawl sector where there was a reduction in the number of industrial trawl vessels from 107 to 76 in the period 2016 to 2019.

(ii) to ascertain the number of operational canoes, a Frame Survey was conducted in 2016 and 11,583 was recorded. The estimated Fmsy[1] (2019) showed a total acceptable fleet of 10,000 to exploit fisheries resources of 330,824mt at Maximum Sustainable Yield. As a step towards ending open access in the artisanal sector, these canoes were registered and embossed with unique identification numbers with the overall objective of capping the number of fleet.

(iii) The Canoe Identification Card (CIC) was launched in December, 2019 as a significant management tool to regulate the artisanal sector. The objectives are; to regulate access to the fishery resource and improve management of the sector; to provide recognition and legitimacy to all canoe owners and to help government adequately plan its provision of social/economic interventions and incentives.

(iv) For the first time, a one-month close season was observed by all canoes and Semi-Industrial vessels in May- June, 2019.
However, in 2020, owing to the impact and effects of the Covid 19 fishing and its related activities were classified as essential towards food and nutrition security amidst the challenges and thus, there was no closed season for all fleet with the exception of the tuna fleet.

(v) Closed season for trawlers was implemented in November 2016, Feb-March 2017, Jan-Feb 2018 and July-Aug 2019 with full compliance based on general observation and interaction with key stakeholders. There was no Closed Season in 2020 because of the effect of the emergence of Covid-19.

(vi) Fisheries Co-Management Policy document gazette for implementation.

[1] Fishing mortality consistent with achieving Maximum Sustainable Yield (MSY)

Outcome 2: Enforcing Legislation

Strict regulations are usually enacted to achieve predefined fisheries management objectives. For any management strategy to be effective, the regulations designed must be enforced through monitoring, evidence gathering, inspections/vessel board procedures, prosecutions and fines. Some achievements from this outcome were:

(i) 20 judges and magistrates, and 10 prosecutors trained in 2016 to expedite adjudication of fisheries infractions
(ii) establishment of 5 tribunals in Central, Volta, Takoradi, Tema and Accra
(iii) 179 arrests, and prosecutions
(iv) 100 % observer coverage on board trawl vessels;
(v) Ratification of Ports States Measures Agreement in 2016; and
(vi) Improved sanitary conditions for trawl industrial vessels

Table 1: Vessel Numbers

Year	Vessel Type		
	Inshore / Artisanal	Industrial (Trawler / Tuna	Total
a 2017	32	17	48
b 2018	7	23	30
c 2019	9	51	60
d 2020	21	20	41
e Total	91	111	179

Outcome 3: Biology / Stock Assessment

Existing data from catch assessment surveys prior to the development of the FMP (2015 – 2019) showed considerable levels of overfishing leading to wide concerns of decreasing fish stocks. To accurately plan and manage a fishery means having credible information on the biology and status of the fish stocks. Under this outcome, considerable efforts were made in the following:

(i) A stock assessment survey to assess the state of pelagic and demersal resources was carried out by the RV Fridtjof Nansen in 2016 sponsored by WARFP.
(ii) In 2017 and 2019, with support from the FAO, another pelagic and demersal stock assessment surveys were conducted by the same vessel.
(iii) Twelve (12) Ghanaian officers were trained in stock assessment methods to build up capacity to conduct surveys in the near future

(iv) Biological studies for small pelagic was carried out before and after the May-June 2019 closed season with the conclusion that the May 15 to June 15, 2019 timing for the closed season did not coincide with the peak spawning season,

(v) Open ARTFISH system using tablets was developed and utilised for improved landings data collection in the artisanal sector with assistance from FAO and SFMP

Outcome 4: Protecting Marine Habitat and Biodiversity

With persisting overfishing coupled with impacts of climate change, the need to conserve specific areas and habitat in order to protect fish populations becomes very crucial. The achievement for this outcome were:

(vi) Procurement of a consultant to develop a strategy document that provides the basis for the selection of prioritized Marine Conservation Areas and systematic and integrated approaches to the management of such areas.

(vii) The development of the Co-management Policy for the Fisheries Sector was initiated in 2018 and completed in 2020 (MOFAD, 2020)

Outcome 5: Reducing Post harvest losses and Improved Fish Product Certification

(i) Class one certification scheme launched in 2019

(ii) 20 fish individual processors certified under class 1 scheme

(iii) 539 Improved smoking ovens (Ahotor oven) distributed nationwide

1.2.2 Challenges and Outstanding issues

1.2.2.1 Operation of the Management Plan

Though the 2015-2019 Fisheries Management Plan prescribed the formation of Operational Committee to oversee to the successful implementation of the management plan and also the development of an annual Operational Plan developed(delete) from the Management Plan's priorities that will transparently designate the actions to be taken in every calendar year, this activity never materialized. Thus, resulted in the limitation by the Fisheries Commission to prepare an annual report on the performance of the fisheries resources against all performance indicators in accordance with the implementation time frame specified in the Management Plan. Other constraints were:

(i) Inadequate budgetary allocation for the implementation of the activities
(ii) Untimely release of operational resources
(iii) Inadequate human resource
(iv) Political interference in fisheries enforcement and regulations
(v) lack of previous political will to implement measure to recover the fishery,
(vi) weak capacities of fisheries stakeholder associations to contribute to co-management

1.2.2.2 Review of the Management Plan

Considering that the 2015 – 2019 Fisheries Management Plan was developed to reflect the perceived understanding of the fisheries resources of Ghana at that time, change was anticipated over the implementation phase. Accordingly, the Management Plan was to be periodically reviewed and improved as advancements in knowledge and management were made without a major departure from the stated management arrangements during the implementation phase. However, there was no review of the Plan during the period.

CHAPTER 2

2.0 Preparation of the 2022 – 2026 Marine Fisheries Management Plan

The current Marine Fisheries Management Plan, MFMP (2022-2026) is to improve upon the achievements of the previous Plan, incorporate lessons learnt, adopt strategies to overcome previous and emerging challenges by

Box 1: Guiding Principles

- **Precautionary approach in management**
  which is a fundamental component of an effective risk management strategy. This approach will not delay action because of lack of information and manages cautiously when uncertainty exists (e.g. uncertainty in the MSY estimate)
- **Ecosystem Approach**
  This considers all components of the eco-system including, ethnic population, communities and habitat and their linkages as the basis for the conservation and sustainable use of the fisheries resources of Ghana.
- **Co-management**
  It is the partnership arrangement in which the community of fisheries resource users (fishers), government, and other stakeholders like the Non-governmental organizations (NGOs), academia and research institutions share the responsibilities and authority for the fishery
- **International Cooperation and coordination**
  Shared responsibility is an important part of managing the fisheries resources of Ghana. This management Plan will promote collaboration and participatory decision making with all stakeholders (both vertically across different levels of government and society and horizontally across agencies and sectors)
- **Participation, public accountability and transparency**
  Shared responsibility is an important part of managing the fisheries resources of Ghana. This Management Plan will promote collaboration, participatory decision making and shared responsibility with all stakeholders.

  The Government will be accountable and transparent in the management of the fisheries resources of Ghana.
- **Limitation of adverse environmental impacts**
  will ensure the conservation and protection of the fisheries resources and shall uphold and apply the polluter pay principle in protecting marine habitats.

conducting a demand-driven research for fisheries. The MFMP (2022-2026) also embraces Ecosystem Approach to Fisheries management (EAF). The Plan takes its locus from the Fisheries Act 2002 (Act 625) Section 42-45.

2.1 Key Policy Drivers and Objectives

Managing fisheries resources depends on the scientific knowledge of its biological potentials. This knowledge informs and guides any management strategies to allow sustainable exploitation based on defined objectives. Accordingly, the MFMP details adequate management measures needed to meet the objectives as well as key performance indicators and timelines. It also specifies how the measures are to be implemented over the period with operational plans as well as monitoring and evaluation performance assessment of the MFMP. The Key policy drivers will provide guiding principles for the development of strategies for effective implementation of the Plan:

2.1.1. Purpose

The Management Plan's purpose is to create a strategy framework for reversing the downward trend in fishery resources and establishing a competent management regime to ensure that fish stocks are utilized sustainably in a better environment.

2.1.2. Goal

The goal of the Management Plan is to Establish and Enhance Sustainable Fisheries Management and Utilization of the Fishery Resources for Improved Livelihoods.

2.1.3 Specific Objectives

The Management Plan has been developed to meet the following key objectives:

- to align fishing effort with estimated annual sustainable levels
- to improve data collection and enhance knowledge of the biology for management decision
- to enforce Fisheries legislation more adequately
- to enhance knowledge on fishing gear and develop gear regulations
- to protect Marine Habitat, Biodiversity and Mitigate Impacts on Climate Variability and Change

- to improve the socio-economic wellbeing of fishers within the fisheries value chain

2.1.4 Rationale

The MFMP objectives remains relevant to Sustainable Development Goal (SDG) 14 to conserve and sustainably use the oceans, seas, and marine resources for sustainable development, and envisioned as a key instrument for implementation of Ghana's 2022-2026 MFMP. At the same time, the Plan also takes into consideration the following:

- SDGs (1, 2, 3, 6, 7, 8, 10, 12, 13 & 16) that will be aided by achieving the targets of SDG 14 and
- SDGs (5, 6, 7, 8, 11, 12, 13 & 17) whose achievement will contribute towards the achievement of SDG 14.
- AU agenda 2063 (1,3,5,6 & 7).
- Medium Term National Development Policy Framework: Agenda for Job: Creating prosperity and equal opportunities for all (Government of Ghana, 2017).
- Sector Medium term plan, 2022-2025
- Ghana Aquatic Animal Health Policy
- The Co-Management Policy
- The Fisheries and Aquaculture Policy, 2021

2.1.5 Scope of the Plan

This Management Plan covers all Ghanaian marine capture fisheries, including artisanal, semi-industrial, and industrial fishing. It also applies to all fishing vessels operating in Ghana's marine waters, as well as all vessels flying the Ghanaian flag wherever they fish. The MFMP applies:

I. All pelagic species;
II. All highly migratory tuna and tuna-like species (managed by the International Commission for the Conservation of Atlantic Tuna (ICCAT);
III. All demersal species
IV. Other non-targeted (e.g. crustaceans and mollusc) associated or dependent species caught in the course of fishing and
V. Effects on fishing on biodiversity and habitats

CHAPTER 3

3.0 Description of the Fisheries Sector

Ghana lies within the Gulf of Guinea Coast with a coastline of about 550km and maritime domain, including the territorial sea and the Exclusive Economic Zone (EEZ) of 228,000km2 (MoFAD 2015). The coastal zone is divided into three geomorphologic zones (West, Central and East Coast) (Fig 1) mostly a low, sandy shore backed by plains and scrubs and intersected by several streams and rivers. Ghana lies in the tropical equatorial belt where average temperatures are between 25°C and 35°C and where climatic conditions change mainly due to the amount and distribution of rainfall. The productivity of Ghana's marine ecosystem is largely driven by a coastal upwelling systems.

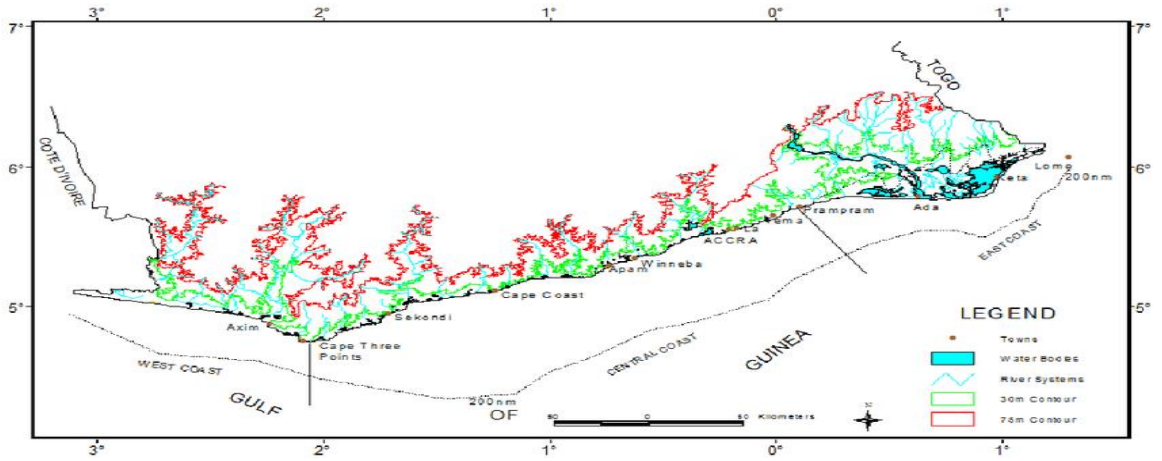

Figure 1: Map of Coastline of Ghana (Boateng, 2009)

3.1 Socio-Economic Importance of the Fisheries Sector

The sector is the main source of fish food, income, employment and livelihoods for coastal dwellers; is an important source of non-traditional export earnings; and provides raw material base for tuna and animal feed processing factories. Furthermore, fish contributes significantly to nutritional food security by providing the bulk (over 60%) of the country's low-cost but high quality protein requirements (FC, 2020), as well as essential minerals, vitamins and fats.

Per capita fish consumption in Ghana, over the last decade lies within a range of 20-25 kg, much higher than that of the average of 14 kg for the ECOWAS zone (FC, 2020). Overall, the sub-sector employs about 10% of the population as fishers, processors, boat owners, boat builders, and others in

ancillary jobs. Direct workforce for the industry includes about 140,000 fishermen in the four coastal regions (FC, 2020).

Fisheries contributes significantly to the national economy especially through foreign exchange earnings of fish and fishery products. In addition to food security, the marine fisheries sector is estimated to generate approximately US$1 billion in total revenue each year (World Bank, 2013). However, its contribution to the nation's gross domestic product (GDP) has declined from 1.5% in 2015 to 0.9% in 2019 due to largely the overexploitation of the fisheries resources (GSS, 2020).

3.2 Categories of Fishing Fleet

Fishing vessels in Ghana are categorized into three based on the construction material, gear type, target species as well the size of each fleet.

3.2.1 The Artisanal Sector

This sector comprises 14,275 motorised and non-motorised registered canoes which operate within the Inshore Exclusive Zone (IEZ) and beyond (FC, 2020). The size of the canoes ranges from 3 meters to almost 20 meters Length Over All (LOA) and are made from "wawa" wood *(Triplochiton spp.) (*Dovlo et., al 2016*)*. The canoes use a variety of fishing gears mainly, beach seines, encircling nets, hook and lines, drift gill nets and set nets.

In 2019, catches from this sector are estimated to be in 170,149 mt (FC, 2020). Production estimates from Fisheries Scientific Survey Division (FSSD) indicates that catches per canoe have declined substantially since 2008 affecting their profitability. This Management Plan will include measures that will make provisions for reducing fishing effort.

Artisanal Fleet (FC, 2020)

Number of vessels

- Motorised- 12,848
- Non-motorized – 1,427
- Total- 14,275

- Fishing gear - beach seines, encircling nets, hook and lines, drift gill nets etc
- Target species- sardinellas anchovy and mackerels(small pelagics)
- Annual catch -170,149 mt

3.2.2. The Semi-Industrial Sector

The semi-industrial vessels are made of wooden hulls with inboard engines operate within the Inshore Exclusive Zone (IEZ) and beyond. They are of two types: (a) larger ones with LOA between 20 and 30 meters using primarily bottom trawls and (b) smaller vessels with LOA between 8 to 10 meters using small purse seines. The semi-industrial sector comprises of approximately 224 operational boats. Currently catches of 2019 are estimated at 11,353 mt (FC, 2020).

Semi-industrial (Inshore) Fleet (FC, 2020)

Number of vessels -224

- Fishing gears- Purse seine and trawl
- Target species- sardinellas and mackerels
- Annual catch- 11,353mt

3.2.3 The Industrial Bottom Trawl Sector

This category of fleet are steel boats of up to 30m LOA. Presently, this sector comprises around seventy-six (76) active vessels, contributing to an estimated annual catch of 37,507mt in 2019 (FC, 2020). Target species include the sparids, croakers and grunts(demersals).

Industrial Trawl Fleet (FC, 2020)

Number of vessels -76

- Fishing gears- bottom trawl
- Target species- sparids, grouper, cuttlefish and snappers
- Annual catch- 37,507mt

3.2.4 The Tuna Sector

Tuna fishing occurs mainly in Ghana's Exclusive Economic Zone (EEZ), and the high seas. The operational vessels comprise 14 bait boats and 16 purse seiners. The targeted species are essentially those under the management

of ICCAT such as skipjack, bigeye and yellowfin tuna. In 2019 the total catch for the tuna fleet was around 90,000mt (FC, 2020). The tuna purse seines have been benefiting from a relatively good stability with current landings estimated at around 77,137.5mt per year.

Ghana will also continue to abide by ICCAT rules and regulations governing fishing in the Atlantic Ocean.

Tuna bait-boat vessels

Number of vessels -14

- Fishing gears- pole and line
- Target species- skipjack and yellowfin
- Annual catch- 13,173.5

Tuna Purse seine boat vessels

Number of vessels -16

- Fishing gears- purse seine
- Target species- skipjack, bigeye and yellowfin
- Annual catch- 77,137.5

1. 3 Ghanaian Fishing Vessels and Catch Data (2019)

The operational status and volumes of catch of Ghanaian Fishing Vessels areas specified below.

Table 2: Ghanaian Fishing Vessels and Catch Data (2019)

	Number of vessels	Volume of catch (Mt)	Percentage contribution	Catch per vessel (Mt/vessel)
Marine canoes				
Motorised	12,848	136,119	44.01	10.60
Non-motorised	1,427	34,030	11.00	23.85
Total canoes	**14,275**	**170,149**	**55.01**	
Semi-industrial vessels	224	11,353	3.67	50.68
Trawlers	74	37,507	12.13	506.85
Tuna vessels	**30**	**90,311**	**29.20**	**3,010.35**
Bait boats	14	13,173.5	14.59	940.96
Purse seine	16	77,137.5	85.41	4,821.09
Grand Total		**309,320**		

3.4 Current Status of Exploitation of Fish Stocks

3.4.1 Status of the Biomass

The survey of marine fisheries resources of Ghana conducted in April 2016 by R/V Fridtjof Nansen estimated the total biomass of the Sardinellas (PEL 1) to be about 500mt and that of anchovy (PEL 1) about 25,000mt. The carangids, scombrids, barracudas and hairtail (PEL 2) were the most abundant species in the trawl catches, caught on both the inner and outer shelf area. The biomass of this group mainly carangids (Chloroscombrus chrysurus and Decapterus punctatus) was estimated to be 107,000mt. Estimated biomasses of valuable demersals usually targeted by trawlers on the shelf within depth of less than 100m were: Seabreams – 12,959mt; Grunts – 620mt; Croakers – 567mt; Groupers – 452mt; and Snappers – 1,450mt.

The 2017 Fridtjof Nansen survey conducted in August estimated the biomass of the Sardinellas and Anchovy to be about 4,000 and 56,990mt respectively. The estimated combine biomass of carangids, scombrids, barracudas and hairtail dropped from 107,000mt in 2016 Survey to 28,000mt in 2017 Survey. The reasons for this dramatic drop in biomass of PEL 2 is unknown. It is however important to note that the two surveys were conducted in different hydrographic seasons (Thermocline and upwelling seasons respectively).

The 2019 Fridtjof Nansen survey conducted in July/August estimated the biomass of the Sardinellas and Anchovy to be about 7,398 and 18,372mt respectively (Table 3). The carangids and scombrids, were the most abundant species in the trawl catches with estimated biomass of 41,783mt in 2019. In 2019, estimated biomasses of valuable demersals on the shelf within depth of less than 100m were: Seabreams – 11,598mt; Grunts – 624mt; Croakers – 1280mt; Groupers – 431mt; and Snappers – 1,026mt. There is clearly a regime shift in small pelagic species composition with anchovy overtaking sardinella as the dominant species. This is confirmed by the results of 2016, 2017 and 2019 Fridtjof Nansen Survey.

Table 3: Results of Fridtjof Nansen Pelagic Survey for 2016, 2017 and 2019

Year	*PEL 1(mt) Anchovy*	*PEL 1(mt) Sardinellas*	*PEL 2 (mt) carangids, scombrids, barracudas & hairtail*	*Total (mt)*
2016	25,000	500	107,000	132,500
2017	73,140	4,000	28,000	88,990
2019	18,372	7,398	41,783	67,553
Total	100,362	11,898	176,783	

Source: Nikolioudakis et al., 2021

From the table above the total biomass of anchovy for the three surveys far exceeded that of the sardinellas. The biomass of the anchovy constituted about half that of the carangids, scombrids, barracudas and hairtail (PEL 2). The highest total biomass of PEL 1 and PEL 2 was recorded in 2016(132,500mt) and declined in both 2017 and 2019. The results of these analyses however should be interpreted with caution as the 2016 survey was conducted in a thermocline season whilst the 2017 and 2019 were conducted during the major upwelling season.

Between 2016 and 2019, the estimated biomass of the valuable demersals resource on the shelf in depth less than 100 metres were stable. Estimated biomass of croakers however doubled in 2019 (Table 4).

Table 4: Estimated biomasses (mt) of valuable demersal on the shelf within depth of less than 100m in 2016 and 2019.

Group/Species	**2016 Biomass (mt)**	**2019 Biomass (mt)**
Seabreams	12,959	11,598
Grunts	620	624
Croakers	567	1,280
Groupers	452	431
Snappers	1,450	1,026
Total Biomass	16,048	14,959

3.4.2 Status of Exploitation

The increased fishing effort in terms of number of vessels by all fleet (available to the Fisheries Commission) over the last couple of decades has not resulted in any significant increase in catches beyond 350,000mt. With the exception of the tuna fleet, catch per unit effort (CPUE) of all fleets has been declining. In addition, data from fish landing sites monitored by the Fisheries Scientific Survey Division of Fisheries Commission indicates the sizes of fish being landed now are much smaller than previous indicating a clear case of growth and recruitment overfishing.

Fishing Effort and Maximum Sustainable Yield (MSY)

The catch volume harvested by the various fleets operating in Ghanaian waters between 1990 and 2019 is shown in (figure 2) below. There was a gradual increase in catch in the early 1990s until the mid-1990s when catch began to fall and levelled off around 300,000mt with the exception of the tuna sector. The data further revealed an increase in trawl catches from 2016 as shown in Figure 5.

The MSY indicators computed from the Schaefer (1954) and Fox (1970) models for all the fleets (Annex 2 – 6) using the best available data from 1990 – 2019 gives regression fits applicable to the long-term series of 30 years. Indications from the Canoe sector shows the prediction or forecast of a reduction to 10,000 canoes from over 12000 currently in 2016 in the short term. For the inshore sector, the Fmsy was computed at 239 vessels whilst that of the industrial was 88 vessels.

Based on a precautionary approach, and the current prevailing fishing activities observed especially in the artisanal and industrial fleet, an annual review of effort levels would be done in conjunction with improved information from assessments on fish stock levels and other relevant management tools enshrined in this plan.

In line with the above, current effort levels in terms of vessels will be maintained.

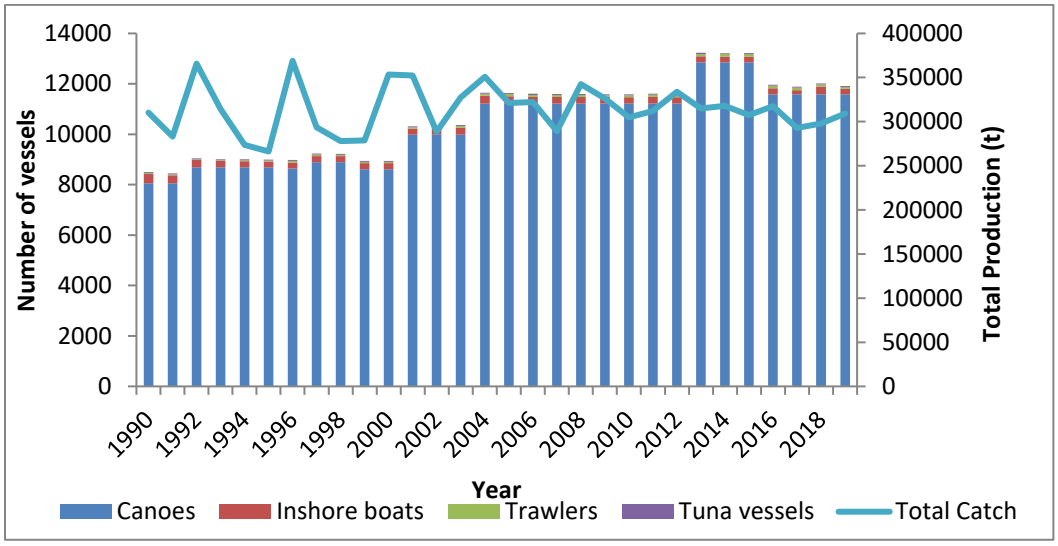

Figure 2: Evolution of Ghanaian fleet and catches. (Source, FSSD)

Catch per Unit Effort (CPUE) by Fleet

Artisanal

It can be observed from Fig 3 that as the number of canoes increases catch begins to drop. This indicates drop in profitability in the artisanal sector. Reducing the number of canoes will significantly increase profitability in the sector.

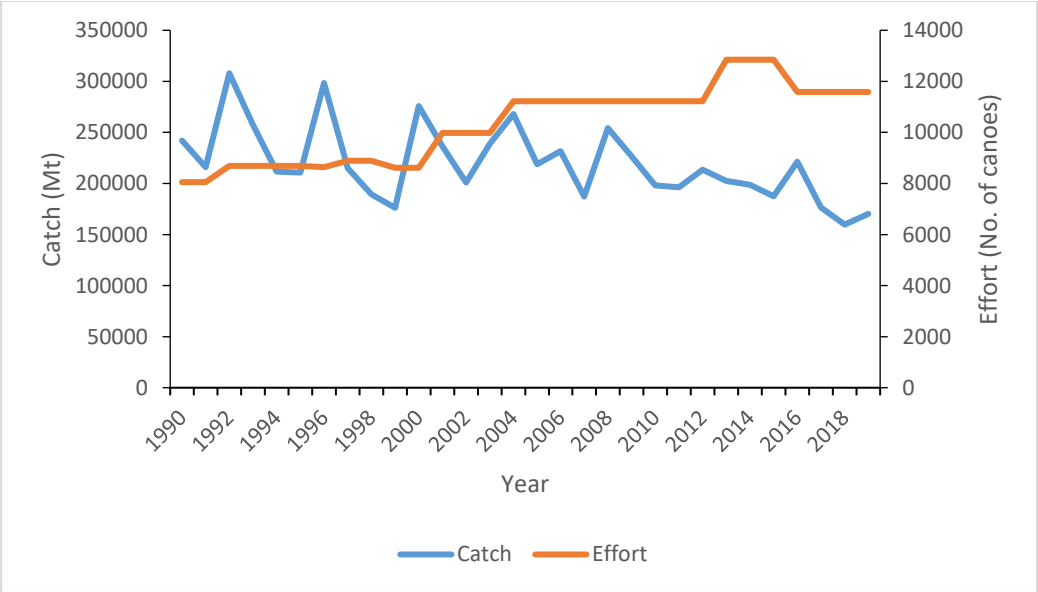

Figure 3: CPUE of Artisanal Fleet

Inshore

It is observed that as the number of inshore vessels begins to decrease, catch increases (Figure 4). A further reduction in the number of vessels in the inshore sector will increase catch significantly and consequently profitability in the sector provided the enabling biological and environmental factors favour high productivity.

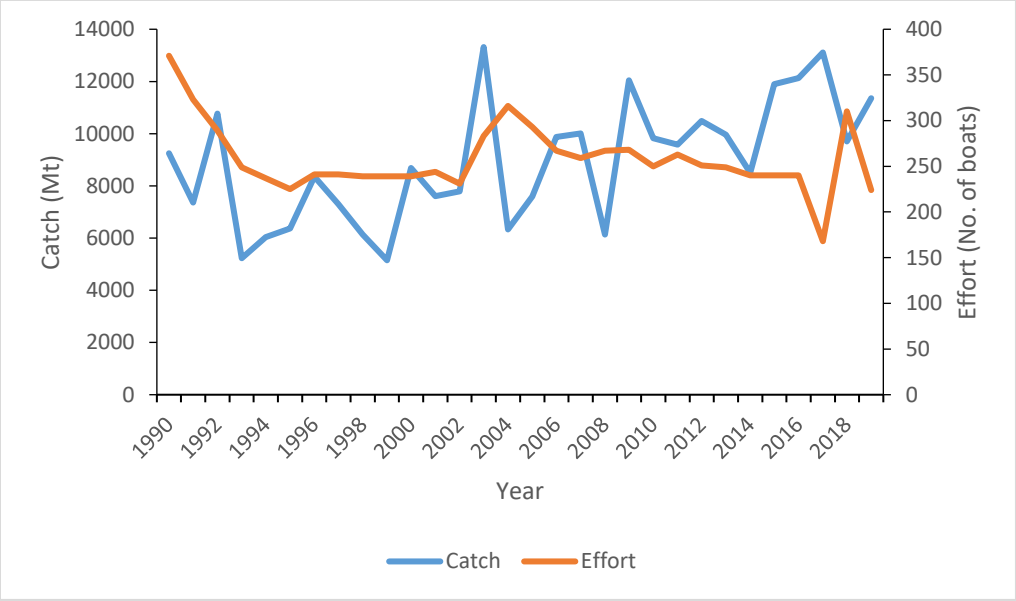

Figure 4: CPUE of Inshore Fleet

Bottom Trawlers

The number of trawlers increased to a peak of 103 in 2014 with a corresponding increase in catch which peaked in 2017 (Figure 5). Since then, number of trawlers have reduced with a slight increase in catches.

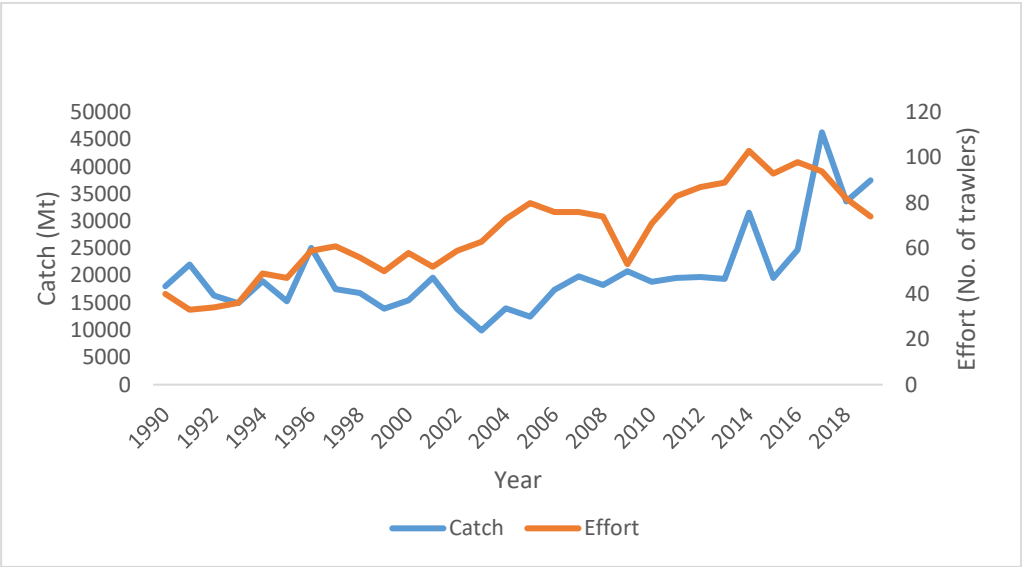

Figure 5: CPUE of Bottom Trawlers

CHAPTER 4

4.0 Main Processes for the Development Management Plan

4.1 Description of the Process

The main process of the MFMP is based on best practice and Ghana's international fisheries obligations and applies the Ecosystem Approach to Fisheries Management that aims to balance ecological well-being (fish resources and the environment) with human well-being (social and economic benefits)

4.1.2 Ecosystem Approach to Fisheries (EAF)

As defined by the FAO, the EAF "strives to balance diverse societal objectives, by taking into account the knowledge and uncertainties about biotic, abiotic, and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries (FAO, 2003)." The EAF seeks to improve all fishery management processes by adopting risk management principles.

4.1.3 Ecological Risk Assessment (ERA)-Identifying Risk Factors

Factors are evaluated by the ERA to determine the risk of fishery being managed unsustainably. ERA identifies the risk factors that contribute to the level of risk for each component in the MFMP. The stages of the ERA include planning, implementation and monitoring reporting.

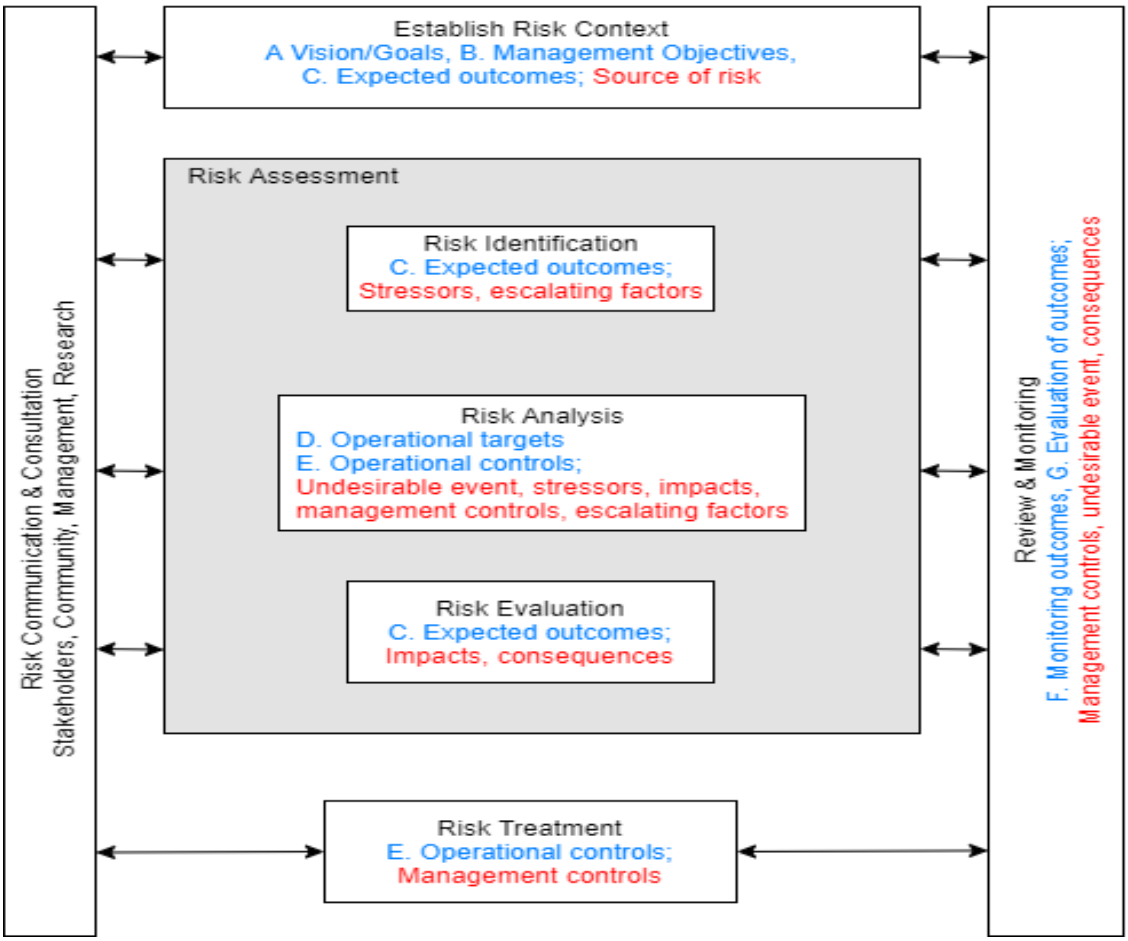

Figure 6: The ERA component within the risk management process consistent with ISO31000:2018 (E) (International Standards, 2010) risk management standard showing input from the management context component (blue text) and from the first stage BTA (red text)

The Bowtie Analysis (BTA) 1 structures the problems that management needs to assess. The components of BTA 1, stressors, management controls, impacts and escalating factors, contribute the factors for the ERA. These factors are evaluated by the ERA to determine the risk of a fishery being managed unsustainably. The purpose of an ERA (International Standard, 2018) connected to a BTA is twofold. First, it assesses the level of risk of not achieving the management objectives for an ecological component (e.g., primary or targeted species of a fishery) under the current management context, and existing knowledge gaps in understanding the dynamics of the ecosystem and management operations.

The level of risk enables management and research to prioritize the ecological component to be addressed. Second and most importantly, the ERA identifies the risk factors contributing to the level of risk for each ecological component. This risk factors are the basis for determining effective risk treatment (Astles, 2015) including management action and filling key knowledge gaps.

The risks factors are then fed into the second stage BTA to evaluate how best to allocate effective management and research actions given limited resources. ERA uses information from the fishery management context and BTA 1 in each of each stages (Figure 6)

Table 5: Key Issues Related to the Fishery

Key Issues	Description of problem
Excessive fishing effort exerted in all fisheries	Excessive fishing capacity - too many vessels exploiting the current resources, especially in the trawl sector - requires effort reduction to more sustainable levels. The exact extent of overcapacity translates into levels of fishing effort above MSY level of effort representing both economic and biological overfishing. Urgent reduction of fishing effort by management action is required.
Inadequate information on biology of the stocks and current biomass levels	Inadequate scientific information on the biology and current biomass levels of the main commercial species are making it difficult to align stocks with current effort. Available information suggests both the small pelagic and demersal fish stocks are overexploited and require rebuilding strategies.
weak enforcement of fisheries Laws and regulations	There is weak enforcement of the fisheries laws and regulations due to inadequate resources (both human and financial) and inadequate conflict resolution mechanisms. More strategic use of existing resources in support of new conservation actions since 2013 are being applied.
inadequate information and regulations on gears	In the past decades, there has not been a consistent inventory of fishing gears in the marine sector leading to infiltration and evolution of destructive fishing gears. Additionally, gear regulations have been on mesh sizes without cognizant to other gear characteristics such as size, construction materials, head rope, wings, panels, hanging ratio etc. In this regard there is a need for an inventory of the gears within the sector and a subsequent development of the gear regulations.
Low levels of Protection of Marine Habitat, Biodiversity and Mitigation of Climate Change	There is inadequate protection of specific marine ecosystems impacting adversely on recruitment patterns of most fish species. Better protection of sensitive ecosystems is required to ensure replenishment of biomass, particularly of coastal areas which are known spawning and nursery grounds of various commercial species. Closure of sensitive/ important areas is required.
Weak socio-economic wellbeing of actors within the fisheries value chain	Over exploitation and decline in fish stocks and landings as well as post-harvest losses have contributed to decrease in revenue, income and nutrition, thereby impacting negatively on the livelihoods of actors within fisheries value chain.

CHAPTER 5

5.0 Institutional Framework, Implementation & Monitoring

5.1 Institutional Arrangements

Based on the common interest in the well-being of Ghana's fishery, the Fisheries Commission collaborates with other institutions concerned with the development and management of the fishery resources. It must be emphasized, however, that stakeholders at all levels must be drawn into the process of deciding how resources are managed to implement the various components of the Plan.

Good governance is essential for effective fisheries management. Successful governance is achieved through an effective and participatory decision-making process. Without good governance, the goal and purpose of the Plan will not be achieved.

5.1.2 Ministry of Fisheries and Aquaculture Development (MOFAD)

MOFAD has oversight responsibility for the sustainable management of fisheries resources and development of the fishing industry.

In this regard, MOFAD will:

i. Obtain Cabinet approval for the implementation of the Management plan
ii. Provide financial resources for the implementation of the Management Plan;
iii. Supervise implementing institutions and agencies; and
iv. Promote collaboration between the Fisheries Commission and Sub Regional, Regional and International Fisheries Management Organizations in the implementation of the Management Plan.

5.1.3 The Fisheries Commission

The Fisheries Commission is responsible for the following:

v. Implementation of the Management Plan through the establishment of a Fisheries Management Operational Committee;
vi. Developing the capacity of staff of the Fisheries Commission for effective implementation of the Management Plan;
vii. Biennial review of the Management Plan

viii. Collaborating with relevant agencies and major stakeholders in the implementation of Plan measures; and
ix. Coordinating the activities of all relevant stakeholders in the implementation of the Plan.

5.1.4 Inter-agency Collaboration

In accordance with Section 13 of the Fisheries Act, 2002 (Act 625), the Fisheries Commission shall collaborate with the following in the implementation of the Plan:

- Ministry of Environment, Science, Technology and Innovation (MESTI); (Environmental Protection Agency);
- Ministry of Justice and Office of the Attorney-General;
- Ministry of Transport, Ghana Maritime Authority (GMA) and Ghana Ports and Harbour Authority (GPHA);
- Ministry of Finance (MOF);
- Ministry of Interior (Ghana Police Service, Ghana Immigration Service);
- Ministry of Defense (Ghana Navy and Ghana Air force);
- Ministry of Trade (Ghana Standards Authority and Ghana Export Promotion Authority);
- Ministry of Health (Food and Drugs Authority, Port Health);
- Coastal Development Authority (CODA); and
- Research Institutions and Universities.

This collaboration will be principally in the following key areas:

- Monitoring, Control and Surveillance;
- Research and Development
- National observer programme;
- Port sampling;
- Enforcement and Compliance;
- Data collection and management
- Control of fish Imports and Exports;
- Designation of Maritime Protected Areas (MPAs); and
- Other relevant areas and activities

5.1.5 Key Stakeholders

Fishing Industry

- NAFAG
    - GNCFC
    - NAFPTA
    - GIFA
    - GTA
    - GITA

NGO'S, CSO's involved in fishery related actives along the coastal Regions

Projects

- Marine Fisheries related projects and interventions with support from Development Partners such as USAID, EU, NORAD, KOICA, JICA, UKAID, DANIDA, PRC, AUSAID, GIZ, CEDA, FAO, AU, WORLD BANK, ECOWAS, AfDB, etc.

5.2 Implementation Arrangement

The operation of the management Plan will operate for a five-year period from 2022 to 2026. There will be an annual Operational Plan developed from the Management Plan's priorities that will transparently designate the actions to be taken in every calendar year. The Fisheries Commission will use the Management Plan to advise the Minister as well as prepare an annual report on the performance of the fisheries resources against all performance indicators in accordance with the implementation time frame specified in the Management Plan.

5.2.1 Fisheries Management Operational Committee (FMOC)

According to Section 42 (3) Fisheries Act 2002 (Act 625), "The Commission shall be responsible in collaboration with such state agencies as the Commission considers appropriate for the implementation of a fishery plan". Subsequently, Section 9 also grants that "The Commission may appoint committees it considers necessary for the implementation of its functions".

In this regard, the establishment of the FMOC may be done comprising MoFAD, FC Board, FC, MOF, FEU, Development Partners, GMA, EPA, NAFAG, Academia and CSO/NGOs.

5.3 Monitoring Evaluation and Review of Management Plan

Monitoring the performance of the FMP involves evaluating and assessing of annual operational plans. This can be achieved in two stages namely:

- Initial Outcome/Output: such as implementation status of workplans;
- Intermediate Outcomes/Output: Compliance from stakeholders with management arrangements

5.4 Review of the Management Plan

This Management Plan is a "living" document that reflects current understanding of the fisheries resources of Ghana and, as such, is expected to change over time. Accordingly, the Management Plan will be biennial reviewed and improved as advancements in knowledge and management are made. However, no major departure from the stated management work plan will occur unless the Fisheries Commission is advised by the Fisheries Management Operational Committee.

CHAPTER 6

RESULTS FRAMEWORK

The results frame work describes the management and operational objectives, management measures, performance indicators, reference point, means of verification, time frame and responsibility roles (Table 6).

Table 6: Results framework

OVERALL EXPECTED RESULTS IMPACT	***Enhanced Sustainable Fisheries Management and Utilization of Fishery Resources for Improved Livelihoods***					
Component 1.1	**Address excessive effort: Canoe (C)**					
Management Objectives	**Align fishing effort with estimated annual sustainable Levels**					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility /Collaborators**
C.1 Registration of all canoes and Implementation of Canoe Identification Card (CIC) Management tool	1.Complete canoe register and embossment	No. of registered and embossed canoes	100% registered and embossed	a. Updated Vessel Registry System b. MOFAD website	2022 Q2	FC, GNCFC, MMDAs
	2. Issue CIC to all registered and embossed canoes	1. No. of cards issued 2. No. of beneficiaries/owners	100% of registered canoes issued with cards	FC annual reports		FC, GNCFC, PREMIX

OVERALL EXPECTED RESULTS IMPACT	***Enhanced Sustainable Fisheries Management and Utilization of Fishery Resources for Improved Livelihoods***					
Component 1.1	**Address excessive effort: Canoe (C)**					
Management Objectives	**Align fishing effort with estimated annual sustainable Levels**					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility /Collaborators**
	3. Update existing canoe register	Canoe register Updated	updated canoe register (hard & soft copies) Published	a. Updated Vessel Registry System	quarterly (a & b)	FC, GNCFC
				b. MOFAD website		
				c. Hard copies	bi-annual (c)	
	4. Develop and Implement Operational Guideline for the CIC	Operational Guidelines Adopted	Operational guideline	Operational Guideline developed and published	2022 Q2	FC, GNCFC, PREMIX SEC., CSOs
C.2 Control of new entrants to the fishery and capacity reduction	1. Implement a 3-year moratorium on new entrants of canoes	1. Zero entrants	Pre-moratorium canoe levels not exceed	Evidence of public announcement made via print and electronic.	2022 Q2	MOFAD/FC, GNCFC, GMA, Forestry Commission
		2. No. of inactive canoes deleted	canoes	a. Updated Vessel Registry System	quarterly	FC, GNCFC,

OVERALL EXPECTED RESULTS IMPACT	***Enhanced Sustainable Fisheries Management and Utilization of Fishery Resources for Improved Livelihoods***					
Component 1.1	**Address excessive effort: Canoe (C)**					
Management Objectives	**Align fishing effort with estimated annual sustainable Levels**					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility /Collaborators**
				b. MOFAD website c. Hard copies		
	2. Implement replacement scheme for old compliant canoes	No. of canoes replaced.	Allow the replacement not exceeding registered capacity of the old canoe	Annual report MOFAD website	Annually	FC
C.3. Re-characterisation of canoes	1. Re-characterisation of canoes	1. Guidelines for standardization developed 2. No. of canoes re-characterised	1 All registered canoes categorized/re classified	document on standardised requisite canoe size, gear and horse power	2023 Q3	FC, NAFAG, GNCFC, CSOs, MMDAs

OVERALL EXPECTED RESULTS IMPACT	***Enhanced Sustainable Fisheries Management and Utilization of Fishery Resources for Improved Livelihoods***					
Component 1.1	**Address excessive effort: Canoe (C)**					
Management Objectives	**Align fishing effort with estimated annual sustainable Levels**					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility /Collaborators**
Improve safety and security of operators	4. Liase with GMA to conduct Safety & Security Training for operators	1. No. of trainings conducted	2	training manual	annually	FC, GMA, GNCFC
		2. No. of beneficiaries trained	All operators	training report		

Component 1.2	**Address and /or prevent excessive effort (Inshore (I) Fishery)**					
Management Objectives	***Align fishing effort with estimated annual sustainable Levels***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
I.**1 Update semi-industrial vessel Register**	1. Conduct Re-registration/census of all inshore vessels.	Census report	All operational vessels	Vessel survey / census report Vessel Registry System	2022 Q3-4	FC, GMA, GIFA
	2. Initiate engagement with GMA for certification of inshore vessels	No. of engagement initiated	All operational inshore vessels	MOFAD Website, Reports	2022 Q3-4	
	3. Update web-based register of inshore vessels	Existing register updated	Vessel Registry System	annual report	quarterly	FC
I.2 Control of new entrants to the fishery and capacity reduction	1. Implement a 3-year moratorium on new entrants of inshore vessels	Zero entrants	Pre-moratorium inshore vessel levels not exceed	Evidence of public announcement made via print and electronic.	2022 Q2	MOFAD/FC, GNCFC, GMA
		No. of inactive vessels deleted	Inshore fleet	a. Updated Vessel Registry System b. MOFAD website c. Hard copies	quarterly	FC, GIFA

Component 1.2	**Address and /or prevent excessive effort (Inshore (I) Fishery)**					
Management Objectives	***Align fishing effort with estimated annual sustainable Levels***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
	2. Implement replacement scheme for old compliant inshore vessels	No. of old vessels replaced	allowing the replacement not exceeding registered capacity of the old vessel	Annual report		FC, GIFA
I. 3 Re-characterisation of inshore vessels	1. Re-characterise inshore vessels based on the size, gear used	1. Guidelines for standardization developed 2. No. of inshore vessel	All registered and embossed inshore vessels	Report on reclassification	2023 Q1	FC, GIFA, NAFAG
	2. Develop and implement new licensing regime (conditions/requirement /fees)	No. of licencing fees reviewed	Current licencing regime	Reports	2023 Q4	
I.4. Improve safety and security of operators	1. Liase with GMA to conduct Safety & Security Training for operators	1. No. of trainings held	2	training manual	annually	FC, GMA, GIFA
		2. No. of beneficiaries trained	All operators	training report		

Component 1.3	**Address and /or prevent excessive effort (Industrial Trawl (IT) Fishery)**					
Management Objectives	***Align fishing effort with estimated annual sustainable Levels***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/Collaborators**
IT.1 Improve management of the industrial trawling effort	1. Implement closed seasons up to 3 months.	No. of successful closed seasons conducted	3 months/ year	Published declaration/ gazette	annually	MOFAD/FC , NAFAG
	2. Impose license conditions to reduce or decrease number of days per vessel available	No. of days per vessel per trip spent at sea in a year.	Maximum 30 days per trip	VMS Quayside inspection reports	monthly	FC

Component 1.3	**Address and /or prevent excessive effort (Industrial Trawl (IT) Fishery)**					
Management Objectives	***Align fishing effort with estimated annual sustainable Levels***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/Collaborators**
	based on the stock assessment.			Logbooks		
IT.2. Control of new entrants to the fishery and capacity reduction	1. Implement a 3-year moratorium on new entrants of trawlers	1. Zero new entrants	Pre-moratorium trawl vessel levels not exceed	Evidence of public announcement made via print and electronic.	2022 Q2	MOFAD/FC, GITA, GMA
		2. No. of inactive vessels deleted	Trawlers	Updated Vessel Registry System MOFAD website Hard copies	quarterly	FC, GITA

Component 1.3	**Address and /or prevent excessive effort (Industrial Trawl (IT) Fishery)**					
Management Objectives	***Align fishing effort with estimated annual sustainable Levels***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/Collaborators**
	2.Implement replacement scheme for old compliant vessels	No. of old vessels replaced	allowing the replacement of two (2) old vessels with one (1) new vessel not exceeding 300 GRT).	Annual report		
IT. 3. Implement Cape Town Agreement	Implement standardised conditions of service for Crew & Observers	Conditions of service developed	Industrial trawlers	Standardized Condition of Service/Crew Contract implemented	2022 Q3	FC, GMA, NAFAG, NUSPAW

Component 1.3	**Address and /or prevent excessive effort (Industrial Trawl (IT) Fishery)**					
Management Objectives	***Align fishing effort with estimated annual sustainable Levels***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/Collaborators**
	Institute periodic training and certification of Crew	1. No of training conducted 2. No. of crew trained	All crew and observers	Training manual Training report	Annually	FC, GMA
	Suspend licences of vessels who do not meet minimum sanitary and safety conditions	No. of licences suspended	industrial trawlers	Annual report	Quarterly (2023)	FC, GMA, GSA, GPHA,NAFAG

Component 1.4 (Tuna Fishery)	**Address and /or prevent excessive effort (Industrial Tuna Fishery TF)**					
Management Objectives	***Current levels of fishing effort and capacity managed***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/Collaborators**
TF. 1 Strict adherence to ICCAT management regimes (capacity limit, quotas and reporting schemes)	1.Ensure compliance with ICCAT recommendations and resolutions	1. Full compliance by vessels with ICCAT recommendations	100%	ICCAT Report	Annually	FC, GTA, FEU
		2. No of letters of concern/identification issued by ICCAT		VMS Catch Certifications Logbooks		
	2.Improve data collection and reporting systems	Fully Compliant with ICCAT data requirement	100%	ICCAT Report	annually	

Component 1.4 (Tuna Fishery)	**Address and /or prevent excessive effort (Industrial Tuna Fishery TF)**					
Management Objectives	***Current levels of fishing effort and capacity managed***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/Collaborators**
	2. Active participation in Adhoc Working Group on FADs	No. of participation in Adhoc working group on FAD	All meetings (100%)	FAD Logbooks in use	Trip by trip	
TF. 2 Bycatch and endangered species mitigation measures regarding the catches of shark, sea birds, turtles, marine mammals and others.	1.Ensure compliance with ICCAT Recommendations and Resolutions	No. of ICCAT letter of concern or identification issued	100% compliance	FC annual reports	annually	FC, GTA, FEU
	2. Improve data collection from artisanal fleet (DGN)	Volume of catch	95% accuracy	FC annual reports		
	3. Modify gears to reduce bycatch	Volume of bycatch	85 % reductions	FC annual reports	2QT 2022	

Component 1.4 (Tuna Fishery)	**Address and /or prevent excessive effort (Industrial Tuna Fishery TF)**					
Management Objectives	***Current levels of fishing effort and capacity managed***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/Collaborators**
			quarter 2022			
	4. Improve public awareness education on bycatch	No. of awareness educational campaigns organized	100 % reduction in by - catches in 5 years		annually	
TF. 3 Prohibit transhipment at sea under ICCAT Recommendation 12-06	1. Restrict vessels and carriers to port operations	No of Transhipment done at port	100%	Trip reports Country report for ICCAT	quarterly	FC, GTA, FEU
			100%	Trip reports		

Component 1.4 (Tuna Fishery)	**Address and /or prevent excessive effort (Industrial Tuna Fishery TF)**					
Management Objectives	***Current levels of fishing effort and capacity managed***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/Collaborators**
	2. Observe 100% coverage of purse seiners	No. of purse seiners observed		Country report for ICCAT	quarterly	
	3. Monitor tuna vessels including carriers all year round	No. of tuna vessels monitored	100%	Trip reports Country report for ICCAT	quarterly	

Component	**Co-management**					
Management Objectives						
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/Collaborators**
C.4 Implementation Co-management Policy	Operationalise the Co-Management Policy	1. No. of Implementation and operational plan developed	1	publications (prints, FC website)	2022 Q1	MOFAD/FC, MMDAs, Fisheries Association, Academia, CSOs
		2. Number of Selection guidelines developed	1			
	Engage and establish co-management committees at all levels	1. No. of National Co-management Committees established	2 (Pelagic & demersal Committees established)	Reports of committee and FC annual report	2022 Q1	
		2. No of sensitization held on the policy for operators	16		2022 Q2 -4	

Component	**Co-management**					
Management Objectives						
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/Collaborators**
		3. No. of communities engaged	8	Reports of committee and FC annual report	2022 Q3-Q4	
		4. No, of Potential Stakeholders and Committee members identified	11 (each committee) 1	Guideline developed Training Reports	2023	
		5. No. of training guidelines developed	1	Guideline developed		

Component	**Co-management**					
Management Objectives						
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/Collaborators**
		6. No. of community co-managements committees established	8	Registration Certificates from District Assembly Endorsed Management Plan	2026	MOFAD/FC, MMDAs, Fisheries Association
		7. No. of communities with established co-management committees	4			
	1.Implement closed season for all fleet	No. of closed seasons observed	3	biological, socio-economic impact assessment report	TBD	

Component	**Co-management**					
Management Objectives						
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/Collaborators**
	Strengthen the enforcement of statutory Fishing Holidays	No. of gazettes per region	4	Ministerial Directive on fishing holidays	2022 Q4	FC, Fisheries Associations MMDAs
	Introduce additional holiday	No. of additional holidays	TBD			

Component 2	**Biology and Stock Assessment**					
Management Objectives	***Data collections improved and knowledge of biology of key fin and shell species (Pelagics, Semi-Pelagics and Demersal) enhanced***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
2.1 improve Data Collection system/scheme aimed at gathering fisheries data that responds to national and international policy interventions	1. Conduct needs assessment for all fleet	No. of needs assessment carried out	Artisanal Inshore Industrial	Needs assessment report of all sectors	2022 Q2	FC, Academia, Industry
	2. Improve data collection systems and methodology	1. No. of standard protocol prepared	1	Revised/ Updated manual	2022 Q3 annual ly	FC, Academia
		2. No. of fish identification Manuals Updated 3. No. of Training and capacity building carried out	1 10	Fish identification manual Training reports, Minutes Webinars	2022 Q2	FC, Academia, CSO's, Industry

Component 2	**Biology and Stock Assessment**					
Management Objectives	***Data collections improved and knowledge of biology of key fin and shell species (Pelagics, Semi-Pelagics and Demersal) enhanced***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
	3. Involve fishers in aspects of data collection process for short term as appropriate (eg. Close season)	1. No. of fishers involved	200	Database available and data regularly updated	2022 Q3	FC
	4. Build capacity of personnel including enumerators	1. No. of training held	5	Reports	2022 Q3	FC
		2. No. of additional staff recruited and trained in data collection	35			
	5.Implement a quality assurance (QA) system to improve data collection and analysis consistent with sub-regional data needs	No. of Standardized protocol on quality assurance developed	1	Quality Assurance Manual	2022 Q3	FC, MOFAD, Academia, CSO's
	6. Improve specialized IT knowledge (statistical tools) for technical staff	1. No. of staff trained in IT	All, staff and enumerators	Training reports, Attendance	2022 Q4	FC, fish. Assoc.

Component 2	**Biology and Stock Assessment**					
Management Objectives	***Data collections improved and knowledge of biology of key fin and shell species (Pelagics, Semi-Pelagics and Demersal) enhanced***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
	and industry players for better data management (Fisheries Management Info System)	2. No. of training organized		Sheets, Evaluations reports		
	7. Develop and share management information on fisheries	No. of Fisheries management information system (FMIS) developed	biannually	FMIS upgraded	2022 Q4	FC, MOFAD
	8. Institutionalize annual science based dialogue on the status of the fish stocks (excluding Tuna)	1. No. of science based dialogue institutionalized	5	Published Proceedings of scientific based dialogue	2022 - 2026	FC, Academia, Industry
		2. No of newsletters published	2 (Annual)	published newsletters		
2.2 Undertake stock assessment surveys	1. Conduct stock assessment surveys and the biology of the key commercial fish stocks annually	No. of surveys conducted	10	Assessment and survey reports	2023 Q1	FC, Academia

Component 2	**Biology and Stock Assessment**					
Management Objectives	***Data collections improved and knowledge of biology of key fin and shell species (Pelagics, Semi-Pelagics and Demersal) enhanced***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
	2.Gear selectivity studies for key species	1. No. of Gear selectivity Studies carried out 2. No. of scientific papers published on gear selectivity	3 3	Reports on the gear selectivity studies papers published	2022	FC, Industry, Academia, CSO's
	3. Assess the spatio-temporal distribution of bycatch in the industrial trawl sub-sector	1. Database on bycatch in the industrial trawl sector	1 (All trawlers)	Scientific observer reports data from scientific observers, log book reports, publications Database	2022 Q4	FC, Industry, Academia

Component 2	**Biology and Stock Assessment**					
Management Objectives	***Data collections improved and knowledge of biology of key fin and shell species (Pelagics, Semi-Pelagics and Demersal) enhanced***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
		2. No. of scientific papers published on bycatch	1	Published scientific papers		
	4. Undertake biological studies in relation to environmental parameters	1. No. of Scientific studies on the biology and population dynamics of fish	2	Reports on biological and environmental studies.	2022-2026	FC, Academia
		2. No. of studies on environmental conditions	5			
2.3 Collect data on fin and shell fish in brackish waters and lagoons (oysters, clams and crabs)	Conduct stock and catch assessment surveys to establish baseline data on these species (oysters, clams and crabs)	1. No. of Surveys undertaken	5 Ref: 10	Assessment and survey reports,	2022-2026	FC, Academia, WRI and CSOs

Component 2	**Biology and Stock Assessment**					
Management Objectives	***Data collections improved and knowledge of biology of key fin and shell species (Pelagics, Semi-Pelagics and Demersal) enhanced***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
		2. No. of different major target species encountered				
2.4 Collaborate with Universities, Research Institutions to develop marine spatial plan	1. Establish MoUs with relevant Research and Development institutions towards MSP	1. No. of MoU developed and signed	5	MOUs and MSP	2023 Q2	FC, Academia MESTI(EPA, LUSPA) Petroleum Commission Research Institutions
		2. No. of institutional collaborations operationalized	5			
	2. Undertake training programs on MSP (ICZM),	1. No. of training programs conducted on MSP	2	Letters of invitation, Attendance sheets, and training reports	2023 Q2	
		2. No. of training beneficiaries	20			

Component 2	**Biology and Stock Assessment**					
Management Objectives	***Data collections improved and knowledge of biology of key fin and shell species (Pelagics, Semi-Pelagics and Demersal) enhanced***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
	3. Develop coexistence guidelines between fishers and oil and gas industries	1. No. of dialogues and fora held between fisheries and O&G	2	Reports on dialogues	2022 – Q4	FC, EPA, Petroleum and Fishing industries
		2. Guideline developed	1	Coexistence guidelines		
2.5 Establish optimal level of fishing for canoes	Assess the biological, socio-economic impact of the previous MSY and MEY	No. of impact assessment carried out	5 (Artisanal fisheries)	biological, socio-economic impact report	2022 - 2026	FC, Fleet operators, Academia
	Conduct acoustic survey and Implement a sustainable yield regime	1. No. of acoustic survey conducted	5	Stock assessment report	2022 - 2026	FC, Fleet operators, Academia
		2. Calculated and established Fmsy	330,824mt 10,000 canoes (Fcur=14,275)			

Component 2	**Biology and Stock Assessment**					
Management Objectives	***Data collections improved and knowledge of biology of key fin and shell species (Pelagics, Semi-Pelagics and Demersal) enhanced***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
2.6 Establish annual optimal level of fishing for inshore vessels	1. Conduct stock assessment surveys (Swept Area).	1. No. of Stock assessment surveys conducted by swept area	5	Survey reports (Calculated and established MSY and MEY(Inshore & trawlers))	2022 - 2026	FSSD -FC
	2. Implement a sustainable yield regime (MSY and MEY)	2. Biomass level established	5			

Component 3	**Enforcing Legislation**					
Management Objectives	***Strengthen Fisheries Enforcement***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
3.1. Sensitize fishers and key stakeholders on the Fisheries Laws and regulations	1. Sensitize and educate fishers	No. of sensitization and education meetings carried out	8(2 per region) 400(100 per region)	Training and meeting reports	2022 – 2026 Q3	FC, FEU, AG, Fisheries Associations
	2. Educate and train fisheries and observers	1. No. of training held	20(4 per annum)	Training manual and reports		
		2. No. of enforcement officers trained	250			
		3. No. of observers trained	170			

Component 3	**Enforcing Legislation**					
Management Objectives	***Strengthen Fisheries Enforcement***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
	3. Provide customized training for groups in the prosecutorial chain	3. No. of trainings customised	5(1 per annum)	Training manual and reports	2022 - 2026	MOFAD/FC, Judicial Service
		4. No. of beneficiaries trained	300			
3.2. Increase effectiveness, efficiency and sustainability of fishery law enforcement.	1. Facilitate the operations of designated law courts to adjudicate fisheries infractions (Judicial Order)	1. No. and types of designated law court operationalized	5	a. functional law courts and FC reports	2023 Q4	MOFAD/FC, Judicial Service
					Annually (Judicial Leave period)	
		2. No. of cases adjudicated by the law court	10	Courts and FC reports		
		3. No. of cases sent to Committee on Compounding of Offences	100 settlement cases	Courts and FC reports		

Component 3	**Enforcing Legislation**					
Management Objectives	***Strengthen Fisheries Enforcement***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
	2.Develop standard operating procedure in accordance with section 116 of the fisheries Act	1. No of SOP developed	1	Reports	2023 Q1	
		2. Percentage of adherence	80%	Reports		
	3. Strengthen Inter-agency cooperation in fisheries law enforcement	1. No of trainings held	20(4 per annum)	Reports	2022 Q4	FC, Relevant Competent Authorities
		2. No. of review meetings	10			
		3. No of Agencies trained	8			
3.3. Strengthen the implementation of Port State Measures Agreement (PSMA) (Amendment	1. Reactivate and Upgrade vessel monitoring system (VMS)	VMS activated, upgraded and operational	functional VMS	Contract document operationalized and VMS data and report	2022 Q2	FC, AG
	2. Train officers in VMS data and tracking analysis to	1. No. of training provided in VMS data tracking and analysis	5	training manuals, training reports	2022 - 2026	FC

Component 3	**Enforcing Legislation**					
Management Objectives	***Strengthen Fisheries Enforcement***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
Regulation LI 2217)	improve the detection rate	2. No of staff trained	15 staff trained			
	3. Use statutory Photographic evidence to complement database as provided in Section 121	1. No. of photographic detections collected	5	photographic evidence, reports	2022 Q3	
		2. No. of cameras procured	100	Cameras		
3.4. **Strengthen regional collaboration to combat IUU fishing**	1. Operationalize NPOA-IUU	1. No. of actions implemented	23 (recommendations)	Reports	2023 Q4	FC
		2. No. of IUU infractions reported through FCWC (RFMO).	10	Reports of alerts received	2022 - 2026	FC, FCWC
		3. No. of sanctions imposed	10	Reports on investigations conducted		

Component 3	**Enforcing Legislation**					
Management Objectives	***Strengthen Fisheries Enforcement***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
3.5. Improve Catch certification scheme	1.Improve verification of VMS data and tracking, logbooks, landing declarations and catch returns	1. Improved logbook introduced	100% coverage	Inspection reports	Annually	FC
		2. Total volume of fish landed	100%	MCS Reports		
		3. No. of catch certificates issued	100%	MCS Reports, No of certificates issued		
		4. No. of VMS Tracking carried out	100%	MCS Reports		
3.6. Enhance compliance of fisheries laws and regulations	1. Suspension of licence of multiple offenders	No. of licence suspended	All trawlers	Annual FC reports	Annually	FC

Component 3	**Enforcing Legislation**					
Management Objectives	***Strengthen Fisheries Enforcement***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
3.7.**Improve remote monitoring of inshore vessels**	Install transponders on all active vessels	2. No. of transponders installed 3. No. of infractions reported from tracking	100 %	AIS, logbooks	2023 Q1	FC, GIFA
3.8. Conduct studies into the extension of the IEZ	Hold national fora to secure the buy-in (IEZ extended from 30 to 50 m depth)	No. and category of stakeholder engaged	10 fora	VMS, Logbooks	2022 Q3	FC, NAFAG, GMA

Component	**Review of Fishing Gear**					
Management Objectives	***Enhance knowledge and develop regulations on fishing gears***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
Monitor the influx and changes of gears	1. Regulate gear specifications, types and mesh size in the trawl sector	1. No. of quayside inspections 2. No. of sanctions against use of prohibited gears	All Trawlers	Reports	2022 - 2026	FC
	2. Research, develop and trial of gears	No of Gears developed and tested	2	Gear research reports	2023 Q3	FC, NAFAG
	3. Recruit additional staff	No. of staff recruited and trained in gear technology	20	Training reports	2023 Q2	FC
	Gear unit strengthened	Functional Gear Unit	1	FC reports		
	4. Enhance capacity of FC Personnel on fishing gears	1. No. of personnel trained in gear technology, and inspections 2. No. of Gear inspection and	50	training reports and manual,	2023 Q2	
			1	Manual		

Component	**Review of Fishing Gear**					
Management Objectives	***Enhance knowledge and develop regulations on fishing gears***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ Collaborators**
		training manual developed				
Conduct Gear Audit	Conduct an inventory of gears in the Artisanal and Semi industrial sectors	No. of Inventories conducted	2	Gear Audit and Inventory reports	2023 Q4	FC, NAFAG

Component 4	**Biodiversity and Climate Change**					
Management Objectives	***Protecting Marine Habitat, Biodiversity and Mitigate Impacts of Climate Variability and Change***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/Collaborators**
4.1Create marine protected areas to enhance biodiversity	1. Establish baseline information (Situational analysis)	1. No. of areas identified	4	Baseline Reports & publications	2023 Q2	FC, EPA, Academia and research institutions, CSOs
		2. No. of rapid assessments carried out	1			
		3 No. of areas proposed	2			
	2. Develop legal framework	1. No. of stakeholders 2. No. of communities engaged	20 50	Stakeholder engagement reports	2023 Q3	MoFAD, MESTI, FC, CSOs, Academia, Wildlife Division, EPA
		3. No. of legal documents developed	1	Legal framework document	2023 Q4	
	3. Designate MPA(s)	No. of MPA(s) (spawning and nursery grounds)designated	2	Georeferenced points of the areas (Mapped)	2023 - 2024	FC, EPA, LUSPA, Academia and research institutions, CSOs, Traditional authority, Chief Fishermen, Local government,

Component 4	**Biodiversity and Climate Change**					
Management Objectives	***Protecting Marine Habitat, Biodiversity and Mitigate Impacts of Climate Variability and Change***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/Collaborators**
	4. Develop management plan for the designated areas	No. of management plans prepared for the designated areas	2	Management Plans	2025	MoFAD-FC, MESTI, EPA, GPHA, MMDAs, Forestry Commission-(Wildlife divisions), CSOs, NGOs, Academia, Oil & Gas, Traditional authority, Chief Fishermen, Local government, Academia and research institutions
4.2 To promote climate change adaptation and mitigation measures	1. Monitor the effect of climate change on key coastal fish species (environmental parameters affecting fish productions)	No. of researches conducted	5	Research Reports on impact	2022 - 2026	FC (FSSD), EPA, Academia and Research Institutions, CSOs
	2. Conduct research on how the fisheries sector has responded to the issues of climate change	No. of researches conducted	1	Research reports and publications	2023 Q4	FC, EPA, Academia and Research Institutions, NGOs

Component 4	**Biodiversity and Climate Change**					
Management Objectives	***Protecting Marine Habitat, Biodiversity and Mitigate Impacts of Climate Variability and Change***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/Collaborators**
	adaptation and mitigation					
	3. Explore opportunities for alternative energy sources driving the fisheries sector	No. of baseline studies carried out	1	Baseline report	2023 Q4	FC, EPA, Academia and Research Institutions, Ministry of Energy, NGOs
	4 Build partnerships with other institutions for climate change adaptation and mitigation model e.g. restoration of mangroves	No. of MoU signed with relevant institutions	2	Agreement (MoUs)	2023 Q4	MoFAD, FC, Forestry Commission, EPA, MESTI, Academia and Research Institutions
4.3 Transform marine debris (plastics, discarded fishing nets, vessels) into a viable	1. Conduct situational analysis on marine debris	No. of reports developed	1	Situational analysis report	2023 Q4	FC, Academia and Research Institutions, EPA, MESTI, MMDAs,
	2. Collaborate with needed institutions to	No. of awareness creation	10	FC reports	2022-2026	

Component 4	**Biodiversity and Climate Change**					
Management Objectives	***Protecting Marine Habitat, Biodiversity and Mitigate Impacts of Climate Variability and Change***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/Collaborators**
industry as a livelihood option ('waste to wealth")	create awareness on marine debris	programmes carried out				
	3. Collaborate with relevant business actors towards marine debris recycling	1. No. of business entities engaged	4	FC reports	2022 - 2026	FC, Academia and Research Institutions, EPA, MESTI, NBSSI, Banks and Financial Institutions
		2. No. of businesses established	2	FC report		
		3. No. of research carried out on marine debris	5	Publication		
4.4 Explore the viability of developing mariculture into a sustainable industry and livelihood measures	Carry out Research in seaweeds culturing	No. of researches carried out	1 2	Research reports and publications Reports, attendance sheets and adopters	2024 Q3	FC, Academia and Research Institutions, EPA
	Hold national fora to secure the buy-in in seaweed culturing	No. of fora held	10			

Components 5	**Socio-economic**					
Management Objectives	***Improve the socio-economic wellbeing/balance of fishers***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ collaborators**
5.1. Increase revenue and income for fishing communities	1. Reduce post-harvest loss from 35% to 20%	No. of sensitization exercises on post-harvest management carried out	4	FC Reports	Annually	FC, FDA, Fisheries Associations, CSOs
		No. of surveys on post-harvest losses for economically important species carried out	2	Survey report		FC, FDA, Fisheries Associations, CSOs
	2. Improve quality and value of fish landings	1. Types of improved handling and processing units developed and introduced (e.g. Ovens and dryers)	3	FC Reports	Annually	FC, FRI, GRATIS, Private sector, Fisheries Associations, Academia
		2. Types of improved handling and processing units adopted	5			
		3. No. of improved handling and processing units adopted	10			
		4. No. of green energy (e.g. solar) fish processing units promoted	10			
		No. of beneficiaries using improved processing units	100			

Components 5	**Socio-economic**					
Management Objectives	***Improve the socio-economic wellbeing/balance of fishers***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ collaborators**
		No. of new products promoted for domestic, regional and international markets	5 (fish powder, shrimp powder, fish kebab, fresh/ smoked fish fillet, fish sausage)			
	3. Improve fish handling standards	1. No. of sensitization and awareness creation programs carried out on fish handling standards	4	FC Reports	Annually	MOFAD, FC, Fisheries Associations, Academia, private sector, GSA, FDA, CSOs
		2. No. of processors and traders trained on fish handling standards	500			
		3. No of improved fish handling containers distributed	500			
		4. No. of improved plastic chopping boards distributed	25000 (10kg)			
			25000 (20kg)			
			Small (25000) (5kg)			
		5. No. of fish processors sensitized on class 1 certification scheme	500			FC, FDA, NGOs

Components 5	**Socio-economic**					
Management Objectives	***Improve the socio-economic wellbeing/balance of fishers***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ collaborators**
		6. No. of processors certified on class 1 certification	10			
	4. Improve packaging and transportation of fish	1. No. of trainings on fish packaging and branding organised	10	FC Reports	Annually	FC, FDA, GSA, Private sector, GPRTU, Fisheries Associations, CSOs
		2. No. of processors trained on fish packaging and branding	500			
		3. No. of packaging equipment and materials supplied	1000			
		4. Frequency of awareness creation programs on transportation of fish carried out	2			
5.2 Improve fish markets and trade	Facilitate the development of fish market infrastructure	1. No. of fish market infrastructure developed and operationalised	10		Annually	FC, FDA, MMDAs Private sector
		2. No. of fish processors sensitized on AfCFTA	500	Infrastructure Report		
	Develop database on fish markets	Database on fish markets developed	Database	Database		FC, CSOs

Components 5	**Socio-economic**					
Management Objectives	***Improve the socio-economic wellbeing/balance of fishers***					
Operational Objective / Strategic Actions	**Management Measures**	**Indicator**	**Target / Limit / Reference Point**	**Means of Verification**	**Time Frame**	**Responsibility/ collaborators**
5.3 Promote inter-agency data sharing	Formalize Inter-agency cooperation in data sharing	No. of Inter-agency agreements signed	3	Agreement (MOU)	2022 Q4	FC, Customs, BOG, GEPA,
5.4 Generate socio-economic information to inform policy development	Undertake socio-economic studies on impact of management interventions (e.g. closed seasons, construction of landing sites)	No. of studies carried out	5	Study reports/ publications	Annually	FC, Academia, CSOs
5.5 Promote alternative/supplementary livelihood	Identify and promote alternative/ supplementary livelihood programs	1. No. of alternative livelihood programs identified and promoted	2	Report	Annually	FC, Fisheries Associations CSOs, local authorities
		2. No. of beneficiaries of identified alternative livelihood programmes	2500			
		Study on alternative livelihood implementation programs				

CHAPTER 7

Financing of the Management Plan

To achieve the objectives of the 2022 – 2026 MFMP, adequate financial and human resources must be allocated to the implementation. The Ministry of Fisheries and Aquaculture Development and the Fisheries Commission are committed to funding the plan through the following sources:

- the Commission's internally generated funds, IGF
- Government of Ghana, GoG
- Bilateral and donor sources

The activities of the management plan will also be incorporated into the Commission's annual action / work plans to ensure easy and smooth implementation. One-year financial plan for 2022 is presented in table 7.

Table 7: Year One (2022) Financial Plan

Components	**Lead Responsibility**	**Activities**	**Implementation Period and Budget - USD**			
Strategic Objectives - SO			Q1	Q2	Q3	Q4
Component 1: Address Excessive Effort - Canoe						
SO 1.1 Registration of all canoes and Implementation of Canoe Identification Card (CIC) Management tool	MFMD, MCSD	Finalise the registration of all active canoes, Print and Issue outstanding CIC, publication of canoe register	45,000	40,000		
SO 1.2 Control of new entrants to the fishery and capacity reduction	MFMD, MCSD	Engagements, communication and sensitization towards moratorium on all fleet	120,000			
SO 1.3 Update semi-industrial vessel Register	MFMD, MCSD	Conduct Re-registration/census of all inshore vessels.			21,000	
SO 1.4 Improve safety and security of vessel operators and crew	MCSD, FEU, MFMD	Liase with GMA to conduct Safety & Security Training for all operators & crew				25000
Component 2: Biology and Stock Assessment						
SO 2.1 improve Data Collection system/scheme aimed at gathering fisheries data that	FSSD	Training of enumerators and fishers		90,000		

responds to national and international policy interventions						
SO 2.2 Conduct minimum of two stock assessment surveys (preferably 1 each in minor and major upwelling season)	FSSD	Conduct stock assessment of pelagic and demersal resources by the acoustic and swept area methodology respectively				60,000
SO 2.3 Initiate Collaboration with Universities and Research Institutions and Oil & Gas industries (towards marine spatial planning)	FSSD	Stakeholder meetings to collaborate and integrate initiatives from other sector agencies		35,000		
Component 3: Enforcing Legislation						
S0 3.1: Sensitize fishers and key stakeholders on the fisheries laws and regulations	MCS / FEU	Educate and train fisheries enforcement officers and other stakeholders	10,000			
		Sensitize and educate fishers		10,000		
		Provide customized training for groups in the prosecutorial chain	20,000	20,000	20,000	40,000
SO 3.2: Increase effectiveness, efficiency and sustainability of fishery law enforcement	MCS / FEU	Strengthen inter-agency cooperation in fisheries enforcement		20,000	20,000	20,000
SO 3.3: Strengthen the implementation of PSMA	MCS / FEU	Train officers in VMS data and tracking analysis to improve the detection rate	20,,000	20,000	40,000	20,000
Component4:Biodiversity and Climate Change						
SO 4.1: Create marine protected areas to enhance biodiversity	MFMD, FSSD	Designate MPAs	50,000	50,000	50,000	
		Prepare management plans			50,000	
SO 4.2: To promote climate change adaptation and mitigation measures	MFMD/ University ,	Undertake research on how the fisheries sector has responded to the issues of climate change adaptation and mitigation		100,000	100,000	200,000
SO 4.3: Transform marine debris into viable industry as a livelihood (waste to wealth)	MFMD, University Private Sector	Conduct situational analysis on marine debris			10,000	10,000
		Develop business plan for marine debris management			10,000	10,000
Component 5:Socio-economic						

SO 5.1: Increase revenue and income for fishing communities	PHU	Carry out sensitization on post-harvest management	20,000	20,000	40,000	20,000
		Sensitization and awareness creation on hygienic fish handling	20,000	40,000	20,000	20,000
SO 5.2 Improve fish markets and trade	PHU	Develop data base on fish markets			50,000	
SO 5.5 Promote alternative livelihoods	PHU, MFMD, IFMD	Carry out studies on alternative livelihood programmes		20,000		
Operational Activities						
Procurement	FC	Consultants Publications	100,00	200,000	300,000	
Recruitment	FC	Staff for fish gear operations			200,000	
Total Budget	**2,326,000.00**					

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ANNEXES

Annex 1: Contributions of Sectors to GDP

Sub-Sector	2015	2016	2017	2018	2019
Agriculture:	22.1	22.7	21.6	19.7	18.5
• Fisheries Sub-sector	*1.5*	*1.4*	*1.2*	*1.0*	*0.9*
Industry	34.6	30.1	32.7	34.0	34.2
Services	43.2	46.7	46.0	46.3	47.2

Source: Ghana Statistical Service

b. Key Issues Related to the Fishery

Annex 2: Management and Operational Objectives

	MSY			~~**Fmsy**~~		
period	**canoe**	**Inshore**	**Trawlers**	~~**canoe**~~	~~**Inshore**~~	~~**Trawlers**~~
2015-2019	239,912	13,713	30,637	~~9,095~~	~~272~~	~~48~~
2020-2025	330,824	9,132	22,823	~~10,000~~	~~239~~	~~88~~