

KINGDOM OF CAMBODIA
NATION RELIGION KING



Ministry of Agriculture, Forestry and Fisheries
Fisheries Administration

**NATIONAL PLAN OF CONTROL AND INSPECTION
FOR MARINE FISHERIES
2020 – 2024**



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Preface

Fisheries in Cambodia are known internationally for their extreme importance for food safety and livelihoods of people, especially for freshwater fisheries products. Similarly, marine fisheries product has grown rapidly in the last several decades, creating employment and food security for coastal communities. Cambodia's marine waters, especially the coastal zone, are rich in key important habitats for aquatic animals such as mangroves, coral reefs, and seagrass. These habitats are highly productive, but are under threat from illegal and destructive fishing practices such as trawls.

In order to prevent and combat these threats, we have produced new management measures, such as community-based fisheries management in coastal areas, including protecting habitats and Marine Fisheries Management Areas (MFMA), which are managed by Community Fisheries (CFs) in cooperation with national agencies and provincial authorities. Despite these initiatives, there is evidence that marine fisheries resources are still under great pressures from habitat destruction and overexploitation. Illegal, Unreported and Unregulated (IUU) fishing is a key factor undermining fisheries management planning, therefore affecting future sustainability of fisheries and marine resources, and therefore on food security and vulnerable fishers.

After the establishment of the National Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Marine Fishing (NPOA-IUU) 2010-2024, the National Action Plan of Control and Inspection for Marine Fisheries (NPCI-MF) is the second five-year plan, which has clear objectives, strategies and activities in order to strengthen and enhance the protection of coastal and marine fisheries resources. This will be achieved through capacity building of government staff, purchasing and implementing equipment, and strengthening cooperation between fisheries administrations at the national and sub-national level as well as with concerning institutions and community fisheries, to ensure highly effective implementation.

The NPCI-MF, based on a consultative process with all relevant agencies and stakeholders involved in protecting and conserving the marine environment and fisheries resources, has identified key important strategies in resolving and reducing threats to coastal and marine fisheries resources. It also provides specific measures for dealing with IUU fishing and strengthening Cambodia's institutional capacity.

I deeply appreciate leaders and officers of all fisheries administrations who have worked really hard on the development of this plan, especially the European Commission that has financially and technically supported developing the NPCI-MF and its future implementation.

At the end, I really hope that this NPCI-MF will be really helpful and assist the FiA in effectively managing marine and coastal fisheries resources, especially in collaborating with concerning stakeholders for combating IUU fishing, to ensure that IUU fishing will be reduced to the minimum level and to secure sustainable fishing in Cambodia.

Phnom Penh, 27 May 2020

Minister

Ministry of Agriculture Forestry and Fisheries

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Abbreviations

ABNJ	Areas Beyond National Jurisdiction
AMS	ASEAN Member State
APEC	Asian Pacific Economic Cooperation
APFIC	Asia Pacific Fisheries Commission
ASEAN	Association of South East Asian Nations
ASSDP	Agricultural Sector Strategic Development Plan
CFA	Community Fisheries Area
CFI	Community Fisheries
CITES	Convention of International Trade in Endangered Species of Wild Fauna and Flora
CPUE	Catch Per Unit Effort
DAAL	Department of Administration Affairs and Litigation
DFA	Department of Fisheries Affairs
DFC	Department of Fisheries Conservation
DPFIC	Department of Planning, Finance and International Cooperation
DPWT	(Provincial) Department of Public Works and Transport
EC	European Commission
EC DG Mare	European Commission Directorate of Marine Affairs and Fisheries
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organization of the United Nations
FAO CCRF	FAO Code of Conduct for Responsible Fisheries
FiA	Fisheries Administration of the Ministry of Agriculture, Forestry and Fisheries
FiAC	Provincial Fisheries Administration Cantonment
FMA	Fisheries Management Area
GDC	General Department of Customs
GDP	Gross Domestic Product
GDWMT	General Department of Waterway and Maritime Transport, and Ports
GPS	Global Positioning System
IPOA-IUU	International Plan of Action to Prevent, Deter and Eliminate Illegal, Unregulated and Unreported Fishing
IUU fishing	Illegal, unregulated and unreported fishing
LOA	Length Overall: maximum length of a vessel's hull measured parallel to the waterline
MAFF	Ministry of Agriculture, Forestry and Fisheries
MaFReDI	Marine Fisheries Research and Development Institute
MCS	Monitoring, Control and Surveillance
MFMA	Marine Fisheries Management Area
MoU	Memoranda of Understanding
MPWT	Ministry of Public Works and Transport
MSY	Maximum Sustainable Yield
NACA	Network of Aquaculture Centres in Asia and the Pacific
NCMS	National Committee for Maritime Security
NMCS	National Monitor, Control and Surveillance team
NPOA-IUU	National Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing
NSDP	National Strategic Development Plan
PDAFF	Provincial Department of Agriculture, Forestry and Fisheries
PDPWT	Provincial Department of Public Works and Transport
PMCS	Provincial Monitor Control and Surveillance team
PSM	Port State Measures
PTT	Provincial Task Team
RFMO	Regional Fisheries Management Organizations
RGC	Royal Government of Cambodia
RPOA-IUU	Regional Plan of Action to promote responsible fishing practices including combating illegal, unreported, and unregulated fishing in the Region
SEAFDEC	South East Asian Fisheries Development Centre
SMOTT	Serious Marine Offences Task Team
SPF	The Strategic Planning Framework for Fisheries
UNCLOS	United Nations Convention on the Law of the Sea
UNFSA	United Nations Fish Stock Agreement
VMS	Vessel Monitoring System

1. BACKGROUND

1.1. Policy Framework

The National Plan of Control and Inspection for Marine Fisheries (NPCI-MF) is set against two policy frameworks:

- a) Cambodia's international and regional obligations, and policy commitments and
- b) Cambodia's domestic legal and policy framework, including the National Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing, 2020-2024 (NPOA-IUU, 2020-2024) and the Statement of the Royal Government of Cambodia on Cambodia's Marine Fisheries Management Key Principles, as well as the 2006 Fisheries Law, currently under revision.

1.2. Goal

The goal of the NPCI-MF is the development of a "control" strategy and organisation of "control" resources in a cost-efficient way to curb illegal activities and ensure compliance in marine fisheries, where "control" means monitoring, surveillance and inspection.

1.3. Objectives

The objectives of the NPCI-MF are to:

- a) Provide guidance and support for the implementation of activities to implement the relevant international and national legal obligations;
- b) Implement the strategic guidance for control and inspection;
- c) Support implementation of marine fisheries management (including future Marine Fisheries Management Plan) and
- d) Support the implementation of the NPOA-IUU.

1.4. Scope

The NPCI-MF shall be applicable to international and national conservation and management measures to be enforced, including, *inter alia*:

- a) All marine capture fisheries in Cambodia's EEZ, including the territorial sea, for small-scale and commercial scale fishing activities;
- b) All marine capture fisheries involving Cambodian fishing vessels in the EEZ of other States and the high seas;
- c) All Cambodian fishing ports and landing sites where fishing vessels land their catch, transshipment points and seafood processing companies; and
- d) All export of fish and fisheries products originating from Cambodia, and import from third party countries and vessels.

1.5. Context for the development of the NPCI-MF

The development a NPCI-MF came about as one of the measures as a result of a negotiating process between the Royal Government of Cambodia (RGC) and the European Commission (EC). The RGC and the EC-DG MARE of the EC initiated dialogue on IUU fishing which ultimately led to the agreement on cooperating efforts to effectively address the issues of IUU-Fishing, which included:

- a) National fishery policy for marine fisheries resources;
- b) National Plan of Action for combating IUU fishing;
- c) Strengthening administrative institution and capacity building;
- d) Fisheries legal framework;
- e) Fisheries Management Plan;
- f) Scientific assessment of fish stocks;
- g) Fishing vessels' registration and licensing;
- h) Monitoring, control and surveillance (MCS); and
- i) International cooperation.

Cambodia has consistently strived to introduce and adopt enabling measures that would result in the lifting of the 'red card'. The FiA has completed the development and adapt of the National Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated fishing (NPOA-IUU, 2020-2024), followed by a three-year rolling work plan for implementation.

Finally, the NPCI-MF, which contributes to the MCS of FAO has been developed, which will eventually contribute to the lifting Cambodia from the list of non-cooperating third countries in combating IUU-Fishing. The NPCI-MF is an instrument developed by DG MARE and enshrined in the European Commission (EC) Council Regulation (EC) No 1224/2009. While the definitions used in this document differ somewhat from the definitions of Monitoring, Control and Surveillance (MCS) of the Food and Agriculture Organisation of the United Nations (FAO), both NPCI-MF and MCS follow the same strategic goal of ensuring compliance with fisheries management rules and regulations.

The NPCI-MF should be implemented in concert with the revised legal and regulatory framework and aligned with the NPOA IUU. Together they are crucial activities for Cambodia's marine fisheries reform.

The NPCI-MF has two important measures: (1) fishing related activities in Cambodia's EEZ, including cross-border trade of fish and fisheries products; and (2) fishing activities by Cambodian vessels in foreign EEZs and international waters. Therefore, the NPCI-MF will:

- a) identify control and inspection measures to be put in place in case Cambodia decides to reopen its international registry; and
- b) estimate related costs such as VMS and observer programmes, based on the situation that prevailed before the closure of the registry (in terms of number and types of fishing vessels and fishing grounds, etc.).

1.6. Situation of Fisheries

Fisheries in Cambodia consist of inland fisheries, marine fisheries and aquaculture. Participants in these sectors include the family scale fishers- use artisanal fishing gear with boats without engine, the small-scale fishers - which use "low technology" fishing gear, and middle-scale and commercial-scale fishers that use "modern" fishing gear and equipment.

Data from the Fisheries Administration (FiA) show that total fisheries production (including aquaculture) was around 900,000 tonnes in 2018, valued at about USD1.8 billion and providing 8-10% to the country's GDP. The value of fish exports has been estimated to be as high as USD100 million per year. In addition to official exports, a substantial quantity of marine fishery products, mainly high-value finfish, shrimp and squids, crosses the border to Thailand and Vietnam without being reported (UNIDO/MAFF, 2015).

Marine fisheries in Cambodia have developed slowly relative to inland fisheries and marine fisheries in neighbouring Thailand. However, there has been a dramatic increase in catch over the past 15 years. FiA statistics suggest a tripling of marine fish landings from 36,000 tonnes in 2000 to 120,500 tonnes in 2017 (MAFF, 2015). Landings appear to have plateaued just above 120,000 tonnes. The marine component of the fisheries sector contributes about 14-16% of total fisheries production in the country. A recent report indicated that small-scale fishing, especially subsistence fishing, was under-reported, and if accounted for could bring total marine fisheries production to 200,000 tonnes (Teh et al, 2014).

The dramatic increase in catch since 2000 indicates that the amount of fishing effort has remarkably increased over this period. There has been an equally dramatic increase in the number and size of vessels, the number and size of fishing gear and the amount of time fishers spend fishing.

Fisheries related activities provide for the livelihoods of almost half of the country's population, with about 25% engaged in full time fishing, and the rest engaged in part-time fishing or fishing rarely (FiA, 2016-a).

Fish and other aquatic animals are crucial for food and nutrition in Cambodia, where malnutrition rates are among the highest in the Asia-Pacific region. Deficiency of protein, energy and micronutrients are still

prevalent, especially in rural areas and among preschool-aged children and lactating women. Fish, a rich source of protein, fatty acids, and essential vitamins and minerals, and other aquatic animals, account for 81.5% of total animal protein intake (FiA, 2016-b).

1.7.Description of marine capture fisheries in Cambodia coastal and marine waters

1.7.1. Coastline and fishing grounds

The marine fisheries of Cambodia are located along the Gulf of Thailand from the Thai border in the northwest to the Vietnamese border in the southeast. The coastal area includes several large bays and numerous islands, and stretches across the provinces of Koh Kong, Preah Sihanouk, Kampot and Kep (Figure 1). In accordance with the current Fisheries Law, the “marine fishery domain” extends from the coastline to the outer boundary of the EEZ and covers approximately 55,000 km² (Constitution of the Kingdom of Cambodia, 1999). The area is relatively shallow with an average depth of about 50 metres. The length of coastline is 435 km, there are approximately 192 coastal villages (Table 1) and the current coastal population in excess of 1 million (938,986 according to 2008 Census). Landing sites (landing areas) are distributed along the coast, with the larger ones located in the towns of Koh Kong, Preah Sihanouk, Kampot and Kep.

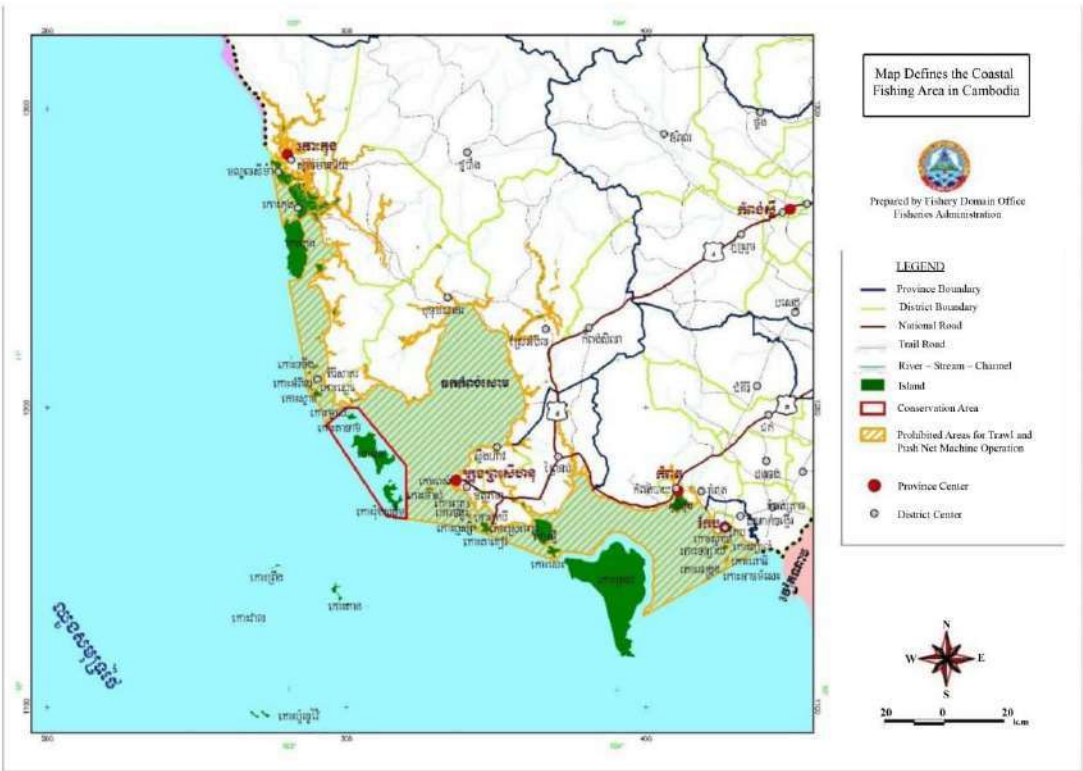


Figure 1. Coastal and marine fishing grounds of the Kingdom of Cambodia

Table 1. Coastline and coastal fishing villages (FAO, 2004; Cambodia 2008 Census, 2008)

Province	Length of coastline (km)	Number of coastal villages	Population (2008 census)
Koh Kong	237	127	117,481
Preah Sihanouk	105	35	199,902
Kampot	67	23	585,850
Kep	26	7	35,753
Total	435	192	938,986

Fishing grounds are currently divided into in-shore waters (<20m depth) and off-shore waters (>20m depth).

Fishing grounds cannot be adequately discussed without some mention of the disputed areas (Figure 2). Vietnam listed an EEZ claim in 1971, followed by Cambodia in 1972, which was followed by a counter claim by Thailand in 1973. Both these claims substantially impact on the territorial waters and EEZ of Cambodia.

The current status is that the overlapping claims area with Thailand is managed by the National Committee for Maritime Security (NCMS) and the Committee for Combating Illegal Activities and Monitoring Fishing in the Fishing Grounds of Koh Kong province, along the border with Thailand, which allows for fishing by both Cambodian and Thai vessels in the overlapping claims area. The Joint Historic Waters Area with Vietnam has also not been resolved, and Vietnamese Coast Guard vessels often shepherd Vietnamese industrial and pair trawling vessels into the waters of the historic zone (Figure 2).

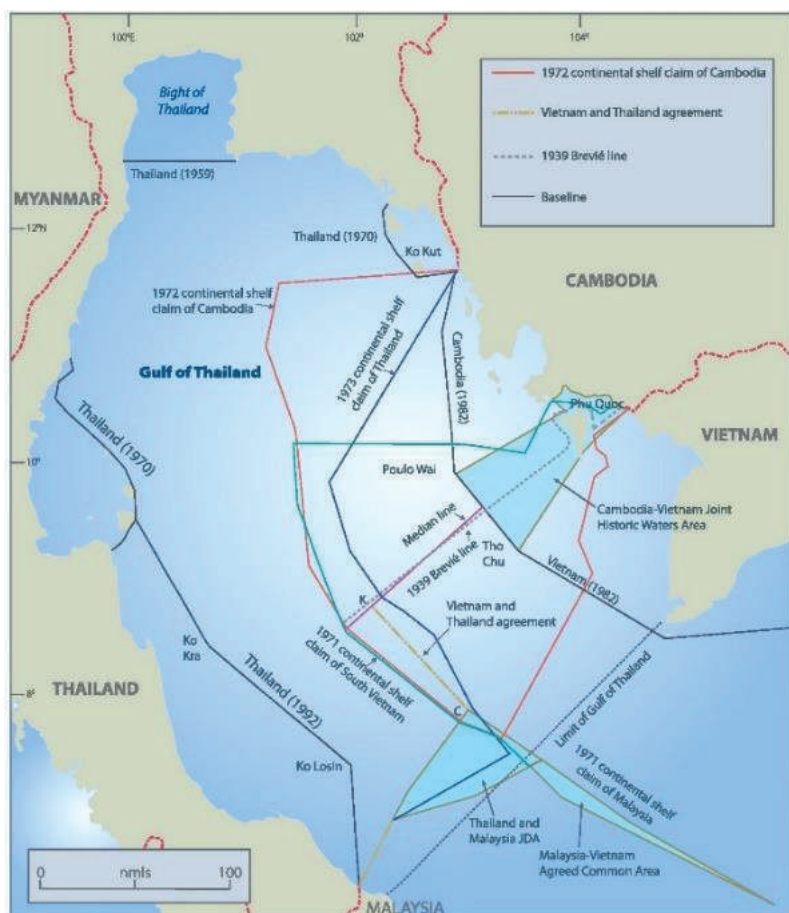


Figure 2. Cambodia's maritime boundary with neighbouring countries (Parliamentary Institute of Cambodia)

1.7.2. Marine fisheries management measures

The marine fisheries domains are open access, and there is no barrier to any Cambodian national entering the fisheries, with a vessel of any size, provided it is recorded with the FiA (for small fishing vessels that are independent of the obligation of MPWT), is licenced and fishes with authorised fishing gear.

Marine fishers can fish for the whole year round and they may change fishing practices seasonally. According to 2018 FiA data, trash fish (bycatch) constituted 40% of the total fish catch. This was followed by penaeid shrimp, squid and octopus, anchovies and blue swimming crabs. Landings of cockles and other shellfish are also high. Of commercially valuable fish, species including threadfin bream, jacks and scads, mackerel, rays, needle fish and lizard fish are the most common groups caught. About 20% of catch is made up of relatively small quantities of high value fish such as grouper, barramundi, snapper, threadfin, croakers, queenfish, and pomfrets. Mud crabs, mantis shrimps, scallops, undulate venus and other squid and octopus are also taken.

The open access nature of Cambodia's marine fisheries indicates that there are no effective controls to limit fishing capacity to a sustainable level. Licences are currently used to collect access fees rather than control the access to the resources. Despite the existence of Fisheries Law (2006) that empowers the government to control illegal activities, this has not been effectively enforced in the marine environment.

Main management measures for fishing in Cambodia are mentioned in the Fisheries Law of 2006. This provides for the distinction between small scale fishing, previously colloquially referred to "family scale" fishing, and middle and large/industrial scale fishing. The FiA will subdivide its management structures to accommodate the distinction between small scale fishing and family scale (subsistence) fishing. Furthermore, the Law of 2006 recognises commercial fishing and designates the responsible agency as the Ministry of Agriculture, Forestry and Fisheries (MAFF), within which the Fisheries Department (FiA) is the lead department. Many of the management and enforcement functions have been devolved to the provincial level, the Provincial Department of Agriculture, Forestry and Fisheries (PD AFF), which is then enacted in the province by the Fisheries Administration Cantonment (FiAC). Provincial structures report to the Governor of the Province (see Figure 34).

a) The main fisheries management measures are:

- The prohibition of trawl fishing, outside the allowed zones, in waters shallower than 20m;
- The list of authorised fishing gear and restricted mesh size;
- The proclamation of a closed season from January to March for species of short body and Indian mackerels; and
- The prohibition of fishing in fishery conservation areas, seagrass and coral reefs.

The Fisheries Law of 2006, Article 11, indicates that *inter alia*, groups of islands, seagrass beds, coral reef areas, and mangrove forests are very important for sustainability of fisheries resources and categorized as "fisheries management areas". In addition, Article 18 specifies that these areas, which are of importance for the sustainability of fishery resources shall be classified as Protected and Conservation Areas of Fishery Resources.

b) To date, two Marine Fisheries Management Areas (MFMA) have been created. These are:

- A 405 km² of MFMA around the islands of Koh Rong and Koh Rong Sanloem (Adapted in 2016); and
- The Kep Archipelago MFMA, with a total area of 11,354 ha (Adapted in 2018).

Closely linked to MFMA is the Law on Protected Areas, 2008 of Ministry of Environment. The MFMA of Koh Rong has been declared as a National Marine Park by the sub-decree of the Royal Government of Cambodia.

c) Other administrative measures include:

- Adherence to CITES rules;
- The need for transport permits; and
- Import and export permits and transshipment restrictions on fisheries products.

Of these requirements, only evidence of import and export permits could be found in use.

Co-management with Community Fisheries (CFi) is a secondary management measure undertaken in Cambodia. This allows community fisheries to manage specific fishing areas. The process of establishment of a CFi is defined by Prakas 316 on Guidelines for Community Fisheries (adopted in 2007). Within the Community Fisheries Area (CFA), there is usually at least one additional fisheries conservation area, which regulates fishing within a demarcated geographic area and may be classified as a "no-take marine protected area".

There are several challenges with CFAs. For example, CFis do not control the access of non- community fishers. CFi members have the right to combat illegal fishing in their CFA, but they do not have the right to fine and have limited budget to implement other management activities. These Community-based Fisheries Management Areas are assisted in enforcement by the officers of the FiA and FiACs.

Catch data related to marine fishing is reported to the Fisheries Administration of the Ministry of Agriculture, Forestry and Fisheries (MAFF). Catch data are obtained from logbooks and enumerated by the FiACs, but the FiACs indicated that they have compiled, estimated fish catches and submitted these data to the FiA by themselves, since very few logbooks are in circulation and used for recording data.

The veracity of the data is uncertain and unverifiable because much of it is estimated from “unknown” catch sources, and then extrapolated for the total number of vessels. The existence of length frequency data, Catch Per Unit Effort data or species composition data could not be verified. No effective stock assessments have taken place for the marine fishery due to the limitations in the quality and quantity of the data.

1.7.3. Domestic fishing fleets, operators, and practices

a) Fishing vessels classification

The estimated total number of fishing vessels was estimated at 7352, according to the preliminary result of a FiA census conducted in 2018, shown in the table 2 below:

Table 2. Number of fishing vessels in all coastal provinces that census was conducted

Coastal provinces	Number of fishing vessels	Percentage
Koh Kong	3,396	45.0%
Preah Sihanouk	2,523	33.4%
Kampot	1,039	13.8%
Kep	594	7.9%
Total	7,552	100.0%

Classification of marine fishing vessels based on length:

Classification of marine fishing vessels can be done via two possible options:

Option 1: Based on the Fisheries Law, all marine fishing boats are categorized into vessels of lengths equal and greater than 24 meters, between 12-24 meters, and less than 12 meters. According to the below table, there are 10 vessels longer than 24 meters, 2,324 from 12 to 24 meters, and 5,218 less than 12 meters in length accounted for. These are distributed in the four coastal provinces, as shown in Table 3 below:

Table 3. The classification of fishing boats as three types based on the lengths distributed along the coastal provinces

Length-based classification (meter)	Koh Kong	Preah Sihanouk	Kampot	Kep	Total
≥ 24	10	0	0	0	10
12 - 24	773	930	317	304	2,324
< 12	2,613	1,593	722	290	5,218
Total	3,396	2,523	1,039	594	7,552

Option 2: In order to make it easy for management, fishing boats are classified into five types: fishing boats that of length 24 meters or longer (10 vessels), those of 18 to 24 meters accounted (115 vessels), those between 12-18 meters (2,209 vessels), those from 6 to 12 meters (4,294 vessels), and those less than 6 meters (924 vessels). Table 4 describes fishing boats that are classified into these five types and their distribution along the coastal provinces:

Table 4: The classification of fishing boats as five types based on the lengths distributed along the coastal provinces

Length-based classification (meter)	Koh Kong	Preah Sihanouk	Kampot	Kep	Total
≥ 24	10	0	0	0	10
18 - 24	67	42	6	0	115
12 - <18	706	888	311	304	2,209
6 - <12	1,727	1,559	718	290	4,294
< 6	886	34	4	0	924
Total	3,396	2,523	1,039	594	7,552

In addition, there are 3 main types of fishing vessels in Cambodia according to characteristics or position of the engine: non-motorized row boats; outboard engine boats, and inboard mounted boats.

The number of row boats is about 12% of boats and may be the only “true” artisanal or family fishing vessels. These vessels use crab traps, fish gillnets, and collapsible (rat-tail) traps which are currently illegal. Fishers also use these boats to penetrate mangroves to look for clams and crabs.

Outboard-mounted vessels - essentially un-decked wooden boats called “long-tail” boats - make up most fishing vessels (some estimated 3,500 vessels). Length can vary from 6 to 15m LOA. They are classified as “family-scale fishing vessels”, but if these boats use fishing gear exceeding what is mentioned in Declaration No. 319 Pro.Kor, these must be classified as commercial fishing boats. Most long-tail fishing boats use fishing various fishing gear types including crab gillnets, shrimp gillnets, fish gillnets, and crab traps. Other fishing gear that such long-tail boats use includes squid traps, mackerel gillnets, pelagic gillnets (*Scomberomorus* gillnets), longlines, push nets, seine nets (beach purse seine), and collapsible (rat-tail) traps. Most fishing boats use more than one type of fishing gear (based on season). Most fishing activities take place in shallow water areas (less than 20 meters depth). Long-tail fishing boats travel up to 120km from the beach.

Inboard engine vessels - vessels with a deck - make up the remaining sector of fishing vessels. Engine range varies from 14 Hp (and 9 m long) to more than 300 Hp (+/-23 m long). These vessels have electronic equipment such as radio communication and GPS. The majority of decked vessels are operating using gillnets, squid traps, “flying net” pelagic trawl nets, etc.

The trawl net used on the trawlers consists of “hard” – exposed chain “foot rope” (which can have metal discs), heavy metal and wooden doors (also known as “otter boards”), double lined nets and triple lined cod-ends. Trawlers catch various aquatic animals including finfish, crab, shrimp, squid and trash fish, etc.

Small trawlers are usually operating at night time and in waters shallower than 20 meters’ depth.

Inboard-engine fishing vessels use purse seines, sea cucumber push nets and squid traps, as they fish in waters deeper than 20m. Aside from this, in Koh Kong province there are fishing vessels longer than 20 meters in total length, using the inboard engines of higher than 180 Hp, operating in deeper than 20m of water contour, and using purse seines.

Inboard engine vessels may also use pelagic trawl nets (also known as “flying trawl”) used to catch pelagic fish, squid or large pelagic tunas or mackerel. When lined with small mesh (0.5mm) it can also be used to target anchovies or other small pelagic fish. At night time, the boats can be changed to operate longline fishing for squid. They also operate gillnets, small mesh-size surrounding nets, deep water traps for fish, shallow water traps for squid/cuttlefish, push nets for sea cucumber and blood cockle trawling.

Some trawlers have changed to electrified trawl nets and pelagic trawl nets.

b) Fleet capacity

A capacity assessment is an estimation of the maximum CPUE of the vessel and fleet. This takes into account vessel characteristics (length/beam, hold capacity), specific gear CPUE and effectiveness in terms of gear design, horsepower of vessel and skill of fishers.

In 2018, the FiA conducted a marine fishing vessel census, which will provide data on fishing vessel characteristics in more detail, such as power and engine configuration, hold capacity, LOA, beam, etc., and can be seen as a first step towards a fishing fleet capacity assessment. These data will advance the understanding and calculation of the specific fishing capacity for the Cambodian fleet.

c) Ownership of the marine fishing vessels

The result from marine fishing vessel census in 2018 showed that, fishers own one fishing vessel is 89%, two fishing vessels are 8%, three fishing vessels are 2% and \geq four fishing vessels are 1% (only in Koh Kong and Preas Sihanouk province). Most small-scale and medium scale fishing vessels (<15m) are owner-operator owned.

d) Registration and licensing of fishing vessels

The current number of licensed fishing vessels accounted for 116 vessels in 2018.

One of the challenges is that according to current regulations, fishing vessels are required to have prior registration with the MPWT.

During the census in 2018 conducted by the FiA, total marine fishing vessels accounted for 7,552 units and were marked and owners were provided with vessel ID. Among them were 10 vessels longer than 24 meters, 2,324 vessels between 12-24 meters, and 5,218 vessels less than 12 meters.

1.7.4. Operations by foreign vessels

Two trawlers from China have been authorized by the Cambodian Government to fish in Cambodia in 2018, but they have yet to be presented.

1.7.5. Description of fishing ports, landing sites and processing plants

There appears to be no designated port for use in Cambodia by foreign fishing vessels, as prescribed in the FAO PSM agreement. Cambodia is currently deliberating internally to allocate a port designated for landing of foreign flagged vessels. There is a licensing process prescribed for registering fish landing sites as well as semi-industrial and industrial processing facilities.

Currently almost all landings and discharges of fish catch take place at private facilities, and the management of these landing facilities are still limited. There are few large private-owned facilities in Koh Kong and Preah Sihanouk province.

Transshipment of fish catch occurs at sea, as well as at some landing sites, especially those close to borders where fish are shipped to neighbouring countries. The movement of fish from moored fishing vessels to buyers on shore is not viewed as transshipment, but as an additional transport of fish catch under the supervision of the fishing vessel's owners.

1.8. Cambodian vessels operating in Areas Beyond National Jurisdiction (ABNJ)

Cambodia's international shipping registration was closed in August 2015. Currently no fishing vessels are registered to fish in ABNJ. The MPWT is considering re-opening its register to shipping and fishing vessels in the future. Before, there were 6 Cambodian flagged vessels operating in the waters under the management of the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) and one fish carrier operating under the International Convention for the Conservation of Atlantic Tuna (ICCAT).

Cambodia is debating its own registration system (as a flag state) for non-IUU vessels in order to fish in other State's EEZs, in international waters and RFMO areas.

1.9. Responsible Agencies

1.9.1. Roles and Responsibilities of the Agencies

Principally, the agencies involved in Control and Inspection actions are the FiA Inspectorate for marine fisheries (based in Preah Sihanouk City) and the FiACs of the coastal provinces (under the PDAFFs). The Marine Police (technically the Marine Border Police) conduct separate patrols but not specifically aimed at fisheries enforcement, with a significant presence at border regions.

The National Committee for Maritime Security (NCMS) was created in December 2009 to promote inter-agency coordination for cooperation with neighbouring countries and other countries in the region, security partners, and international institutions in order to strengthen maritime security and respond to all kinds of threats, including terrorism, piracy, human trafficking, cross-border crimes, drug trafficking, illegal fishing, environmental pollution, destruction of natural resources and natural disasters.

The NCMS is led by Deputy Prime Minister and Minister of Ministry of National Defence, it connects key institutions such as Ministry of Interior, Ministry of Economy and Finance, Ministry of Foreign Affairs and International Cooperation, MPWT, MAFF, Ministry of Justice, Ministry of Environment, Fisheries Administration (FiA Inspectorate and FiAC), General Department of Customs (GDC), and governors of the coastal provinces. To facilitate the joint operation of combined forces, the NCMS has its own front-line command structure - Tactical Command Headquarter of General Secretariat of NCMS, located at Ream Maritime base. The Tactical Command Headquarter of General Secretariat of NCMS host monthly coordination meetings at national and provincial level, where threats are discussed and briefings provided on intended patrol plans and areas. The NCMS host meeting twice per year.

In addition, there is another committee for combating illegal activities and monitoring fishing in the fishing grounds of Koh Kong province, along the border with Thailand. This committee's members consist of the governor of Koh Kong, advisor of the Prime Minister, Commander of the Maritime Border, and provincial departments and concerning institutions in Koh Kong. This committee has the duty to: combat anarchic (illegal) fishing and protect the legal fishing practices of local people; combat illegal transportation of forestry products, non-timber forest products, and processed timber; combat smuggled goods, drugs and other illegal activities; to cooperate and communicate with responsible Thai authorities on fish exploitation and other relevant matters on the maritime waters of Cambodia and Thailand and overlapping claims area between Cambodia and Thailand, and discuss and solve any conflicts with Thai counterparts in a friendly and peaceful way, etc. This committee conducts meeting every three months in order to summarize activities and discuss results of the work in order to submit to the Royal Government of Cambodia.

The police guard the water border of the Ministry of Interior is also plays role to inspect activities at sea, including fishing vessels. However, the coordination at an operational day-to-day level at the FiAC and lower tiers of government are not integrated, primarily because they are very influenced by weather, seasonal staff availability and operational status of patrol vessels and vehicles.

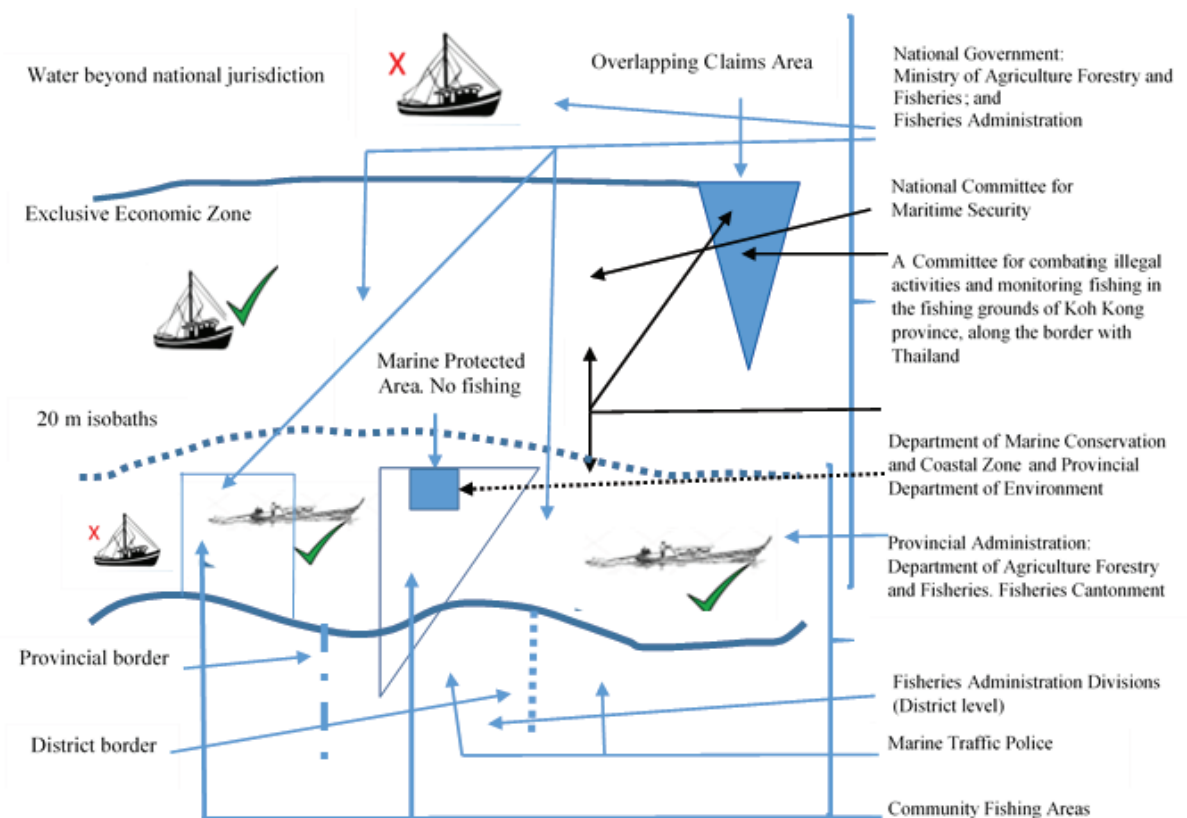


Figure 3. Coordination and jurisdiction of various actors in waters under Cambodian Jurisdiction

1.10. Resources for fisheries control

1.10.1. Equipment and Materials

There are extremely limited materials and equipment available for enforcement at the national and provincial level. The FiA Inspectorate is the best equipped of all the non-military agencies that are part of the NCMS with two operational patrol boats with the total length of 18 meters of each, which despite being 36 years old and with minimal modern surveillance equipment, still regularly undertake patrolling. The FiACs in Koh Kong, Preah Sihanouk and Kep have one patrol boat, and the Kampot FiAC has two patrol boats. Almost all these patrol vessels do not have surveillance equipment, communication equipment or an echo sounder.

There is no Vessel Monitoring System (VMS) to track domestic fishing vessels but the Navy does operate radar stations to detect surface vessel movements. Vessel position data from the International Automatic Identification System (AIS), supplied via an arrangement with China, is available but does not cover the fishing fleet.

There is a vehicle at the Marine Inspectorate for patrolling, while all FiACs do not have a vehicle for patrolling or inspection on land or at fish landing sites. There is no aerial surveillance activity at sea.

1.10.2. Human resources

One key challenge is human resource at the national and provincial level. The multi-disciplinary status of most staff occurs at national and provincial level. Most of the work consists of community fisheries development, administration, law enforcement, and aquaculture development and conservation, etc. National fisheries staff work based on their technical expertise. All coastal provincial staff, which have the duty to work on law enforcement, consist of: 2 people in Kep; 8 people in Kampot, 9 people in Preah Sihanouk and 5 people in Koh Kong. The Marine Fisheries Inspectorate has 27 staff, which consists of one director, six deputy director, five administrators, and 15 patrol team members (including two drivers, two engineers, and two chiefs on two patrol boats). There are 19 juridical police officers. In order to effectively fulfil the duty, more staff should be recruited for the coastal FiACs.

Officers of the Marine Fisheries Inspectorate and coastal FiACs have been undertaking training on basic control and inspection with other local authorities and agencies for some time, but they need additional training courses on skill development, including:

- a) Procedure of Port State Measures - boarding and inspection procedure;
- b) Marine criminal law, inspection at sea, document fraud, fish species identification, fishing gear identification, evidence collection, etc. to juridical police officers; and
- c) Monitoring, collection and analysis of data of inspection for implementing a Vessel Monitoring System (VMS).

1.11. Activities of Control and Inspection

The Marine Fisheries Inspectorate undertakes the bulk of patrols at sea. Patrolling takes place approximately 10-15 days per month for the two large patrol vessels (each). The vessel patrols are the most active control activities and concentrate on illegal gear and illegal vessels. The FiACs indicate a range of patrolling activities taking place on average 7 - 10 days per month. Patrolling using land vehicles has limitations at local bases due to a lack of means of transportation and budget.

1.12. Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of MCS activities

Regarding MCS activities, SWOT analysis has been conducted to identify strengths, weaknesses, opportunities, and threats. There are a few opportunities and strengths, while a key threat is lack of political will. The main weaknesses, are:

- a) A lack of stakeholder's attention on fisheries due to low perceived contribution of fisheries to the country's GDP. This has, therefore, resulted in an extremely limited budget allocation for fisheries management (including MCS). The lack of data indicating the health of the stocks and the perception of the fisheries contribution to the poor resulted in food security issues.
- b) Issuing a license for a fishing boat is challenging due to the fact that prior to issuing a license, registration of the fishing boat at the MPWT is required.
- c) Fishing and transporting fisheries products across borders between Thailand, Cambodia and Vietnam has not been properly managed.

1.13. Key Challenges

Main IUU fishing activities include

Unregulated fishing activities:

- Almost fishing vessels operate without fishing vessel registration or fishing licenses in the Cambodian EEZ;
- Fishing capacity is increasing in public fishing grounds;
- "Big trawl fishing vessels" with large hold capacity and horsepower, several times larger than the average trawl vessel, are being constructed;
- Fishing activity is essentially operated without following existing regulations;
- Exporting fisheries products from IUU fishing to neighbouring countries;
- Fish landing at unregistered landing sites;
- Fish processing facilities are unregistered or unlicensed;
- Foreign vessels fishing without licensing from their flag state.

Unreported fishing activities:

- The number of Thai and Vietnamese vessels fishing illegally in the waters under Cambodian jurisdiction is not known;
- No record of catch from Cambodian vessels landed in the landing sites of neighbouring countries;
- No record of fish catch landed in Cambodia, and the ~~then~~ quality exported to neighbouring countries;
- No information on fish catch, catch by species composition or length frequency analyses.

Illegal activities

- **By Cambodian fishing vessels**
 - o Some fishing boats fishing without registration, or recording or licensing;
 - o Violations of trawlers in fishing grounds that are shallower than 20m deep contour;
 - o Habitat destruction by fishing vessels (seagrass and coral reef);
 - o Legal and illegal vessels use fishing gear with illegal mesh sizes for trawls, gillnets, crab traps, purse seines, and other modified illegal gear such as small mesh “bags” in cod-end of trawlers. electrocuted trawls, or undefined fishing gear such as pelagic trawls or sea-cucumber harrows;
 - o Use of banned gear such as dynamite, motorized push nets, electrocuted trawls, collapsible (rat-tail) traps, and sea-cucumber harrows;
 - o Use of fishing gear not on the list of authorised fishing gear, such as rat-tail traps, pots and sea cucumber harrows;
 - o Violation of gear limits by “family scale” fishing vessels;
 - o Violation of closed seasons;
 - o Fishing in closed areas (conservation areas) of community fishing areas;
 - o Fishing with prohibited gear in community fishing areas.
- **By foreign vessels**
 - o Possible neighbouring countries IUU vessels landing fish catch in Cambodia (currently, Thai vessels are tracked with AIS for only bigger than 30 GT). ~~but they~~ Thai vessels could be able to land their catches in Cambodia if there is authorization from the FiA;
 - o Fishing vessels from neighbouring countries fishing in Cambodian waters without authorization and use of gear that are not legal in Cambodia (pair trawl, electrocuted trawl and light-attracting fishing).
- **By Cambodian citizens**
 - o Transshipment and transport of possible IUU fisheries products from neighbouring countries;
 - o Export of possible IUU fisheries products to neighbouring countries;
 - o Destruction of fishery habitats (e.g. mangrove forests, seagrass beds and coral reefs).
- **Neighbouring countries**
 - o Export of re-branded fisheries products from probable IUU origin in Cambodia;
 - o Allowing landing of Cambodian fishing vessels;
 - o Use of unregulated and illegally imported trash fish from Cambodia in mariculture and livestock feed processing plants.

1.14. Key Activities for the NPCI-MF

1.14.1. Strengthen compliance of fisheries operations

The assessment of risks, fisheries resources, sustainability of fish stocks and conservation areas which have been conducted during the implementation of NPOA IUU and the review of the NPCI process, have identified the sustainability of fisheries resources and food security as the biggest threats, and these threats as used to determine the objectives of the NPCI-MF.

This assessment clearly identified key areas where strategic intervention is required:

- Licensing to fishing vessels, which includes registration/recording of fishing vessels, and communication and coordination between the FiA and the MPWT;
- Stopping fishing in unauthorised or protected areas (such as trawling waters shallower than 20m, fishing in community conservation areas, fishing in closed areas of MFMA's);
- Preventing fishing with illegal gear, including unauthorised fishing gear;
- Apprehending foreign vessels fishing without authorisation in waters under Cambodian jurisdiction.

1.14.2. Strengthening the institutional capacity of Agencies in Monitoring, Control and inspection

Priority actions are:

- Strengthen the FiA's leadership role at MAFF. To achieve this, the FiA shall establish a National MCS Management Team under the leadership of the DDG. This management team shall implement the objectives of the NPCI at the National and Provincial level;
- Establishing a professional Inspectorate which will exclusively undertake MCS and combat IUU issues by implementing the objectives of the NPCI-MF;
- Establishing provincial coastal MCS management teams in each province
- Assist FiACs to build professional skills in inspection, to allow them to exclusively deal with MCS and IUU issues.

1.14.3. Dealing with the lack of appropriate equipment

Equipment is one of the fundamental enabling conditions of effective implementation of the NPCI-MF. Effective equipment, such as patrol vessels, aerial surveillance and Vessel Monitoring Systems will greatly enhance the ability to effectively and efficiently undertake MCS operation to combat IUU fishing.

New patrol vessels will greatly increase the effectiveness of inspection because new vessels would be able to travel more economically, carry more people, have a longer range and remain at sea longer and in more unsettled weather.

A VMS will enhance the effectiveness of patrol vessels by providing them with information on target areas that contain high concentrations of fishing vessels, allow patrol vessels to travel to such fishing vessel concentrations faster, or track vessels heading across borders, which they would previously not have known about. VMS would also increase protection of protected areas and increase the productivity of marine resources, leading to an increase in fish catch.

Chartering aircraft to conduct aerial surveillance can dramatically improving fisheries compliance. Flights to search for fishing patterns, distribution of fishing effort and areas of fishing will greatly assist in adding knowledge and effectiveness in identifying areas and deploying patrol vessels to the areas where they are needed - thereby reducing patrol time, fuel costs and staff time. Several cost-effective aerial surveillance options can be found even in Cambodia, and range from drones to manned aircraft.

2. STRATEGY FOR FISHERIES CONTROL AND INSPECTION IN MARINE WATERS

The Strategic Goal is to address the 4 key areas identified in the risk assessment. The first risk to the fishery resources is primarily Illegal, Unregulated and Unreported (IUU) fishing. Thus, IUU fishing should be addressed in a comprehensive manner to exert control over all fishing activities and fishing vessels operating in the waters under its jurisdiction, as well as vessels on the Cambodian Register fishing in areas beyond national jurisdiction. The specific strategic goals shall include *inter alia*:

- Ensuring that all fishing vessels and all fishing operations comply with national legislation and Cambodia's international obligations, including catch, processing, import and export provisions;
- Implement measures to ensure coordination at national and provincial levels between stakeholders to improve the effectiveness of management and reduce duplication of efforts;
- Maintain fish stocks at sustainable levels through reducing and eliminating IUU fishing and improving management through the development of Fisheries management plans.

To reduce, deter and eliminate these risks identified in point 1.13 and 1.14 above, the NPCI-MF contains four strategic objectives:

1. Strengthen the administrative arrangement of the FiA and the FiAC;
2. Procure essential facilities and materials for patrol boats and other equipment for patrolling work;
3. Undertake registration and licensing of the Cambodian fishing fleet;
4. Undertake patrolling using vessels and vehicles, and implement an educational principle through prosecution.

2.1. Strengthen administrative arrangements

2.1.1. Establish MCS Offices at National and Provincial level to undertake Control and Inspection

The National MCS Management Team will be responsible with the implementation of the NPCI-MF and shall report to the DG of the FiA. The FiA's DG who shall report to the Minister of MAFF and via appropriate reporting mechanisms, provide information to the Coastal Provincial Governors. It will also be responsible for liaising with the NCMS for intervention support (Figure 4).

The National MCS Management Team should facilitate the implementation of the NPCI-MF by:

- Reviewing information on IUU fishing and implement specific plans to prevent, deter and eliminate serious offences using SMOTT (Figure 4); and
- Ensure that administrative actions are implemented, such as licensing and registration of fishing vessels and strengthening Control and Inspection to verify the administrative mechanisms are in place and adhered to by participants in fishing.

The National MCS Management Team shall also assist the PDAFF and FiAC to establish a Provincial Coastal MCS Management Team in each coastal province under the leadership of PDAFF and with the coordination of the FiA. The PMCS Management Teams (PCMS) will consist of officers from FiACs and other concerning responsible agencies in order to undertake routine coordinated action plans.

The PMCS Management teams shall report to the NMCS Task Team and support with communication between National and provincial authorities.

2.1.2. Establish a Serious Marine Offences Task Team (SMOTT)

Once established, the National MCS Management Team shall establish a special task team to address serious marine offences, undertake investigations and plan for Control and Inspection. It is proposed that the Serious Marine Offences Task Team (SMOTT) consist of FiA judicial police officers under the lead of a senior judicial officer from the FiA Inspectorate.

2.1.3. Establish Provincial Task Teams (PTT)

The PMCS Management teams will establish Provincial Task Teams (PTT) in each province, consisting of FiAC Judicial officers and staff from other concerning agencies (the specific make-up to be determined based on available resources). These PTTs will be responsible for PMCS Management teams, and report the operations, successes and challenges.

The PTTs shall:

- prevent, deter and combat illegal fishing mentioned in the Fisheries Law of 2006;
- plan and conduct marine and land-based operations;
- liaise with the Serious Marine Offense Task Team (SMOTT) and report to the National MCS Management Team;
- Implement the routine fisheries inspection at sea and on land; and
- Assist FiACs in protecting their fisheries resources.

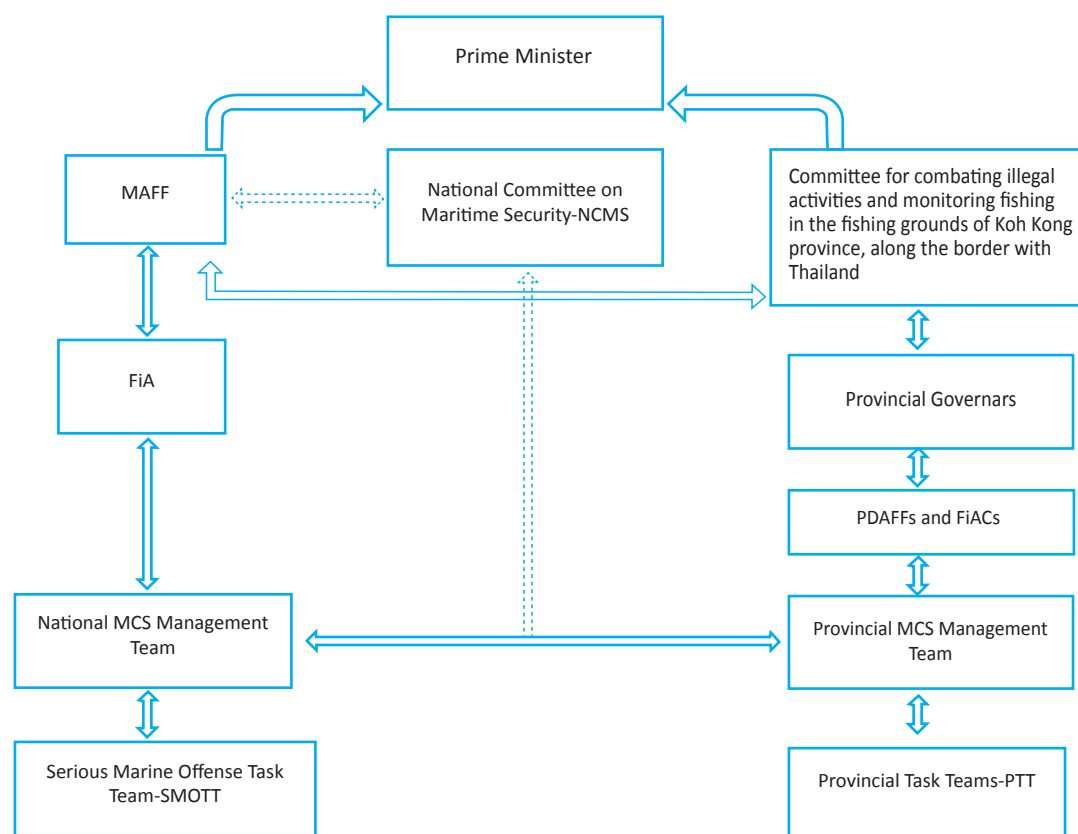


Figure 4. Command, control and coordination

2.2. Procure Essential Equipment for Control and Inspection

2.2.1. Control equipment

The FiA is going to procure, *inter alia*, a large patrol vessel, several small patrol vessels, vehicles, computers, and other surveillance tools (cameras and night vision binoculars) (see Table 5).

One of the most critical aspects of control is the position of fishing vessels. In this regard Vessel Monitoring Systems are essential. It is imperative that vessels shall be controlled and monitored on a real-time or near-real time basis. It should be a requirement that all fishing vessels intending to fish in ABNJ are equipped with a Satellite based VMS with a tamper proof unit, that complies with the type specification of the Pacific Island Forum Fisheries Administration's type approval process.

The recommended implementation for VMS 's implantation in Cambodia is:

- A satellite-based VMS is to be installed for large scale fishing vessels fishing (and possibility the middle scale fishing vessels are longer than 18m in total length) in the ABNJ;
- A phone system is to be installed for middle fishing vessels operating in the Cambodian waters;
- VMS should not be equipped for small scale and subsistence vessels;

The majority of fishing vessels in Cambodia fish within phone coverage and all the restricted areas are in close proximity to the coast. Phone relay systems could be placed on remote islands as well as on patrol vessels. More detailed information is provided in **Error! Reference source not found..**

2.2.2. Surveillance equipment

Aerial surveillance

While aerial surveillance may be costly to undertake - it is one of the best means to collect information on fishing activities to plan for sea-based patrolling. An effective patrol scheme can consist of a minimum of two coastal flights per week. This activity could be coordinated through the National Committee for Maritime Security.

FiA should strongly consider implementing a vessel monitoring system with an operations room (see recommendation on VMS above). Proposed essential equipment and facilities, and indicative cost are listed below (investment costs must be identified and auctioned by a private company):

Table 5. Implementation Cost of Equipment

Type	Current existing Government resources/equipment			Cost	
		Equipment/facilities needed	Number of equipment/facilities requested	Cost of equipment/facilities	Operational cost (annual), not including salaries
Smart tool's support equipment for inspectors and and FiAC to monitor and record their activities	Papers based report	120 set of Blackview mobile phones	inland and Marine inspectorate and FiAC	<u>USD +/- 7 to 800 per unit</u>	
Border Patrol boat for operating along the border and EEZ	2 slow and inefficient patrol vessels, incapable of apprehending IUU vessels. No electronic surveillance equipment such as radar. No modern navigation or communication equipment	A vessel: 20 – 24 m Hull: Aluminium. Accommodation: 14 x berths. Engines: 3 x CAT C32 ACERT D-Rating. Speed @ Cruise: 16 Knots, Speed @ Full: 22 Knots. 8000l fuel capacity tanks (add additional 5 000l fuel) Air-conditioners Sterndrive and stern launched Rescue Boat: 8.5m Guardian Interceptor with a launch & recovery Davit. Deck Space: 51sqm. FiFi equipment	1 vessel, with crew of 4 to operate vessel and 12-15 Fisheries officers on board	<u>USD +/- 7 to 800,000</u> with domestic build of Aluminium kit vessel, with marinized truck engines. USD +/- 100,000 for radar, communication, and satnav/plotter, 8.5 m inspection vessel and Fire-fighting equipment. ¹	<u>USD 360,000 / year</u> (USD 30,000 / month) with 15 days use per month. [Aim for 100 l/h. engine, meaning 2 engines x 10h/day x 1 USD/l = USD 2,000/day] Additional undetermined costs: Service and maintenance: USD50,000/year Insurance: N/A DSAs: 19 people x 10 days x 12 months x USD35= USD79,800/year
Inshore and offshore patrol boats	At least 4 inshore patrol vessels but slow and inefficient, incapable of apprehending IUU vessels	<u>Option1:</u> 14m MANOMA/ catamaran with accommodation	4 Inshore Patrol Vessels, with crew of 3 per vessel and capacity to transport 8-12 Fisheries officers on board	Purchasing second hand: USD200,000 to 500,000 X 4 vessels = <u>USD 800,000 to 2,000,000</u> ² . If locally built, it costs around USD300,000/vessel	-Expenses: USD72,000 x 4 vessels = USD288,000 -Operations: USD6,000/month and 10 days/month -Fuel consumption: 100 l/hour (for both engines), to be used 6 hours/day = 600 l x USD1/l = USD600/day/vessel Additional undetermined costs: -Service and maintenance: USD80,000/year -Insurance: N/A -DSAs: 15 people x 10 days x 12 months x USD35 = USD63,000/year.
		<u>Option2:</u> 12-14m new wooden vessel built. These vessels could patrol the protected areas and play an important role in visible policing.	2 vessels, with crew of 3 per vessel and 8-12 Fisheries officers	<u>USD 600,000</u> (USD 300,000 each) to be built locally.	<u>Expense of USD144,000/year</u> or USD6,000 per month. And vessel operated at 10 days per month with: 50l/hour (using both engines) x 12h/day x 2 vessels x 1 USD/l = USD 1,200/day
Patrol vehicles	1 vehicle for FiA, 1 vehicle for Marine Inspectorate, 4 vehicles for 4 FiACs (each get one).	4x4 double cab (Nissan or Toyota)	6 vehicles (2 for FiA [+Inspectorate] and 1 for each FiAC/ Province)	<u>USD240,000</u> (purchase price for 6 vehicles)	-Expenses: USD 57,600 per year for the 6 vehicles (USD9,600/ year/vehicle or USD800/month. -Fuel consumption per vehicle: 40l/day x 20 days x USD1/l =USD800/month/ vehicle] - Additional undetermined costs: Service and maintenance: US2,500/year/vehicle x 6 vehicles = USD15,000/year Insurance: USD1,200/vehicle x 6 vehicles = USD7,200/year. DSAs: 4 people x 20 days x 12 months x USD35=USD33,600/year

Type	Current existing Government resources/equipment			Cost	
		Equipment/facilities needed	Number of equipment/facilities requested	Cost of equipment/facilities	Operational cost (annual), not including salaries
Hiring aerial surveillance plane			USD 4,000/hour, For 2 fisheries officers of Marine Inspectorate		-Average estimation: USD 430,000 per year; - Highest estimation: USD 570,000/ year (12hr/month); - Lowest estimation: USD 288,000/year (6hr/month).
Concrete blocks for habitat protection and enhancement	1,000 units (budget from externally funded projects)	Private sector, or NGOs, or development partners to construct concrete blocks	+/- 1,000 units to be deployed	USD500,000 for construction and deployment of 1,000 units at an average of USD500/unit.	The cost for transportation is included in the construction's cost.
Satellite based VMS for vessels in the ABNJ	No VMS in place, insufficient staff at National Departments	Procurement and contracting for installation	10 units at USD3000/unit	Outsourcing the management and operation of VMS with the cost of USD 6000/ vessel, and the FIA to purchase VMS with the cost of USD100,000/unit.	To be installed for 10 vessels
VMS Units for middle scale fishing vessels >18m ;(Satellite AIS)		Procurement and contracting for installation	120 units	USD +/- 1 million (units and software, at USD500 /unit)	USD60,000
VMS for middle scale fishing vessels < 18m and trawl <12M; (GSM mobile phone app)		Procurement and contracting for installation	Download GSM software for installing 3,000 units of mobile phone	Contract with a company at approximately USD0.5 to USD1 million (estimated) to procure and install units and provide equipment and database for a centralised VMS system for FIA to administer	USD100,000
Fisheries Monitoring Center		Procurement of hardware and software	4 to 6 Fisheries officers		
Total Cost				Indicative costs: Lowest options = USD 4 million Higher option = USD 6 million	Indicative cost: USD1.5 million/year

2.3.Improvement of recording and licensing obligations

The main driver of administrative non-compliance with the Fisheries Law of 2006 - FiA being unable to provide licensing for many fishing vessels - is that the task of fishing registration is under the responsibility of the Ministry of Public Works and Transport and Provincial Coastal Departments of Public Works. Progress with amending the law of MPWT to revise the registration process is slow and it is unclear when the draft will be adopted by parliament. The FiA will initiate closer cooperation with the General Department of Waterway and Maritime Transport and Ports (GDWMTP), and provincial Department of Public Works and Transport (DPWT) on registration of fishing vessels through the joint technical working group between the two agencies.

2.3.1. Register and record all fishing vessels operating in the EEZ of Cambodia

In parallel to the ongoing work of the joint technical working group, the FiA implemented a census of all fishing vessels in 2018, and all motorized fishing vessels that were identified have received a Census Card with a census number. These data were collated in a database and will form the basis of Cambodia's National Record of Fishing vessels. Fishing vessels that were allocated a Census card have been provided with a Certificate of Licensing. FiA shall continue with recording all new fishing vessels which are constructed or imported.

The classification of marine fishing vessels was clarified by the FiA, as follows:

- Large scale vessels: ≥ 24 m LOA
- Middle scale vessels: 12 –< 24 m LOA, and trawlers of less than 12 m LOA
- Small scale vessels: Less than 12 m LOA, excluding trawlers
- Subsistence/family-scale vessels: vessels without an engine.

2.3.2. License all fishing vessels

The FiA should provide licenses to fishing vessels even if they are not registered at the time with the General Department of Waterway and Maritime Transport and Ports (GDWMTP) or provincial Department of Public Works and Transport (DPWT), if these fishing vessels have census cards (recorded).

The FiA shall establish license conditions for fishing vessels and issue them to all licensed fishing vessels, where the license conditions shall:

- a) Identify the type of vessel (or class, such as large, middle scale, etc.) and fishing gear that the license conditions shall apply to;
- b) Identify the type of gear that a vessel is allowed to deploy and specify the particular areas and/or season. For example, no mackerel nets may be on-board in the closed season from 15 January to 31 March; and
- c) A Prakas be promulgated that clearly identifies legal and illegal fishing gear and specifically illegal fishing practices such as modifying trawl gear. For example, “double knotted cod-end” of a trawler.

Following this, the FiA and FiACs shall immediately license all fishing vessels in possession of a Census Card (see above). The approach should be staggered with, for example:

- Year 1: Initiate the process to licence fishing vessels > 18 m to be licenced in period January to December 2020;
- Year 2: During 2021 commence on the licensing of all fishing vessels which are < 18. A provisional licensing schedule is provided in the Matrix of Activities in **Error! Reference source not found.**;
- From 3 to year 5, FiA and FiACs shall undertake annual renewal of fishing licenses for all vessels that have been issued a licence during past years.

2.3.3. Issuing logbooks to large and Middle scale fishing vessels

The administrative bottle neck caused by the lack of registration is affecting FiA’s ability to fully manage its fisheries. Fisheries recording in logbooks can be a useful method to collect fisheries information. The current legislation does not require fishing vessels that do not have a license to have a log book. Where possible, the FiA may issue logbooks to large and middle scale fishing vessel upon licensing. The fisheries specific data from medium scale, small scale and family scale will be collected through a sampling or survey strategy to be developed by the FiA. Please find more detail in **Error! Reference source not found.**

Reservations regarding implementation of observer schemes

However, when evaluating the estimates of the catch assessment programs costs, implementing the recommended number of sampling would not be too high, even with a 5% sampling coverage for family scale vessels. *A more cost-effective method would be to encourage self-reporting for family scale vessels, with bi-annual statistical catch assessments, rather than domestic* the catch assessment programs. Examples of self-reporting data systems (using mobile technology) called “Our fish” or “Abalobi”. The self-reporting apps have the benefit that they operate in real-time, are “user pays”, which means the fishers will pay for data costs. This software can provide stock assessment-type data, species composition, position of fishing fleet, and catch per unit effort data. Generally, these data use data compressing techniques and are very cost effective.

Large and medium scale fishing vessels can be targeted with the catch assessment programs, but the level of sampling representative is as low as 2-4%, and may be statistically significant because the vessels use similar gear and fish in the same fishing grounds and target the same stocks. Thus 2% - 3% of sampling would be scientifically viable and cost effective. These the catch assessment programs can be phased step by step to the fisheries in a similar manner as the proposed licensing of fishing vessels.

2.3.4. Record all public and private landing sites

While it is incumbent on the operators of both public and private landing sites to obtain permission and a license, there is poor compliance with the process. FiA will record the position of all active public and

private landing sites in their annual report. Landing site operators are encouraged to register such landing sites.

2.4. Strengthen Law Enforcement with Gear and Area restrictions through Inspection and Prosecution

2.4.1. Implementing a strategy of “Education through Prosecution”

Currently, the overwhelming emphases on “educating” delinquent fishers have not been effective, as the level of IUU fishing has not been substantially reduced. Despite legitimate expectations of fishers to see their resources being protected, limited sanctions and an overall limited number of cases and fines (in the marine realms) seem to be the norm. This “education first, compliance later” approach should be ended immediately and be replaced with “education through prosecution”.

Practically, it means that offences are prosecuted through the available actions prescribed in Chapter 15 of the Fisheries Law, and not through an un-official policy of informing the offender that “he has acknowledged that he committed an offence and should not do it again”. The latter policy has not succeeded in reducing IUU fishing and is thus largely ineffective.

The obvious next step is to educate through prosecutions. This is an appropriate approach that with fewer weak points with encouragement, and should be implemented by replacing the old system in a step-by-step manner. The implementation must also ensure that illegal operators will be sanctioned, and legal operators be allowed to operate unhindered.

Prosecution should target the most serious fisheries offenses, and should follow the Operational Control & Inspection priorities below. In addition to this, priorities include:

- First-time offenders should be issued with a warning letter and all non-compliant fishing gear should be removed and destroyed;
- Second time offenders should be fined, and the fishing gear destroyed;
- Repeat offenders should be prosecuted with jail time, and fishing vessels and fishing gear should be forfeited. The revised offences and penalties scheme, as well as administrative measures that can be taken by the FiA, should be applied.

2.4.2. Identify fishing zones to address Trawling in inshore areas, Fishing in Prohibited and Protected and Conservation areas (Also see for recommendations on Zonation)

a) Fisheries control and inspection activities and zonal violations are in the following:

- FiA (Department of Fisheries Conservation-DFC) and FiACs to undertake research in areas with seagrass beds and coral reefs by starting with baseline studies of their distributions.

b) FiA should identify high-risk fishing areas such as seagrass beds, coral reefs and borderline areas with neighbouring countries in order to map them and set up concrete blocks (artificial reefs), and conduct frequent monitoring based on the plan (see on Zonation and deployment of concrete blocks and passive protection options). FiA should also establish new MFMA's;

- FiA (Department of Fisheries Affairs-DFA) and FiACs to undertake Zonation for <20m isobath areas by consulting with medium scale, small-scale and community fisheries as well as NGOs, to provide a map of trawl-able areas within the 20m isobaths;
- FiA to procure patrol vessels, vehicles and computers to increase the effectiveness of on-land and at sea inspections;
- FiA to initiate the implementation of VMS for all decked vessels >12m and trawlers.

2.4.3. Conduct control and Inspection activities

Control and inspection activities should take place from the air, at sea and on land. This is the only way to ensure that IUU fishing can be detected, stopped, deterred and fined. Below is a range of Control and Inspection activities that are at the base of highly effective Control and Inspection regimes.

a) Vessel based control measures:

Vessel based inspection and control measures are essential for most effective MCS. Below are some of the successful components of a vessel-based control:

- An effective system to licensing of vessels;
- A Vessel Monitoring System (VMS) for industrial and middle scale vessels;
- Observer systems should be established (shore based or sea based); and
- An effective data collection system and stock assessment methodology should be established.

b) Vessel inspection at sea

Vessel-based patrols have proven to be an effective measure to control fishing activity at sea to reduce, prevent and eliminate IUU fishing. In order to undertake effective vessel-based control and inspection, patrol vessels need to be cost effective, able to intercept and apprehend threats and provide a visible deterrence (more on this topic later). Inspections at sea can address many issues:

- Documentation: license and registration, fishing crew documentation, competency certificates of vessel's captain;
- VMS function (functional/not);
- Observers (health treatment of crews, report of delinquent behaviour);
- Fishing gear: types of fishing gear, lengths, mesh sizes, numbers, and attachments;
- Catch: assessment (volume [capacity or weight], size, by-catch), comparison with logbook/landing declaration (sampling, etc);
- Verifying foreign flagged fishing vessels on innocent passages.

c) Inspection on landing and mooring sites:

- Validity of landing sites' permit/authority;
- Documentation on fishing vessel: license and registration, fishing crew documentation;
- VMS function;
- Observers (treatment, report of delinquent behaviour);
- Fishing gear: types of fishing gear, mesh sizes, number of traps, length of fishing gear allowed and attachments;
- Catch: assessment (volume [capacity or weight], size, by-catch), comparison with logbook/landing declaration (sampling, etc); and
- Check fishing vessels operating under foreign flags.

d) Inspection on land:

Control activities should take place at fishing port and/or landing sites, fish transferring sites, temporary or permanent parking sites, and undertake the following:

- Check validity of permission to fish (expiry dates);
- Check documents for registration, licensing, vessel logbook, and competency certificates of vessel's captain;
- VMS (whether it is functional or not);
- Observers (health check and report on behaviour);
- Fishing gear, type of fishing gear, length, size, mesh size, numbers and attachments;
- Catch: assessment (volume [capacity or weight], size, by-catch), comparison with logbook/landing declaration (sampling, etc);
- If any fish is transported – check transport permits;
- Transshipment monitoring;
- Implementation of provisions of Port State Measures agreement (when inspecting foreign fishing vessels); and
- Fishing activities in allowable zones (Note: Zonation for fishing was strongly recommended during consultation with FiA, FiACs and concerning institutions. Zonation should be implemented through an amendment to the Fisheries Law, a sub-decree on marine fisheries and fishing in international waters, or a condition written in the licensing document. See Annex 2 on Zonation and Concrete Blocks).

e) Inspection of marketing and processing establishments:

The inspection at fish markets and processing plants should look at key important points in the following:

- Validity of processing establishment's permit/authority;
- Health certification;
- Transport permits of fish;
- Length/size of fish; and
- Import/export documentation, inter alia, the origin of the fish and fisheries products.

f) Inspection at points of entry and exit

- Import/Export documentation (such as a Certificate of Origin of the products);
- CITES Permits (for endangered species); and
- Compliance with the Fisheries Law, such as a catch certification that provides a Certificate of Origin for the products.

2.5. Control and Inspection Benchmarks

The benchmarks of control and inspection is important for measuring the effectiveness of these activities. Below (Table 6) is the list of inspection benchmarks that the provincial authorities (FiACs and/or PDAFFs) and the FiA should reach to ensure successful control and inspection.

Table 6. Target benchmarks of inspection

Targets to be set in terms of number of vessels or activities or areas per province (%)			
Activity	2020 (Year 1)	2024 (Year 5)	Data recorded on activities undertaken, preferable on an electronic system such as "Smart" or "Abalobi"
Inspection of fishing vessels in Port, transhipments or landing sites by FiA and by FiAC in each province in their area of competence	5% of vessels inspected	80% inspected in last 5 years	Data verified and analysed
Inspection of vessels at sea by FiA and by FiAC in each province in their area of competence	5% of registered vessels inspected	80% of registered vessels inspected at sea in the last 5 years	Data verified and analysed by inspection at fishing ports/landing sites. Reports to be posted in websites of the port's owners.
Inspect that VMS installed on all trawlers, semi-industrial by FiA and by FiAC in each province in their area of competence	0%	100% of vessels	80% of all fishing vessels inspected within 5 years
Inspection and certification of fish processing facilities by FiA and by FiAC in each province in their area of competence	5%	50% with certified letter of locations and products in 5 years	Data verified and analysed. 50% of all processing facilities inspected in past 5 years
Community Fisheries areas adequately patrolled and inspected by FiACs	10% of CFAs patrolled	80% of fishing vessels	Data verified and analysed. 80% of all CFAs inspected in 5-year period
Fishing vessel Registration system initiated and completed by FiA and by FiAC in each province in their area of competence	0%	100% of vessels	Liaison with MPWT and reports from FiACs, to be compared data with the census
Fishing vessel licensing system initiating and completed by FiA and by FiAC in each province in their area of competence	0%	100% of vessels	FiA and FiACs to imitate and complete licensing.

2.6. Selection criteria for inspection

Below (Table 7) is illustrated how Cambodia has defined criteria to evaluate the level of risk of non-compliance (risk profile) in order to determine a "risk code" for vessels (high, medium and low risk).

The majority of these actions will be conducted during field inspections, with some verification by officials based at the national offices.

Table 7. Criteria to Evaluate Risk

Activity	Risk profile	Inspection action
	Low/medium/high	Note or Inspect
Previous compliance and inspection history of the vessel; master; processing plant; importer or exporter	No record of violations – Low Less than 3 violations in past 5 years – Medium	If Low – Note only If Medium – Inspect if time allows and no other higher risk activities detected

Activity	Risk profile	Inspection action
	<i>Low/medium/high</i>	<i>Note or Inspect</i>
	More than 3 violations - high	If High – Inspect.
The introduction of new rules and regulations;	Medium/High	If Medium – Inspect if time allows and no other higher risk activities detected If High – Inspect.
Report from legal operator and/or CFI committee;	High	Inspect.
Industrial scale of vessel with illegal gear and/or fish in illegal zones;	High	Inspect.
Semi-industrial Category of vessel with gear restrictions and / or zone restrictions for fishing; and Family scale vessels	Low/medium	If Low – Note only If Medium – Inspect if time allows and no other higher risk activities detected
Consistency among documents and actual inspection results (e.g. fish catch not consistent with fishing gear);	Consistent – Low Minor Inconsistency – Medium Significant inconsistency – High	If Low – Note only If Medium – Inspect if time allows and no other higher risk activities detected If High – Inspect.
Reliability and accuracy of required documents especially log books;	Consistent – Low Minor Inconsistency – Medium Significant inconsistency – High	If Low – Note only If Medium – Inspect if time allows and no other higher risk activities detected If High – Inspect.
Fishing inside EEZ	Low/medium/high	If Low – Note only If Medium – Inspect if time allows and no other higher risk activities detected If High – Inspect.
Fishing inside EEZ	Medium or High	If Medium – Inspect if time allows and no other higher risk activities detected
Fishing adjacent boundaries of Conservation and Protection areas and in close proximity of borders	High	If High – Inspect.
Origin of vessel – Domestic	Low/Medium	If Low – Note only If Medium – Inspect if time allows and no other higher risk activities detected
Origin of vessel (foreign flagged)	High	If High – Inspect.
Quantity of fish landed	Low or Medium	If Low – Note only If Medium – Inspect if time allows and no other higher risk activities detected
Quantity of fish landed (either caught or transhipped)	High	If High – Inspect.
Type and price of fish landed imported or processed	Medium/High	If Medium – Inspect if time allows and no other higher risk activities detected If High – Inspect.
Type and reliability of electronic surveillance equipment (e.g. VMS);	Consistent - Low Minor Inconsistency - Medium Significant inconsistency - High	If Low – Note only If Medium – Inspect if time allows and no other higher risk activities detected If High – Inspect.
Amount of catch in relation to actual vessel size and fishing effort of a fishing trip (under-reporting);	Consistent - Low Minor Inconsistency - Medium Significant inconsistency - High	If Low – Note only If Medium – Inspect if time allows and no other higher risk activities detected If High – Inspect.
Quality and reliability of observer data;	Consistent - Low Minor Inconsistency - Medium Significant inconsistency - High	If Low – Note only If Medium – Inspect if time allows and no other higher risk activities detected If High – Inspect.
Monitoring seasonal closures	High	If High – Inspect.
Zonal/spatial closures	High	If High – Inspect.
A Ministerial or Parliamentary enquiry	Medium/High	Medium – Inspect if time allows and no other higher risk activities detected

Activity	Risk profile	Inspection action
	<i>Low/medium/high</i>	<i>Note or Inspect</i>
		If High – Inspect.
Media reports of IUU	Medium/High	Medium – Inspect if time allows and no other higher risk activities detected If High – Inspect.

3. ACTION PLAN FOR CONTROL AND INSPECTION OF ILLEGAL FISHING IN CAMBODIAN MARINE WATERS-NPCI

3.1. Priorities Activities

The following 5 priority activities need to be implemented by the SMOTT and the PTT to ensure IUU fishing is reduced and law enforcement is enhanced. Specific guidance to the implementation of these activities are:

- Specific vessel-based actions;
- Identification of target for conservation areas;
- Identification of target of illegal/prohibited and non-compliant fishing gear;
- Control illegal foreign fishing vessels in Cambodia;
- Control import and export of marine fisheries products

A shortened Operational Implementation Plan is provided that can be used as an implementation template.

The matrix of activities below provides for the activities and times of actions. The underline outputs are set to measure implementation activities, agreed indicators between EU, MEF and MAFF.

3.2. Matrix of activities

The matrix of activities to implement the NPCI-MF, is set out below

Table 8. Matrix of activities with key output are underline

No	Action	Tasks	Output				Responsible entity
			2020	2021	2022	2023	
	1. Strategic objective 1: Strengthen administrative arrangements						
	1.1 Establish effective MCS units at National and Provincial levels						
1	Establish a National MCS Management team to supervise implementation of the NPCI and outputs are achieved	Approval obtained from Minister to form unit from existing fisheries personnel.	National MCS Team established	At least Quarterly meeting and report of progress work	At least Quarterly meeting and report of progress work	At least Quarterly meeting and report of progress work	FIA
2	Establish Provincial MCS Management teams to supervise implementation of the NPCI and outputs are achieved at provincial level	Approval obtained from Governor to form unit from existing FIACs' personnel.	Provincial MCS Management teams established in all 4 coastal provinces	Quarterly meeting and report of progress work Quarterly meeting	Quarterly meeting and report of progress work	Quarterly meeting and report of progress work	PDAFF & FIAC of Kep, Kampot, Preah Sihanouk and Koh Kong
	1.2 Establish a Serious Marine Offences Task Team (SMOTT)						
3	The National MCS Management team appoints the Serious Marine Offences Task Team (SMOTT). The SMOTT will undertake active MCS operations nationally, and <i>inter alia</i> , provide inspectors for patrol boats, judicial actions	Quarterly management meetings (Staff travel to Phnom Penh)		Serious Marine Offences Unit Task Team established	At least Quarterly meeting and report of progress work	At least Quarterly meeting and report of progress work	FIA/MAFF
	1.3 Establish Provincial Task Teams (PTT)						
4	The Provincial MCS Management team appoints the Provincial Task Team (PTT). The PTT will undertake active MCS operations within the whole province under its juridical area	Quarterly management meetings with representative from FIA - located along the coastal zones		Provincial Task Teams established in all 4 coastal provinces	At least Quarterly meeting and report of progress work	At least Quarterly meeting and report of progress work	PDAFF and FIAC of Kep, Kampot, Preah Sihanouk and Koh Kong
	2. Strategic objective 2 : Procure MCS equipment						
	2.1 Patrol boat procurement						

No	Action	Tasks	Output				Responsible entity
			2020	2021	2022	2023	2024
5	Procure 1 large patrol vessels	The FiA should finalize the specific requirements of the patrol vessels. This will include the exact build specifications, such as Australian Build specification for commercial vessels; The specific manufacture of the main components of the vessel refer to <i>inter alia</i> the engine, gearbox, shafts, radio communication, radar, stand-by generators, and inspection equipment specifications for a large patrol vessel. Guarantees of built quality, timelines and delivery, satisfactory sea trials and ongoing (15 years) availability of spare parts of major components.	<u>Vessel specifications determined and agreed.</u> <u>Procurement dossier approved and launched.</u>	<u>Tenders adjudicated and awarded</u>	<u>Vessel delivery of 1 large patrol boats</u>		FIA/MAFF
6	Procure up to four small patrol vessels		<u>Vessel specifications determined and agreed.</u> <u>Procurement dossier approved and launched.</u>	<u>Procurement process completed and tenders adjudicated and awarded</u> <u>Vessel delivery of 4 small patrol boats</u>			
7	Procure 6 Patrol vehicle	The FiA should finalize the specific requirements of the patrol vessels.	<u>Patrol vehicle specifications determined and agreed.</u> <u>Procurement dossier approved and launched.</u>	<u>Tender adjudicated and awarded</u> <u>6 Patrol vehicle delivered</u>			
8	Procure Smart tool's support equipment for inspectors	FiA inspectoriate and FIAC will use smart tool to monitor and report inspection activities	Smart tool's support equipment determined and agreed. Procurement dossier completed and tenders adjudicated and awarded. SMART handsets delivered and deployed.				
	2.2 Establishment of GSM-based VMS (Global System for Mobile Communications)						

No	Action	Tasks	Output				Responsible entity
			2020	2021	2022	2023	2024
9	VMS Tender advertised and awarded.	GSM based VMS specified and tender issued for a service provider to implement a GSM based VMS system. The service provider shall provide the base station to Cambodia's 24 hr operations room. The service provider shall ensure sufficient (up to 3000 VMS) units are available. The service provider shall plan and implement the VMS through mobile-phone GSM system, including installation of units and the service provider shall manage cell-phone contracts used to activate and maintain communication from the GSM units. The furnishing of a VMS base station for the VMS operations room should be part of the tender specifications. Equipment for VMS is set for bidding. Service provider is a company that should be in partnership with a local company in order to maintain a presence and provide support for the duration of VMS installation and operation until the end of 2023.	Procurement dossier approved and launched.	Tender adjudicated and awarded			FIA: DFA, DAAL, MaFRaDI, Marine Inspectorate, FIACs;

No	Action	Tasks	Output				Responsible entity
			2020	2021	2022	2023	
10	Setting up of a VMS operations room	FIA will need to deploy staff to an operations room to manage the 24/7 operations. The Operation Room equipment (software and hardware) should be provided by the service provider and should include at 3 sets of computers (including monitors) and high speed internet connection. This room should be housed in a secure office. Training to the staff on VMS data interpretations, trouble shooting, and communications should also be provided by the service provider.	Procurement dossier approved and launched.	VMS Operations room established			FIA
11	VMS implemented for all middle- and large-scale vessels and progressively installed	The service provider should initiate a small team of VMS units to test the installation procedure, and operations Room software and hardware. Thereafter, the service provider should roll out the installation progressively	Report from field trip to coastal province, by VMS's Specialist to conduct survey and workshop on VMS strategy	VMS installed to large scale fishing vessels (EEZ >24m) fishing outside and inside EEZ; VMS installed, extend to medium scale start from 18m-24m	GMS installed, continuing with trawl vessels with the category of 12- 18 m;	GMS installed, continuing with all trawlers under 12 m	FIA: DFA, DAAL, MaFreDI, Marine Inspectorate, FIACs;
3. Strategic objective 3: Improve compliance with recording and licensing							
3.1 Registration and recording							
12	A database developed to serve as the record of all marine fishing vessels for Cambodia	Convert the census database to a foundational database that will form the record of fishing vessels; which FIA, FIACs, and GDWMTP get access to the database	<u>Database able to generate reports on 40% of the vessels that were recorded in the census. FIA, FIACs, and GDWMTP have rights to access to the database.</u> <u>Database specialist to finalise database and clean.</u>	<u>Database able to generate reports on 100% of all vessels that were recorded in the census. FIA, FIACs, and GDWMTP have rights to access to the database.</u> <u>Data on vessel licensing added to the database and searchable by inspectors at sea.</u>	<u>Data on vessel licensing added to the database</u> <u>Database operational and searchable by inspectors at sea.</u> <u>The data is linked with VMS to ensure effective control of all vessels with VMS and in the database</u>	<u>The data is linked with VMS to ensure effective control of all vessels with VMS and in the database</u>	FIA: DFA, DPFC, DAAL, Marine Inspectorate, FIACs;

No	Action	Tasks	Output				Responsible entity
			2020	2021	2022	2023	2024
13	PDAFF to provide a "Certificate of Record" to all small-scale vessel <12m, that are not trawlers	FIACs to mobilise teams, similar to census teams to physically go to fishing vessels and issue a certificate of Record.		Prepare certificate of record and activities plan. 4 workshops with stakeholders on the certification "Certificate of Record" issued to 50% of small-scale vessels <12m that are not trawlers in all 4 coastal provinces	"Certificate of Record" issued to 80% of small-scale vessels <12m that are not trawlers in all 4 coastal provinces	"Certificate of Record" issued to 100% of small-scale vessels <12m that are not trawlers in all 4 coastal provinces	FIA, Marine Inspectorate, FIAC of Kep, Kampot, Preah Sihanouk and Koh Kong
14	3.2. Licensing to all fishing vessels <u>Providing license to all middle and large scale fishing vessels</u>	Mobilize "Licensing teams" A team could consist of 3-5 people and be able to undertake the full scope of the required licensing activity. It is required to have 2 to 3 such teams.	<u>Appointing licencing teams. Planning on deployment of licencing teams and the schedule for visiting the coastal provinces.</u> <u>Provide licenses and issue logbooks to all fishing vessel >18m</u>	<u>Provide licenses and issue logbooks to</u> <u>-all fishing vessel >18m (renewal)</u> <u>-40% of fishing vessels between 12-18m (new)</u>	<u>Provide licenses and issue logbooks to</u> <u>-all fishing vessel >18m (renewal)</u> <u>-70% of fishing vessels between 12-18m (40% renewal – 30% new)</u>	<u>Provide licenses and issue logbooks to</u> <u>-all fishing vessel >18m (renewal)</u> <u>-all 100% of fishing vessels between 12-18m (renewal)</u>	FIA, DFA, Marine Inspectorate
15	3.3 Catch monitoring Plan and undertake fish catch assessment surveys and catch monitoring	FIA, MaFReD was accessed by scientists and experts from the FAO, SEAFDEC, NGOs to develop guideline for scientific monitoring of marine catch and conduct catch assessment survey and catch monitoring, effectiveness analyses for reporting, which can be used for stock assessment purposes. including fish lengths and effectiveness analyses, which can be used for stock assessment purposes.	Adopt Guidelines for the scientific monitoring of marine catch. Train the concerned staff on the methodology Commence catch assessment and catch monitoring surveys Model testing of database and outputs	FIA, MaFReDI undertake catch assessment surveys with select of marine fishing vessels base on agreed guidelines Produce 12 monthly statistical tables and 1 annual report FIA develop a database to host and import all the data collected during the fish catch assessment. This includes data from the provinces.	FIA, MaFReDI undertake catch assessment surveys with select of marine fishing vessels base on agreed guidelines Produce 12 monthly statistical tables and 1 annual report	FIA, MaFReDI undertake catch assessment surveys with select of marine fishing vessels base on agreed guidelines Produce 12 monthly statistical tables and 1 annual report	FIA, MaFReDI, NGOs, and SEAFDEC
16		FIA and FIACs to conduct catch monitoring at landing sites and collect catch based on size and fishing effort data.		Planning for conducting catch monitoring commences with SEAFDEC/ FAO base on logbook or mobile application Technical planning and methodology testing of	FIA and FIACs to undertake catch monitoring with all scale fishing vessels (20 Fishing vessels) in selected coastal provinces.	FIA and FIACs to undertake catch monitoring with all scale fishing vessels (100FV) in all 4 coastal provinces. Submit catch monitoring report	FIA and all four coastal FIACs

No	Action	Tasks	Output				Responsible entity
			2020	2021	2022	2023	2024
				catch monitoring takes places	Submit catch monitoring report		
	3.4 Recording of fish landing sites						
17	Undertake recording of landing sites	FIA assists the FIACs in planning and support to undertake landing site recording	FIA assists the FIACs in planning and support to undertake landing site recording, reporting and mapping.	All landing sites recorded and mapped			DPfIC, MAFREDI , Marine Inspectorate, and four coastal FIACs.
	4. Strategic objective 4: Improve compliance with gear and protected areas						
	4.1 Designate legal and illegal fishing gear, and control its use in marine fishing domain						
18	Update the list of legal fishing gears and sizes, and illegal fishing gears	The FIA, FIACs and CFIs to undertake meetings to determine what gear is legal and what gear is illegal. Such legal fishing gear are then described by a proclamation.	<u>The proclamation on legal and illegal fishing gears, including the definitions and fishing conditions is drafted.</u>	<u>The proclamation on legal and illegal fishing gears is adopted, published and shared</u>			DFA, DFC, CFIs, MAFREDI, and Marine Inspectorate
19	Adopt a zoning for inshore trawling	Identify and maps the areas within the inshore water (< 20 m deep) where trawling can be authorized without damaging protected or conservation areas, such as the seagrass beds and coral reefs.	Plan and prepare a methodology for the mapping exercise	<u>A proper-scale map, of the authorized areas for inshore trawling is prepared and published (potentially: 1 map per province).</u>			DFA, DFC, CFIs, MAFREDI, four coastal FIACs, and CFIs
	4.2 Fishing zone classification to address inshore trawling and fishing in protected and conservation areas						
20	Undertake a survey to find and map all seagrass beds and coral reefs or important potential areas to be identified as potentially protected or conservation areas.	FIA undertakes a survey to find and map all seagrass beds and coral reefs or important potential areas to be identified as protected or conservation areas. Collect sampling and test whether an area is likely to have seagrass or coral reefs.	Plan and prepare a survey to locate, assess and map all seagrass beds, coral reefs and other important potential areas.	<u>Undertake the survey. All seagrass beds, coral reefs and other important potential areas are identified. A proper-scale map, with the known seagrass and coral reef areas, is prepared and published</u>			DFA, DFC, MAFREDI, and four coastal FIACs, and CFIs

No	Action	Tasks	Output				Responsible entity	
			2020	2021	2022	2023		2024
21	Designate Fisheries Management	Promulgate in a proclamation (Prakas) of critical areas that need to be classified as conservation areas, protection areas or fisheries refugia		Conduct consultations to identify key areas to classify for protection and conservation purpose	Develop, adopt and promulgate the proclamation of Fisheries Management Areas to designate Protected or Conservation Areas" where no trawling shall take place. Is promulgated and published			DFA, DFC, MaFrEdI, and four coastal FIACs, and CFIs
22	Establish fishing zones in the inshore waters (shallower than 20m depth),. and describe the conditions of fishing	On the basis on the mapping of the critical habitats and of areas suitable for trawling, FIA and national experts to prepare a proclamation on the zoning of the inshore waters and the conditions of fishing in those different zones (gears authorized, season, etc) and demarcate these different zones with poles and/or buoys		Develop adopt and promulgate the proclamation on fishing zones and applying conditions of fishing.	25% of the fishing zones are demarcated	50% of the fishing zones are demarcated	100% of the fishing zones are demarcated	DFA, DFC, MaFrEdI, and four coastal FIACs, and CFIs
23	Formulate and implement an action plan for management of protected or conservation areas, including the deployment of "concrete blocks"	FIA and other regional experts to prepare an action plan for management of protected or conservation areas, including the deployment of "concrete blocks". The design of concrete blocks to be finalised, and the concrete blocks to be deployed in protected or conservation areas.		25% seagrass and coral reefs are protected through the deployment of "concrete blocks".	50% seagrass and coral reefs are protected through the deployment of "concrete blocks".	75% seagrass and coral reefs are protected through the deployment of "concrete blocks".	100% seagrass and coral reefs are protected through the deployment of "concrete blocks".	DFA, DFC, MaFrEdI, and four coastal FIACs, and CFIs
	4.3 Control and Inspection: Domestic vessels; foreign fishing vessels prevalent in boundary and disputed areas							
24	Patrol vessels (large and small) to patrol along the boundary region, starting from the territorial waters to the outer limit of the EEZ	FIA's SMOTT of the Inspectorate should undertake monthly risk assessment based on information to determine high risk areas. Then, FIA should prepare monthly planning sessions through coordination with the NCMS, to plan and conduct	4 days per month patrol within a 20 nm strip along the borders	4 days per month patrol within a 20 nm strip along the borders	4 days per month patrol within a 20 nm strip along the borders	4 days per month patrol within a 20 nm strip along the borders	4 days per month patrol within a 20 nm strip along the borders	FIA, Marine Inspectorate

No	Action	Tasks	Output				Responsible entity	
			2020	2021	2022	2023		2024
		patrols in high risk areas marine areas.						
25	Large patrol vessel to patrol: fishing zone (the area from 20m depth to the outer limit of the fishing zone) in the area bordered with Vietnam in the south and with Thailand in the north and West.	SMOTT in cooperating with Marine Inspectorate should undertake monthly risk assessment based on information to determine high risk areas. Then, FIA should conduct monthly planning secessions through coordination with the NCMS, to plan and conduct patrols in high risk marine areas.	At least 7 days/month (with the objective to control the target 125 marine fishing vessels and recorded in Smart tool)	At least 7 days/month (with the objective to control the target 300 marine fishing vessels and recorded in Smart tool)	At least 7 days/month (with the objective to control the target 300 marine fishing vessels and recorded in Smart tool)	At least 7 days/month (with the objective to control the target 300 marine fishing vessels and recorded in Smart tool)	At least 7 days/month (with the objective to control the target 300 marine fishing vessels and recorded in Smart tool)	FIA, Marine Inspectorate
26	Using small patrol vessels in each province, patrol the area within the 20m isobath, and possibly be in deeper areas (areas under provincial juridical areas)	The FIAC's PTT should be in coordination with Marine Inspectorate to undertake a monthly risk assessment based on information to determine high risk areas. Then, FIACs should conduct monthly planning secessions through coordination with Marine Inspectorate, to plan and conduct patrols in high risk marine areas.	At least 7 days/month (with the objective to control the target 400 marine fishing vessels and recorded in Smart tool) 5 months	At least 7 days/month (with the objective to control the target 960 marine fishing vessels and recorded in Smart tool)	At least 7 days/month (with the objective to control the target 960 marine fishing vessels and recorded in Smart tool)	At least 7 days/month (with the objective to control the target 960 marine fishing vessels and recorded in Smart tool)	At least 7 days/month (with the objective to control the target 960 marine fishing vessels and recorded in Smart tool)	FIACs (Kep, Preah Sihanouk, Kampot and Koh Kong)
4.3. Collaboration between coastal provinces								
27	Establish an information sharing and communication network between coastal FIACs for preventing and combating provincial transboundary illegal fishing	Establish a communication network and select officers within the FIACs including conducting regularly quarterly meetings.	Communication network established, and responsible officers selected. Quarterly meetings conducted.	Quarterly meetings conducted.	Quarterly meetings conducted.	Quarterly meetings conducted.	Quarterly meetings conducted.	FIA, four coastal FIACs
4.4 Aerial surveillance								
28	Aerial surveillance	Undertake aerial surveillance to determine the distribution of fishing boats and support organization of control missions at sea	Determine the conditions of aerial surveillance (manned missions or drones) and identify service providers	Conduct aerial surveillance in the EEZ, at least once a month	Conduct aerial surveillance in the EEZ, at least once a month	Conduct aerial surveillance in the EEZ, at least once a month	Conduct aerial surveillance in the EEZ, at least once a month	FIA, Marine Inspectorate.
4.5 Inspection of Fishing Ports, Landing sites and import/export								

No	Action	Tasks	Output				Responsible entity
			2020	2021	2022	2023	
29	Inspection of foreign vessels in designated ports (PSMA) using a vehicle	FIA to undertake on land-based inspections at ports and landing sites for Port State Measures (PSM) and import/export locations (ports and border posts)	Identified designated fishing port for PSMA. Inspections at selected ports are planned, and officers selected.	1 port is designated and inspected All foreign vessels are inspected if any	1 port is designated and inspected All foreign vessels are inspected if any	2 port is designated and inspected All foreign vessels are inspected if any	FIA, Marine Inspectorate
30	Inspection at landing sites in each Province by the FIACs and using land-based vehicles.	FIACs to undertake on land-based inspections at ports and landing sites	At least 7 days/month (with the objective to control the target 400 marine fishing vessels and recorded in Smart tool)	At least 7 days/month (with the objective to control the target 960 marine fishing vessels and recorded in Smart tool)	At least 7 days/month (with the objective to control the target 960 marine fishing vessels and recorded in Smart tool)	At least 7 days/month (with the objective to control the target 960 marine fishing vessels and recorded in Smart tool)	All four FIACs

4. EXPENDITURE

4.1. Human Resources

4.1.1. Control activities

Table 9 below illustrates the specific priority operational actions, specific human resources and activity levels to be initiated by the FiA and the FIACs in order to effectively implement the NPCI-MF.

Table 9. Specific priority operational actions, the specific human resources and activity levels

Priority actions to be implemented	Fishing grounds	Implementing institutions	Activities to be implemented	Duration	Human Resources at FiA	Human Resources at FIACs
1. Specific vessel-based actions at sea	> 20 m	FiA		15 days/month	8-15ps (existing staff)	
	< 20 m	FIACs	Monitoring and prevention of: - Fishing in conservation areas (Article 18 of Fisheries Law of 2006) - Illegal fishing gear at sea - Illegal foreign vessels in Cambodia	10 days/month for 4 coastal FIACs		-Kep: 2ps + 6ps (contracted staff) -Kampot: 8ps + 4ps -Koh Kong: 5ps + 5ps -PSH: 9ps + 6ps
2. Specific vessel-based actions on land		FiA + FIACs (joint)	Targeting illegal fishing gear on land	8days/month for all four FIACs	8-15ps (existing staff)	-Kep: 2ps + 6ps (contracted staff) -Kampot: 8ps + 4ps -Koh Kong: 5ps + 5ps -PSH: 9ps + 6ps
3. Cambodian vessels fishing outside Cambodia	ABNJ	FiA	FiA & DPFC, whether there is any Cambodian fishing vessel fishing in ABNJ			

4.1.2. Other land based actions

Table 10 below illustrates the, specific human resources and activity levels to be initiated by FiA and specific priority land-based activities that FIACs to effectively implement.

Table 10. Status of human resources and activity levels

	Who	What	When	Resources FiA	Resources FIAC
Licensing scheme to fishing vessels (key agencies to be identified, will be determined by FIA)	FiA	>18m	Start in 2020, and renew every year	2 existing officers	
	FIACs	<18 m	Start in 2021, and renew every year		3 existing officers
Providing identification card to small-scale vessels (motorized boat)	FIAC	Small-scale	Family fishing	2020: Training 2021: Implement (5%/year)	
Collect data and catch reporting system (fishing log book)	FiA	Plan for catch assessment surveys	Start in 2020	- DFA – 2 staff - DFPIC – 2 staff	Existing staff, but needs to have cooperation with FIACs
	FIACs	Participate in planning for catch assessment surveys	Start in 2020		
Conduct scientific sampling	FiA in cooperation with FIACs & MaFReDI	Family-scale fishing	2020: Pilot and testing 2021: Implementation of Scientific sampling	FiA: 8ps (existing staff) and in cooperation with MaFReDI	FiA: 8ps for taking random sampling. Planning in cooperation with DPFIC. (Error! Reference source not found.).
Electronic documentation system for fisheries import/export	FiA	All imports and exports		-	
	FIACs	All landing sites/province/2yrs (piloting for 1 landing site/ province/yr.)		-FiA: 2 existing officers (DPFIC) - Marine Inspectorate	
Recording of landing sites	FiA	All landing sites/province/2yrs	Piloting 1 landing site/province/yr.		

4.1.3. Budget and expenditure

Below is the list of capital and operational expenditure items required (Table 11). The rationale of the expenditure is provided in the Priorities Issues section. Items underlined are essential activities. The other aspects will greatly contribute to improved implementation of the NPCI, but are not essential.

The expenditure is also reliant on policy decisions such as:

- a) Logbooks are essential, but they will probably carry a substantial and ongoing cost of printing and dissemination. Logbooks are cumbersome data collection instruments and require full time data entry, management and meticulous quality control. It is recommended that a dedicated catch assessment survey rather be undertaken, that will maximize accurate data collection.
- b) The Vessel Monitoring System is potentially the highest cost item. If there is a significant uptake of VMS, its benefits to reduce patrol costs and to improve fisheries and fleet management. The FiA of MAFF has selected three options:
 - a. either pay for the VMS units, monitoring station and the communication costs (USD 6.5 million), or
 - b. only pay for the procurement of the VMS units and monitoring station (USD850,000, and let fishermen pay for the communication costs [USD 10- 30/month]), or
 - c. Fishermen pay for everything (once off cost of unit USD300 & monthly communication cost of USD10-30), but with the option of a rebate from the government to small trawlers (with less than 12 m length). See **Error! found..**

Table 11. Operational and Capital cost of implementing the NPCI-MF

Implementation cost of equipment and services for NPCI [Recommended actions are underlined]	Capital costs			Operational costs							Operating and capital cost for 5 years	Essential
	Cost/unit item	Items	Total capital cost	Cost per day per unit	Cost per month per unit	Annual cost (or per unit)	No of units/time	Operating cost per unit	Operation in a year	Operating cost total for 5 years		
Law revision and stakeholder workshops						5,000	30			150,000	150,000	150,000
<u>Workshops costs on domestic legislation, mostly workshops with all stakeholders in the provinces and at PP. Estimated costs for 10 sets of legislation, and 3 meetings per proclamation = 30 (participants)</u>												
Vessels Management: Licensing and Certificate of Record of fishing vessels												
<u>FIA licensing</u>								50,000	5	250,000	250,000	250,000
<u>PDAFFs to issue a certificate and record to fishing vessels</u>						20,000	4	80,000	5	400,000	400,000	400,000
<u>Recording of landing sites - part of normal duties</u>								0		0		
Patrol vessels												
<u>Offshore patrol vessel (22m-length patrol vessel)</u>	850,000	1	850,000	2,000	40,000	480,000	1	480,000	5	2,400,000	3,250,000	3,250,000
<u>Inshore patrol boats for Option 1: 15m-length vessels-multi-day/trip</u>	300,000	3	900,000	300	3,000	36,000	3	108,000	5	540,000	1,440,000	1,440,000
<u>Inshore patrol boats for Option 2: 8m-length vessels – Day & night trip (24 hours) only – no coming to pear at night</u>	100,000	3	300,000	250	2,500	30,000	3	90,000	5	450,000	750,000	
<u>Additional wooden patrol vessels (12-14m)</u>	250,000	2	500,000	480	4,800	57,600	2	115,200	5	576,000	1,076,000	
<u>Patrol on land (to purchase 6 vehicles)</u>	40,000	6	240,000	40	800	9,600	6	57,600	5	288,000	528,000	528,000
<u>Aerial surveys, for 2 years only</u>				4,000	64,000 ³	448,000	1	448,000	2	896,000	896,000	
<u>Habitat protection (under conservation Program's budget)</u>	500	1,000	500,000									
<u>Mapping of conservation areas-seagrass beds and coral reefs</u>	20,000	1	20,000								20 000	20 000

Table 12. Operational and capital cost for implementing the NPCI-MF

Capital costs				Operational costs									
Cost of equipment and services for NPCI implementation [Recommended actions are underlined]	Item	Cost/unit	No. of items	Total capital cost	Cost/day (/unit)	Cost/month (/unit)	Cost/year (/unit)	No. of units	Operating Costs/unit	Operating years	Operating costs for 5 years	Option 1's cost	Option 2's cost
Recommended mandatory requirement for vessels fishing beyond the waters under Cambodian jurisdiction									Operating cost year 1 cellphone VMS		Operating cost years Satellite VMS	Option 1	Option 2
	<u>VMS units for ABNJ vessels (10). Option 1: Service provider monitors the vessels at USD1,000/vessel</u>	3,600	10	36,000	3	90	2,080	10		5	10,400	46,400	
	<u>VMS for ABNJ vessels (10). Option 2: Cambodian owned and operated satellite base station and software</u>	100,000	1	100,000	3	90	2,080	10		5	10,400		110,400
	TOTAL											46,400	110,400
<u>VMS for Domestic vessels</u>													
<u>Option 1:</u>													
The Cambodian Government to procure the AIS units, but fishers to pay for communication and installation costs													
VMS Sat-AIS units - government procurement	300	3,000	900,000								0	900,000	
VMS Sat-AIS unit communication - user pay (by fishermen)					3	90	1,080	3,000	3,240,000	5	16,200,000		
VMS Sat-AIS based station Cambodian owned and operated in Operations Room	50,000	1	50,000									50,000	
<u>Option 2:</u>													
<u>VMS - Cellphone system where fishermen buy the VMS unit from service providers and pay for communication costs</u>	250	3,000	750,000							5			
VMS Cellphone system communication cost					1	30	360	3,000	1,080,000	5	5,400,000		
<u>VMS- Cellphone system where the government buys the VMS unit from service providers and pay for communication costs</u>	250	3,000	750,000										750,000
VMS Cellphone system base station or outsourced	100,000	1	100,000										100,000
TOTAL												950,000	850,000

5. MONITORING AND EVALUATION

5.1. Verification and achieved indicators

Verifying report and registration for each monitoring activity and inspection reports have to be integrated into a database, and then analysed (quality process, scoreboards and statistics) must be conducted at least on a yearly basis, in order to measure the effective implementation of the NPCI and the impacts of implementation.

Verifying reports should be provided to monitoring authorities at all levels (conclusions on the impacts of control activities, the status of regulatory compliance, the types of infringements accounted for, and follow-up activities).

Implementation of the national illegal fishing control system and actual field implementation can be reinforced by the definition of procedures in evaluating the quality of control activities, and by the assessment of internal or external body for effective performances based on the defined objectives and procedures. Target indicators are provided below (Table 13), but the actual targets are provided in the Matrix of Activities, Error! Reference source not found..

Table 13. Target indicators

	% offences	Targets: % of offences per number of inspectors		
Activity	Current level (baseline)	2020 (Year 1)	2024 (Year 5)	Data recorded on activities undertaken, preferable on an electronic system "Smart Tool"
Inspection of fishing vessels at ports, transshipments or landing sites	>80%	50%	5%	Data verified and analysed
Inspection of vessels at sea	>80%	50%	5%	Data verified and analysed
Port State Measures and Port State control	>80%	50%	5%	Data verified and analysed
Inspection using VMS, and installation of the surveillance equipment on all large- and middle- scale fishing vessels	100%	50%	5%	Data verified and analysed
Inspection and certification of fish processing facilities	>80%	50%	5%	Data verified and analysed
Active patrol and control in CFAs	>80%	50%	5%	Data verified and analysed
Inspection of labour on fishing vessels and in processing factories	>80%	50%	5%	Data verified and analysed
Conduct data collection on CPUEs for 5 key species	FiA to identify the 5 species	Data collection started	CPUEs for 5 key species determined	The analysis of CPUEs is from logbooks for statistics and stock assessment for 5 key species
Conduct data collection for estimating maximum sustainable yield (MSY)	FiA to identify the 5 species	Data collection started	100% of fisheries at MSY	The analysis of CPUEs is from logbooks for statistics and stock assessment for 5 key species
Fishing vessel registration system initiated and completed	< 5%		100%	Liaison with MPWT and reports from FiACs
Fishing vessel licensing system initiated and completed	< 5%	50%	100%	FiA and FiACs to imitate and complete licensing system

5.2. The sustainability of the Cambodian fisheries

The sustainability of fish stock in Cambodia will ultimately determine how successful the implementation of the NPCI-MF is.

Monitoring of Total Catch against Maximum Sustainable Yield (MSY):

Following the determination of the MSY, monitoring is required to ensure that the total fish caught shall not exceed the determined MSY. Data on Total Catch, which combines all fish types in Cambodia need to be

assessed in order to determine if the landings of Cambodian fish catches exceed the maximum level (or over exploitation) of fish stocks. If the landings are below the estimated optimal yield, NPCI has been a success. If the landings are above the yield, the performance on Control and Inspection needs to be improved and other alternative management measures need to be applied, such as closed seasons, closed areas or gear restrictions.

Fishing ports shall be responsible for reporting or providing data to the FiACs. The data shall be input into the database within three days of collection. The total weight of fish catch landed by individual fishing vessels shall be recorded in a quarterly summary report in terms of quantity and fishing effectiveness compared to the target level. The data collectors at the provincial level shall provide a summary monitoring report to provincial and regional MCS Centres on a weekly basis, in order to subsequently inform related institutions for further actions, such as the reduction of fishing effort and the closure of fishing grounds.

5.3.Reducing activities that is detrimental to stocks

Evaluation of the IUU Monitoring Activities:

For the nine control and inspection activities reported above (see Section 6), an officer shall assume a number of responsibilities for each activity. First, he/she shall be responsible for inputting a surveillance report into the national-central database, and for retrieving relevant information for developing reports. By doing that, there will be an enhancement of the efficiency of his/her assigned surveillance area. For activities 2 to 6, the report frequency is once per week if an urgent case. For the 7th activity, prior to issuing a document, past records must be checked for suspicious IUU fishing if there is any suspicious violation. Should any concerns arise regarding IUU fishing, an investigation should be taken place, issuing a new licence may be suspended as well as previous permits/certificates may be revoked. Under normal circumstances, the report shall be done once a month.

Should any IUU fishing related suspicion arise, the report must be filed immediately into the central database. Additionally, the MCS team must report and alert relevant agencies for further surveillance actions.

5.4. Cost benefit analysis

Evaluation of costs and benefits:

The MCS Centre will be responsible for calculating fund required for evaluating activities. Activities includes cross-checking documents with the origin countries and determine penalties for an IUU fishing violation. Also, the Centre will be responsible for comparing the cost of monitoring/surveillance with economic values of the marine resources. The most cost-effective method and report procedure shall be determined after the study. The evaluation will be done at least once a year.

5.5. Conclusion

The challenges to the sustainability of Cambodian fisheries are many and varied. However, key challenges are a lack of investment in management and administration of the sector and the increase in unsustainable fishing practices.

The NPCI-MF can help marine fisheries management move toward sustainability, and improve management of marine fisheries resources. Foreign investment and support will make it possible for FiA to implement this plan. But ultimately, it is the Royal Government of Cambodia that has to take the decision to what level it wishes to intervene in its marine fisheries and environment, and its international and domestic commitments.

The strategic interventions are not easy, but they are necessary:

- Ensuring that all fishing vessels comply with national legislations and Cambodia's international obligations;

- Ensuring that all fishing operations or other operations comply with national legislations and Cambodia's international obligations; including, fishing, processing, import and export provisions;
- Implementing all measures to ensure coordination at national and provincial levels between relevant stakeholders in order to improve the effectiveness of control and reduce duplication or overlapping of efforts;
- Maintaining fish stocks at a sustainable level through reducing and eliminating IUU fishing, and improving the management through the development of fisheries management plan.

The possible strategic actions are:

- a. Preparation for implementing:
 - Administrative arrangements to register, record and provide license to all small, middle and large-scale fishing vessels;
 - Strengthen implementation through close cooperation with the MPWT and the PDPWT;
 - After the registration of fishing vessels, the FiA shall provide licenses to all fishing vessels operating in the waters under Cambodian jurisdiction and shall record all vessels below 12m in length that are not trawlers;
 - Providing logbooks for industrial fishing vessels;
 - Undertaking catch assessment surveys for small-scale fisheries; and
 - Registration of all public and private landing sites.
- b. Adopt a strategy of "Education through Fining".
- c. Establish a SMOTT and PTT
- d. Procure adequate equipment and facilities, including patrol vessels, VMS system and other equipment to implement the NPCI-MF.

In order to implement the Fisheries Control and Inspection Plan for Marine Fisheries more effectively, the Ministry of Agriculture, Forestry and Fisheries authorizes the Fisheries Administration to revise its action plan, key outputs in each years and timeline (Key outputs are underlines) in the Matrix table 9, as outlined by adhere to this annual practice in consultation with relevant institutions and entities.

6. Annexes

6.1. Annex 1: Action Plan

Specific activities are contained in the **Error! Reference source not found.**, but this sequence of actions will guide the implementation. After the NPCI-MF was approved - the operational implementation of the action plan can be taken place in the following.

Action 1. Establish a Serious Marine Offences Task Team (SMOTT) and a Provincial Task Team

A dedicated fisheries enforcement unit is needed at National and Provincial level to ensure that significant attention is paid to combat IUU fishing.

Activity:

- a) The FiA shall establish the special task team to address the serious marine offences to undertake intelligence driven, and planned interventions. The Serious Marine Offences Task Team (SMOTT) consists of FiA judicial police officers and the officers of the Police, and the SMOTT shall be led by a senior judicial officer in the FiA Inspectorate;
- b) The MAFF, through the FIA shall assist PDAFF and FiAC to establish a Provincial MCS Management Team in each province. The Provincial MCS Management teams will implement routine Control and Inspections services, and will be conducted as planned. The PMCS Management teams will form a Provincial Task Team (PTT) in each province;
- c) **Human and operational resources needed to address fishing vessel-based actions:**
 - Legal resource persons, who have expertise in law and finance, to undertake the amendment of the Fisheries Law and other legal frameworks; and
 - Additional human resources, where additional staff are required: Kep - 6 people, Kampot - 4 people, Preah Sihanouk - 6 people and Koh Kong - 5 people.

Action 2. Licensing to fishing vessels

The FiA to begin with the issuing of fishing licenses immediately, irrespective of vessel registration status. The FiA will encourage marine vessel owners to register with the GDWMTP and PDPWT.

Activity:

FiA and FiACs to coordinate:

- a) Develop and integrated fishing vessel management system that will consist of licensing component, catch assessment and data collection component, landing site recording component, the implementation of VMS/GMS system for all fishing vessels above >12m, and all trawl vessels irrespective of the length.
 - a1. The implementation of the licensing component shall be as follows:

Fishing vessels that have been provided with a Census Card or Certificate of Record should be provided with license for fishing. This data shall be entered into the record of fishing vessels (database of fishing census). [Note - the revised Fisheries Law (fishing boats that have been provided with Census Cards) should indicate that the record of fishing vessels shall be deemed as Cambodia's Record of Fishing vessels]. These activities should have implementation plans in the following:

 - Year 1: Preparing plans for licensing team and schedule for all four coastal provinces;
 - Year 2: During 2020 commence on licensing for all middle-scale decked fishing vessels with the length of more than 18m;
 - From year 3 to year 5: Implement the activities in the Matrix of activities table 8.

Beside activities are mentioned in point a), the following activities can be implemented as follow:

- b) Inspection of fishing vessels at sea and at landing sites shall commence immediately at a rate of 5% of the number of all fishing vessels per month per province;
- c) A VMS implementation plan shall be prepared by the FiA in cooperation with FiACs;
- d) The integrated vessel management system, such as a cell phone app for a) registration and b) logbooks to facilitate the participation of small-scale fishers; could be developed;
- e) Logbook Component

- All licensed industrial fishing vessels (longer than 24 m length) and middle-scale (18m to 24m) that have a licence, shall be provided with a logbook;
 - The logbooks shall be collected by the FiACs on monthly basis, and 12 logbooks shall be provided to a fishing vessel in a year;
 - Data for middle-scale vessels (12m-18m length) and small-scale, will be evaluated via a statistical surveys and to be undertaken at least every two years.
- f) Recording data at landing sites and fisheries production sites.

Action 3: Conservation areas: enforcing Article 18 of the Fisheries Law of 2006, “Fisheries Management Areas-FMA”

This article is specific in the protection and conservation of marine conservation areas, particularly, coral reefs, seagrass beds and mangrove areas. Since these areas are of high ecological importance for both the lifecycle of shrimps, cephalopods and nursery areas for many aquatic juveniles, the protection is imperative for sustainability of the fisheries. Significant habitat modification has taken place in many seagrass beds and coral reef areas, could potentially change these aquatic animals.

While enforcement is considered as important actions, such as monitoring and surveillance, it can also employ tactics in order to deter, prevent and eliminate IUU fishing. Cambodia has initiated actions to prevent and deter fishing in vulnerable fishing areas (coral reef, seagrass and mangrove areas) with the deployment of “concrete blocks”, which are essential to prevent fishing with large- and middle-scale fishing gear in such areas. Taken into consideration that these concrete blocks shall not be deployed in an area that can damage coral reefs but in the adjacent areas, to protect and prevent fishing on coral reefs.

Activity:

- a) All areas that have been mentioned in Article 18 (seagrass beds, coral reefs and mangroves) should be identified immediately;
- b) A map of these areas and buffer zones should be drafted and shall be formally identified as Protected and Conservation Areas with a prohibition to fish. This prohibition shall be made part of the conditions to fish in the EEZ of Cambodia (beyond 12nm) may be identified as areas of highly important for conservation;
- c) Construction of “concrete blocks” shall built with complete amounts and they shall be deployed in areas in a patchy mode to prevent and deter fishing. The FiA and FiAC could cooperate on the deployment of the concrete blocks;
- d) Actively patrolling in the conservation and protected habitats exists shall be undertaken by all relevant stakeholders. 20% of patrol time shall be spent in and adjacent to the Protected and Conservation areas;
- e) Establish VMS system (see above).

Action 4. Focusing on illegal fishing gear and illegal fishing practices

Illegal fishing gear is hugely destructive on the fisheries resources, and can be hugely destructive to the habitats and ecosystems. Catches from illegal gear also distort the benefits of legal fishing practices, and making it harder for legal fishers to remain in fisheries, then in the face of overwhelming non-compliance, legal fishers also start fishing with illegal gear. Thus, it is imperative that the provision of the Proclamation No. 319 *pror kor.kor sor kor* of MAFF shall be implemented and updated on a regular basis based on the evaluation of new fishing gear technology.

The list of illegal fishing gear currently in frequent use in Cambodia includes electro-equipped trawls, rat tail (collapsible) traps, sea-cucumber harrows, small-mesh size at the cod-end in trawl nets, pair trawls, mid-water (flying) trawls, and light fishing at night.

Activity:

- a. Develop a joint operational plan between the FiA and concerning institutions in order to initiate inspections for illegal fishing gear, including liaison with NCMS and Marine Police.
- b. Human resource, where additional staff at provincial level are required: Kep - 6 people; Kampot - 4 people and Preah Sihanouk province - 6 people, Koh Kong - 5 people (previously mentioned);

- c. Inspect 5% of vessels/month/province;
- d. The three provinces in close proximity to borders with neighbouring countries should be primarily targeted first, starting in January 2019 for 3 months, then continue the work in Preah Sihanouk province for 3 months;
- e. Vessel patrols to be undertaken at night by one team, and vehicle patrol team to be undertaken at landing sites of fishing vessels during the day;
- f. Active vessel patrols in areas where the conservation and protected habitats exists shall be undertaken by all relevant stakeholders. 20% of patrol time should be spent in and adjacent to the Protected and Conservation areas;
- g. All illegal fishing gear to be confiscated and destroyed following due procedure;
- h. All perpetrators (illegal fishers) to be warned by official letter, copied to a Governor and the Minister of MAFF;
- i. Some fishing gear are currently classified as illegal, or have not been mentioned in the proclamation, deemed illegal. However, some of these fishing techniques may be less damaging than those current fishing practices, such as rat-tail traps, compared to inshore trawling. Fishing activities such as rat-tail traps can have a low impact to the physical marine environment, but this gear catch only small juveniles may lead to the loss of fish stock replenishment.

It is recommended that comparative studies to be undertaken in order to specifically determine the impacts of fishing gear on species, target aquatic animals, by-catch, demersal habitats, or on other environments.

Action 5. Foreign Fishing vessels and fisheries resources in areas close to marine borders with neighbouring countries

Currently, the NCMS is tasked for conducting patrol and inspection on disputed areas with neighbouring countries, while the Marine Police undertake surveillance on this area as well. While little data exist to confirm the successful implementation of these two agencies, it does not negate the role of MAFF, in which the FiA is the core agency to plan and undertake its own fisheries patrols, and can be coordinated through the NCMS.

The FiA should with immediate effect increase its presence and effectiveness inside the disputed areas of the waters under Cambodia's mandate, and undertake at least 1 marine patrol in each border area with of a minimum of 4 days per week.

Activity:

- a) The FiA and the FiACs should liaison with *inter alia*, the NCMS and the Marine Police, in order to implement patrolling plan on quarterly basis and to patrol in the areas under the jurisdiction of Cambodia;
- b) The FiA and FiACs shall undertake at least 1 marine patrol in each boundary area with a minimum of 4 days per week;
- c) The FiA and FiACs shall develop an operational plan on how to deal with vessels detected and/or apprehended.

Action 6. Control of Import and Export of marine products

While the current legislation exists that allows for import and export permits, the current practices are in limitation. The current legislation mentioned that export and import of live or fresh fisheries products of exceeding 10 kg must obtain a permit.

It is **recommended** that the FiA and FiACs to communicate with General Department of Customs (GDC), in order to develop a procedure for import and export fisheries products at the border posts, and to adopt the harmonised trade tariff codes, to identify fish and fisheries products.

Activity:

- a. The FiA the develop or review procedures for issuing import and export permits and communicate with freight agents and import/export agencies, including the use of harmonised trade tariff codes in a standardized-value list.

- b. The FiA and FiACs liaison with GDC to develop a joint methodology to verify and control import and export of fisheries products at border posts.
- c. The FiA and FiACs initiate inspection by roving teams at provincial border posts and landing ports of fish and fisheries products.

Human resources and operation needed to implement these activities are:

- Legal expertise resource to undertake the legal revision and update according to national laws;
- Human resource, where additional staff at provincial level are required: Kep - 6 people; Kampot - 4 people, Preah Sihanouk province - 6 people, and Koh Kong - 5 people;
- Human resource and documents to undertake the licensing process, which can be either physically processed, or via electronic process on an app-based platform, and recording at landing sites and production sites;
- Resources to ensure habitat protection and enhancement with the construction concrete blocks;
- Production of maps that detail the distribution coral reefs, seagrass beds and mangroves, to demarcate protection and conservation areas;
- VMS or GMS systems to track marine fishing vessels;
- One large (20 - 30m Length overall minimum) ballistic protected, steel hulled, high speed patrol vessel, equipped with a ballistic protected unit, in order to undertake patrol in the border regions and the EEZ. Equipped with stern launch inspection boat to undertake inspection in shallow water and near shore;
- Five MANOMA/catamaran (not less than 12 m) vessels with protective keel strip and propeller protection to undertake shallow water and near shore patrol;
- 6 double cab 4x4 pick-ups for landing site inspection.

6.2. Annex 2: Most Important Recommendations

a) Zoning for fishing on coastal zone

One of the key factors to the non-compliance of demersal trawl fishing vessels is the distinction between designated fishing zones deeper and shallower than the 20m isobaths, as inside the shallower zone, trawling cannot take place. The main species that trawling catch are shrimp that inhabit in the shallow bottom with muddy-sandy substrate, including coral reefs and seagrass beds. Fishing vessels, especially trawlers, fish predominantly in inshore areas shallower than 20m, irrespective of the bottom topography or sediment. Appropriate zonation and designation for suitable trawl able areas within 20m isobaths is requested. However, seagrass beds and coral reefs, and areas in proximity to mangroves (irrespective of bottom sediment) shall be determined as protected or conservation areas. Most large and middle-scale trawlers have GPS units on board, so small-scale trawlers should have GPS units on board as well. The GPS coordinates of non-trawling zones should be uploaded into all GPS units of the trawlers. Immediate roll-out of VMS units on all trawlers will facilitate the compliance with such zonation. By doing this, fish and other marine animals will be recovered in protected and conservation areas.

FiA shall start an immediate process to identify aspects of zonation in areas shallower than 20m isobaths. The zones division could then be linked to the licensing condition of fishing vessels. These zones should be promulgated as a declaration by MAFF.

b) Passive measures to enhance the environment protection and prevent trawling

The differences between surveyed data and monitored data on seagrass distribution indicate that there is still room for improvement. Kampong Som Bay is almost devoid of reports on seagrass. While the impacts on ecosystems is critical, seagrass has been replanted, particularly in areas with high turbidity. While seagrass has been replanted, mangroves should be replanted in order to reduce the turbidity.

The FiA should implement the activities in the following:

- Design an activity matrix for protection priorities;
- Select the best quality seagrass beds to be the highest priority;
- Any seagrass (irrespective of quality) that is important for endangered species (in CITES list or national criteria) or nursery grounds for commercially important juveniles as the highest priority;
- Select disturbing but not damaging seagrass beds to be 2nd top priority. Restore all patches into large ones. Select pilot areas to test whether seagrass beds can be restored as a prospective third priority, and alternate funding sources should be investigated.

c) Construction and deployment of concrete blocks

The primary function of concrete block construction (Figure 5 and Figure 6) is to reduce fishing in seagrass beds and designated coral reef areas. Anti-trawling concrete blocks will be the primary defence against trawling (Figure 5) in areas where it is prohibited. The construction of concrete blocks (Figure 6) for preventing other fishing gear from being used. The construction of concrete blocks (Figure 7) for habitat restoration, and it will be in the process of construction of more blocks.

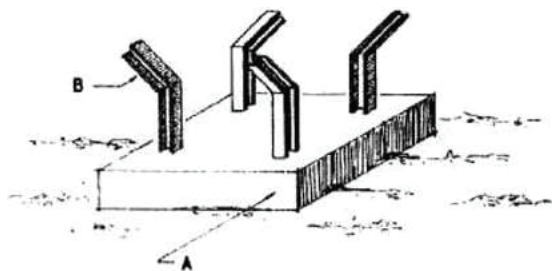


Figure 5: A concrete block used for preventing trawling

Construction method: It is built at the size of: 1m x 1m x 0.3m cement (stone, sand, cement, bamboo fibre), with 4 x 0.80m railway track, bent at 30 degree and re-welded at 0.25 cm from surface.

Deployment: Random placement at 35 % coverage of 100ha (65 anti-trawl blocks per 100 ha). Deploy primarily at the routes/paths from which illegal vessels approach the seagrass beds. Try to identify the best/densest areas of seagrass, and ensure that the block placement is adjacent to these optimal seagrass beds.



Figure 6: Concrete blocks used for preventing fishing gear

Construction method: 0.5m x 0.5m x 0.5m block on a 0.75m x 0.75m x 0.1m base (stone, sand, cement, bamboo fibre), 16-mm Rebar 4 x 1m - embedded in the block at 0.15 m depth, bent at the top for 30 – 60 cm. Make 4 additional 20-mm holes for potential replacement in the future.

Deployment: Random place at 35% coverage of 100ha (65 anti-trawl blocks per 100 ha). Try to deploy these blocks in empty space at or near coral reefs.

Habitat enhancement

Construction Method: 3 x 3 x3 m cube, hollow block with uprights and crossbars of 0.1m x0.1m x 0.1m cement (stone, sand, cement, bamboo fibre or reinforced steel bars).

Deployment: Find optimal habitat for Indian Mackerel species (consider on water depth and water quality). Deployment rate is suggested at 5 blocks per 100 ha. The design below is more complex, but a simple square upright and crossbeam design will be sufficient.

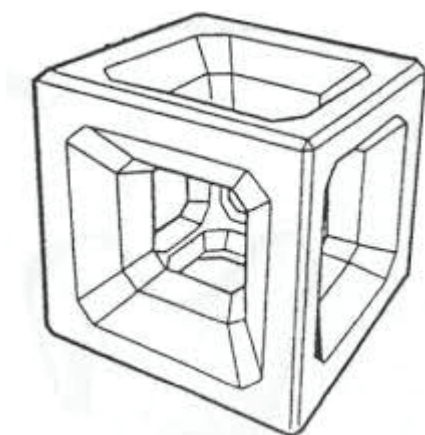


Figure 7: A concrete block used as a habitat for aquatic animals (artificial reef)

d) Coordination and capacity

With the devolution of authority, provincial authorities are empowered to manage fisheries resources. This is legally correct for inland fisheries, however, in terms of Cambodia's Maritime Law and the Fisheries Law, the provincial government's jurisdiction ends at international waters. Based on the real practices is that day-to-day management of fisheries resources is at the provincial level. However, based on the current practices of fisheries management, provincial authorities have not taken into consideration on provincial transboundary fisheries resources, which these resources could not be managed in disaggregated way.

Similarly, the enforcement cannot stop at the provincial water borders, when fishing vessels of all provinces arbitrarily cross borders and fish in neighbouring provinces. The coastal provincial authorities should cooperate for joint management of fisheries resources and law enforcement.

The FiA has better resources and means in terms of patrol boats and operational capacity than the provincial authorities. Resources, means and facilities at the provincial level are at a lower operational level, making it difficult to effectively conduct Control and Inspection at sea for all coastal provinces. The FiA and the FiACs shall cooperate, where the FiA shall assist the FiAC of each province to undertake patrols in inshore areas (<20m isobath) for minimum of 7 working days per month, for a period of 5 years or until the specific FiAC has enough resources and equipment to undertake such patrols by themselves.

6.3. Annex 3: The implementation of fishing Vessel Monitoring System (VMS)

The arrangements for the deployment of the cellphone VMS system, include:

Procedural arrangement:

- a) The FiA shall select one service provider who will provide the data (vessel position) including software, hardware and training to the fishing vessel monitoring office;
- b) The selected service provider will sell the VMS equipment to fishermen through the establishment of a 2-year contract;
- c) The VMS sold to fishermen should include functionalities that are directly beneficial to fishermen, such as e.g. an auto alarm system; and
- d) Fishing vessels will have to be equipped before the owners making a request for a fishing license.

VMS deployment will be started with firstly the largest vessels, then followed by other vessels (see **Error! Reference source not found.**)

Cost: The large- and middle-scale fishing vessels will be required to purchase the VMS equipment and cellphone service contracts. Equipment for small trawlers (less than 12m LOA), there will be subsidized by the government for planting the VMS.

It is expected that the VMS on small trawlers (<12m) will be in place in the third year of VMS deployment plan. These subsidies could take the form of direct payment to the supplier based on the number of units sold (no payment made to fishermen), or a discount on the cost of licensing for the first year of the plan.

6.4. Annex 4: Fish Catch Assessment Surveys

Arrangements for the monitoring marine catches are:

Logbooks will be only used for large and middle scale fishing vessels, as it will require a lot of resource for processing. Logbooks from the middle-scale vessels (which are estimated to be in the range of 2,000 to 3,000) are without much workable as the information in most of the time is not reliable.

In addition, monitoring of fish catch will rely on a combination of tools and methods, which are in the following:

- a) Voluntary catch reported by fishermen, using an application such as Abalobi (from previous experience, samples are around 20% within small-scale fishermen, mostly from women who also find that the tool is useful to record their sales and manage family business).
- b) Catch surveys to be conducted by MaFREDI, include:
 - b.1) A marine fish catch assessment survey, which shall record all catches landed from all fishing boats at fishing ports or landing sites during identified number of days; and the survey shall be repeated twice a year. This type of survey shall provide a good understanding of the situation of fish stock and changes (through repeating survey);
 - b.2) A statistical data collection from fishing ports or landing sites, which have promptly been selected as samples, for analysing within the whole year.

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