Promoting Community-based Climate Resilience in the Fisheries Sector

Environmental and Social Management Framework

FISHERIES DIVISION, MINISTRY OF INDUSTRY, COMMERCE, AGRICULTURE AND FISHERIES

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Environmental and Social Management Framework
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Acronyms

BP	Bank Procedure	NEGAR	National Ecological Gap Assessment Report
CBD	Convention on Biological Diversity	NEPA	National Environment and Planning Agency
C-CAM	Caribbean Coastal Area Management Foundation	NRCA	Natural Resources Conservation Authority
CEO	Chief Executive Officer	NSWMA	National Solid Waste Management Authority
CFRAMP	CARICOM Fisheries Resource Assessment and Management Program	NWC	National Water Commission
CITES	Convention on International Trades of Endangered Species of Wild Flora and Fauna	OP	Operational Policy
CMS	Conservation of Migratory Species of Wild Animals	P&L	Permit & License
CRFM	Caribbean Regional Fisheries Mechanism	PAD	Project Appraisal Document
EA	Environmental Assessment	PCCR	Promoting Community-based Climate Resilience in the Fisheries Sector
EEZ	Exclusive Economic Zone	PCT	Project Core Team
EIA	Environmental Impact Assessment	PIF	Project Information Form
ESMF	Environmental and Social Management Framework	PIOJ	Planning Institute of Jamaica
EMP	Environmental Management Plan	POM	Project Operational Manual
EPI	Environmental Performance Index	PPCR	Pilot Program for Climate Resilience
EPMP	Environmental Policy and Management Procedure	PPCR-SC	PPCR Steering Committee
ESIA	Environmental and Social Impact Assessment	PPCR-PIU	Fiduciary Services Unit for the PPCR
FAD	Fish Aggregating Devices	SFCA	Special Fishery Conservation Area
FAO	Food and Agriculture Organization	SIDS	Small Island Developing States
GOJ	Government of Jamaica	SPAW	Specially Protected Areas and Wildlife
HEART	Human Employment And Resource Training	SPCR	Strategic Program for Climate Resilience
IAC	Inter-American Convention for the Conservation of Sea Turtles	TCPA	Town & Country Planning Authority
ICDIMP	Improving Climate Data and Information Management Project	TEF	Tourism Enhancement Fund
ICRI	International Coral Reef Initiative	TOR	Terms of Reference
IUCN	International Union for Conservation of Nature	TPDCo	Tourism Product Development Company
JNHT	Jamaica National Heritage Trust	UNESCO	United Nations Educational, Scientific and Cultural Organization
JTB	Jamaica Tourist Board	USAID	United States Agency for International Development
LDUC	Land Development & Utilization Commission	WB	World Bank
MICAF	Ministry of Industry, Commerce, Agriculture and Fisheries	WHMSI	Western Hemisphere Migratory Species Initiative
MOAF	Ministry of Agriculture and Fisheries	WHO	World Health Organization
MOH	Ministry of Health		

MPN Most Probable Number

1. Introduction

"Jamaica achieves its goals of growth and prosperity for its people, while meeting the challenges of climate change as a country with enhanced resilience and capacity to adapt to the impacts, and to mitigate the causes in a coordinated, effective and sustainable manner".
(Vision Statement, Climate Change Policy Framework, 2012)

Jamaica, like other Small Island Developing States (SIDS), is particularly vulnerable to the impacts of climate change in terms of increasingly severe and unpredictable weather events, rising sea level, warming oceans, and vector-borne diseases. The country's natural resources, economic development and social well-being are at risk as parameters of change threaten key sectors, livelihoods and settlements.

Vision 2030, Jamaica's National Development Plan, which provides the framework to allow for mainstreaming climate change issues into national policies and development activities, targets a **Healthy Natural Environment** as Goal # 4 , and climate change adaptation is included in National Outcome #14 *Hazard Risk Reduction and Adaptation to Climate Change*. Jamaica has developed a Strategic Program for Climate Resilience (SPCR) as part of the Pilot Program for Climate Resilience (PPCR) that will assist in climate proofing the country's development. The SPCR is aligned to Vision 2030 and builds on gaps and challenges identified in the development strategy.

In November 2012, the PPCR Sub-Committee agreed to allocate USD$5 million in grants to Jamaica in order to advance the objectives and implementation of Jamaica's SPCR. This allocation is intended to support the Project ***"Promoting Community-based Climate Resilience in the Fisheries Sector (PCCR)"***, which aims at enhancing community-based climate resilience among targeted fishing and fish farming communities of Jamaica. This project aligns well with the SPCR's Investment Project 1 – ***"Improving Climate Data and Information Management Project***, (**ICDIMP**) which aims to improve the quality and use of climate related information for effective planning and action at local and national levels, including improvement of early warning systems for fishers.

The key outcomes expected from the PCCR Project include:

1. Strengthened and climate-smart fisheries and aquaculture policy and regulatory framework;
2. Reduced vulnerability of the targeted fishing and fish farming communities to climate shocks;
3. Diversified and strengthened livelihoods of targeted artisanal fishers and fish farmers.

The above-mentioned outcomes will be accomplished through four project components. Components 1, 3, and 4 deal with policy, training and management issues, while **Component 2** deals with *Diversification, Alternative Livelihoods and Aquaculture for Sustainable Fisheries and Aquaculture*.

This Environmental and Social Management Framework (ESMF) relates to the implementation of **Component 2.** Activities under this component must be compliant with World Bank Environmental and Social Safeguards, and Jamaican national law. The ESMF has been prepared to:

- Establish procedures for screening all proposed sub-projects that will fall under Component 2 of this project for their potential environmental and social impacts.
- Suggest measures for managing, mitigating and monitoring environmental impacts during project operation.

A draft of this ESMF was presented at a consultation meeting in February 2017, and disclosed again in March 2017 to relevant stakeholders. The final ESMF reflects comments and observations received and shall be referenced as part of the Project Operational Manual (POM).

It should be noted that the ESMF was developed using best available data and information, which may not necessarily represent the most recent data. Where possible, the Executing Agency should consider more recent data to ensure accuracy.

2. Existing Environmental and Social Situation of the Fisheries Sector

2.1 Jamaica's Marine Resources

Jamaica's coastal zone and marine resources provide social and economic benefits to Jamaica's population through activities such as fishing and tourism, and accommodate the majority of Jamaica's population.

The island's irregular coastline is 795 km long and has diverse coastal features and ecosystems including harbours, bays, sandy beaches, rocky shores, estuaries, wetlands, mangrove swamps, seagrass beds and coral reefs. The majority of living marine resources are found on the main island shelf and nine proximal banks, which cover an area of 4,170 sq. km. This area does not include the Pedro and Morant Banks. The island shelf is much wider on the south coast with a maximum width of approximately 24 km. On the north coast, the shelf averages only 1.6 km in width. It is interesting to note that the area of Jamaica's territorial waters exceeds that of the main island and over 8.8 percent (1,800 sq km) of the country's archipelagic waters covering 22,000 sq km) is designated marine protected area (USDS, 2004).

Jamaica's marine ecosystems (beaches, coral reef, mangrove and seagrass) have in general been declining in quantity and quality, though data on each is variable. Causes for this decline have been attributed to multiple factors and are summarized below in Table 1 (NEPA, n.d.; NEGAR ,2009). As an example, Jamaica's coral reefs are generally in 'poor' condition (Coral Reef Health Index value of 2.1) (NEPAb, 2014). On average hard coral cover was 20.3 percent and macro-algae cover was 28.3 percent. The 2013 Coral Reef Report Card highlighted that harvesting of commercially important fish species and herbivorous fish were having a negative impact on the coral reef health.

Table 1: Threats to Jamaica's marine ecosystems

	Beaches	Coral Reef	Mangrove Forests	Seagrass beds
Coastal Development (and its negative impacts such as increased sedimentation, physical removal, etc.)	✓	✓	✓	✓
Poor Water Quality (solid waste, fouling from chemical spills, nitrification from run-off, thermal discharges, etc.)		✓	✓	✓
Poor fisheries management (overfishing, fishing of key ecosystem species, destructive fishing practices)		✓	✓	✓
Harvesting for agriculture, fisheries, charcoal burning, sand mining and/or construction	✓	✓	✓	
Poor public perception and disregard		✓	✓	✓
Physical damage from marine users (e.g. damage from anchors, etc.)		✓	✓	✓
Erosion	✓			
Hurricane and storm damage	✓	✓	✓	✓
Loss of key ecosystem species (*Diadema*, parrotfish, etc.)	✓	✓		

To help conserve Jamaica's marine resources, the Government embarked upon a series of activities, including establishment of protected areas viz., Marine Parks, Conservation Areas, Marine Protected Areas, Ramsar sites, Special Fishery Conservation Areas (SFCAs), etc. (NEGAR, 2009). Some of the marine conservation targets identified in the National Ecological Gap Assessment Report (NEGAR) (2009) include broad, 'coarse' targets of sandy shores, rocky shores, mangroves, estuarine areas, seagrass beds, corals and coral reefs, soft bottom communities, cays and offshore banks, and more detailed, 'fine' targets of seabird nesting and roosting areas, overwintering shorebird areas, turtle nesting beaches and manatees.

Based on the gaps identified in the NEGAR (2009) which fall under either representation, ecological or management gaps, recommendations include, among others:

1 Implementation of sustainable financing mechanisms (for protected areas)
2 Strengthen and improve capacity of government and environmental agencies and protected area managers
3 Strengthen Environmental Impact Assessment (EIA) process, particularly for those developments in or near protected areas
4 Research on marine, terrestrial, and freshwater ecosystem connectivity
5 Establish status of critical resource stocks

2.2 The Fisheries Sector

The fisheries sector in Jamaica is comprised of both artisanal and industrial levels, and provides employment directly and indirectly to some 40,000 fisher folk, whilst also contributing to the livelihoods of over 200,000 (PCCR, 2015). Jamaica which has one of the highest levels of fish consumption per capita in the Americas (30.6 kg per year), and is highly dependent on imports, which account for about 79% of all fishery products consumed domestically (FAO Food Balance Sheet, 2013). In 2010, the industry output was valued at over US $90 million. Fishery imports are the third most important food item bought abroad by Jamaicans, and accounted for 12% of total food imports in 2010 (FAO Food Balance Sheet, 2013). Given the economic significance of fisheries, the Fisheries Division continually explores mechanisms to optimise regulation.

The fisheries sector is typically categorized into (i) inland, freshwater; (ii) marine capture; and (iii) aquaculture sub-sectors. The inland, freshwater fishery in Jamaica is small and limited to subsistence or small-scale commercial fishing (Masters, 2014). However Jamaica's marine capture and aquaculture sub-sectors are highly developed and economically significant.

2.2.1 Capture Fishery

At the end of 2015, there were 23,631 registered fisher folk and 7,133 registered boats operating from 187 fishing beaches and 2 cays located at the Pedro Bank (ESSJ, 2015). Whereas Jamaica's capture fishery primarily targets its reef finfish fisheries, other fisheries such as lobster and Queen Conch play an important role in Jamaica's export market. This is especially so for conch.

The marine fishery resource in Jamaica includes those within the Archipelagic Waters (22,000 sq. km), Territorial Sea (17, 995 sq. km), Exclusive Economic Zone (181,190 sq. km) and Jamaica/Colombia Joint Regime Area (52036 sq. km) (USDS, 2004). Jamaica's total maritime space is approximately 24 times the size the main island (10,990 sq. km).

The major fishing grounds include the EEZ, the nine proximal banks (New Bank, Blossom Bank, Walton Bank, Mackerel Bank, California Bank, Albatross Bank, Henry Holms Bank, Grappler Bank, Formigas Bank), two offshore banks (Morant and Pedro), and the main island shelf (See Figure 3). These fishing grounds provide a source of livelihoods for thousands of fisher folk and their families who access the grounds via numerous active fishing beaches of varying sizes (See Figure 1 and Figure 3).

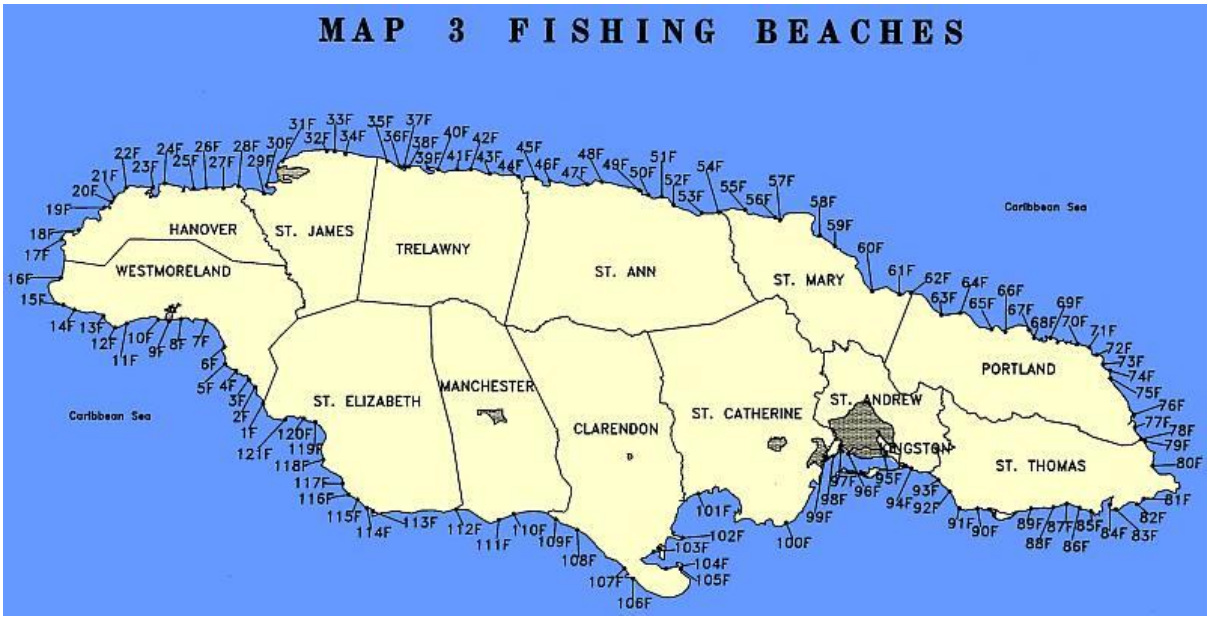

Figure 1 Map of fishing beaches located on mainland Jamaica (NEPA, n.d.)

Jamaica's marine capture fisheries production has seen one of the most dramatic declines in the region falling from 11,000 mt/year to 7,000 mt/year in the 1960s from (Hardt, 2009). Then, between 1996 and 2001, fisheries production increased and ranged between 9,000 and 14,000 mt, due to the improved fishing technology and the increase in the number of fishing boats (Draft Fisheries Policy, 2008)(See Figure 2). It is significant to note that for calendar year 2015, fish production was estimated to have improved by 14.2 percent (PIOJ, 2016). The increase in production was linked to the growth in marine fish production by 15.1 percent to 12,961 mt. The increase in marine production was, in part, attributed to a reduction in the price of fuel which made it more affordable for fisher folk to engage in fishing activities (PIOJ, 2016).

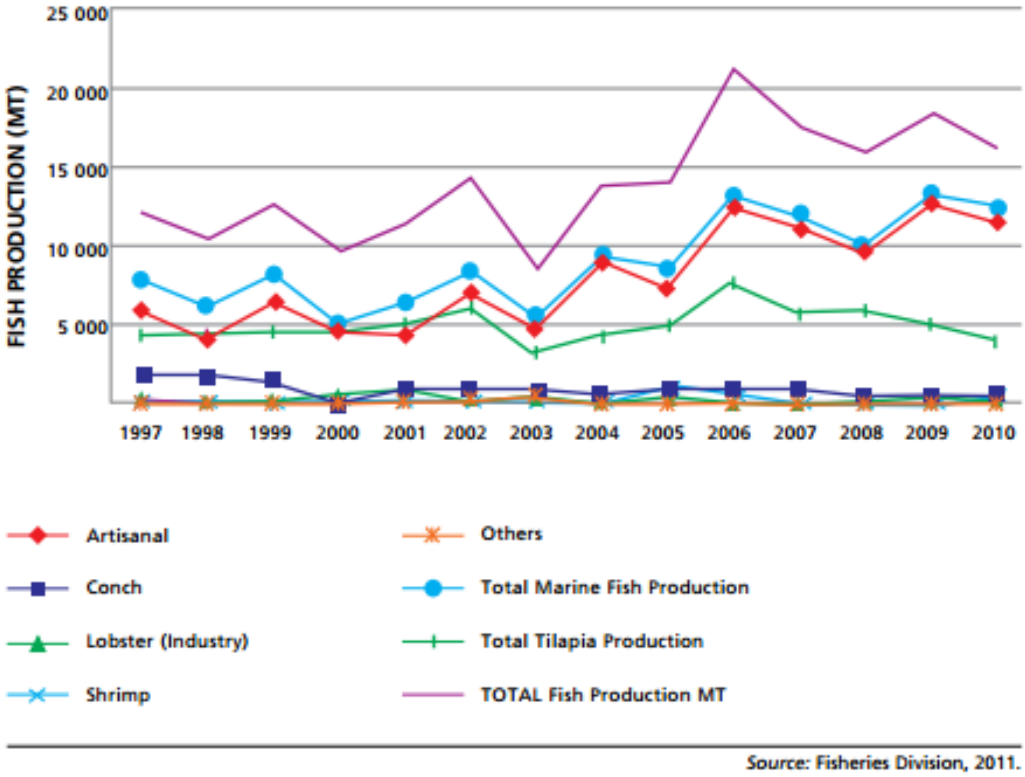

Figure 2: Fish Production in Jamaica (1997-2010)

While data show that overall, national trends in fish catch volume and values have been relatively stable, if low, in recent years, studies also show that the quality and average size of fish landed are declining, with a shift in catch composition to smaller fish and to "trash' fish species such as Doctorfish. This compares with large, high value species such as Snapper (Murray and Aiken, 2006; Selvaraju et al, 2013). Most of the fish caught are young adults or juveniles, reflecting signs of severe over-fishing and over- exploitation of the fish resource. There is a significant dependence and stress on the marine fishery as available fish stocks within the inshore fisheries are considered inadequate to support a viable fishing industry (Murray and Aiken, 2006).

It should be noted that Jamaica's conch fishery is sustainably managed and plays a considerable role in Jamaica's export. Additionally the pelagic fishery including species such as wahoo, tuna and diamond back squid are considered to be underutilized and with similar management to the conch fishery could provide a significant, additional fishery resource (Kong, 2017 *person comm)*.

Jamaica's fishing resources are primarily reef and reef associated finfishes, and these are considered to be over-exploited. This can be attributed to numerous sources including extreme natural events, unsustainable fishing practices (including spear fishing, use of seine nets in nursery areas, and dynamite

on reefs), lack of awareness by fishermen about fisheries management, pollution and destruction of critical marine ecosystems (Selvaraju et al, 2013). These practices negatively impact the coral reefs resulting in degradation of breeding grounds for juvenile fish (Selvaraju et al, 2013). Climate change is expected to exacerbate these problems. The challenges being experienced in Jamaica's fisheries sector were reflected in the low score (24.8) recorded for the Fisheries indicator of the Environmental Performance Index (EPI) 2016 (PIOJ, 2017).

Jamaica's overfished stock represents not only an ecological concern, but a social and economic one as fishers are forced to work harder – use more fish traps, increase fishing trips, and travel further out to sea to maintain their level of catch. The majority of fishers have to supplement their income with other forms of employment such as agriculture and tourism. Additionally persons in complementary industries like vending and cleaning, the majority of whom are women, report competition from young men who can no longer support their livelihood as fishers.

2.2.1 Aquaculture

Aquaculture has globally been considered as a key activity to increase fish production. In Jamaica, it has been suggested that the industry is key to the provision of fish. Commercial aquaculture was first introduced to Jamaica in 1976 through a USAID/GOJ funded project (MOAF, 2011). The main food fish produced in Jamaican aquaculture both for local consumption as well as for export is Tilapia. However, the aquaculture industry has expanded to include mangrove oysters and ornamental aquatic flora and fauna species (MOAF, 2011).

Aquaculture in Jamaica peaked in 2007 producing up to 7,000 mt, but has declined since then (Kong, 2017 *person comm)*. For example, aquaculture production fell by 7.4 percent to 646 mt for the calendar year 2015 (PIOJ, 2016). This fall-off was attributed to among other things, the continued scarcity of red tilapia seed stock which negatively impacted production, as well as the drought conditions during the year which affected pond operations (PIOJ, 2016). These conditions are typical of the challenges faced by the aquaculture sub-sector (Negroni, 2016) which also include:

- Weak to no advocacy from the industry, which may not yet realize its economic and social significance, and potential strength.
- Lack of funding for working capital financing, re-financing and upgrading
- High demand on water supply/water availability (ACP Fish II-EU, 2013).
- Suitable soil type (ACP Fish II-EU, 2013).
- Poor consumer perception of fresh-water fish in terms of taste and quality (compared to marine product)
- Poor production practices at some farms
- Cost of feed production
- Praedial larceny

Although larger aquaculture operations do exist, many of the farmers in Jamaica are small-scale with less than 1.0 ha of land. (ACP Fish II-EU, 2013). According to Negroni (2016) the main characteristics of aquaculture in Jamaica are a predominance of small holders, 90% inland Tilapia production, and poor competitiveness.

It was believed that aquaculture could provide more jobs in the respective communities and relieve some pressure from the marine fishery, provided the environment for its growth was facilitated and some of the key challenges above addressed (National Export Strategy, 2009).

2.3 Fisheries Management in Jamaica

Governmental supervision of the fishing industry in Jamaica began in December 1949, and currently falls under the Fisheries Division of the Ministry of Industry, Commerce, Agriculture and Fisheries (MICAF). The Ministry deals mostly with fish culture and the management and conservation of fishery resources, and is responsible for the administration of fisheries management laws such as the Fishing Industry Act (1975). MICAF also implements different fisheries management mechanisms including gear and equipment regulations, closed seasons for select species, regulation of fishing licenses, etc. Fines for violation of regulations are under the jurisdiction of the courts.

One fisheries management mechanism employed by the Fisheries Division was the declaration of seventeen marine areas as Special Fishery Conservation Areas (SCFA) – also known as fish sanctuaries (MOAF, 2012) (See Figure 3). These include the recently declared East Portland SFCA in Portland, and Boscobel East and West (rotational SFCAs) in St Mary (Kong, 2017 *person. comm.*). Each SFCA varies in size, ecosystems present, and management. Currently, management across the different SFCAs varies between government, community-based organizations, fishing organizations, private sector, and partnerships. The SFCAs prohibit fishing activity without special permission from the Government (e.g. authorization to cull the invasive Lionfish). This has allowed for the protection and rehabilitation of remaining fish stocks and the protection of large fish with the notion that they produce and fertilize more eggs than do smaller fish. This activity to protect and enhance the fish stock is intended to promote increased biodiversity in coastal and marine areas. A small amount of data exists on the success of the SFCAs, but most noticeably is that of the Oracabessa Bay SFCA which showed a 1,313.05 percent increase in fish biomass between 2011 and 2014 (NEPA, 2014).

Figure 3: Location of fourteen of Jamaica's SFCAs (also known as Fish Sanctuaries). This map does not include the recently added East Portland (Portland) or Boscobel East and West (St. Mary).

With respect to aquaculture, the Aquaculture Branch of the Fisheries Division has been mandated to provide the support mechanisms needed to foster the sustainable development of the sector (MOAF, 2011). This is to be achieved through the following:

- Provision of Extension Services to fish farmers
- Provision of other support services including sale of high quality ornamental and food fish seed stocks
- Engaging in adaptive research of economically important species of freshwater flora and fauna and
- Training and technology transfer

Fishers have articulated challenges they face and at the local level, the majority of fishers form informal groups or associations to facilitate assistance (See Figure 4). Island-wide consultations revealed some of the key challenges (Campbell, 2017):

- Management
    - Tenure of fishing beach
    - Conflicting use of marine space (fishers, tourist operators)

  - Poor enforcement of fisheries laws
  - Access and cost of insurance, fuel, etc.
  - Lack of financial resources and management
  - Management of fishing organizations (keeping membership up, internal communication)
- Environment
  - Destruction of coastal ecosystems (beach erosion, mangrove removal, etc.)
  - Declining condition of marine resources (quantity and quality of fish stock, coral reef health)
  - Waste management and pollution of waters
  - Climate change (changing fishing grounds, weather patterns, etc.)

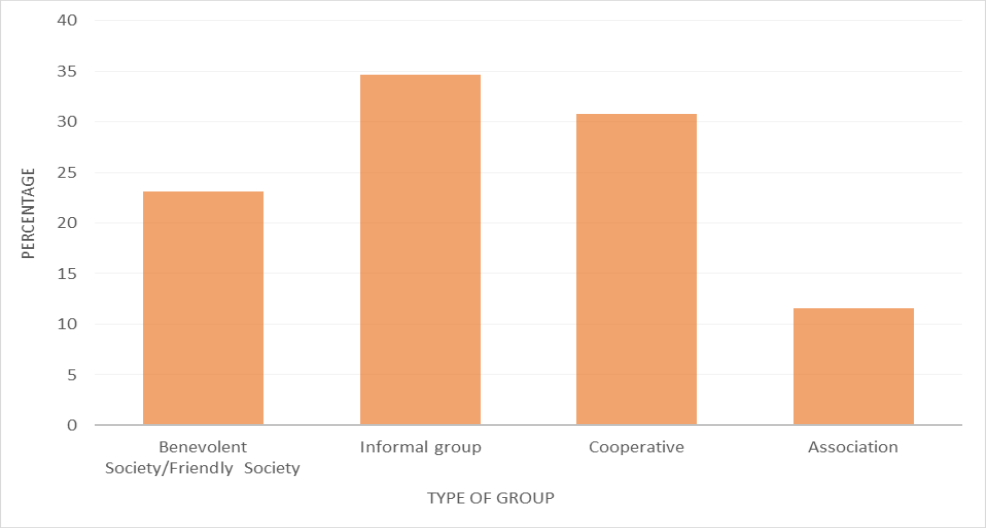

Figure 4: Types of fishing groups in Jamaica (Campbell, 2017)

2.4 Pursuing Livelihood Diversification for Fishers

The need to implement programs and frameworks to ensure that the fisheries sector is more resilient and adaptive to climate change has been an on-going initiative of many national economies and is considered necessary for Jamaica. The industry is key to:

- Nutrition and Food Security
- Poverty alleviation
- Employment
- Creating Opportunities for Women
- Foreign Exchange Balance
- Support for Alternative Income Generating Opportunities

The challenges faced by fisher folk have sparked numerous initiatives targeting alternative livelihood opportunities. Providing alternate forms of income for fishers is one approach. The success of these initiatives depends on a variety of factors including the willingness for established fisher folk to change

or diversify their livelihood, their capacity to adapt to new skills, market readiness for new services/products developed and environmental and economic conditions, among others.

Land tenure poses a big problem for many fishers in the country (Campbell, 2017). Most fish landing sites are informal and not owned by the fishers. In some cases, such as Oracabessa Bay the land is under lease from the owners to the fishers, or as in the case with Bluefields Bay land is leased to a group of different users including fishers. This means that the type of activities occurring or potentially occurring on landing sites is restricted to temporary non-capital intensive projects for which land ownership is not a prerequisite (Jones, 2017).

One of the most popular alternative livelihoods suggestions for and from communities is that of tourism development. Although potentially viable, the fishing groups face numerous challenges including land tenure, appropriate licensing, certifications and permits, training and capacity building, and access to market. Some of the required or suggested certifications and licenses from the Ministry of Tourism include the Jamaica Tourist Board (JTB) license, the Tourism Enhancement Fund (TEF) Rest Stop certification, Water Sports license and Tour Guide and TEAM Jamaica certification for employees. In addition to this, NEPA has a number of permitting procedures for land- or water-based attractions including beach permits, eco-tourism permits, and sea-floor modification permits. A number of policies pertinent to beach licensing including management of the foreshore, public access, provision of adequate and safe restroom facilities, security, water supply, good water quality, pollution mitigation, protection of wildlife, etc. (Jones, 2017).

Oftentimes the application procedure for tourism-related licenses is too onerous for community-based organizations or fishing groups. For example the Jamaica Tourist Board Attraction Application requires the submission of up to 30 documents if the attraction is water-based, including proof of insurance, lease/rental agreements, food handler's permits, public health certificates, approval from regulatory agencies, numerous certifications etc. Practically, fishing organizations do not have the capacity or resources to fulfill these requirements. In addition to national permits, licenses and certification, tour companies are more likely to support sites that provide full amenities, and secure environments (Jones, 2017).

Another approach to livelihood diversification includes the exploration of alternate fishing grounds or techniques which include exploration into offshore marine species (e.g. tuna) or freshwater aquaculture species (e.g. Pangasius). Jamaica is thought to have un-utilized species (e.g. diamondback squid, sea urchins) and under-utilized species (e.g. pelagic finfish such as wahoo, tuna). These resources are currently being explored by the Fisheries Division as a form of diversifying the fisheries livelihood (Kong, 2017 *person. comm.*). This approach is particularly relevant when considering that some of the predicted impacts of climate change include migration and shifts in marine fish species, and uncontrollable weather pattern shifts.

2.5 Climate Risk

The Caribbean is expected to be among the earliest and most impacted by climate change over the course of this century, with the impacts being felt from "ridge to reef" (Pulwarty et al. 2010; Simpson et al. 2009). The vulnerability and sensitivity of SIDS to the negative effects of global climate change is largely seen as a function of their relatively small geographic size, high coastal population densities, poorly developed infrastructure, limited natural and human resource base, open economies, and location in regions highly prone to extreme weather events such as hurricanes and droughts (Gamble et al. 2010; Mimura et al. 2007; Nurse et al. 2001; Nurse and Moore 2005; Pelling and Uitto 2001). It is also attributed to their heavy dependence on climate sensitive sectors such as agriculture and tourism. Therefore, the impacts will vary across islands, sectors and different socio-demographic groups. The current trends and predictions point to a state of increasing vulnerability for the Caribbean, largely through four main variables – Temperature, Precipitation, Hurricanes and Storms, and Sea Level Rise, *inter alia* (See Table 2).

Table 2 Climate Change Impacts for the Caribbean and Jamaica

Climate Variable	Current Situation	Projection
Temperature	• Caribbean temperatures have increased by 1° in the last century • Warmer days and nights have increased since 1960 • Cold days and nights have decreased since 1960	• Increase by between 0.7°C and 2.4°C by the end of the 21st century (and up to 4° in some models)
Rainfall	• Change in rainfall patterns (intensity, frequency, duration)	• Shorter rainy seasons, longer dry seasons, , increased and more intense flooding events • 25-30% drier by the end of the century • Annual precipitation varying from –29% to +14% with a median value of -5%.
Hurricanes and Storms	• Noticeable increase in frequency since 1995 • Increase in storm strength	• More intense storms predicted (wind speed) • No significant predicted change in frequency
Sea Level Rise	• Caribbean's rate is approximately 1.7mm a year (between 1950 and 2010) • Some areas show an increase in rate between in latter years	• 0.26 – 0.82m by 2100 (and up to 1.5m in some models)

(IPCC Fifth Assessment Report, 2013; Gamble and Curtis 2008; Gamble 2009; Chen and Taylor 2002; Taylor et al. 2011., Taylor, M. 2016).

Each of the impacts is projected to affect broadly across ecosystems, societies and economies, and to increase pressure on all livelihoods and food supplies. The economic loss from climate change in these sectors is estimated to be millions of $USD. For example, increasingly frequent storms and hurricanes often mean destruction of fishing infrastructure and fishing habitats, while also making it too dangerous to go to sea. The impacts also affect the fisheries sector through increased vulnerability of fishing-dependent coastal communities through shoreline destruction (erosion and storm damage) and will be compounded by issues such as poorly planned coastal development and sedimentation resulting from land-based sources of pollution (Selvaraju et al, 2013).

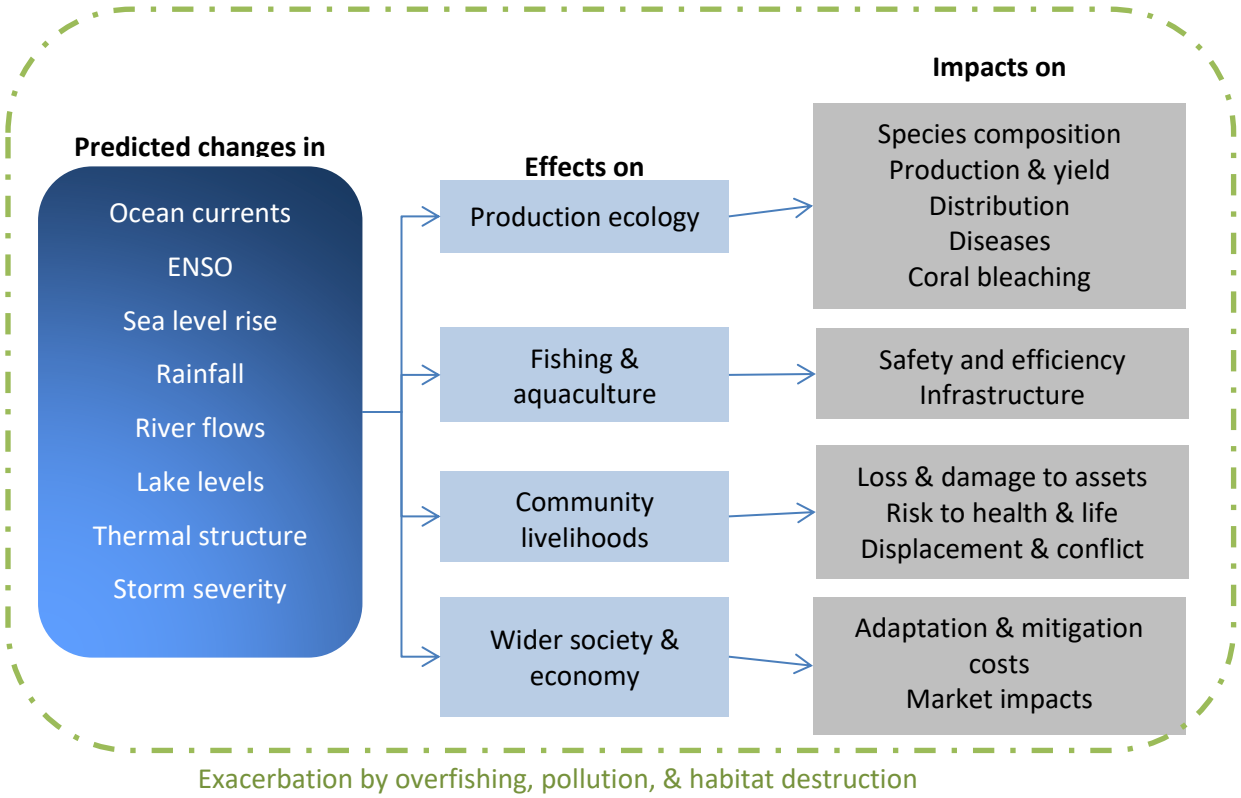

Figure 5 Impacts of Climate Change on Fisheries & Aquaculture. Modified from Badjeck et al., 2010.

As noted in Figure 5, the impacts of climate change on the sector are further exacerbated by other factors including but not limited to overfishing, pollution, and habitat destruction. These can severely affect the number, composition and biodiversity in coastal and marine areas. More effective fisheries management strategies/alternatives that try to address the issues of overfishing etc., can lead to opportunities for increasing local fisheries production, and improving the livelihoods of those involved in the fisheries sector. Additionally, strategies to diversify fishing livelihoods will help reduce fishing pressure on traditional, over exploited reef and reef associated finfish resources.

3 Description of Projects

As outlined in the PCCR proposal, Component 2 (Diversification, Alternative Livelihoods and Aquaculture for Sustainable Fisheries and Aquaculture), includes emphasis on three subcomponents as follows:

- Promoting Community-based Aquaculture – which involves the establishment of fish farm clusters in selected communities, contracting new fish farmers and providing inputs and farming materials by partnering with aquaculture/processing enterprises, and providing training. This subcomponent would support fisher folk, women and youth in targeted fishing communities to invest in aquaculture;

- Developing Coastal Mariculture/Polyculture – which are commercially viable and ecologically important with the aim of increasing marine-based sustainable livelihoods activities that keep the communities' seafaring traditions alive; and

- Exploring Artisanal Fishery for Pelagic Species – which includes the establishment of fisheries for coastal and offshore pelagic species (e.g., FAD fisheries).

The activities under Component 2 listed above are expected to synthesize directly with the other components of this PPCR Project. In addition to this however, other PPCR Projects will also be complementary to these activities. For example, under PPCR's Investment Project 1 "Improving Climate Data and Information Management", it is expected that fishers could benefit from improved early warning systems (predictions or communications of these predictions) through improved technology at the Meteorological Service of Jamaica.

The below Table 3 outlines the potential sub-projects, as identified in the Project Appraisal Document (PAD).

Table 3: Summary of sub-projects and activities under Component 2 as outlined in the Project Appraisal Document

Key Activities	Direct Beneficiaries / Possible Location
Subcomponent 2.1: Promoting and Developing Community-based Freshwater Aquaculture and Coastal Mari-culture/Poly-culture.	
• Support for new and/or existing climate-smart capture/culture practices among the stakeholders (e.g. windbreaks, short season species e.g. short maturation hybrid, water management, more efficient feed, green water system, aquaponics system, ecosystem (coral, mangrove and seagrass) restoration, fish sanctuaries, alternative energy, beach recovery system, artificial reef) • Pilot testing the delivery of agrometeorological climate services for inland freshwater aquaculture operations.	• Fish farmers and all Fish Sanctuary sites. Sites/communities already engaged in ecosystem restoration activities. For example: ○ Coral gardening in Bluefields Bay/Oracabessa ○ Mangrove restoration in the Portland Bight Protected Area led by C-CAM ○ Sustainable energy system – Whitehouse • The agromet service will build on recent advances in climate services in the Agriculture sector and will benefit inland freshwater aquaculture operators
• Establishment of (private) hatchery for tilapia, pangasius, bivalve mollusk, sea cucumber, ornamental fishes, finfish, Irish moss as well as other proposal from fish farming communities. • Species-specific hatchery management plans and applied research for broodstock/fingerling production • Strengthen private sector partnerships and marketing (and possibly certification) of selected species (e.g. tilapia, pelagics, and oysters).	The Aquaculture Branch facility at Twickenham Park has been identified as the location for the hatchery – however, a proper site assessment will be required. This will also include the establishment of a private sector engagement strategy for the production of seed for other important fish species in Jamaica e.g. tilapia, pangasius, and oysters where possible. Possible locations for community aquaculture activities include: ○ Oyster Production – Bowden, Green Island and Falmouth ○ Pelagic – Whitehouse, Alligator Head, Oracabessa ○ Tilapia – Hill Run.
• Support for existing oyster production.	• Bowden (St. Thomas) – Farm established • Green Island (Hanover) – Farm established • Falmouth (Trelawney) – Possible location • Port Antonio (Portland) – Possible location
• Enhance fisheries – tourism linkages to increase livelihood options at the community-level while supporting sustainable financing for SFCMA.	• Oracabessa Fishers Association (St Mary) • Bluefields Bay Fishers Friendly Society (Westmoreland) • Caribbean Coastal Area Management Foundation (Clarendon)

• Some community-based groups have already made good progress towards improving fisheries-tourism linkages.	
Subcomponent 2.3: Exploring Artisanal Longlines for Coastal and Offshore Pelagic Species	
• Pelagic fisheries stock assessment to determine the feasibility/sustainability of coastal and offshore fishing • Implement skills-based training workshop series for persons engaged in coastal and offshore pelagics. Training topics include navigation, safety at sea, long lining technology and ship husbandry. • Provide equipment to support offshore fisheries (e.g. boats, safety equipment, fishing gear)	• Training series will be organized in strategic locations around the island to provide all interested fishers with opportunities to participate. Training will be delivered in collaboration with the Caribbean Maritime Institute, Human Employment And Resource Training Trust (HEART) and other relevant agencies. • Fishing groups and members will benefit from improved capacity to fish offshore

Some of these activities are implemented at a national level, and other pilot projects will be implemented at select locations. Some of the activities also have synergies with Components 1, 3 and 4.

4 National & World Bank Environmental Requirements

The proposed sub-projects under the PCCR (listed above) must meet the requirements of:

a) Jamaica's environmental, health and safety laws and regulations
b) World Bank Environmental Safeguard Policies

4.1 Jamaica's Environment, Health and Safety Laws and Regulations

4.1.1 National Legislation

In Jamaica, there are 52 statutes that have direct or indirect jurisdiction over matters of the environment. These range from the public health to physical planning and land use, with many instances of overlapping responsibilities among Ministries. Relevant national legislation for the Project is outlined in the sections below.

The Natural Resources Conservation Authority (NRCA) Act

The Natural Resources Conservation Authority Act provides for the management, conservation and protection of the natural resources of Jamaica. This Act was passed in the Jamaican Parliament in 1991 and subsequent to this; the NRCA was established. The NRCA tasks include taking the necessary steps to ensure the effective management of the physical environment of Jamaica, and the management of marine parks and protected areas.

The Act also gives power of enforcement of a number of environmental laws to the NRCA, namely the *Beach Control Act* (section 0), *Watershed Act* and the *Wild Life Protection Act*, as well as a number of regulations and orders including:

- Natural Resources (Marine Parks) Regulations, 1992 (and Amendment) Regulations, 2003;
- Natural Resources (National Parks) Regulations, 1993 (and Amendment) Regulations, 2003;
- Natural Resources Conservation (Permits and Licenses) Regulation, 1996;
- Natural Resources Conservation (Ambient Air Quality Standards) Regulations, 1996;
- Natural Resources (Hazardous Waste) (Control of Transboundary Movement) Regulations, 2002;
- The Natural Resources (Prescribed Areas) (Prohibition of Categories of Enterprise, Construction and Development) Order 1996;
- Natural Resources Conservation (Coral Spring – Mountain Spring Protected Area) Order, 1998;
- Natural Resources Conservation (Palisadoes-Port Royal Protected Area) Order, 1998;
- Natural Resources Conservation (Portland Bight Protected Area) Order, 1990;
- Natural Resources Conservation (Ocho Rios Marine Park Protected Area) Order, 1999;
- Natural Resources Conservation (Negril Environmental Protection Area) Order 1997; and
- Natural Resources Conservation (Negril Marine Park) (Declaration) Order, 1998.

Jamaica's national environmental regulatory requirements are prescribed by the Environmental Permit & License System (P&L) of 1997, which is administered by the National Environment and Planning Agency (NEPA). The P&L is a mechanism to ensure that all Jamaican facilities and development projects meet the relevant standards and procedures to minimize adverse environmental impacts during construction and operation of a facility as it relates to, for example, the handling of sewage, trade effluents, or harmful substances discharged into the environment.

The P&L System is administered by the NEPA, through the Applications Section (formerly the Permit and License Secretariat). Permits are required by persons undertaking new development which fall within a prescribed category. A list of the categories is provided in Annex 1 'Environmental Policy and Management Procedure (EPMP)').

Under the NRCA Act of 1991, the NRCA is authorized to issue, suspend and revoke permits and licenses if facilities are not in compliance with the environmental standards and conditions of approval stipulated. An applicant for a Permit or License must complete an application form as well as a Project Information Form (PIF) for submission to the NRCA. NEPA is responsible for reviewing the PIF and determining whether or not an Environmental Impact Assessment (EIA) is required. If a project does not require an EIA, then the permit may be issued upon payment of the appropriate fees. Permits are typically issued with a validity period of five years. If an EIA is required, then NEPA will develop Terms of Reference (TOR) to address each specific case, and the applicant must then prepare the EIA and submit it to NEPA for review and eventual approval. This would ensure familiarity with the NRCA legislative and regulatory amendments of April 9, 2015. It is possible that NEPA will require an Environmental Assessment (EA) in lieu of an EIA which is less detailed.

The Conservation Orders give provisions on the management of Protected Areas and impose restrictions on the type of activities that can be undertaken within these areas.
Amendments to the regulatory framework in 2015 include:

- *The Natural Resources Conservation (Permits and Licenses) (Amendment) Regulations, 2015 (LN 51C)* – These Regulations deal with the permitting process and period for which a permit would be valid. The amendment lists activities for which an application for permit to undertake an enterprise, construction or development should be sought. This includes oil exploration activities;
- *The Natural Resources (Prescribed Areas) Prohibition of Categories of Enterprise, Construction and Development (Amendment) Order, 2015 (LN 51A)* – This Order widens the range of Categories of enterprises, construction or development. This was passed as a result of Section 9 of the NRCA Act, since the section declares the entire island and the territorial sea as a 'prescribed area'. Section 9 specifies which activities require a permit and for which activities a regulatory EIA or EA may be required.

National Environmental and Planning Agency (NEPA)

NEPA was established as an Executive Agency under the Executive Agencies Act of 2002. NEPA's role is to carry out the technical and administrative mandate of three statutory bodies: NRCA, the Town & Country Planning Authority (TCPA), and the Land Development & Utilization Commission (LDUC). NEPA's main responsibility includes:

- Conservation & Protection (Natural Resources Management);
- Environmental Management;
- Spatial Planning;
- Compliance & Enforcement;
- Applications Management;
- Public Education;
- Policy and Research; and
- Legal Services & Standards Management.

NEPA operates under the following Acts:

- Executive Agencies Act of 2002;
- Natural Resources Conservation Authority Act of 1991;
- Town and Country Planning Act of 1958;
- Land Development and Utilization Act of 1966;
- Beach Control Act of 1956;
- Watersheds Protection Act of 1963;
- Wild Life Protection Act of 1945; and
- Endangered Species (Protection, Conservation and Regulation of Trade) Act of 2000.

NEPA will need to be involved especially if projects require permitting, assessments or ecological licenses. Their role is considered in Section 7 'Institutional Framework'.

Marine Regulatory Framework

The Maritime Areas Act of 1996 declares Jamaica an archipelagic State. This includes the outermost points of the outermost islands and reefs of Jamaica and the breadth of the territorial sea (located within 12 nautical miles from shore), the contiguous zone and the continental shelf. As an archipelagic State, the sovereignty of Jamaica extends to the waters enclosed by the archipelagic baselines, as well as the air space over the archipelagic waters, their bed and subsoil and the resources, living and non-living, within the boundaries.

Offences under this Act include the refusal, neglect or failure to comply with directives of the Marine Officer, or to produce a license to the Marine Officer, as well as participation while on the vessel in acts contrary to Jamaica's peace, order or security.

The Exclusive Economic Zone Act of 1993 is designed to protect the living and non-living resources in the EEZ. It establishes the EEZ, a marine zone prescribed by the United Nations Convention on the Law of the Sea. The Act stipulates conditions for the exploration and exploitation of living and non-living resources of the zone, and defines the powers and duties of marine officers.

The Beach Control Act 1956 (amended in 2004) was passed to ensure effective management of Jamaica's coastal and marine resources. It includes a system of licensing of activities on the foreshore and sea floor. It addresses issues related to access to the shoreline and other rights associated with fishing and public recreation, as well as the establishment of marine protected areas. It is currently undergoing review to update legal and management aspects including expansion of Judges' discretion on sentencing, increases in fines, and the economic valuation of natural resources.

4.1.2 Policies, Plans, International Conventions and Others

Protected Areas

The Policy for the National System of Protected Areas 1997 is an essential tool for environmental protection, conserving essential resources for sustainable use, helping to expand and diversify economic development, and contributing to public recreation and education. Six types of protected areas are proposed in order to encompass the diverse natural resources and landscape, and are comparable to the categories defined by the International Union for Conservation of Nature (IUCN):

1) National Nature Reserve/Wilderness Area (Equivalent to IUCN Category I)
2) National Park, Marine Park (Equivalent to IUCN Category II).
3) Natural Landmark/National Monument (Equivalent to IUCN Category III)
4) Habitat/Species Management Area (Equivalent to IUCN Category IV)
5) National Protected Landscape, or Seascape (Equivalent to IUCN Category V)
6) Managed Resource Protected Area (Equivalent to IUCN Category VI)

Table 4 presents the existing categories of protected areas in Jamaica. The responsible agencies and legislative tools are also presented.

Table 4: Existing Categories of Protected Area in Jamaica (as of January 2012)

Category	Responsible Agency	Law
Protected Area	Forestry Department: Ministry of Economic Growth and Job Creation	Forest Act, 1996 and Forest Regulations
	NEPA: Ministry of Economic Growth and Job Creation	NRCA Act, 1991
	NEPA: Ministry of Economic Growth and Job Creation	Beach Control Act, 1956
National Park	NEPA: Ministry of Economic Growth and	NRCA Act, 1991

Category	Responsible Agency	Law
	Job Creation	
Marine Park	NEPA: Ministry of Economic Growth and Job Creation	NRCA Act, 1991
Environmental Protection Area	NEPA: Ministry of Economic Growth and Job Creation	NRCA Act, 1996
Forest Reserve	Forestry Department: Ministry of Economic Growth and Job Creation	Forest Act, 1996 and Forest Regulations
Special Fishery Conservation Area	Fisheries Division: Ministry of Industry, Commerce, Agriculture and Fisheries	Fishing Industry Act, 1976
National Monument	Jamaica National Heritage Trust (JNHT): Ministry of Culture, Gender, Entertainment and Sport	JNHT Act, 1985
Protected National Heritage	JNHT: Ministry of Culture, Gender, Entertainment and Sport	JNHT Act, 1985
Game Sanctuary	NEPA: Ministry of Economic Growth and Job Creation	Wild Life Protection Act, 1945
Game Reserve	NEPA: Ministry of Economic Growth and Job Creation	Wild Life Protection Act, 1945
Tree Order Preservation	Local Authority (TCPA): Ministry of Economic Growth and Job Creation; and Local Government Department, through Parish Councils	Town and Country Planning Act, 1958
Conservation Area	NEPA (parish councils): Ministry of Economic Growth and Job Creation	Town and Country Planning Act, 1958
Protected Watershed	NEPA: Ministry of Economic Growth and Job Creation	Watershed Act, 1963 Protection
Ramsar Site	NEPA: Ministry of Economic Growth and Job Creation	Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)
UNESCO World Heritage Site	JNHT: Ministry of Culture, Gender, Entertainment and Sport	World Heritage Convention

(Palisadoes EIA, 2014)

The NRCA and NEPA have responsibility for managing the national system of protected areas; however a number of other government, local management entities, non-governmental entities, private sector and individuals are outlined as important role players as well.

The National Policy and Regulations for the Conservation of Seagrasses, Mangrove and Coastal Wetlands (1996 – DRAFT) aims to promote the management of coastal wetlands and seagrasses to ensure that the many benefits they provide are sustained. Among other objectives, the policy seeks to:

- Designate wetlands and seagrasses as protected areas;
- Protect wetlands and seagrasses from pollution;
- Ensure that all developments planned for wetlands are subject to a regulatory EIA; and
- Ensure that traditional uses of wetlands are maintained.

The Coral Reef Protection and Preservation Policy and Regulation (1997 – DRAFT) aims to regulate coastal zone development and prevent coral reef destruction and or degradation. It discusses the functions and uses of coral reefs, as well as the various issues affecting reef ecosystems. The aim of the policy is to ensure the conservation of coral reefs in order to sustain their ecological and socio-economic functions.

Wildlife Protection

The Wildlife Protection Act (1945) Amended 1991 is primarily concerned with the protection of specified species of fauna and precludes the hunting of any protected species. The Act also stipulates the periods for hunting, prescribes the conditions for such activities, and the penalties for going in contravention of these provisions. This Act protects several rare and endangered faunal species (listed in the Second and Third Schedule), including species of sea turtles (Green turtle, Hawksbill turtle, Loggerhead turtle, Atlantic Leatherback turtle, and Atlantic Ridley turtle), marine mammals (Caribbean monk seal or Pedro seal, West Indian manatee, bottleneck dolphin, sperm whale, pantropical spotted dolphin, baird's beaked whale, short-fined pilot whale, humpback whale), species of coral (Black coral and white coral), the American crocodile, and a number of game birds.

The Endangered Species (Protection Conservation and Regulations of Trade) Act (2000) and Amendments (2015) seeks to incorporate the Convention for the International Trade in Endangered Species of Wild Fauna and Flora (Convention on International Trades of Endangered Species (CITES) Convention) into national law. This Act governs international and domestic trade in endangered species in and from Jamaica. Under this Act, the functions of NEPA include the grant of permits and certificates for the purpose of international trade, and the monitoring of the trade in endangered species. Sea turtles for example are often illegally traded internationally.

Fishing Regulations

The Fishing Industry Act (1976) is the main piece of legislation that provides for the regulation of the fishing industry in Jamaica. The Act gives the Fisheries Division responsibility for inter alia licensing fishermen and fishing boats, protection of the fishery by establishment of closed season, creation of SFCAs (fish sanctuaries), and penalties for landing or sale of illegally caught fish. Section 19 of this Act establishes the requirement for a closed fishing season, applicable to certain species to be determined by the Minister.

In addition to the license to fish, every boat used for fishing (whether for business, recreation or sport) must be registered under the Act and the owner of the boat must possess a license authorizing the boat to be used for fishing.

A number of Regulations have been promulgated under the Fishing Industry Act. These include:

- The Fishing Industry (Exemption) Order, 1976;
- The Fishing Industry (Declaration of Close Season) (Lobsters) Order, 1987;
- Fishing Industry Regulations, 1996;
- Fishing Industry (Amendment of Schedule) Order, 2000;
- Fishing Industry (Conservation of Conch, *Strombus Gigas*) Regulations, 2000; and
- Fishing Industry (Fishery Management Areas) Order, 2000.

The Fishing Industry Act does not specify a legal nearshore limit for commercial fleet/artisanal fisheries; however provisions were made regarding the prohibition of fishing activities in SFCAs (fish sanctuaries) (Section 18).

Fishing Industry (Special Fishery Conservation Area) Regulations (2012)

The Fishing Industry (Special Fishery Conservation Area) Regulations, 2012 deals with the declaration of special fishery conservation areas. Special Fishery Conservation Areas are reserved for the reproduction of various fish populations. "Their nature reserve statuses are declared by the Agriculture Minister under Orders privileged through Section 18 of the Fishing Industry Act of 1975. It is, therefore, illegal and punishable by law to engage in any unauthorized fishing activities in the demarcated zones," (Ministry of Industry, Commerce, Agriculture and Fisheries, 2011, p.g.1). Therefore, any person who contravenes this legislation or commits an offense against it will be liable on summary conviction before a Parish Judge to fines. This Regulation was amended in 2016 and now has a maximum fine of JM$1 million.

The Fishing Industry Regulations Legislation states that no person shall fish in a special fishery conservation area except in accordance with a:

a) License issued by the Licensing Authority under the provisions of the Act (to allow removal of invasive species and for research or educational purposes), and
b) The provisions of the directions issued by the Minister under regulation 5.

Environmental Pollution Prevention and Waste Management

NRCA has primary responsibility for controlling water pollution in Jamaica in compliance with the national standards for industrial and sewage discharges into rivers and streams, and freshwater quality standards.

For drinking water, World Health Organization (WHO) Standards are applied and these are regulated by the National Water Commission (NWC). Table 5 provides the draft national marine water quality standards for Jamaica as determined by NEPA.

Table 5: Marine Water Quality Standards

Parameter	Unit	Standard Range
Phosphate	mg/l	0.001 – 0.003
Nitrate	mg/l	0.007 – 0.014
BOD5	mg/l	0.0 – 1.16
pH	-	8.00 – 8.40
Total coliforms	Most Probable Number (MPN)/100ml	2 – 2.256

The Public Health Act of 1976 makes provisions under section 14 which empowers the designated Minister to make regulations relating to air and soil pollution, occupational diseases and employment health hazards, and for the control and destruction of rodents, mosquitoes and other insects, termites, and other vermin. The Public Health (Nuisance) Regulations 1995 are aimed at controlling, reducing, removing or preventing air, soil and water pollution in all possible forms.

The National Solid Waste Management Authority Act (2001) provides for the regulation and management of solid wastes. The National Solid Waste Management Authority (NSWMA) was established in 2002 under the Act to effectively manage and regulate the collection and disposal of solid waste in Jamaica. The NSWMA aims to safeguard public health, ensure that waste is collected, sorted, transported, recycled, reused or disposed of, in an environmentally sound manner and to promote safety standards in relation to such waste. The Act makes provisions for hazardous materials (except asbestos) that can be neutralized to be disposed at licensed waste disposal facilities. No provisions are included however for disposal of hazardous wastes that cannot be neutralized. In instances such as this, the decision rests with the Ministry of Health and NEPA.

The Natural Resources Conservation (Wastewater and Sludge) Regulations of 2013, promulgated under the NRCA Act, addresses sewage and trade effluent, industrial and sewage sludge, and provide regulatory means to manage untreated sewage, trade effluents[1] and domestic wastewater releases and industrial sludge in Jamaica. The Regulation directly applies the 'polluter pays' principle and carries out Jamaica's international obligations under the Protocol Concerning Pollution from Land-Based Sources and Activities under the Cartagena Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region. The regulations do not however cover wastewater and waste disposal from offshore sources, such as vessels.

[1] Trade effluent is any liquid waste other than domestic sewage, which is discharged from premises being used for a business, agricultural land, trade or industry.

4.1.3 Relevant Regional and International Conventions and Agreements

Jamaica is signatory to a number of international treaties and conventions that obligate signatories to take wide ranging measures in support of environmental protection and sustainable development, including enacting enabling legislation.

The Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region or Cartagena Convention is comprehensive, umbrella agreement for the protection and development of the marine environment. The convention entered into force in October 1986 and provides the legal framework for cooperative regional and national actions in the Wider Caribbean Region. The Convention is supported by three Protocols on Oil Spills, Specially Protected Areas and Wildlife (SPAW) and Land Based Sources of Marine Pollution.

Protocol on Specially Protected Areas and Wild Life (SPAW) to the Cartagena Convention on the Protection of the Marine Environment of the Wider Caribbean Region

The Protocol Concerning Specially Protected Areas and Wild Life (SPAW Protocol) was adopted in 1990, and entered into force in 2000. The SPAW Protocol seeks to "Take the necessary measures to protect, preserve and manage areas that require protection to safeguard their special value, and threatened or endangered species of flora and fauna," in a sustainable way.

The objectives of the SPAW Sub-Program are to assist Governments in meeting the provisions of the Protocol and to:

1. Significantly increase the number, and improve the management of, protected and/or managed areas in the Wider Caribbean Region (WCR), including support to national and regional conservation management strategies and plans.
2. Support the conservation of threatened and endangered species and sustainable use of natural resources to prevent them from becoming threatened or endangered.
3. Develop strong regional capability for information exchange, training and assistance, in support of national biodiversity conservation efforts; Coordinate activities, and develop synergies, with the Secretariat of the Convention on Biological Diversity (CBD), as well as other biodiversity-related treaties and initiatives, such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora(CITES), the Convention on Wetlands/Ramsar Convention, the Convention on the Conservation of Migratory Species of Wild Animals (CMS)/Bonn Convention, the Western Hemisphere Conventions, the Inter-American Convention for the Conservation of Sea Turtles (IAC), the International Coral Reef Initiative (ICRI) and the Western Hemisphere Migratory Species Initiative (WHMSI).

Jamaica is a signatory to this protocol (January 1990), but has not yet ratified.

United Nations Convention on Biological Diversity, 1992

The Convention on Biological Diversity (CBD) was signed by 150 government leaders at the 1992 Rio Earth Summit and is committed to promoting sustainable development. The CBD is regarded as a means of translating the principles of Agenda 21 into reality and recognizes that *"biological diversity is about more than plants, animals and microorganisms and their ecosystems – it is about people and our need for food security, medicines, fresh air and water, shelter, and a clean and healthy environment in which to live".*

Jamaica's Green Paper Number 3/01 'Towards a National Strategy and Action Plan on Biological Diversity in Jamaica' is evidence of Jamaica's continuing commitment to its obligations as a signatory to the Convention.

Ramsar Convention (Convention on Wetlands of International Importance especially as Waterfowl Habitat), 1998

The Ramsar Convention is an intergovernmental treaty that focuses on maintaining ecological wetland systems and planning for sustainable use of their resources. It was adopted on 2 February 1971 in Ramsar, Iran.

The mission of the Convention was adopted by the Parties in 1999 and revised in 2005: *"the conservation and wise use of all wetlands through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world".*
Jamaica became a contracting party on 7 February 1998 and has 4 sites covering a combined total of 37,847 hectares (378.47 km^2).

FAO Code of Conduct for Responsible Fisheries

The Code of Conduct is a collection of principles, goals and elements for action representing a global consensus or agreement on a wide range of fisheries and aquaculture issues. It stresses that countries and all those involved in fisheries and aquaculture should work together to conserve and manage fish resources and their habitats. Fishing operations and policies should be designed with a view to achieving long-term sustainable use of fish resources as a means of assuring resource.

The Caribbean Regional Fisheries Mechanism (CRFM)

The CRFM took over from the CARICOM Fisheries Resource Assessment and Management Program (CFRAMP) as one response of regional governments faced with serious over –fishing and habitat degradation in the inshore fisheries of the region. Its mandate sought to ensure that the strengthening and enhancing the capacity of national fisher folk organizations to become co-managers of the region's fisheries resources and to ensure that organized resource users in all the participating countries are effectively and democratically represented on the National Fisheries Advisory Committees. The Caribbean Community Common Fisheries Policy was established by CRFM as a binding treaty focusing on cooperation and collaboration of Caribbean people, fishermen and their governments in conserving,

managing and sustainably utilizing fisheries and related ecosystems. The strong regional fisheries policy supports the welfare and well-being of all Caribbean people.

4.2 Triggered World Bank Safeguards

This project was evaluated for compliance with the World Bank Safeguard Policies and was determined to be Category B in accordance with OP/BP 4.01 (Environmental Assessment). This means that potential environmental impacts may occur but are minimal and can be mitigated with standard measures. Identification and specific location of the sub-projects are not yet finalized, however they are likely to occur in areas that have shown initiative in fisheries improvement and demonstrate capacity as fishing groups to implement projects. As such the Bank requires that all proposed subprojects be screened to ensure that the sub-project beneficiaries carry out appropriate Environmental Assessments.

This ESMF contains measures to ensure that World Bank Environmental and Social Safeguards policies (World Bank, 2017a) are not triggered by the Project (See Table 6). Relative to the sub-projects and activities, screening and exclusion criteria have been developed (Annex 1 'Environmental Policy and Management Procedure (EPMP)') to ensure that no projects will be funded which could potentially trigger the policies.

Table 6: World Bank Environmental and Social Safeguards and their applicability to this project

Safeguard Policy	Relevance
Environmental Assessment (OP 4.01) This Policy aims to ensure that projects proposed for Bank financing are environmentally and socially sound and sustainable; to inform decision makers of the nature of environmental and social risks; to increase transparency and participation of stakeholders in the decision-making process	Yes – given that the potential sub-projects or activities can generate negative environmental and social impacts. This ESMF has been prepared to prevent undue negative impacts, and present mitigation measures such as improved solid waste management and training.
Natural Habitat Policy (OP/BP 4.04) This Policy aims to safeguard natural habitats and their biodiversity; avoid significant conversion or degradation of critical natural habitats, and to ensure sustainability of services and products which natural habitats provide to human society	Yes – due to the potential of projects to affect or alter sensitive coastal zones and marine environments, via construction or clearing, emissions of nutrients and particulates, introduction of species, or other impacts.
Forestry Policy (OP 4.36) This Policy is to ensure that forests are managed in a sustainable manner; significant areas of forest are not encroached upon; the rights of communities to use their traditional forest areas in a sustainable manner are not compromised	Yes – given the potential impacts to coastal mangrove forests, and potentially to other forested areas for inland aquaculture activities. This ESMF aims to prevent unsustainable management or encroachment of forest areas whilst not compromising the rights of communities

Safeguard Policy	Relevance
	to use their additional forest areas in a sustainable manner.
Pest Management Policy (OP/BP 4.09) This policy is to ensure pest management activities follow an Integrated Pest Management (IPM) approach, to minimize environmental and health hazards due to pesticide use, and to contribute to developing national capacity to implement IPM, and to regulate and monitor the distribution and use of pesticides	Yes – not only land-based aquaculture activities, but also ocean-based (e.g. cage culture), or tourism activities (e.g. landscaping). The ESMF proposed that activities minimize environmental and health hazards due to pesticide use.
Physical Cultural Resources (OP/BP 4.11) This policy is to ensure that: Physical Cultural Resources (PCR) are identified and protected in World Bank financed projects; national laws governing the protection of physical cultural property are complied with; PCR includes archaeological and historical sites, historic urban areas, sacred sites, graveyards, burial sites, unique natural values; implemented as an element of the Environmental Assessment	No – screening for presence of coastal or submarine physical cultural resources will be included in the ESMF in accordance with OP/BP 4.11 (Physical Cultural Resources), but the policy was not triggered because the chance-find and screening procedures can effectively reduce the risk of damage to such resources.
Indigenous Peoples (OP/BP 4.10) This Policy aims to foster full respect for human rights, economies, and cultures of indigenous people, and to avoid adverse effects on indigenous people during the project development. 'Indigenous People' are defined as distinct, vulnerable, social and cultural group attached to geographically distinct habitats or historical territories, with separate culture than the project area, and usually different language.	No – There are no indigenous peoples in Jamaica, so this is not germane.
Involuntary Resettlement (OP/BP 4.12) This policy aims to minimize displacement; treat resettlement as a development program; provide affected people with opportunities for participation; assist displaced persons in their efforts to improve their incomes and standards of living, or at least to restore them; assist displaced people regardless of legality of tenure; pay compensation for affected assets at replacement cost;	No – the project will not be supporting any activities that will displace persons

Safeguard Policy	Relevance
Safety of Dams (OP/BP 4.37) This Policy is to ensure due consideration is given to the safety of dams in projects involving construction of new dams, or that may be affected by the safety or performance of an existing dam or dams under construction; important considerations are dam height & reservoir capacity	No – the project activities do not include dam/reservoir related activities
Projects on International Waterways (OP/BP 7.50) The Policy aims to ensure that projects will neither affect the efficient utilization and protection of international waterways, nor adversely affect relations between the Bank and its Borrowers and between riparian states	No – the project activities do not include activities related to international waterways
Disputed Areas (OP/BP 7.60) The Bank may support a project in a disputed area if governments concerned agree that, pending the settlement of the dispute, the project proposed for one country should go forward without prejudice to the claims of the other country	No – There will be no project activities in disputed areas in Jamaica, so this is not germane.

5 Potential Project Impacts

5.1 Positive Impacts

This project is expected to have numerous positive impacts, such as:

- Strengthened policy and regulatory framework
- Improved livelihoods of fishers and fish farmers
- Increased income generation
- Increased source of good protein
- Improved food security
- Increased economic security for fisher folk
- Improved resilience to climate change
- Improved ecosystem health
- Enhanced agricultural competitiveness
- Increased skillsets for fishers
- Reduced vulnerability to climate change

5.1 Negative Impacts

It is possible that some sub-projects may lead to negative environmental and social impacts. The activities with potential negative environmental and social impacts are described below in Table 7.
Table 7: Potential negative environmental & social impacts of proposed sub-projects

Environmental and Social Impacts	PCCR Considerations
Climate Smart Technologies	
Resource (water and energy)	This activity suggests exploring pilot projects on, for example, beach recovery systems, solar desalination plants, mangrove restoration, compost and solar waste disposal, artificial reef systems, pond wind breakers, recirculating aquaculture systems, short maturation hybrid species, etc. Many of these will require extensive collaboration and discussion with NEPA from the early stages to ensure all potential impacts are identified and mitigated for.
Solid waste disposal	
Conversion/removal of habitats for construction	
Freshwater Aquaculture and Coastal Mari-culture/Poly-culture	
Sustainable supply of good quality water	Species being investigated for this activity are those that can already be found in Jamaica, i.e., Tilapia, oysters, sea cucumber, and Irish Moss (Gracilaria sp.). Although some of these species were presented by the consultations as being of interest, not all of them are feasible at this time. For example, activities involving sea cucumber will have to await the assessment examining the potential of sea cucumber culture currently being completed through the Fisheries Division in association with the FAO. Although it is not expected that importation of new species will occur, the Executing Agency should be wary of persons independently exploring either specie that have not been assessed, new species, or improvement of existing species that could cause an impact to naturally occurring systems. This activity includes a component to investigate establishing an extruded feed production within Jamaica. The choice of technology may vary in terms of resource requirements (electricity, water, source and supply of feed base, etc.), as well as waste generated (if any). Some set ups (for feed extrusion, or aquaculture) involve water recycling which would reduce risk of wastewater discharge and heavy reliance on water supply. This activity may require small scale infrastructure or changes to the sea floor or other habitats, which will require permission from NEPA. Consideration should be given to the impacts of the setup on, for example,
Impacts to sensitive coastal and marine ecosystems	
Increased odour in the community	
Resource (water and energy)	
Wastewater Management	
Introduction of new species	
Introduction of parasites and disease	
Solid waste disposal	
Increased pollution of ground and surface waters due to use of fertilizers and pesticides, and/or processing of agricultural products , erosion, sedimentation or wastewater	
Conversion/removal of habitats for construction	
Exploitation of wild stock (for breeding)	

Harm to aquaculture 'predators' e.g. crocodiles, ospreys	hydrology or other users (human or faunal) of the area.
Occupational, health and safety of workers e.g. exposure to hazardous chemicals	
Tourism or landing site activities	
Wastewater Management (including sewage)	This activity focusses on general improvement of landing sites and can range from infrastructural changes to additions of gear (e.g. boat trailers). Careful consideration should be given to any of the identified actions and their impact on the environment, or how the climate change predictions will impact it. The tourism activity is complex and requires careful and site-based consideration on behalf of the Executing Agency to ensure impacts remain at a minimum. Tourism activities will vary depending on the assets the site has to offer, and the capacity of the managing body. One aspect of tourism is to use fisheries conservation as part of the tourism package. This activity can include handling of sensitive or protected habitats or species, for example restoration of coral reefs or mangroves, which would require close collaboration with NEPA or other regulatory agencies. Some conservation activities may increase numbers of fish species, including invasive species such as the lionfish. Some sanctuary-related activities focus on enforcement (as opposed to increasing compliance) which could lead to increased community tension.
Solid waste disposal	
Conversion/removal of habitats for construction	
Resource demand (water, energy)	
Water quality and Food Safety	
Damage to sensitive environment from interactions with humans, boats etc. (e.g. seagrass, coral reefs)	
Improper use of fertilizer (for landscaping)	
Removal of wildlife or wildlife products (e.g. coral, starfish)	
Changes to community dynamics and culture that are often associated with tourism	
Fishing for Coastal and Offshore Pelagic Species	
Inadvertent by-catch of unwanted species (birds, turtles)	This activity has the potential to exploit an unassessed stock of migratory pelagic species. Additionally, many technologies for offshore fishing (FADs, longline) are associated with heavy by-catch of non-target species (turtles, birds, other fish). Consideration should also be given by the Executing Agency to the culture of current Jamaican fisheries of not throwing back, or harvesting everything available in anticipation of poor catch days in the future. Additionally, monitoring of the impacts of this activity may prove a challenge given the geographical scale involved.
Stock depletion of unassessed pelagic species	
Increased marine debris and pollution (e.g. engine oil)	
Waste of fish byproducts (e.g. internal organs)	
Increased demand for water (for ice)	

Measures to mitigate/manage these potential environmental impacts and risks are presented in Annex 3 and Section 6.4.

Some of the activities identified under Component 2 (e.g. pilot climate resilient practices) will have no direct environmental impacts, but if projects/investments informed by these activities are implemented in the future, there could be some potential indirect environmental implications associated with this project.

It is also important to consider that the proposed sub-projects are highly dependent on the environment for their success. For example a coral reef system that is in good condition will have a positive impact on the tourism activities, and in contrast poor water quality will negatively impact marine aquaculture activities. It is integral, then that good environmental practices be considered from (i) how it will help mitigate sub-project impacts; and (ii) how it will help enhance sub-projects.

Table 7: Potential negative environmental & social impacts of proposed sub-projects

Environmental and Social Impacts	PCCR Considerations
Climate Smart Technologies	
Resource (water and energy)	This activity suggests exploring pilot projects on, for example, beach recovery systems, solar desalination plants, mangrove restoration, compost and solar waste disposal, artificial reef systems, pond wind breakers, recirculating aquaculture systems, short maturation hybrid species, etc. Many of these will require extensive collaboration and discussion with NEPA from the early stages to ensure all potential impacts are identified and mitigated for.
Solid waste disposal	
Conversion/removal of habitats for construction	
Freshwater Aquaculture and Coastal Mari-culture/Poly-culture	
Sustainable supply of good quality water	Species being investigated for this activity are those that can already be found in Jamaica, i.e., Tilapia, oysters, sea cucumber, and Irish Moss (Gracilaria sp.). Although some of these species were presented by the consultations as being of interest, not all of them are feasible at this time. For example, activities involving sea cucumber will have to await the assessment examining the potential of sea cucumber culture currently being completed through the Fisheries Division in association with the FAO. Although it is not expected that importation of new species will occur, the Executing Agency should be wary of persons independently exploring either specie that have not been assessed, new species, or improvement of existing species that could cause an impact to naturally occurring systems. This activity includes a component to investigate establishing an extruded feed production within Jamaica. The choice of technology may vary in terms of resource requirements (electricity, water, source and supply of feed base, etc.), as well as waste generated (if any). Some set ups (for feed extrusion, or aquaculture) involve water recycling which would reduce risk of wastewater discharge and heavy reliance on water supply. This activity may require small scale infrastructure or changes to the sea floor or other habitats, which will require permission from NEPA. Consideration should be given to the impacts of the setup on, for example, hydrology or other users (human or faunal) of the area.
Impacts to sensitive coastal and marine ecosystems	
Increased odour in the community	
Resource (water and energy)	
Wastewater Management	
Introduction of new species	
Introduction of parasites and disease	
Solid waste disposal	
Increased pollution of ground and surface waters due to use of fertilizers and pesticides, and/or processing of agricultural products , erosion, sedimentation or wastewater	

Conversion/removal of habitats for construction	
Exploitation of wild stock (for breeding)	
Harm to aquaculture 'predators' e.g. crocodiles, ospreys	
Occupational, health and safety of workers e.g. exposure to hazardous chemicals	
Tourism or landing site activities	
Wastewater Management (including sewage)	This activity focusses on general improvement of landing sites and can range from infrastructural changes to additions of gear (e.g. boat trailers). Careful consideration should be given to any of the identified actions and their impact on the environment, or how the climate change predictions will impact it. The tourism activity is complex and requires careful and site-based consideration on behalf of the Executing Agency to ensure impacts remain at a minimum. Tourism activities will vary depending on the assets the site has to offer, and the capacity of the managing body. One aspect of tourism is to use fisheries conservation as part of the tourism package. This activity can include handling of sensitive or protected habitats or species, for example restoration of coral reefs or mangroves, which would require close collaboration with NEPA or other regulatory agencies. Some conservation activities may increase numbers of fish species, including invasive species such as the lionfish. Some sanctuary-related activities focus on enforcement (as opposed to increasing compliance) which could lead to increased community tension.
Solid waste disposal	
Conversion/removal of habitats for construction	
Resource demand (water, energy)	
Water quality and Food Safety	
Damage to sensitive environment from interactions with humans, boats etc. (e.g. seagrass, coral reefs)	
Improper use of fertilizer (for landscaping)	
Removal of wildlife or wildlife products (e.g. coral, starfish)	
Changes to community dynamics and culture that are often associated with tourism	

Fishing for Coastal and Offshore Pelagic Species	
Inadvertent by-catch of unwanted species (birds, turtles)	This activity has the potential to exploit an unassessed stock of migratory pelagic species. Additionally, many technologies for offshore fishing (FADs, longline) are associated with heavy by-catch of non-target species (turtles, birds, other fish). Consideration should also be given by the Executing Agency to the culture of current Jamaican fisheries of not throwing back, or harvesting everything available in anticipation of poor catch days in the future. Additionally, monitoring of the impacts of this activity may prove a challenge given the geographical scale involved.
Stock depletion of unassessed pelagic species	
Increased marine debris and pollution (e.g. engine oil)	
Waste of fish byproducts (e.g. internal organs)	
Increased demand for water (for ice)	

These impacts are expected to be mitigated through appropriate planning, development, and project design, as well as good implementing and management practices.

5.2 Cumulative Impacts

Cumulative impacts are not expected to be a high concern, particularly as potential negative impacts are expected to be prevented and/or mitigated through careful planning, project design and implementation. However, the Executing Agency should be mindful of possible interactions between projects that may cause added or new environmental and social impacts. This may include implementation of pilot projects in nearby areas, or future planned developments not related to the PCCR project.

6 Project Environmental Management and Guidelines

As outlined in the PAD and in Section 7, MICAF will be the Executing Agency, which will receive proposals from interested beneficiary organizations for projects that fall within the proposed categories. The proposals will then be reviewed and screened before they can be approved and grants be awarded. In the event that such is not the procedure, the Environmental Management and Guidelines still remain, as all activities should be screened for environmental and social risk prior to implementation. The necessary steps or roles and responsibilities may be modified, but not significantly so.

6.1 Activity related research and studies

The proposed activities and sub-projects from the Alternative Livelihood and Value Chain Specialist in Section 3 above suggest the need for various assessments or development plans to improve sustainability. These are expected to be done prior to on the ground implementation. There is a wide scope for these studies and can include Development Orders, and Local Sustainable Development Plans, or Environmental Assessments.

The implementing partner for these studies is still to be determined. Recognizing that there are a variety of study types, which may result in a variety of environmental implications, the environmental assessment strategy will include the following for the three major types of studies envisioned:

- National scoping and planning documents such as the National Development Plan will include an identification of environmental and social assessment needs, definition of TOR elements for future assessments, and an estimation of costs to complete those studies for hatchery-related projects such as irrigation expansion, pond creation, etc. This high-level integrated approach to environmental and social assessment within the Master Plan will provide a first tier of assessment for guidance, direction and input for future, more detailed assessments if and as they are subsequently proposed, whether or not such studies are funded by the Bank.

- A second type of study envisioned is Environmental and Social Impact Assessments (ESIAs) and would be specified to include analysis of national and cumulative effects, social assessment needs, extensive consultation (including NEPA and in-country authorities to ensure regulatory requirements are incorporated), biological resource assessment, and other elements as identified in the scoping-level first tier assessments.

- Some activities may require national permitting, or additional documents e.g. Environmental Management Plans (EMPs) through NEPA. These will be specific to the activities and/or sites.

The benefit of this three-tiered approach is that it would satisfy the need for a national assessment of potential impacts, but without including unnecessary details for future project elements that could substantially change or never materialize. It would also reduce reputational risk to the Bank by presenting an integrated approach at the early planning stages and providing guidance for future assessments to meet Bank policy and safeguards requirements.

It is not expected that EIAs will become a part of this project. Any proposed sub-project that would require an EIA would become ineligible on the grounds that it would no longer fall under a World Bank Category B project. However, other environmental studies may be required. All studies shall ensure that adequate consideration of environmental aspects is included in the TORs, for example, consideration of environmental and social aspects (impacts, risks and benefits) as part of any alternative analysis, public participation in the preparation of the study as relevant, and specific conclusions and recommendations regarding environmental management for the project development and implementation. It is advisable that a standard TOR template for additional studies should be developed and submitted to the Bank for no objection. All subsequent studies shall use the acceptable standard TOR text and modify as needed. The TORs should meet all applicable Jamaica environmental regulatory requirements, and any World Bank health and safety guidelines.

It is advised that the Executing Agency shall explore a potential agreement for technical support with NEPA in the execution of this project. Specifically, this could include the review of draft TORs, assistance or guidance to selected consultants in the development of the studies (in particular an EA or related), and technical review of draft reports. This is particularly so since, under Jamaican environmental laws and regulations, most sub-projects will require a permit or license from NEPA. Both NEPA and Parish Authorities must be brought into the loop at early stages to realistically define national environmental and permit requirements and ensure they are met. This way the permitting would be built into the application and screening process, to further the streamlining and reforming of local permitting.

6.2 On the ground pilot activities

The proposed sub-projects include pilot activities to occur on the ground, at the community level and higher. The specific activities will need to be assessed for environmental and social impacts before implementation, and monitored during and after implementation. This section provides guidelines for the assessment of sub-projects from beginning proposal stages to approval and implementing stages. Annex 1 'Environmental Policy and Management Procedure (EPMP)' provides further detail on each step including the required checklists to be implemented during the screening procedure.

With reference to Figure 6, this procedure includes:

- Screening procedure to categorize sub-projects as either low, medium, high or very high environmental and social risk (Step 1 to 3)

- Assessment procedure to finalize environmental and social risk status (Step 4 to 5)
- Documentation to outline necessary documentation needed and monitoring and reporting requirements (Step 6 – 7)

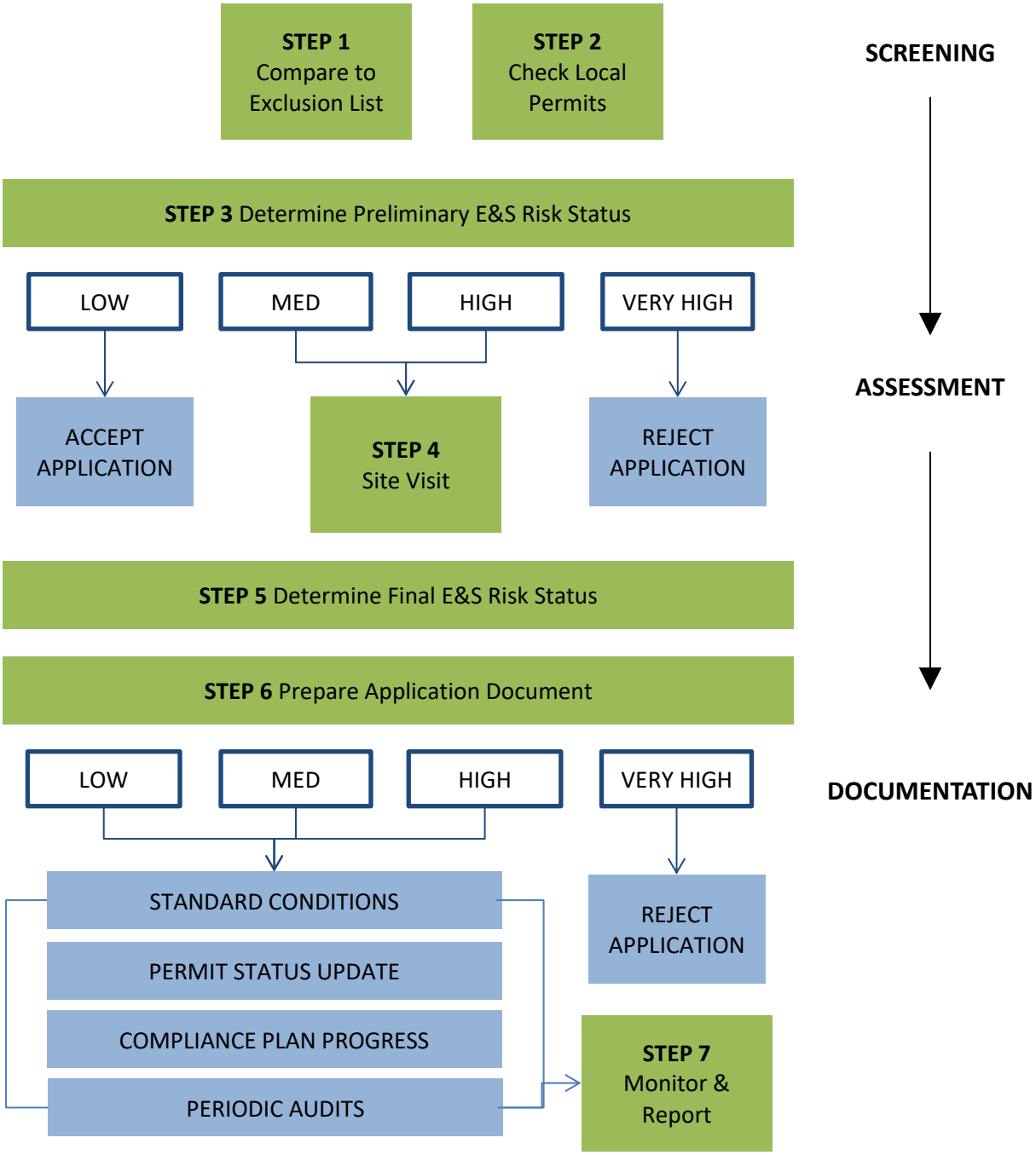

Figure 6: Environmental Screening and Permitting Process

6.2.1 Screening Procedure

Environmental issues should be considered from the concept or application stage. Screening should be done for any sub-project proposal at the initial stages. The purpose of the screening is to assess proposed projects and determine the level of risk for negative impacts (taking into consideration potential impacts, mitigation measures, project design, etc.). A series of lists and checklists are made available for the Executing Agency in Annex 1 'Environmental Policy and Management Procedure (EPMP)', namely:

- A project exclusion list
- EPMP Checklist 1; Safeguard Trigger Checklist
- EPMP Checklist 2: Permit/License Status Checklist
- EPMP Checklist 3: Environmental Screening (to be completed by the project applicant)

6.2.2 Assessment procedure

During the assessment stage, the Executing Agency may have to perform a site visit to determine if there gather more information about the situation and highlight if there are any key environmental or social concerns that need to be considered, that were not previously mentioned. Annex 1 'Environmental Policy and Management Procedure (EPMP)' provides:

- EPMP Checklist 4: Environmental Screening Checklist (to be completed by the Executing Agency)
- EPMP Checklist 5: Guide to final determination of E&S Risk Status

6.2.3 Documentation procedure

Once the environmental and social risk has been determined, and the sub-project approved, it becomes necessary to ensure that any agreements include the proper documentation as it relates to permitting, regulations, monitoring and reporting. This step of the implementation is key to providing updates on environmental aspects, especially on the mitigation measures, if any, being used. It provides the monitoring body an opportunity to take action if new or additional mitigative action is needed. The ESMF needs to identify (i) monitoring objectives and (ii) type of monitoring needed. Annex 2 'Environmental Management Plan' outlines proposed monitoring procedures. The sub-projects must be monitored during implementation by the Executing Agency, World Bank, and regulatory agencies where applicable. Step 8 'Monitor & Report' ensures operations are being implemented according to agreements and operation manuals, and allows grantees to be given guidance and improve their knowledge of sustainability. Monitoring can take the form of regular safeguard monitoring reports (and where possible independent safeguard audits), and/or site visits by regulatory agencies and /or implementing agencies. Annex 1 'Environmental Policy and Management Procedure (EPMP)' provides:

- EPMP Checklist 6: Guide for Agreement Conditions

6.3 Environmental Management Plan (EMP) Format

Environmental Management Plans are designed to avoid or mitigate negative environmental impacts and should be required for any Category B sub-projects. Annex 2 'Environmental Management Plan' outlines the approved World Bank format for Environmental Management Plans that should be adhered to.

It is proposed that a simple, checklist format for EMPs be used that would cover include the essential elements to meet the Environmental Assessment requirements of the World Bank (under OP/BG/GP 4.01) (See Annex 2 'Environmental Management Plan'). It would consist of (i) project description; (ii) relevant safeguards; (iii) simple environmental and social screening; and (iv) a site specific monitoring plan. Regulatory agencies should be consulted with to develop monitoring plans in accordance with any permitting requirements.

6.4 Management and Mitigation

The World Bank has developed generic mitigation and management measures for different sectors and these should be consulted whilst screening, finalizing projects and preparing Environment Management Plans. Annex 3 outlines World Bank Mitigation and Management measures for activities under the proposed sub-projects.

An overarching mitigation measure is to liaise and collaborate with regulatory agencies (e.g. NEPA and TPDCo) from the early stages. Permit and licensing by these agencies include compliance with environmental regulations. Partners that are currently working in proposed sub-projects (e.g. The Competitiveness Company in ornamental fishing) have already established Quality Control Protocols that include mitigation for environmental impacts.

Table 8 suggests broad mitigation measures for the proposed sub-projects. During the application process, beneficiaries (in collaboration with the Executing Agency and regulatory agencies where possible) should outline site- and context- specific mitigation measures. Annex 3 lists additional World Bank suggested mitigation measures for environment, occupational health and safety, and community health and safety.

Table 8: Broad suggestion mitigation measures for proposed sub-projects. Site- and Context- specific mitigation measures should be considered by each applicant.

Negative Impacts	Mitigation Measures
Destruction or modification of sensitive, critical or protected habitats	Clearly identifying critical or sensitive species, carefully designing facilities to intersect with as little natural habitat as possible, limit number of users, clear protocols on user-habitat interaction (e.g. no touching of coral reefs), etc.
	Clearly identify all users of a project area and hold consultations, environmental assessments to determine if the project activities will impact them (e.g. changes to hydrology, blocking access, etc.)
Impacts to sensitive, critical or protected species	Preserve sensitive species through clear assessment of presence and behavior (e.g. nesting turtles), avoid the introduction of invasive species (flora or fauna), and avoid the removal of wildlife products. Where fish conservation actions occur, ensure that lionfish culling is taken into consideration.
Modification of natural systems through, for example, introduction of new species	Installation of escape prevention mechanisms e.g. mesh screens, establish regular inspection schedules, contingency plans, avoid importing of new species, carefully vet and quarantine if possible importation of new stock of existing species, avoid harvesting from the wild to establish stock, careful assessment of interactions, training of partners on dangers of invasive species or introduction of diseases in etc.
Exploitation of non-target species (by-catch)	Exploring sustainable methods for offshore fishing, training for fishers, establishing monitoring and enforcement mechanisms as part of project activities
Over-exploitation of a fisheries resource	Perform stock assessments on under-utilized species e.g. sea cucumber, pelagic species (e.g. wahoo)
	Engage project beneficiaries in conservation awareness raising and training to reduce frequency of mass-harvesting
	Ensure little to no harvesting from the wild for broodstocks
	Establish and implement monitoring protocols that perform frequent assessments on fish production and harvesting techniques
Wastewater contamination	Carefully constructed ponds, aquaculture infrastructure, establish feeding procedures that include appropriate feed types, mechanisms to prevent over feeding, good storage of feed, avoid use of chemical fertilizers, etc.
	Ensure fish processing facilities have adequate water supply, waste management plans, design facilities to recover waste streams where possible, etc.

	Establish good wastewater management practices to avoid nutrient rich waters
Solid Waste Management	Promote good solid waste management through practices such as recycling, reusable containers, bulk dispensers, frequent cleaning of beaches, etc.
Resource (water, electricity) exploitation	Establish and use resource conservation technologies for water and energy including but not limited to rainwater catchment, low-flush toilets, solar panel systems, use of day lighting techniques etc.
Occupational health and safety of workers	Extensive occupational health and safety training for community members engaging in tourism activities including life-saving, food safety and food handling licenses, etc.
	Provision of protective and safety gear for staff, especially for those handling species known to cause allergic reactions (e.g. crabs)
	Provide fishers with life-saving equipment (safety jackets, radios, GPS, etc.), Safety-at-Sea training, and emergency response plans
Community conflict or tension	Promote activities that encourage compliance (e.g. incentives for non-compliant fishers like rotational warden spots) versus activities that increase enforcement (e.g. confiscation of gear)
	Clearly identify all users of a project area and hold consultations, environmental assessments to determine if the project activities will impact them (e.g. changes to hydrology, blocking access, etc.)

7 Institutional Framework

As outlined in the Project Appraisal Document (PAD), the MICAF is the Executing Agency of the proposed Project, and PIOJ, the national Focal Point for the PPCR and Phase 2 of the SPCR, will be supporting this execution. The Project established a Project Core Team (PCT) within the MICAF to lead the development of the Project. The PCT will be comprised of: the CEO of the National Fisheries Agency, the Director of the Fisheries Division, the Chief Technical Director at MICAF, the Director of Planning and Policy at MICAF, and the Director of Projects at MICAF. A central Fiduciary Services Unit (PPCR-PIU) will be established within the PIOJ, which will be responsible for fiduciary management, environmental and social safeguards, and monitoring and evaluation. PIOJ has successfully managed the Project Preparation Grant of the Improving Climate Data and Information Management Project as well as other WB-funded projects in the past and is capable of providing extensive support and capacity building to the MICAF.

The GOJ has established a PPCR Steering Committee (PPCR-SC) to serve as the main body responsible for providing technical advice and oversight to the implementation of PPCR projects including the proposed Project. PPCR-SC is chaired by the Director of the Sustainable Development & Regional Planning Division, PIOJ who also acts as the PPCR Focal Point. Members of PPCR-SC are drawn from a cross-section of stakeholders with technical interest in and knowledge of natural hazards, risk and climate change issues, including relevant government entities, private sector bodies, academia, and civil society.

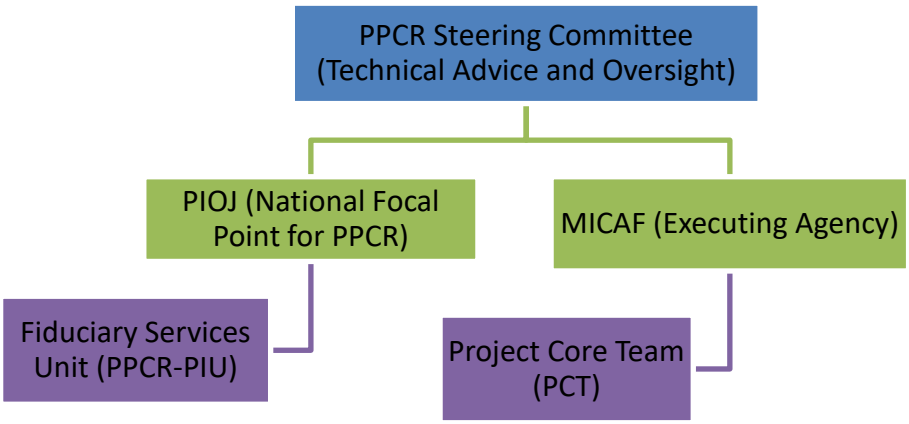

Figure 7: Institutional Arrangement Chart for the PCCR project

The key responsibility of proposed partners as it relates to the ESMF is listed below in Table 9.

Table 9: Roles and Responsibilities of Organizations as it relates to the ESMF and screening of projects

Organization	Role	Responsibility
World Bank	Lending Agency	• Provide guidance on World Bank guidelines
PPCR Steering Committee	Technical Advice and Oversight	• Providing technical advice and oversight to the implementation of PPCR projects
Fiduciary Services Unit of the PIOJ	Oversight & Execution Support	• Fiduciary management, environmental and social safeguards, and monitoring and evaluation
MICAF	Executing Agency	• Manage and implement the screening processes • Document key processes • Perform necessary steps under screening process (e.g. site visits if necessary) • Provide technical support to grantees where necessary • Review grant applications for safeguard documentation • Monitor subproject compliance with mitigation plans • Work with the grantee to ensure that the grant procedures adhere to the necessary steps in the ESMF • Review reports from beneficiaries/grantees • Report progress of implementation, challenges encountered, etc. to Oversight groups and to regulatory agencies where necessary
NEPA, Ministry of Health (MOH), TPDCo, etc.	Regulatory Agencies	• Approve or comment on the required documents as necessary • Comment on any monitoring or mitigations reports received • Provide technical support including recommendations on actions proposed
Grantee (e.g. community-based organization)	Grantee	• Engage regulatory agencies from early to establish necessary permits and regulations • Submit sub-project concept to Executing Agency • Work with MICAF to ensure that grant procedures adhere to the necessary steps in the ESMF • Obtain and comply with required permits/licenses • Maintain documentation • Meet reporting requirements (to Executing Agency)

8 ESMF Consultation Process

The consultation process for this ESMF was extensive and involved stakeholder identification, prioritization, collaboration and consultation. A wide variety of stakeholders were identified from different sectors including fisher folk organizations, regulatory agencies, private sector, community-based organizations, government agencies, etc. Where possible, the consultations were held in collaboration with other members of the project development team.

The draft ESMF was disseminated to project implementation stakeholders (e.g. MICAF, PIOJ) for review. It was also presented at the two project workshops, (i) Validation Workshop (February 24, 2017) and (ii) Disclosure Workshop (March 17, 2017). Stakeholders were given the opportunity to comment and provide feedback on the ESMF. All relevant comments were incorporated into the Final ESMF document, which will be made available for public viewing. The ESMF will then be used by the Executing Agency and Grantees during project implementation.

Annex 4 'Stakeholder Consultation Report' outlines the scope, participants, and findings from the consultation process.

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Annex 1 'Environmental Policy and Management Procedure (EPMP)'

The following information describes the environmental policy, screening procedures, and management system, which will be applied throughout implementation of the Project Component 2.The EPMP will be used to screen and assess applications, document the appraisal results, identify relevant requirements and perform grant administration.

I. Statement of Policy and Purpose

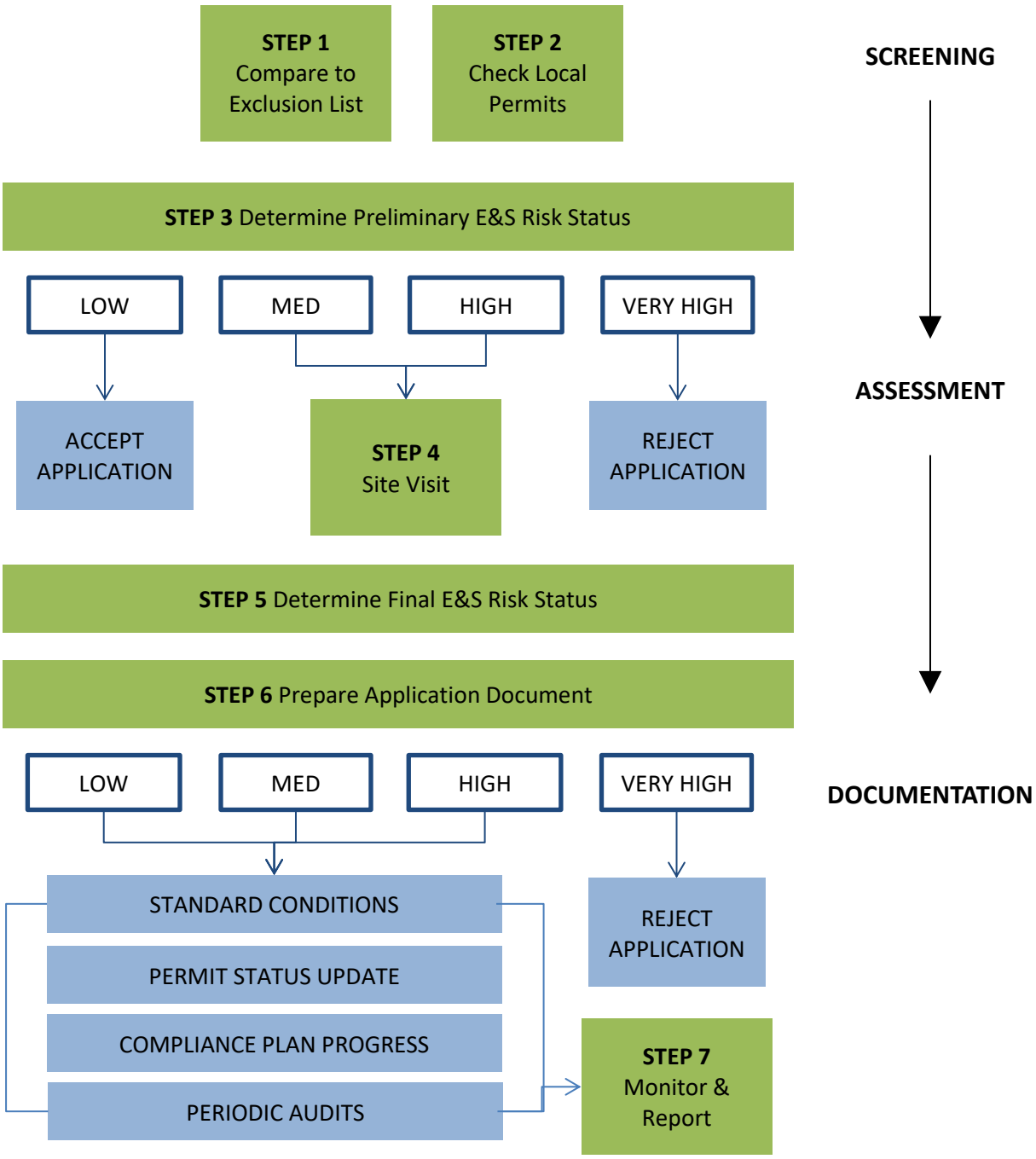
The World Bank is committed to:

- Environmental support in all areas of its operations;
- Continuously support the improvement of environmental performance through an environmental management system;
- Ensuring environmentally responsible financial investment and development;
- Fostering environmental due diligence within partners with respect to risk and impact assessment and management;
- Compliance with relevant laws, regulations and standards within Jamaica;
- Promotion of the environmental policy and management system among all project partners through training and awareness programmes;
- Supporting the Sustainable Development Policy of the Government of Jamaica.

II. Grant Application Processing Procedures

The sub-project application procedures will follow a set of steps which are designed to ensure that environmental considerations are taken into account. The steps are summarized in Figure 1 for which the applicable steps must be completed and approved as part of the application process.

FIGURE 1. FLOW CHART FOR APPLICATION PROCESSING



- ✓ Has the project activity been compared to the Exclusion Checklist (Step 1)?
- ✓ If any new local or government permitting is required, has the project brief been filed with NEPA and the Parish (Step 2)?
- ✓ Has the project been screened/assessed for environmental impacts (Step 3?)

- ✓ If an (optional) site visit is required, have the evaluations been completed (Step 4?)
- ✓ Have all required environmental and building permits been obtained (Step 5)?
- ✓ Have environmental and social clauses and conditions been included in any agreements (Step 6)?

The steps described below must be completed before execution of any legal agreement with partners. Additional formats, templates and guidance can be developed as desired throughout the course of the project implementation to assist in its environmental management activities.

Step 1: Compare to Exclusion List

The following project activities are not eligible for financing:

- Those that are illegal under Jamaica country laws, regulations or ratified international conventions and agreements
- Projects that would be classified as Category A under the World Bank OP/BP 4.01
- Projects that would involve significant conversion or degradation of critical natural habitats or natural habitats
- Projects that would involve significant impacts on physical cultural resources
- Projects that would involve the purchase, use or management of significant quantities of pesticides
- Forest commercial harvesting that includes areas of critical forest or related critical habitat or industrial-scale projects, including plantations, that do not have independent forest certification
- Community or small-scale harvesting forest projects by small-scale landholders or local communities that do not adhere to forest management standards consistent with requirements for a forest certification system (World Bank OP 4.36, Para. 10) or have an acceptable time-bound action plan to achieve such standards
- Projects that would directly or indirectly involve the construction of a dam greater than 10 meters in height or the use of water from a dam greater than 10 meters in height
- Projects on international waterways (in Jamaica, any bay, gulf, strait, or channel recognized as a necessary channel of communication between the open sea and other states).
- Weapons and munitions
- Alcoholic beverages (excluding wine and beer)[2]
- Tobacco[3]
- Gambling, casinos and equivalent enterprises[4]
- Wildlife or wildlife products regulated under Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)[5]

[2]This does not apply to companies for which the operations/activities related to these criteria comprise less than 10 percent of companies total annual revenue

[3] This does not apply to companies for which the operations/activities related to these criteria comprise less than 10 percent of companies total annual revenue

[4] This does not apply to companies for which the operations/activities related to these criteria comprise less than 10 percent of companies total annual revenue

- Radioactive materials[6]
- Unbounded asbestos fibers[7]
- Commercial logging operations or the purchase of logging equipment for use in primary tropical moist forest[8]
- Polychlorinated biphenyl compounds (PCBs, a class of synthetic organic chemicals)
- Pharmaceuticals subject to international phase outs or bans[9]
- Pesticides/herbicides subject to international phase outs or bans[10]
- Ozone depleting substances subject to international phase out[11]
- Drift net fishing in the marine environment using nets in excess of 2.5 km. in length
- Transboundary trade in waste or waste products[12], except for non-hazardous waste destined for recycling
- Persistent Organic Pollutants (POPs)[13]
- Non-compliance with workers fundamental principles and rights at work[14]
- Significant degradation of a National Park or similar protected area[15]
- Real estate speculation
- Land acquisition that would involve involuntary resettlement or land acquisition in which there is not a willing seller (that will trigger Involuntary Land Acquisition (OP/BP 4.12)

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[5]www.cites.org

[6] This does not apply to the purchase of medical equipment, quality control (measurement) equipment and any equipment where it can be demonstrated that the radioactive source is to be trivial and/or adequately shielded

[7] This does not apply to the purchase and use of bonded asbestos cement sheeting where the asbestos content is <20%.

[8] Primary forest is defined as relatively intact forest that has been essentially unmodified by human activity for the previous 60 to 80 years; and Tropical moist forest is generally defined as forest in areas that receive not less than 100 mm of rain in any month for two out of three years and have an annual mean temperature of 24^0 C or higher.

[9] Pharmaceutical products subject to phase outs or bans in United Nations, *Banned Products: Consolidated List of Products Whose Consumption and/or Sale Have Been Banned, Withdrawn, Severely Restricted or not Approved by Governments*. (Last version 2001, www.who.int/medicines/library/qsm/edm-qsm-2001-3/edm-qsm-2001_3.pdf)

[10]Pesticides and herbicides subject to phase outs or bans included in both the Rotterdam Convention (www.pic.int) and the Stockholm Convention (www.pops.int).

[11] Ozone Depleting Substances (ODSs) are chemical compounds which react with and deplete stratospheric ozone, resulting in the widely publicized 'ozone holes'. The Montreal Protocol lists ODSs and their target reduction and phase out dates. The chemical compounds regulated by the Montreal Protocol includes aerosols, refrigerants, foam blowing agents, solvents, and fire protection agents. (www.unep.org/ozone/montreal.shtml).

[12] Define by the Basel Convention (www.basel.int).

[13] Defined by the International Convention on the reduction and elimination of persistent organic pollutants (POPs)(September 1999) and presently include the pesticides aldrin, chlordane, dieldrin, endrin, heptachlor, mirex, and toxaphene, as well as the industrial chemical chlorobenzene (www.pops.int)

[14] Fundamental Principles and Rights at Work means (i) freedom of association and the effective recognition of the right to collective bargaining; (ii) prohibition of all forms of forced or compulsory labor; (iii) prohibition of child labor, including without limitation the prohibition of persons under 18 from working in hazardous conditions (which includes construction activities), persons under 18 from working at night, and that persons under 18 be found fit to work via medical examinations; (iv) elimination of discrimination in respect of employment and occupation, where discrimination is defined as any distinction, exclusion or preference based on race, color, sex, religion, political opinion, national extraction, or social origin. (International Labor Organization: www.ilo.org)

[15] In addition to in-country designated areas, other areas include: natural World Heritage Sites (defined by World Heritage Convention, http://whc.unesco.org/nwhc/pages/doc/main.htm.), United Nations List of National Parks and Protected Areas, designated wetlands of international importance (defined by RAMSAR Convention, www.ramsar.org), or selected areas (e.g., strict nature reserves/wilderness areas, natural parks, natural monuments or habitat/species management areas) defined by IUCN (International Conservation Union, www.iucn.org).

natural values; implemented as an element of the Environmental Assessment

- Interference, modification or destruction of any Physical Cultural Resources (e.g. archaeological and historical sites, historic urban areas, sacred sites, graveyards, burial sites, unique) that would trigger Physical Cultural Resources safeguard (OP/BP 4.11)

To determine if proposed sub-project triggers any of the World Bank safeguards, it is proposed that the below EPMP Checklist 1 be used at this stage.

EPMP Checklist 1; Safeguard Trigger Checklist

Criteria		If Yes,
Will project involve land excavation?	[ ] Yes [ ] No	**Natural Habitat Policy (OP/BP 4.04)** Triggered
Will project involve modification of habitats (mangrove forests, coral reefs, seagrass, beaches)?	[ ] Yes [ ] No	
Will project contribute to habitat degradation?	[ ] Yes [ ] No	
Will project generate solid wastes, including toxic wastes?	[ ] Yes [ ] No	
Does project generate effluents?	[ ] Yes [ ] No	
Will project contribute to sedimentation of waterbodies?	[ ] Yes [ ] No	
Does project generate air emissions?	[ ] Yes [ ] No	
Will project result in resettlement of individuals or families?	[ ] Yes [ ] No	
Will project involve hazardous materials?	[ ] Yes [ ] No	
Is project located in or near sensitive areas?	[ ] Yes [ ] No	
Will project cause underground or surface water pollution? (including use of fertilizers, pesticides, etc.)	[ ] Yes [ ] No	**Pest Management Policy (OP/BP 4.09)** Triggered
Will project involve introduction of alien species?	[ ] Yes [ ] No	
Will project contribute to the spread of weeds, pests or animal / plant diseases?	[ ] Yes [ ] No	
Will project impact or involve modification of mangrove or terrestrial forests?	[ ] Yes [ ] No	**Forestry Policy (OP 4.36)** triggered
Will the sub-project potentially impact areas of known local, regional or national cultural heritage significance?	[ ] Yes [ ] No	**Physical Cultural Resources (OP/BP 4.11)** triggered
Will the project result in the temporary or permanent loss of crops, fruit trees and household infra-structure (such as granaries, outside toilets and kitchens, etc.)?	[ ] Yes [ ] No	**Involuntary Resettlement (OP/BP 4.12)** Triggered
Does project impact or involve indigenous persons?	[ ] Yes [ ] No	**Indigenous Peoples (OP/BP 4.10)** Triggered

Step 2: Check Local Permits

Many project types require environmental permits under the Natural Resources Conservation Authority Act. Prescribed categories are listed below pursuant to Section 9 of the Act and may be amended from time to time and require renewal every 5 years. A list of activities requiring Environmental Licenses or Permits can be obtained from NEPA at the referenced website address[16] and by making an enquiry to the DAC (Development Assistance Center) of NEPA who will provide a determination of whether or not a License or Permit is needed.

Parish authorities will also require building and/or zoning permits for projects which change land use, emissions, or require construction. The Applicant must provide any relevant business license or other required permit to demonstrate that they are in compliance with the applicable Parish regulations. Though compliance may be encouraged, disbursement is permitted under this component.

The Applicant should attach evidence of any existing Environmental Permit or License, business license, or other relevant documentation that the Applicant is in compliance with NEPA. In most cases it is expected that the applicant's current Permit status is current and no updating, renewal, or new permitting is required. However, in some cases a Permit may be required but has not been obtained or is not current (this is particularly so since the 2015 NEPA amendments to the list of enterprises which require Environmental Licenses and/or Permits). It is proposed that applicants use the below EPMP Checklist 2 to assess status of permits and licenses. It is recognized that applicants will take time to obtain these permits in their continuing efforts to improve compliance levels with prevailing national law. In such cases where an applicant would require new permits to be obtained or existing permits to be amended, evidence shall be provided that such applicants have begun that process. Such evidence may include the filing of a project brief or conceptual plan to NEPA, an enquiry to the NEPA Development Assistance Center (DAC) and/or Parish "Help Desk" or DAHD for permitting guidance, and/or the filing of a Permit Application with NEPA. In cases where a NEPA Permit or License requires a Compliance Plan, the Applicant shall attach a copy of the Plan and any relevant documentation. Applicants are to provide sufficient evidence that all applicable environment-related permits are in process, and that the Applicant is committed to updating any Permit deficiencies before grants are considered eligible.

[16] Insert NEPA website address for Schedule B list of facilities requiring permits.

EPMP Checklist 2: Permit/License Status Checklist

Permit/License Status Checklist		
	NEPA	**Parish**
No Permit or License Required		
Existing and Current		
Deficient but Compliance Intent by: Enquiry Letter Project Brief Filing Permit Application Compliance Plan		

The list below is intended to assist in the screening of whether or not a NEPA Permit would be required by a particular applicant. It has been modified from the comprehensive list to indicate those which could potentially apply under this project.

Prescribed Categories for NEPA Permits .

1. Construction or installation of pipelines 1km or more for the supply of water
2. Modification, clearance or reclamation of wetlands
3. Construction and operation of facilities for food processing
4. Construction and operation of bottling facilities and boxing plant
5. Construction and operation of fish and meat processing plant
6. Construction and operation of aquaculture facilities and ponds for intensive fishing farming
7. Construction and operation of facilities for processing of agricultural waste
8. Importation or introduction of species of flora and fauna or other biological organisms

Step 3 - Determine Preliminary E&S Risk Status

The EPMP Checklist 3 below will be filled out by the project applicants with assistance where necessary, to make a preliminary determination whether a particular proposed activity or project may exhibit compliance problems, significant environmental or social risk, or complex or sensitive environmental conditions.

EPMP Checklist 3: Environmental Screening (to be completed by the project applicant)

Project Name:			
Brief Description of Project: *to include nature of project, estimated size and cost, specific site area/location, whether it is expansion of construction, etc.*			
Will the project have impacts on the following criteria? Check all that apply.			
	Preparation Phase	Implementation Phase	Mitigation Measures needed
Physical Environment			
Will project involve land excavation?	☐	☐	☐
Will project involve modification of habitats (mangrove forests, coral reefs, seagrass, beaches, forests)?	☐	☐	☐
Will project contribute to habitat degradation?	☐	☐	☐
Will project generate solid wastes:			
a Toxic wastes?	☐	☐	☐
b Use or generate plastics, Styrofoam or non-biodegradable products?	☐	☐	☐
c Include marine debris from fishing activities (including engine oil)?	☐	☐	☐
Does project generate effluents that: a. Are different than currently discharged and would therefore require a new permit	☐	☐	☐
b. Violate Jamaican effluent standards	☐	☐	☐
c. Result in a long term violation of Jamaican water quality standards	☐	☐	☐
d. Contaminate public drinking water resources	☐	☐	☐
e. Harm fish of aquatic ecosystems	☐	☐	☐
f. Contaminate a natural habitat or protected area	☐	☐	☐
g. Are difficult, expensive or hard to control	☐	☐	☐
h. Are inconsistent with World Bank Environment Health and Safety guidelines	☐	☐	☐
i. Alter downstream riverbasin characteristics	☐	☐	☐
j. Contain fertilizers, pesticides or other treatments	☐	☐	☐
k. Contribute to the sedimentation of surrounding water bodies	☐	☐	☐
Does project generate air emissions that are: a. Are different than currently discharged and would therefore require a new permit	☐	☐	☐
b. Violate Jamaican air emission standards	☐	☐	☐

c. Result in a long term violation of Jamaican air quality standards	☐	☐	☐
d. Release pollutants that affect downwind sensitive receptors (hospitals, schools, etc.)	☐	☐	☐
e. Harm sensitive ecosystems	☐	☐	☐
f. Impact a natural habitat or protected area	☐	☐	☐
g. Are difficult, expensive or hard to control	☐	☐	☐
h. Are inconsistent with World Bank Environment Health and Safety guidelines	☐	☐	☐
Is project located in or near sensitive areas? a. protected areas or areas under consideration by the Government for official protection status?	☐	☐	☐
b. forested areas	☐	☐	☐
c. coastlines, wetlands, or other bodies of water	☐	☐	☐
d. river valleys where well-preserved vegetation still exists	☐	☐	☐
Will project involve introduction of alien species?	☐	☐	☐
Will project involve introduction of new stock of existing species?	☐	☐	☐
Will project have impacts to species causing a. Aggregation of invasive species such as lionfish?	☐	☐	☐
b. Possibility of exploitation of non-target species (by-catch)?	☐	☐	☐
c. Exploitation of unassessed stocks of species?	☐	☐	☐
d. Exploitation of breeding stock from the wild?	☐	☐	☐
e. Harm to protected species (e.g. Crocodiles, Ospreys)?	☐	☐	☐
Will project contribute to the spread of weeds, pests or animal / plant diseases?	☐	☐	☐
Will project involve fish processing where parts/byproducts are discarded?	☐	☐	☐
Will project generate noise levels that : a. Violate Jamaican noise standards	☐	☐	☐
b. Impact particularly sensitive receptors (natural habitats, schools, hospitals, etc)	☐	☐	☐
c. Are inconsistent with World Bank EHS Guidelines	☐	☐	☐
Will project produce significant odour?	☐	☐	☐
Will project consume, store, produce or utilize hazardous materials (Hazmats can be classified according to the hazard as explosives; compressed gases, including toxic or flammable gases; flammable liquids; flammable solids; oxidizing substances; toxic materials; radioactive material; and corrosive substances) that: a. require special permits or licenses	☐	☐	☐
b. require licensed or trained personnel	☐	☐	☐

c. are outlawed or banned in EU or Western countries	☐	☐	☐
d. are difficult, expensive, or hard to manage	☐	☐	☐
e. are inconsistent with World Bank EHS Guidelines (general or industry specific as applicable)	☐	☐	☐
f. have a high risk of explosion, fire, or danger to workers	☐	☐	☐
g. are vulnerable to seismic, flood, terrorist attack, or other danger	☐	☐	☐
Will project involve frequent interactions between humans and natural habitats?	☐	☐	☐
Does project have the potential to involve handling or removal of wildlife or wildlife products?	☐	☐	☐
Will project require significant water demand (including for ice generation?)	☐	☐	☐
Will project require sustainable source of good quality water?	☐	☐	☐
Will project require significant energy demand?	☐	☐	☐
Socio-Economic Environment			
Will the project impact assure non-deterioration of human health, occupational safety, and non-disturbance or persons involved? a. identification of hazardous tasks and training as required?	☐	☐	☐
b. use of personal protective equipment (construction related equipment, life jackets) as required?	☐	☐	☐
c. first aid and emergency plans?	☐	☐	☐
d. supervision and enforcement of rules and regulations regarding health and safety?	☐	☐	☐
e. road safety, safe ingress and egress to the property for delivery and equipment?	☐	☐	☐
f. accident and incident reporting, investigation and resolution?	☐	☐	☐
g. safety-at-sea including emergency response actions			
Does the project require public consultation to consider local people, environmental concerns and inputs?	☐	☐	☐
Have there been any complaints raised by local community or affected groups? a. material complaints from the public within the last three (3) years related to environmental, social, or health and safety aspects	☐	☐	☐
b. legal claims against the company due to environmental or social issues	☐	☐	☐
c. significant accidents or deaths of workers or public environmental incidents or accidents (spills, dust clouds, releases, etc.)	☐	☐	☐

Will the sub-project potentially impact areas of known local, regional or national cultural heritage significance? These may include: a. historical structures	☐	☐	☐
b. archeological sites	☐	☐	☐
c. buildings or areas not officially protected but recognized by the local population as significant	☐	☐	☐
Will project reduce other people's access to their economic resources, like fishing grounds, agriculture, water, public services or other resources that they depend on?	☐	☐	☐
Does project have the potential to increase community tension or dispute?	☐	☐	☐
Will project result in permanent or temporary resettlement of individuals or families?	☐	☐	☐
Will the project result in the temporary or permanent loss of infra-structure (such as fish processing facilities, washrooms, etc.)?	☐	☐	☐
Might the project adversely affect vulnerable people and underserved groups (e.g., elderly poor pensioners, physically challenged, women, particularly head of households or widows, etc.) living in the area?	☐	☐	☐
Does project put any of the workers or beneficiaries in situations threatening to their health and safety?	☐	☐	☐
a Offshore ocean fishing grounds?	☐	☐	☐
b Handling of common allergic products (e.g. shrimp, crabs, etc.)?	☐	☐	☐
c Exposure to hazardous chemicals?	☐	☐	☐
d Exposure to heavy machinery?	☐	☐	☐
e Access to areas (ponds, swimming areas, etc.) where drowning is possible?	☐	☐	☐
Does project have community-wide implications that could have negative impacts? (e.g. changing from a fishing community to a tourism-driven community)	☐	☐	☐
Permitting and Licensing			
Does project have valid operating permit, licenses, approvals, etc?	☐	☐	☐
Does project meet all Jamaican environmental regulations regarding air, water and solid waste management?	☐	☐	☐
Does project have any significant outstanding environmental fees, fines or penalties or any other environmental liabilities? *(e.g. lack of permit from NEPA, contaminated soil, water, dead or stressed vegetation, stockpiled chemicals, etc)*	☐	☐	☐

Step 4 – Site Visit

If an application should involve any factors that may represent potential significant or material environmental or social risks, as determined from Step 3 above, a site visit should be done by the Project Management Unit. A site visit will help assess the state of the applicant's operations, in particular environmental, health and safety, and human resources management issues. Site visits must be made to all applicants where the E&S Risk Status has been deemed as MEDIUM or HIGH.

The checklist below will assist in conducting the site visit. The checklist should be used in conjunction with the relevant and applicable IFC Environment, Health and Safety Guidelines (general and sectors) with equivalent or supporting information from other sources. NEPA or other application regulatory agencies may also have relevant and applicable guidelines or technical support. If, after conducting the site visit, there are significant unresolved issues of concern, then an environmental or social consultant or specialist can be retained to conduct an additional audit of the site. The advice and guidance provided by the environmental and social experts should aid the decision-making process of the responsible assessor.

Set out below is checklist for use during a site visit. The checklist should be used in conjunction with the relevant sub-sectoral guideline from NEPA or other application regulatory agency, to ask relevant question of the company management during the site visit.

EPMP Checklist 4: Environmental Screening Checklist (to be completed by the Executing Agency)

Question	Observation(s)
Key Processes (List the key processes, using the appropriate sub-sectoral guideline) and attach ESAT or equivalent for reference	
Environmental Risks (List the key issues form appropriate sub-sectoral guideline and discuss how management control these risks)	
Environmental Opportunities (List the key opportunities, from the appropriate sub-sectoral guideline, and discuss these with management if appropriate)	
Environmental Issues *Use this list as a check for indication of the existence or environmental issues of their good/poor management as you go around the site*	
a. Level of cleanliness in general (good or bad)	
b. Nature of air emission form chimney or stacks (clean or dirty), and adequacy of treatment of emissions.	
c. Odour of site (no odour or strong odour)	
d. Noise level (high or low)	
e. Eye irritation (clean or dusty)	
f. Past use of land (could indicate contamination of ground)	
g. Storage of hazardous or polluting materials, by-products or	

Question	Observation(s)
waste (check method of disposal for environmental impact)	
h. Underground storage of liquids (difficult to see leakage but ask about how Management control possibility of leaks).	
i. Proximity to residential areas (close or distant).	
j. Proximity to polluting source e.g. neighbouring industry (could contaminate customer's property)	
k. Proximity to water courses (indicates likelihood of contamination by accident/leakage).	
l. Health and safety record (good or bad).	
Financial Issues	
a. What are the annual costs for user fees, past fines/penalties?	
b. What is the required capital or operational investment costs for environmental improvements in the short/long term?	
c. Are environmental costs incorporated into the business plan and other financial projections?	
Legal Issues	
Have there been any environmental notices or orders served on the organization which restrict business activities?	
Does the company have all the required environmental permits?	
Is the company compliant with environmental impact assessment requirements?	
Is the company aware of their legal obligations in the future through for example changes in environmental legislation due to accession to the EU?	
Has the company made plans to comply with this legislation?	
Reputation Issues	
Is the company exposed to reputational risk through its activities or local impact on the environment (e.g. trading in a hazardous product, high local emissions disturbing the local community)?	
What steps has the company taken to control its reputation on environmental issues (for example, public information on environmental management, open days for local community groups)?	
Market Issues	
What are the environmental standards or expectations of the company's market; is the customer meeting these, and how might they change in the future?	
Is the company reliant on the environmental standard of any supplied product and, if so, can the customer rely on this supply in the future?	
Managerial Issues	

Question	Observation(s)
Is there someone with responsibility for environmental matters?	
Do they seem well informed and able to manage their environmental responsibilities?	
Do they produce documentation in a timely fashion (e.g. for yourselves)?	
Other	
Any further environmental appraisal required of the environmental appraisal process);	
Any further information promised by the company.	

Recommendations for environmental management or reporting by the partners throughout the life of the grant may also be included in the site visit report and incorporated into documentation.

Step 5 –Determination of Final Environmental Risk Status

The results of the site visit can now be used to inform the final determination of E&S Risk Status. The preliminary determination of the E&S Risk Status will have to be cross referenced with the results of the field visit using the EPMP Checklist 5 below, and assign a final category of Low, Medium, High, or Very High.

EPMP Checklist 5: Guide to final determination of E&S Risk Status

Preliminary Risk Status	Site Visit Observations				
		Unacceptable Conditions Detected	**Major Issues Detected**	**Minor Issues Detected**	**No Issues Detected**
	Very High	N/A	N/A	N/A	N/A
	High	Very High	Very High	High	Medium
	Medium	Very High	High	Medium	Low
	Low	N/A	N/A	N/A	N/A

The E&S Risk Categories in EPMP Checklist 6 above are subjective and will require the use of professional judgment by the Implementing partner, who may elect to seek supporting or expert opinions as is deemed necessary or appropriate on a case by case basis. The matrices may be adjusted and revised from time to time based on experience and judgment, taking into account such factors as scale of the enterprise, location in or near protected areas or other sensitive areas, complaints or violations noted, or other information in the Basic Information screening form.

Projects which are determined to have an E&S Risk Status of VERY HIGH will not be considered eligible. Projects deemed LOW, MEDIUM and HIGH will advanced towards the preparation of loan documents as described in the next step below.

Step 6 – Prepare Application Document

The outcome of the environmental and social risk evaluation should be summarized and included in the documentation submitted in the grant approval package. Following the evaluation and documentation of environmental and social risk, MICAF is in a position to accept the grant application, subject to conditions that will describe measures being taken to control the risk, or to reject the grant application due to unacceptably high risk.

Projects deemed LOW risk will only require the use of standard, general conditions. Projects deemed MEDIUM or HIGH risk will need to include requirements to update or acquire Permits, adhere to Compliance Plans, perform periodic Audits, or adhere to any other condition applicable by NEPA or other relevant agencies. The following EPMP Checklist 6 will be used to guide the necessary grant conditions to be included in the Agreement.

EPMP Checklist 6: Guide for Agreement Conditions

Final Risk Status	Grant Agreement Conditions				
		Standard Conditions	**Permit Update Status**	**Compliance Plan Progress**	**Periodic Audits**
	Very High	N/A	N/A	N/A	N/A
	High	✓	✓	✓	✓
	Medium	✓	✓	✓	
	Low	✓	✓		

The standard language relative to environmental and social matters appears below and will be included in all grant documentation, as general conditions. The language of the conditions may be adjusted as deemed necessary or appropriate, using subjective judgment and professional experience, calling upon the advice of peers or third parties as deemed prudent. Additional conditions will be included on a case by case basis, taking into account the regulatory requirements, findings of the site visit, or other information, with the general goals of 1) updating permit status (including the process of acquiring new permits or licenses); 2) fulfilling the requirements of a Compliance Plan, if applicable; 3) performing periodic Audits of the facility to verify progress and document advances towards improving compliance status; 4) other conditions as appropriate and prudent to ensure that the grantee is fulfilling the intent to achieve full compliance status with laws, regulations, permit conditions, or compliance plans, as applicable. Reporting by the grantees shall also include updates and status reports on any of the relevant or special loan conditions described herein.

Representations and Warranties

(i) the Grantee's operations and activities are in compliance with all applicable environmental, health and safety regulatory requirements; (ii) the Grantee's operations

and activities do not involve any activity included in the List of Excluded Activities; and (iii) with respect to the Grantee's operations and activities, to the best of its knowledge and belief after due-inquiry, there are no substantial or material liabilities, claims or unmitigated risks to the Borrower's employees, buildings or offices, or assets due to environmental, occupational health and safety or labour related issues.

Covenant

The Client shall:

(i) Maintain all operations and activities in compliance with all applicable Jamaica environmental, health and safety regulatory requirements, including laws, regulations and applicable permits/authorizations;

(ii) Ensure that all required permits are obtained and in force through the life of the loan agreement

(iii) Not undertake any operation or activity included in the List of Excluded Activities;

(iv) Ensure that potentially adverse project-related environmental effects, from wastewater effluent, surface drainage and air emissions, and any other potential damage to the natural environmental, are adequately and mitigated.

(v) With respect to the Client's employees, buildings and offices, and assets, take all reasonable and prudent actions to avoid substantial or material liabilities, claims or unmitigated risks due to environmental, occupational health and safety or labor related issues, and if such event does occur, take the appropriate and reasonable actions to adequately resolve and mitigate such liability, claim or risk.

(vi) Ensure that appropriate health and safety and environmental protection measures, are being used in connection with the implementation and operation of the facilities

(vii) Promptly notify the Lender of any incident or accident relating to its operations which could have a significant or material adverse effect on the environment or worker health and safety, such as worker health and safety accident resulting in death, hospitalization or more than 5 days of loss worker time, material environmental health and safety regulatory non-compliance. The notification should include actions to resolve the issue/incident.

(viii) Submit within 45 days after the end of the calendar year, a statement on environmental and worker health and safety performance, including current status of compliance with all applicable environmental and worker health and safety regulatory requirements, summary of actions any incidents of non-compliance in the last calendar year, list of any material public complaints or any material legal claims related to environment, health or safety.

Environmental, Health and Safety Permits, Laws and Regulations

(i) The Client shall ensure that all required permits are obtained and in force through the life of the loan agreement. Where applicable the Client shall ensure that potentially adverse environmental effects, from wastewater effluent, surface drainage and air emissions, and any other potential damage to the natural environmental, are adequately permitted and mitigated in the operation, and maintenance of project facilities.

(ii) The Client shall ensure that appropriate health and safety and environmental protection measures, are being used in connection with the implementation and operation of the facilities.

(iii) Additional recommendations from the site visit or by the environmental expert audit may include as applicable the following optional conditions or restrictions;

(a) as applicable, any project specific environment clause which should be added to the agreement; and
(b) as applicable, any project specific grant administration (i.e., if supervision or reporting is required)

<u>Reporting</u>

The Client shall furnish immediate notice (within 3 days) of any incident or accident relating to its operations which had an adverse effect on the environment or worker health and safety. In particular, such adverse effect is deemed to have occurred;

(a) Where the applicable law requires notification of the accident/incident to the authorities;
(b) Where the accident/incident involves fatality of worker(s) or multiple serious injury requiring hospitalization.

The Client shall submit to the MICAF, as soon as available, but in any event within (…) days after the end of the (financial) year, an annual report on environmental and worker health and safety matters relating to the project and its operations, in a form satisfactory to the MICAF, which shall include copies of any information on environment matters that the Company may have to make available to the authorities and, in any event:

(a) The current status of environmental and worker health and safety permits, licences or other approvals required for (…) operations [including copies of renewals or modifications of any such approvals].

(b) A summary of incidents of non-compliance with the application environmental law, [including legal or administrative action or proceedings involving the Client or fines, penalties or increased charges imposed on the Client].

(c) Progress made on the implementation of any improvements recommended for environmental management or performance.

(d) Worker health protection and safety initiatives [including training programmes] taken by the Client.

(e) Public complaints/representation, if any.

The report shall state the steps taken or proposed by (…) to address any problems in the above areas, and shall identify the person at the company with overall responsibility for environmental health and safety matters.

Step 7 - Grant Administration, Evaluation and Reporting

As part of grant administration, the Executing Agency will maintain information on partner performance in its portfolio. The Executing Agency will require the following annually, and will provide a summary report annually with the following information for the partner portfolio funded by the project:

1. Breakdown of portfolio by type of transaction, and environmental risk classification (low, medium and high environmental risk clients).
2. Describe how environmental procedures have been integrated into the transaction approval process.
3. Give details of any transaction rejected on environmental grounds, in particular, for actual or perceived non-compliance.
4. Give details of any other transaction rejected on environmental or health and safety grounds
5. Give details of any material environmental issues associated with borrowers during the reporting period, in particular:
    (a) Any accidents / litigation / complaints.
    (b) Any incidents of non-compliance with applicable environmental and health and safety regulations and standards, such as fines, penalties or excess fees for non-compliance.
    (c) Any incidents of non-compliance by borrowers with environmental covenants/conditionality imposed by the Bank.
6. Give details of any loans/investments/guarantees etc. used to finance environmental improvements, such as; energy efficiency, waste minimization, switch to cleaner technology, reduction of permit fees or fines due to environmental improvements.
7. Give details of any bad loans due to environmental problems.
8. Describe how the borrowers' environmental performance is monitored (e.g. site visit by Bank staff; inspection by environmental/health authorities; copies of updated permits, reports from

the borrower). Include information on monitoring of special conditions from Permits or other compliance-related items that were included in the Grant Agreements.

9. Specify name and position of the individual(s) formally responsible for the implementation of the environmental procedures.

10. State any difficulties and/or constraints related to the implementation of the environmental procedures.

Based on the results of the annual reporting, the Executing Agency will utilize and evaluate this information to continually improve and adapt its Environmental Policy and Management System. Follow-ups on individual partners will be performed if deemed necessary.

Annex 2 'Environmental Management Plan'

Source: World Bank, OP 4.01, Annex C – Environmental Management Plan (January, 1999)

A project's environmental management plan (EMP) consists of the set of mitigation, monitoring, and institutional measures to be taken during implementation and operation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The plan also includes the actions needed to implement these measures. Management plans are essential elements of EA reports for Category A projects; for many Category B projects, the EA may result in a management plan only. To prepare a management plan, the borrower and its EA design team (a) identify the set of responses to potentially adverse impacts; (b) determine requirements for ensuring that those responses are made effectively and in a timely manner; and (c) describe the means for meeting those requirements. More specifically, the EMP includes the following components.

Mitigation

The EMP identifies feasible and cost-effective measures that may reduce potentially significant adverse environmental impacts to acceptable levels. The plan includes compensatory measures if mitigation measures are not feasible, cost-effective, or sufficient. Specifically, the EMP (a) identifies and summarizes all anticipated significant adverse environmental impacts (including those involving indigenous people or involuntary resettlement); (b) describes--with technical details--each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate; (c) estimates any potential environmental impacts of these measures; and (d) provides linkage with any other mitigation plans (e.g., for involuntary resettlement, indigenous peoples, or cultural property) required for the project.

Monitoring

Environmental monitoring during project implementation provides information about key environmental aspects of the project, particularly the environmental impacts of the project and the effectiveness of mitigation measures. Such information enables the borrower and the Bank to evaluate the success of mitigation as part of project supervision, and allows corrective action to be taken when needed. Therefore, the EMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the EA report and the mitigation measures described in the EMP. Specifically, the monitoring section of the EMP provides(a) a specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions; and (b) monitoring and reporting procedures to (i) ensure early detection of conditions that necessitate particular mitigation measures, and (ii) furnish information on the progress and results of mitigation.

Capacity Development and Training

To support timely and effective implementation of environmental project components and mitigation measures, the EMP draws on the EA's assessment of the existence, role, and capability of environmental units on site or at the agency and ministry level. If necessary, the EMP recommends the establishment or expansion of such units, and the training of staff, to allow implementation of EA recommendations. Specifically, the EMP provides a specific description of institutional arrangements--who is responsible for carrying out the mitigatory and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training). To strengthen environmental management capability in the agencies responsible for implementation, most EMPs cover one or more of the following additional topics: (a) technical assistance programs, (b) procurement of equipment and supplies, and (c) organizational changes.

Implementation Schedule and Cost Estimates

For all three aspects (mitigation, monitoring, and capacity development), the EMP provides (a) an implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans; and (b) the capital and recurrent cost estimates and sources of funds for implementing the EMP. These figures are also integrated into the total project cost tables.

Integration of EMP with Project

The borrower's decision to proceed with a project, and the Bank's decision to support it, are predicated in part on the expectation that the EMP will be executed effectively. Consequently, the Bank expects the plan to be specific in its description of the individual mitigation and monitoring measures and its assignment of institutional responsibilities, and it must be integrated into the project's overall planning, design, budget, and implementation. Such integration is achieved by establishing the EMP within the project so that the plan will receive funding and supervision along with the other components.

SAMPLE EMP CHECKLIST

PART 1: INSTITUTIONAL & ADMINISTRATIVE				
Country				
Project title				
Scope of project and activity				
Institutional arrangements (Name and contacts)	WB (Project Team Leader)	Project Management	Local Counterpart and/or Recipient	
Implementation arrangements (Name and contacts)	Safeguard Supervision	Local Counterpart Supervision	Local Inspectorate Supervision	Contractor
SITE DESCRIPTION				
Name of site				
Describe site location			Attachment 1: Site Map [ ]Y [ ] N	
Who owns the land?				
Geographic description				
LEGISLATION				
Identify national & local legislation & permits that apply to project activity				
PUBLIC CONSULTATION				
Identify when / where the public consultation process took place				
INSTITUTIONAL CAPACITY BUILDING				
Will there be any capacity building?	[ ] N or [ ]Y if Yes, Attachment 2 includes the capacity building program			

PART 2: ENVIRONMENTAL /SOCIAL SCREENING			
Will the site activity include/involve any of the following potential issues and/or impacts:	**Activity and examples of potential issues and/or impacts**	**Status** **If Yes for any**	**Additional references**
	1. Building rehabilitation • Site specific vehicular traffic • Increase in dust and noise from demolition and/or construction • Construction waste	[ ] Yes [ ] No	See Section **B** below
	2. New construction • Excavation impacts and soil erosion • Increase sediment loads in receiving waters • Site specific vehicular traffic • Increase in dust and noise from demolition and/or construction • Construction waste	[ ] Yes [ ] No	See Section **B** below
	3. Individual wastewater treatment system • Effluent and / or discharges into receiving waters	[ ] Yes [ ] No	See Section **C** below
	4. Historic building(s) and districts • Risk of damage to known/unknown historical or archaeological sites	[ ] Yes [ ] No	See Section **D** below
	5. Acquisition of land[17] • Encroachment on private property • Relocation of project affected persons • Involuntary resettlement • Impacts on livelihood incomes	[ ] Yes [ ] No	See Section **E** below
	6. Hazardous or toxic materials[18] • Removal and disposal of toxic and/or hazardous demolition and / or construction waste • Storage of machine oils and lubricants	[ ] Yes [ ] No	See Section **F** below
	7. Impacts on forests and/or protected areas • Encroachment on designated forests, buffer and /or protected areas	[ ] Yes [ ] No	See Section **G** below

[17] Land acquisitions includes displacement of people, change of livelihood encroachment on private property this is to land that is purchased/transferred and affects people who are living and/or squatters and/or operate a business (kiosks) on land that is being acquired.

[18] Toxic / hazardous material includes and is not limited to asbestos, toxic paints, removal of lead paint, etc.

	• Disturbance of locally protected animal habitat		
	8. Handling / management of medical waste • Clinical waste, sharps, pharmaceutical products (cytoxic and hazardous chemical waste), radioactive waste, organic domestic waste, non-organic domestic waste • On site or off-site disposal of medical waste	[ ] Yes [ ] No	See Section **H** below
	9. Traffic and Pedestrian Safety • Site specific vehicular traffic • Site is in a populated area	[ ] Yes [ ] No	See Section **I** below

PART 3: MITIGATION PLAN		
ACTIVITY	**PARAMETER**	**GOOD PRACTICES MITIGATION MEASURES CHECKLIST**
A. General Conditions	Notification and Worker Safety	(a) The local construction and environment inspectorates and communities have been notified of upcoming activities (b) The public has been notified of the works through appropriate notification in the media and/or at publicly accessible sites (including the site of the works) (c) All legally required permits (to include not limited to land use, resource use, dumping, sanitary inspection permit) have been acquired for construction and/or rehabilitation (d) All work will be carried out in a safe and disciplined manner designed to minimize impacts on neighboring residents and environment. (e) Workers' PPE will comply with international good practice (always hardhats, as needed masks and safety glasses, harnesses and safety boots) (f) Appropriate signposting of the sites will inform workers of key rules and regulations to follow.
B. General Rehabilitation and /or Construction Activities	Air Quality	(a) During interior demolition use debris-chutes above the first floor (b) Keep demolition debris in controlled area and spray with water mist to reduce debris dust (c) Suppress dust during pneumatic drilling/wall destruction by ongoing water spraying and/or installing dust screen enclosures at site (d) Keep surrounding environment (side walks, roads) free of debris to minimize dust (e) There will be no open burning of construction / waste material at the site (f) There will be no excessive idling of construction vehicles at sites
	Noise	(a) Construction noise will be limited to restricted times agreed to in the permit (b) During operations the engine covers of generators, air compressors and other powered mechanical equipment should be closed, and equipment placed as far away from residential areas as possible
	Water Quality	(a) The site will establish appropriate erosion and sediment control measures such as e.g. hay bales and / or silt fences to prevent sediment from moving off site and causing excessive turbidity in nearby streams and rivers.
	Waste management	(a) Waste collection and disposal pathways and sites will be identified for all major waste types

PART 3: MITIGATION PLAN		
ACTIVITY	**PARAMETER**	**GOOD PRACTICES MITIGATION MEASURES CHECKLIST**
		expected from demolition and construction activities. (b) Mineral construction and demolition wastes will be separated from general refuse, organic, liquid and chemical wastes by on-site sorting and stored in appropriate containers. (c) Construction waste will be collected and disposed properly by licensed collectors (d) The records of waste disposal will be maintained as proof for proper management as designed. (e) Whenever feasible the contractor will reuse and recycle appropriate and viable materials (except asbestos)
C. Individual wastewater treatment system	Water Quality	(a) The approach to handling sanitary wastes and wastewater from building sites (installation or reconstruction) must be approved by the local authorities (b) Before being discharged into receiving waters, effluents from individual wastewater systems must be treated in order to meet the minimal quality criteria set out by national guidelines on effluent quality and wastewater treatment (c) Monitoring of new wastewater systems (before/after) will be carried out
D. Historic building(s)	Cultural Heritage	(a) If the building is a designated historic structure, very close to such a structure, or located in a designated historic district, notify and obtain approval/permits from local authorities and address all construction activities in line with local and national legislation (b) Ensure that provisions are put in place so that artifacts or other possible "chance finds" encountered in excavation or construction are noted, officials contacted, and works activities delayed or modified to account for such finds.
E. Acquisition of land	Land Acquisition Plan/Framework	(a) If expropriation of land was not expected and is required, or if loss of access to income of legal or illegal users of land was not expected but may occur, that the bank task Team Leader is consulted. (b) The approved Land Acquisition Plan/Framework (if required by the project) will be implemented
F. Toxic Materials	Asbestos management	(a) If asbestos is located on the project site, mark clearly as hazardous material (b) When possible the asbestos will be appropriately contained and sealed to minimize exposure (c) The asbestos prior to removal (if removal is necessary) will be treated with a wetting agent to minimize asbestos dust (d) Asbestos will be handled and disposed by skilled & experienced professionals (e) If asbestos material is be stored temporarily, the wastes should be securely enclosed inside closed containments and marked appropriately (f) The removed asbestos will not be reused
	Toxic / hazardous waste management	(a) Temporarily storage on site of all hazardous or toxic substances will be in safe containers labeled with details of composition, properties and handling information (b) The containers of hazardous substances should be placed in an leak-proof container to prevent spillage and leaching

PART 3: MITIGATION PLAN		
ACTIVITY	**PARAMETER**	**GOOD PRACTICES MITIGATION MEASURES CHECKLIST**
		(c) The wastes are transported by specially licensed carriers and disposed in a licensed facility. (d) Paints with toxic ingredients or solvents or lead-based paints will not be used
G. Affects forests and/or protected areas	Protection	(a) All recognized natural habitats and protected areas in the immediate vicinity of the activity will not be damaged or exploited, all staff will be strictly prohibited from hunting, foraging, logging or other damaging activities. (b) For large trees in the vicinity of the activity, mark and cordon off with a fence large tress and protect root system and avoid any damage to the trees (c) Adjacent wetlands and streams will be protected, from construction site run-off, with appropriate erosion and sediment control feature to include by not limited to hay bales, silt fences (d) There will be no unlicensed borrow pits, quarries or waste dumps in adjacent areas, especially not in protected areas.
H. Disposal of medical waste	Infrastructure for medical waste management	(a) In compliance with national regulations the contractor will insure that newly constructed and/or rehabilitated health care facilities include sufficient infrastructure for medical waste handling and disposal; this includes and not limited to: ▪ Special facilities for segregated healthcare waste (including soiled instruments "sharps", and human tissue or fluids) from other waste disposal: a. Clinical waste: yellow bags and containers b. Sharps – Special puncture resistant containers/boxes c. Domestic waste (non-organic): black bags and containers ▪ Appropriate storage facilities for medical waste are in place; and ▪ If the activity includes facility-based treatment, appropriate disposal options are in place and operational
I Traffic and Pedestrian Safety	Direct or indirect hazards to public traffic and pedestrians by construction activities	(b) In compliance with national regulations the contractor will insure that the consruction site is properly secured and construction related traffic regulated. This includes but is not limited to ▪ Signposting, warning signs, barriers and traffic diversions: site will be clearly visible and the public warned of all potential hazards ▪ Traffic management system and staff training, especially for site access and near-site heavy traffic. Provision of safe passages and crossings for pedestrians where construction traffic interferes. ▪ Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement ▪ Active traffic management by trained and visible staff at the site, if required for safe and convenient passage for the public. ▪ Ensuring safe and continuous access to office facilities, shops and residences during renovation activities, if the buildings stay open for the public.

Sample Environmental Management Plan Format							
Phase	**Environmental Impact**	**Mitigating Measure(s)**	**Cost**		**Institutional Responsibility**		**Remarks**
			Install	**Operate**	**Install**	**Operate**	
During preparation							
During implementation							
During supervision							

Sample Environmental Monitoring Plan Format										
Phase	**What parameter will be monitored?**	**Where will the parameter be monitored?**	**How will the parameter be monitored?**		**Why is the parameter being monitored?**		**Cost**		**Institutional Responsibility**	
							Install	**Operate**	**Install**	**Operate**
Baseline										
During preparation										
During implementation										
During supervision										

Annex 3 World Bank 'Management and Mitigation Measures'

The below three tables summarize the World Banks Environmental, Health and Safety Guidelines for specific sectors. The General Environmental Health and Safety Guidelines should also be considered during this process.

Table 3.1 Management and Mitigation Measures for Aquaculture Activities (National Aquaculture Hatchery, Ornamental Fishery, Marine Aquaculture)

World Bank Guidelines	World Bank Suggested Management
Environment	
Threats to biodiversity: Conversion of natural habitats (removal of, alteration of hydrology, substrates etc)	Survey project area prior to conversion, delineate boundaries and ascertain biodiversity importance at national or regional level
	Ensure area does not represent unique or protected area, or is of high biodiversity value.
	Be aware of presence of critically endangered or threatened species
	Design facilities so that as much of natural vegetation is left in tact
	Design mitigation measures to achieve no net loss of biodiversity where feasible (including post-construction restorative action)
	Avoid the need to frequently abandon or replace poorly designed ponds (careful assessment of soil and hydrological conditions required)
Threats to biodiversity: Conversion of agricultural land (salinization)	Ensure that the embankments around brackish water pond systems are high enough to form a physical division between agriculture and aquaculture
	Ensure that the saline / brackish water discharges are appropriately treated and disposed of (e.g. through use of discharge canals) for the receiving waters
	Ensure that appropriate discussions are held at the community level to avoid conflicts of interest when agricultural land is transferred to aquaculture production
Threats to biodiversity: Introduction of alien, selectively bred, or genetically engineered species	Application of codes and guidelines
	Farming of sterile fish
	Preventing the escape of species from pond-based aquaculture systems (e.g. mesh screens, fish-proof strainer dams, gravel filtration, chemical treatment of discharged water, hydrological assessments, contingency plans)
	Preventing the escape of species from open water aquaculture systems. (e.g. regular inspection, hardy design of equipment, containment periods during bad weather, adequate marking of systems, contingency plan)

Threats to biodiversity: Impacts of harvesting on ecosystem functions	Support breeding of stock material in captivity.
	However, for some species, careful harvesting of hatchlings/ and or fry (less than 3 cm) of select species
Threats to biodiversity: Fish meal and fish oil	Support use of fish meal and oil based feed alternatives (e.g. soya)
Source Water Quality	Adhere to relevant water quality guidelines
Contamination of aquatic systems: soil erosion and sedimentation	Construct pond and canal levees with a 2:1 or 3:1 slope (based on soil type) as this adds stability to the pond banks, reduces erosion, and deters weeds
	Avoid pond construction in areas that have a slope of more than 2 percent, as this will require energy-intensive construction and maintenance
	Stabilize the embankments to prevent erosion
	Reduce excavation and disturbance of acid sulfate soils during construction
	Carry out construction work during the 'dry' season to reduce sediment runoff that may pollute adjacent waters
	Install temporary silt fences during construction to slow down and catch any suspended sediments
	Silt fences can be made of woven plastic or fabric, or hay bales.

Contamination of aquatic systems: wastewater discharge	Feed • Ensure that pellet feed has a minimum amount of "fines" or feed dust. Fines are not consumed and add to the nutrient load in the water • Match the pellet size to the species' life-cycle stage (e.g. smaller pellets should be fed to fry or juvenile animals to reduce the unconsumed fraction) • Regularly monitor feed uptake to determine whether it is being consumed and adjust feeding rates accordingly. Feed may be wasted due to overfeeding or not feeding at the right time of day • Where feasible, use floating or extruded feed pellets as they allow for observation during feeding time • Store feed in cool, dry facilities and ideally for no longer than 30 days to avoid reduction in vitamin contents. Moldy feed should never be used as it may cause disease • Spread feed as evenly as possible throughout the culture system, ensuring that as many animals as possible have access to the feed. Some species are highly territorial, and uneaten feed adds to the nutrient load • Feed several times a day, especially when animals are young, allowing better access to food, better feed conversion ratios and less waste • Halt feeding at a suitable interval before harvest to eliminate the presence of food and / or fecal material in the animal's gut • During harvesting, contain and disinfect blood water and effluent to reduce the risk of disease spread and to contain effluent matter
	Other organic materials • Perform slaughter and processing in an area where the effluent is contained • Prevent effluent leakage from harvest rafts and bins by using harvest bins in good condition with sealed bin liners and secure lids and bindings • Equip off-loading bays with a waterproof apron and surround with a bund to contain potential spills and prevent contamination with effluent.
	Suspended solids • Avoid discharging waters from ponds while they are being harvested with nets, as this will add to the suspended solids in the effluent drainage • If feasible, use partial draining techniques to empty ponds that have been harvested. The last 10–15 percent of pond water contains the highest quantities of dissolved nutrients, suspended solids, and organic matter. After harvest, hold the remaining water in the pond for a number of days before discharge, or transfer to a separate treatment facility.

	Fertilizers • Plan the rate and mode of application of fertilizers to maximize utilization and prevent over-application, taking into account predicted consumption rates • Increase the efficiency of application and dispersion through such practices as dilution of liquid fertilizers or solution of granulated fertilizers prior to application. Other options include the use of powdered fertilizers or the placement of powdered fertilizer bags in shallow water to allow solution and dispersion • Consider the use of time-released fertilizer in which resin coated granules release nutrients into the pond water, with the rate of release corresponding to water temperature and movement • Avoid the use of fertilizers containing ammonia or ammonium in water with pH of 8 or above to avoid the formation of toxic unionized ammonia (NH3) • Depending on the system (e.g., freshwater aquaculture), grow organic fertilizer (e.g. natural grass) in the pond basin after harvest • Initiate pond fertilization only in static ponds with no pond water overflow that can impact downstream waters and watersheds • Conduct pond fertilization to avoid or minimize consequences of potential runoff due to floods or heavy rain and avoid application to overflowing ponds.
	Chemicals • Design the pond depth to reduce the need for chemical control of aquatic weeds and reduce thermal stratification • Do not use antifoulants to treat cages and pens. The chemically active substances used in antifouling agents are very poisonous and highly stable in an aquatic environment. Clean nets manually or in a net washing machine.
	Prevention of pond effluent entering surrounding water bodies • In some fish systems, avoid automatic drainage of ponds at the end of the production cycle as the same pond water may be used to cultivate several crop rotations of certain species (e.g. catfish) • Reuse water from harvested ponds by pumping it into adjacent ponds to help complement their primary productivity, provided that the level of BOD is controlled; This process is called “bloom seeding,” and requires careful timing of harvests • Consider the hydrology of the region in the design of the pond system and ensure that the pond embankments are high enough to contain the pond water and prevent loss of effluent during periods of increased rainfall and potential flooding
Contamination of aquatic systems: process wastewater treatment	See general EHS Guidelines

Contamination of aquatic systems: other wastewater streams and water consumption	See general EHS Guidelines
Hazardous Materials	See general EHS Guidelines
Occupational Health and Safety	
Physical hazards: heavy lifts	Use mechanical and / or automated equipment to facilitate lifts heavier than 25 kg
	Design workstations that can be adapted to individual workers, especially if fish are processed post-harvest
	Construct ponds that are rectangular in shape to facilitate harvesting. If ponds are of sufficient size, and the embankments are at least 2.5 meters wide, vehicles can be used on the embankments to drag harvest seines
Physical hazards: electric shock	Waterproof all electrical installations
	Ensure that fuses are used and that there is an appropriate connection to the ground
	Ensure that all cables are intact, waterproof, and without connection
	Provide training in the correct handling of electric equipment (e.g. pumps and) to avoid the risk of short circuits
	Employ lock out / tag out procedures.
Physical hazards: drowning	Provide lifejackets and harnesses with safety clips (karabiners) that lock on to lines or fixed points
	Ensure that personnel are experienced swimmers
	Train personnel in safety at sea, including procedures for supervision of personnel
	Require that personnel wear lifejackets at all times on exposed sites and at sea
	Where large vessels are used to transport personnel and equipment to marine sites, ensure that the vessel can be securely berthed on the pontoons, reducing the risk of falling into the gap between the vessel and the pontoon.
Exposure to chemicals	See general EHS Guidelines
Water-borne diseases	See general EHS Guidelines
Community Health and Safety	
Effects on water resources	maintain hydrologic conditions which provide water quality and quantity consistent with community needs and uses
	in the case of coastal facilities, prevent salt water intrusion from affecting drinking and agricultural water supplies
	plan site design and operation to prevent and control these potential impacts
Food Safety: Resistance to veterinary drugs	Limit antibiotic use (e.g. through vaccination)
	If possible, fallow sites annually (for four weeks at end of cycle)
	Frequent assessment by veterinary service (stock and staff assessment)

	Develop Health Plan (including emergency procedures)
	If antibiotics are recommended • Use according to manufacturer and under guidance of professional • Develop contingency plan • Store antibiotics in secure, contained areas in original packaging • Avoid stockpiling and dispose of any past expiration date
Physical Hazards	Prevent potential community interaction with ponds by well-designed access routes, wide walkways and fences where necessary

Source: World Bank Environment, Health and Safety Guidelines for Aquaculture (World Bank, 2007a)

Table 3.2 Management and Mitigation Measures for Fish Processing Activities (Marine Aquaculture, Offshore Fishing)

World Bank Guidelines	World Bank Suggested Management
Environment	
Solid Waste and By-Products	Encourage fishers to reduce by-catch of "nontarget species" that could result in extra waste in the by-product line
	Design fish processing operations to enable the recovery of waste streams in accordance with Good Manufacturing Practice (GMP) and Hazard Analysis and Critical Control Points (HACCP) food safety programs
	Where feasible, reprocess waste into commercial byproducts (e.g. fish internal organs converted to fish meal, production of fish silage)
	Encourage economically feasible recovery of wastewater (e.g. stick-water evaporation plants)
Solid Waste and By-Products: Sludge Treatment and Disposal	Sludge dewatering on sludge drying beds for small-scale factories and dewatering using belt presses and decanter centrifuges for medium and large-scale factories;
	Land application (as fertilizer) of wastes from on-site wastewater treatment in agricultural production
	Pathogens can be destroyed during controlled anaerobic digestion (biogas) or aerobic treatment (composting)
	Disposal of wastes in landfill if not used for biogas production or combustion.
Wastewater: Industrial Process Wastewater	Collect internal organs and other organic materials separately, for processing into by-products according to the recommendations for solid waste management above
	Design the production line so that cooling water, storm water, and process effluents can be kept separate to permit appropriate treatment options
	Conduct a dry precleaning of equipment and production areas before wet cleaning (e.g. rubber scraping of work tables and plant floor before hosing)
	Establish procedures for the dry removal of offal, using dry vacuum systems where feasible
	Use grids and screens on floor drains, collection channels and wastewater channels to reduce amount of solids, coarse material and fat entering the wastewater

	Avoid submersion of open products (e.g. fillets) in water, as soluble protein may leak out and enter the wastewater effluent stream
	Ensure that tanks are effectively bunded and provide overfilling protection on bulk storage tanks
	Choose cleaning agents that do not have adverse impacts on the environment in general, or on wastewater treatment processes and sludge quality for agricultural application.
Wastewater: Process Wastewater Treatment	See general EHS Guidelines
Wastewater: Other Wastewater Streams and Water Consumption	Use enough ice to secure product quality and match ice production to requirements
	Improve efficiency by concentrating activities or certain processes on fewer days per week, if the facility or process is not operated at full capacity
	Improve the process lay out to facilitate cleaning and eliminate wet transport of wastes, thereby minimizing water consumption
	Dry clean with a scraper or broom before cleaning with water. Use efficient cleaning procedures as mentioned in the section "Industrial Process Wastewater" section above
	Avoid recycling contact process water. Recycling of cooling water, rinse water, and wastewater for some specific noncritical applications may be feasible as long as hygiene considerations are observed.
Emissions to Air: Odor Prevention	Avoid processing batches of raw material that are of considerably lower than average quality; this will reduce the odor components
	Reduce the stock of raw materials, waste, and by-products and store this stock for short periods of time only in a cold, closed, well-ventilated place
	Seal by-products in covered, leak-proof containers
	Keep all working and storage areas clean and remove waste products immediately from the production line
	Empty and clean fat traps on a regular basis
	Cover all transfer systems, wastewater canals, and wastewater treatment facilities to reduce the escape of foul odors.
Emissions to Air: Odor Control	Install condensers on all appropriate process equipment (e.g., cookers and evaporators) to treat air emissions for odor, including sulfides and mercaptans
	Install biofilters as the final method of air treatment and acid scrubbers for ammonia removal ahead of the biofilter
	Install cyclones and filtration (fabric filters normally are adequate) to remove particulates
	Reduce fugitive odor sources from open doors, open windows, and general room ventilation through the use of negative pressure-controlled ventilation systems
Emissions to Air: Exhaust Gases	See general EHS Guidelines
Emissions to Air: Particulates	Consider use of integrated smoking units with incineration and heat recovery
	Clean the kiln exhaust using filters, incinerators, and / or wet scrubbers
	Ensure that smoke from the fish processing process is emitted from a stack of sufficient height
	Transfer air emissions to the boiler house for use as the supply air for the combustion process

Emissions to Air: Energy Consumption and Management	
Occupational Health and Safety	
Physical Hazards	See general EHS Guidelines
	Provide workers with training in the proper use and maintenance of cutting equipment (including the use of machine safety devices, handling / storage and upkeep of knives, and emergency shutoff procedures) and personal protective equipment (e.g. metallic gloves and leather aprons for cutting activities, and protective footwear with rubber soles)
	Design the plant so that different activities and the flow of processes do not cross. Use clear demarcations, handrails and non-slip flooring where available
	Use completely enclosed conveyer belts to protect hands and fingers.
Biological Hazards	See general EHS Guidelines
	Consider work rotation strategies to reduce occupational exposure to allergens
	Wear gloves to protect hands from exposure to products, especially when working with seafood that is known to create allergic reactions (e.g. scallops and shrimp).
	Provide food-approved shielding hand creams;
	Avoid aerosol-generating activities. Provide proper ventilation of enclosed or semi-enclosed areas to reduce or eliminate exposure to aerosols, in addition to adequate distances between workers and aerosol-generating activities
	Ensure physical segregation of work and personal facilities to maintain worker personal hygiene.
Lifting, Carrying and Repetitive Work	See general EHS Guidelines
Chemicals	See general EHS Guidelines
	Where smoke ovens are involved, avoid putting in the same room, ensure smoke does not enter building and use respiratory protection when cleaning.
	Ensure that employees handling concentrated lye, acid, and chlorine wear protective clothing and eyewear.
Heat and Cold	Set temperature in air-conditioned processing facilities according to temperature stress management procedures. Products awaiting the next processing step can be kept chilled without lowering the ambient temperature through proper use of ice, slush-ice, or waterice mixtures
	Equip cold stores and chill stores with strip curtains to avoid extensive drafts when doors are open. Ensure freezers can be opened from the inside;
	Design air-conditioning systems for processing facilities in conjunction with strip curtain placement to minimize drafts;
	Provide protective clothing in cold environments (e.g. refrigerated storage rooms). Process workers should always be equipped with proper working garments, including dry boots;
	Reduce movement of processing workers between different temperature zones (e.g. when packing frozen products).
Confined Space	See general EHS Guidelines
Noise and Vibration	See general EHS Guidelines

Community Health and Safety	
Food Safety Impacts and Management	Respect "clean" and "dirty" zoning. Design in accordance with veterinary rules (e.g. surfaces are easy to clean and desterilize knives)
	Improve the cooling chain
	Facilitate tracing parts of processed product
	Comply with veterinary regulation and precautions for waste and by-products
	Full institutionalization of HACCP prerequisites including Sanitation, Good Management Practices (GMPs), Implement integrated pest and vector management, programs and maximize pest and vector control, through mechanical means(e.g. traps), and use mesh, on doors and windows to reduce the need for chemical pest and vector control, Chemical control, Allergen control, Customer complaints mechanism, Traceability and recall

Source: World Bank Environment, Health and Safety Guidelines for Fish Processing (World Bank, 2007b)

Table 3.3 Management and Mitigation Measures for Tourism Activities (Tourism)

World Bank Guidelines	World Bank Suggested Management
Environment	
Resource Consumption: Water conservation	See general EHS Guidelines
	Use by communities and /Rainwater collection practiced through a network of gutters and pipes, and channeled into a cistern or a catchment basin. Rainwater collected can be used for multiple purposes (irrigation, cooling equipment, replacing lost water, etc.)
	Biological treatment should be used to enable reuse of grey water from bathrooms, sinks, kitchens, etc. Wastewater streams should be carefully monitored to ensure that grey water is not mixed with other sewage resulting in potentially hazardous situations
	Garden design and plant selections to enable irrigation water requirements to be met by rainwater and natural water percolation in soils
	Water-saving equipment, including ultra-low-flush toilets, spray nozzles, urinals, faucet aerators, and low-flow showerheads, infrared and ultrasonic sensors, water spigots, and pressure-control valves.
Resource Consumption: Energy conservation	Use of passive solar design to take advantage of natural sunlight and airflow
	Optimized building orientation
	Use of direct gain and day lighting techniques, allowing sunlight to penetrate a building to provide light to illuminate interiors and to provide heat
	Implementation of Trombe walls (glazing-encased thin airspace in front of a thermally massive wall);
	Installation of a renewable energy systems where local conditions permit (e.g. solar water heating, wind turbines, etc).
Emissions to Air	See general EHS Guidelines

Wastewater	Controlling consumption of cleaning chemicals; Use biodegradable products when possible
	Avoiding or minimizing the use of cleaning chemicals containing toxic chemicals (See Guidelines)
Hazardous Material Management	See general EHS Guidelines
Waste Management	Buying in bulk quantities whenever possible
	Use of refillable, bulk dispensers (e.g. toiletries) rather than individually packaged products
	Working with suppliers to limit use of, and establish recycling for, product packaging
	Avoiding use of polystyrene foam in all operations
	Providing in-room recycling procedures and appropriate receptacles
	Use of glass or durable plastic instead of disposable plastic items (e.g. straws, cups)
	Implementing organic-waste composting
	Disposing of wastes only after all waste prevention and recycling strategies have been explored and maximized
Biodiversity Conservation	Timely identification of sensitive habitats and implementation of protective measures (e.g. buffer zones or corridors) to maintain links between natural systems within and beyond the site, limiting habitat fragmentation
	Avoiding the introduction of new invasive species during construction, landscaping, and operation of tourism facilities
	After construction, restoring habitat through the use of native plants
	Reducing the impact of the hotel presence on nocturnal environments by avoiding lighting that extends off site or into the night sky
	Identification and engagement in regional coordination to enable management of potential impacts related to migratory species and transboundary ecosystems
	Establishing limits (e.g. numbers of visitors), for excursions to sensitive sites
	Coordinating with ancillary suppliers (e.g. food suppliers / farmers, construction-material suppliers, product suppliers) to ensure sustainable practices for biodiversity conservation in the supply chain
	Implementing appropriate landscape, sacred-site, cultural, and natural heritage conservation activities and plans
	Promoting appropriate guest and staff behaviors and also developing specific codes of conduct for sustainable practices in tourism-related activities (e.g. walking and trekking; camping; vehicle, boat, and aircraft use; snorkeling and scuba diving; trail riding; wildlife watching; and fishing)
	Developing and implementing contingency plans for emergencies that may threaten the environment and the conservation and sustainable use of biodiversity
	Implementing specifically tailored environmental and cultural sustainability audits and tourism activity reviews to assess the effectiveness of impact management measures
Noise	See general EHS Guidelines
Pesticide Use	The World Bank suggested mitigation list for Pesticides is very extensive including suggestions for (i) alternatives for pesticide application, (ii) pesticide application, and (iii) pesticide handling and storage. See EHS Guidelines for more details

Fertilizer Use	Avoiding excess fertilization by analyzing soil to establish nutrient needs
	Timing the application of crop nutrients using meteorological information to avoid, where feasible, application during or close to precipitation events
	Establishing buffer zones, strips, or other "no-treatment" areas along water sources, rivers, streams, ponds, lakes, and ditches to act as a filter to catch potential runoff from the land
	Storing fertilizers in their original packaging and in a dedicated location that can be locked and properly identified with signs, and with access limited to authorized persons.
Occupational Health and Safety	
Noise	Installing double doors between guest rooms and between rooms and noisy environments; positioning, enclosing or isolating noise equipment
	Installing windows with sound-reduction materials;
Physical Hazards: Slips and Falls	Equipping shower stalls with nonslip surfaces or antislip strips, secure handles, and ready access to emergency phones;
	Installing nonslip surfaces in areas with potentially slippery floors or subject to frequent wetting (e.g. open hallways or swimming pool decks)
	Maintaining frequently transited areas as dry as possible;
	Placing of temporary or permanent warning signs on wet floors during cleaning or after rain
Biological Hazards: Water and Food Quality	Compliance with food hygiene and water-quality standards defined by central authorities or, in their absence, application of international food-handling, preparation and storage and water-quality recommendations
	Supply of safe potable water for drinking, bathing, food preparation, and other purposes where it may be ingested
	Regular testing of potable water according to World Health Organization (WHO) standards as a minimum.
Biological Hazards: Indoor Air Quality	Use low-VOC-emitting products (e.g. water-base paints rather than oil based paints, low VOC containing adhesives for flooring and wall decorations)
	Avoid aerosols and sprays
	Use housekeeping and cleaning products during unoccupied hours taking care to follow safety precautions including appropriate ventilation;
	Avoid the use of "air fresheners"
	Expose products in open or ventilated areas before installation and increase ventilation rates during and after installation.
	Employ in room control techniques including no-smoking policies, exhaust ventilation with pressure control for major local sources, avoid paper clutter; provide specific staff-training and guest information.
	For HVAC systems, conduct preventative maintenance, keep duct lining dry, maintain clean mechanical rooms and rapidly fix leaks and clean spills
Biological Hazards: Use of Chemical Cleaners	See general EHS Guidelines
Biological Hazards: Exposure	Train personnel to apply pesticides and ensure that personnel have received the necessary certifications, or equivalent training where such certifications are not required

to pesticide	Respect post-treatment intervals to avoid operator exposure during reentry to crops with residues of pesticides
	Ensure hygiene practices are followed (in accordance to FAO and PMP) to avoid exposure of family members to pesticides residues
Community Health and Safety	
Swimming (Pool) Safety	Design of swimming areas to reduce or avoid the risk of injuries or drowning, including posting of depth warning information
	Institution of lifeguard supervision policies
	Implementation of a (pool) water sanitization program to prevent health issues. The water sanitation program should include monitoring of water quality to establish treatment need and frequency.
Fire Safety	See general EHS Guidelines

Source: World Bank Environment, Health and Safety Guidelines for Tourism and Hospitality Development (World Bank, 2007c)

Annex 4 'Stakeholder Consultation Report'

INTRODUCTION

This document constitutes a Stakeholder Consultation Report outlining consultations with key individuals, governmental and non-governmental organizations, and fisheries related interests that may influence or be impacted by the Pilot Program for Climate Resilience (PPCR), specifically the 'Promoting Community-based Climate Resilience (PCCR) in the Fisheries Sector. The PCCR for Fisheries is expected to produce the following outcomes:

1. Strengthened and climate-smart fisheries, and aquaculture policy and regulatory framework;
2. Reduced vulnerability of the targeted fishing and fish farming communities to climate shocks;
3. Diversified and strengthened livelihoods of targeted artisanal fishers and fish farmers.

This Stakeholder Consultation Report summarizes the results of the consultations held toward the development of the Environmental and Social Management Framework (ESMF). This framework focused specifically on Component 2 of the project, i.e. "Diversification, Alternative Livelihoods and Aquaculture for Sustainable Fisheries and Aquaculture including (i) community-based aquaculture; (ii) coastal mariculture /polyculture; and (iii) artisanal longline fishery for pelagic species".

Consultation Plan

Based on the Stakeholder Consultation Plan (February 2017) a number of priority stakeholders were identified for consultation. Some of these stakeholders were met with prior to the Stakeholder Consultation Plan, in order to efficiently collaborate with the consultation schedules of the other Consultants of the Technical Team.

METHODOLOGY

Priority stakeholders were identified in the Stakeholder Consultation Plan, according to their level of interest or influence, as listed below in Table 10.

Table 10: List of Priority and High Level Stakeholders as identified in the Stakeholder Consultation Plan (February 2017)

Group 1 Priority Stakeholders	Group 2 High Level Stakeholders
1. National Environment & Planning Agency (NEPA) 2. Ministry of Tourism (MOT) / Tourism Product Development Company (TPDCo) / Tourism Enhancement Fund (TEF) 3. Planning Institute of Jamaica (PIOJ) 4. Ministry of Industry, Agriculture, Commerce and Fisheries (MICAF) 5. Veterinary Services Division (VSD) 6. Veterinary Public Health (VPH) 7. B&D Trawling 8. Rainforest Seafoods 9. The Competitiveness Company 10. National Irrigation Commission (NIC) 11. University of the West Indies (UWI) Centre for Marine Sciences	1. Jamaica Broilers 2. Fisheries Management and Development Fund (FMDF) 3. Bureau of Standards of Jamaica (BSJ) 4. Agriculture Investment Company (AIC) 5. The Nature Conservancy (TNC) 6. Food for the Poor (FFP) 7. Water Resources Authority (WRA) 8. BREDS Treasure Beach Foundation 9. Caribbean Coastal Area Management (C-CAM) Foundation 10. Alligator Head Foundation 11. Bluefields Bay Fishermen's Friendly Society 12. Gillings Gully Fishing Co-op (Whitehouse) 13. Oracabessa Foundation

Consultation Meetings

Consultations were requested through the Ministry of Industry, Commerce, Agriculture and Fisheries (MICAF), and where possible a representative of the Ministry was present at Consultations. This was particularly important, as emphasized by the World Bank during team meetings, to increase the perception of a Government-run project. Appendix I: List of Stakeholder Meetings lists the stakeholder meetings that this Consultant attended and participated in.

In addition to the meetings listed above, a number of other consultations were held by other members of the Technical Team, namely Dr. Donovan Campbell (Project Development Specialist) and Mr. Gianluigi Negroni (Alternative Livelihood and Value Chain Specialist). The results of these consultations were incorporated into the ESMF document.

During consultations, the project was introduced, and the objectives and activities outlined. Specific to the ESMF, consultations probed any potential environmental and social impacts recommended activities may have, given the sites and context within which they were located. In addition, regulatory requirements and agency processes were also explored.

Workshops

As a part of the consultation process two workshops were held: a Validation Workshop on February 24, 2017, and a Dissemination Workshop on March 17, 2017. Invitees to these workshops were carefully selected based on their interest/influence in and on the project and its activities. Agendas, participants and reports are attached as Appendices II and III.

Table 11 below outlines the list of stakeholders consulted under this project by the Technical Team, identifying method of consultation.

Table 11: List of Fisheries Stakeholders and method of consultation

Stakeholder	Consultation Type		
	Meeting	Workshop #1	Workshop #2
Government / Quasi-Government / Executive Agencies			
Ministry of Industry, Agriculture, Commerce and Fisheries (MICAF)	Ongoing communication; team meetings; Oversight Committee meetings; comments and feedback from reports incorporated		
Aquaculture Branch (MICAF)	✓	✓	✓
Fisheries Division (MICAF)	✓	✓	✓
Ministry of Finance			✓
National Environment & Planning Agency (NEPA)	✓	✓	✓
Tourism Product Development Company (TPDCo)	✓	✓	✓
Veterinary Services Division (VSD)		✓	
Port Authority of Jamaica (PAJ)		✓	✓
Development Bank of Jamaica (DBJ)		✓	
Department of Co-operatives			✓
Heart Trust NTA	✓		✓
Planning Institute of Jamaica (PIOJ)	Oversight Committee meetings; comments and feedback from reports incorporated		
Fishing Groups			
Food Fish Farmers Association (Aquaculture)	✓		
Jamaica Ornamental Fish Farmers Association	✓		✓
Blue Lagoon Alliance	✓		
Bryan's Bay Fishermen's Group	✓		
North Eastern Fishermen Cooperative	✓		
Buff Bay Fishermen Benevolent Society	✓		
Annotto Bay Fishermen Group	✓		
Pagee Fishermen Group	✓		
Oracabessa Fisher's Association	✓	✓	✓
Rio Nuevo & Stewart Town Fishers Association	✓		
White River Fishers Association	✓		

Stakeholder	Consultation Type		
	Meeting	Workshop #1	Workshop #2
Sailor's Hole Fisherfolk Benevolent Society	✓		
Mammee Bay Fishermen Group	✓		
Salem Fishermen Group	✓		
Alloa Fishermen Co-operative	✓		
Falmouth Fishermen Group	✓		✓
Half Moon Bay Fishermen Group	✓	✓	
Montego Bay Fishermen Co-operative	✓		
Green Island Fisherfolk Co-operative Society	✓	✓	
Rocky Point Fishermen Co-operative Society	✓		
Morant Bay Fisherfolk Association	✓		
Long Acre Fishing Group	✓		
Treasure Beach Fisherfolk Association	✓	✓	
Old Harbour Bay Fishermen Co-operative Society	✓	✓	
Rae Town Fishing Group			✓
Greenwich Town Fishing Village			✓
Half Moon Bay Fisherman's Co-operative Society	✓		
Hill Run Fish Farmers Association	✓		
Gillings Gully Fishing Co-op (Whitehouse)	✓		
Jamaica Fishermen's Co-operative Union (JFCU)	✓	✓	✓
NGOs / Interest Groups			
Bluefields Bay Fishermen's Friendly Society	✓	✓	
Alligator Head Foundation	✓		
Oracabessa Bay Foundation	✓	✓	✓
BREDS Treasure Beach Foundation	✓	✓	✓
Caribbean Coastal Area Management (C-CAM) Foundation	✓		
Food for the Poor	✓		
The Competitiveness Company	✓		
Commercial Fishers			
B & D Trawling	✓		
Rainforest Seafood	✓		

Stakeholder	Consultation Type		
	Meeting	Workshop #1	Workshop #2
Tonrick Enterprises			✓
Other			
Kings College London (Ms. Laura Canevari)		✓	✓
AP + FM PPCR Project (Ms. Winsome Townsend)		✓	
RE School of Fisheries Science (Dr. Raghavan Ramamoorthy)		✓	
University of the West Indies (UWI)			✓

SUMMARY OF CONSULTATIONS

The consultations revealed a complex, challenging situation for fisheries in Jamaica. Nevertheless there were stories of success and change through for example, Special Fishery Conservation Areas (SFCAs) and previous initiatives to expand livelihood options.
Some of the results of the consultations have been incorporated into the 'Fisher folk Association Consultation Report' by the Project Development Specialist (See **Error! Reference source not ound.**), and the 'Recommendations Document by the Alternative Livelihood' and Value Chain Specialist. These include in-depth assessments of the fisher folk association's organizational structure, challenges, and opportunities for livelihood improvement.

Community Consultations

It is useful to note that many fishing associations or groups were only formed recently, indicating a growing momentum for local collective action on behalf of the sector. This emphasizes another finding from the consultation, which was a need for individuals to form groups, or work better with existing groups. Organizations such as the Jamaica Fishermen's Co-operative Union or Hill Run Fish Farmers Association act as key agents to achieve change. Additionally many funders or large groups are unable to work with individuals directly but require a group or association to support.
Also of note, is that "poor waste management" was one of the most popular challenges or concerns that fishers noted during consultations. Some other key environmental concerns included loss of habitat (beach erosion, mangrove destruction, declining coral reef health), poor water quality and changing weather patterns including more intense rainfall that triggered flood events and unpredictability.

Potential Impacts

Consultations indicated that the groups had some level of understanding or concern for the state of the environment. Views were expressed regarding how the condition of the environment impacts their sector (e.g. poor coral reef health) and how human activities impact their environment (e.g. waste management).

The capacity of the stakeholders to conduct activities that adhered to environmental standards ranged along a scale. For example, some fishing groups expressed support for offshore Fish Aggregating Devices (FADs) without knowledge or consideration of some of the impacts such as the potential for over-exploitation of pelagic species, potential for waste through by-catch of unwanted species or social disputes over ownership of the fish using the FADs. In addition, modification of the sea floor requires NEPA permits. Lying somewhere in the middle of the scale were organisations such as Bluefields Bay Fishermen's Friendly Society (BBFFS) who, over the past decade has made large strides in developing eco-tourism in the area, and consequently have become aware of the required regulations and permits from NEPA. The Society created sustainable business plans incorporating environmental considerations, and experienced first-hand some of the environmental or social impacts that come with the activity. At the upper end of the scale are organisations such as The Competitiveness Company who have designed environmentally-friendly water recycling systems for ornamental fish production, and who require all their partner farmers to adhere to a strict Quality Control Protocol, incorporating mitigation of environmental impacts. Taking this range of environmental management consciousness into consideration, the role of the ESMF becomes even more important to ensure that regardless of the capacity of the respective project beneficiary, activities are implemented with the best environmental and social management practices.

A number of considerations were highlighted from a national or regulatory biodiversity perspective including but not limited to:

- Violations of the Wildlife Protection Act (killing of aquaculture predators like ospreys, crocodiles)

- Inadvertent exploitation of unwanted species through by-catch (e.g. during offshore fishing activities)
- Improving invasive or alien fish species (e.g. freshwater ornamental fish) that may outcompete endemic species and
- Status of wild stock being harvested.

From the social perspective concerns were raised about:

- Competition between users of a space (e.g. recreational swimmers and oyster farms)
- Cleanliness of fishing beaches (solid waste, waste from fish products, sewage disposal, etc.)
- Types of activities and necessary health and safety permits (e.g. life guards for recreational beaches)

Although project activities and locations have been proposed in the Project Appraisal Document (PAD), further consultations with stakeholders and assessment of the site- and context- specific impacts should be completed.

National Regulations and Standards

Jamaica, in its efforts to support sustainable development, has numerous guidelines, support agencies, regulations, standards, permits and licenses in effect. For example the Tourist Product Development Company (TPDCo) requires some fifteen documents for its application for Water Sports License. Whereas application for such license is not expensive, some of the requirements are. This is, for example, the case with insurance. The requirements for permits were created under guidance from, and in consideration of NEPA's national guidelines and standards. Some of these documents include environment, health and safety certifications.

The Permit and License system in Jamaica exists to ensure all Jamaican facilities and development meet relevant standards to minimize adverse environmental impacts. Consultations with NEPA, the regulatory agency, outlined a number of potential permits, standards and guidelines required based on the proposed activities, including but not limited to:

- Trade Effluent Standard for aquaculture operations
- Beach licenses required for mariculture options (e.g. oyster farms, tourism construction) requiring modification of seafloor, or tourism recreational options
- Lease from Commissioner of Land for activities that require infrastructure on the seafloor
- Environmental permits for eco-tourism activities (including possible exemptions to the Wildlife Protection Act for handling of coral)
- Water Quality Standard for swimming or recreational activities
- Additional externally obtained licenses e.g. Health, Food and Safety licenses, Beach Safety licenses (e.g. life guards), permission from Parish Council Planning, etc.

It is important that activities adhere to national permits, licensing and standards, and as such, fishing groups embarking on proposed activities will most likely require a significant amount of support (including financial) to achieve the requirements. The National Environment and Planning Agency emphasised that project beneficiaries/ applicants should be encouraged to get NEPA involved very early in the planning stage prior to actual application to determine what regulatory requirements would be needed.

It was noted that projects applying for grants under the PCCR need to ensure that their existing facilities are compliant prior to any application for expansion or modification. The screening process includes checklists to determine whether there are any existing permits, and their level of

compliance, including options to indicate that there is intent to be compliant. It should be noted that where the Executing Agency (MICAF) may be willing to provide some degree of support to bring the existing operation into compliance, it is not the goal of the grants being offered.

MONITORING AND EVALUATION

The monitoring and evaluation system that is developed for the respective pilot projects should include indicators for continued stakeholder engagement. Evaluation of stakeholder engagement throughout the project would be included in the overall evaluation program for all aspects of the investment programme. A simple monitoring program would entail project start-up, three month intervals for the first year, and twice per year to the end of the project.

NEXT STEPS

The ESMF has been developed with stakeholders inputs and comments incorporated. It shall remain a public document and will be used during project implementation. The findings of all consultations from all Consultants should be taken into consideration when identifying potential project partners.

REFERENCES

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APPENDIX I: LIST OF STAKEHOLDER MEETINGS

Table 12: Stakeholder Meetings Completed

Stakeholder	Date of Consultation	Consultant
Blue Lagoon Alliance	December 6, 2016	D. Campbell
Bryan's Bay Fishermen's Group	December 6, 2016	D. Campbell
North Eastern Fishermen Cooperative	December 6, 2016	D. Campbell
Buff Bay Fishermen Benevolent Society	December 6, 2016	D. Campbell
Annotto Bay Fishermen Group	January 11, 2016	D. Campbell
Pagee Fishermen Group	January 11, 2016	D. Campbell
Oracabessa Fisher's Association	January 12, 2017	D. Campbell
Rio Nuevo & Stewart Town Fishers Association	January 12, 2017	D. Campbell
White River Fishers Association	December 18, 2016	D. Campbell
Sailor's Hole Fisherfolk Benevolent Society	December 18, 2016	D. Campbell
Mammee Bay Fishermen Group	December 18, 2016	D. Campbell
Salem Fishermen Group	December 18, 2016	D. Campbell
Alloa Fishermen Co-operative	December 16, 2016	D. Campbell
Falmouth Fishermen Group	December 16, 2016	D. Campbell
Half Moon Bay Fishermen Group	December 16, 2016	D. Campbell
Montego Bay Fishermen Co-operative	January 30, 2016	D. Campbell
Green Island Fisherfolk Co-operative Society	January 30, 2016	D. Campbell
Rocky Point Fishermen Co-operative Society	January 30, 2016	D. Campbell
Morant Bay Fisherfolk Association	January 18, 2017	D. Campbell
Long Acre Fishing Group	December 11, 2016	D. Campbell
Treasure Beach Fisherfolk Association	December 11, 2016	D. Campbell
Old Harbour Bay Fishermen Co-operative Society	November 13, 2016	D. Campbell
Half Moon Bay Fisherman's Co-operative Society	November 13, 2016	D. Campbell
Hill Run Fish Farmers Association	February 12, 2016	D. Campbell
Caribbean Coastal Area Management (C-CAM) Foundation	January 23, 2017	G. Negroni
Food for the Poor	January 18, 2017	G. Negroni
BREDS Treasure Beach Foundation	January 24, 2017	G. Negroni
B & D Trawling	January 27, 2017	G. Negroni
Rainforest Seafoods	January 27, 2017	G. Negroni
Bluefields Bay Fishermen's Friendly Society	January 25, 2017	G. Negroni, E. Jones
Gillings Gully Fishing Co-op (Whitehouse)	January 25, 2017	G. Negroni, E. Jones
Alligator Head Foundation	January 28, 2017	G. Negroni, E. Jones
Oracabessa Foundation	January 28, 2017	G. Negroni, E. Jones
Jamaica Fishermen's Co-operative Union (JFCU)	February 9, 2017	G. Negroni, E. Jones
Tourism Product Development Company (TPDCo)	February 21, 2017	G. Negroni, E. Jones
The Competitiveness Company	February 23, 2017	G. Negroni, E. Jones
Aquaculture Branch (Fisheries Division) including representatives from Food Fish Farmers Association and Association of Ornamental Fish Farmers.	February 6, 2017	G. Negroni, E. Jones
National Environment & Planning Agency (NEPA)	March 16, 2017	E. Jones

APPENDIX II: VALIDATION WORKSHOP DOCUMENTS

PROMOTING COMMUNITY-BASED CLIMATE RESILIENCE IN THE FISHERIES SECTOR OF JAMAICA
Stakeholder Validation Workshop, Knutsford Court Hotel, Windward Suite, Chelsea Ave., Kingston,
Friday February 24, 2017
AGENDA

Time	Session	Description	Lead Person
9:00	**Registration**		
9:15	**Opening Remarks and Introductions**	Welcome/Introductions	Chairperson- Mrs. Eleanor Jones, Environmental Management Specialist
		Opening Remarks	Andre Kong, Director of Fisheries, MICAF
9:30	**The PCCR Fisheries Project**	Summary of project objectives, components and methodology	Dr. Donovan Campbell, Project Development Specialist
9:40	**Findings from National Consultations**	Presentation of key findings from the island-wide consultations- (with communities and organisations)	Dr. Donovan Campbell, Project Development Specialist Ms. Natalie Johnson, Executive Assistant to PCCR in the Fisheries Sector of Jamaica Project
10:00	**Proposed Activities**	Brief overview of proposed activities under the three project components	Mr. Gianluigi Negroni, Alternative Livelihoods and Value Chain Specialist
10:20	**Coffee Break**		
10:35	**Environmental Management Framework**	Overview of the environmental considerations of the proposed activities	Mrs. Eleanor Jones, Environmental Management Specialist
10:50	**Breakout session**	Participants have an opportunity to provide feedback and suggestions on implementation of proposed activities	Moderated by MICAF
12:00	**Lunch**		
1:00	**Presentations from Breakout sessions**		Moderated by MICAF
1:40	**Question and Answer Session**		Mrs Eleanor Jones Moderator
1:50	**Closing Remarks**		Dr. Donovan Campbell, Project Development Specialist

VALIDATION WORKSHOP REPORT
Prepared by MICAF

PRESENTATIONS

"The PCCR Fisheries Project" & "Findings from National Consultations" by Dr. Donovan Campbell

Dr. Donovan Campbell was charged to give a summary of project objectives, components and methodology. Dr. Donovan Campbell also gave a presentation of the key findings from the island wide consultations with communities and organization, from which he reported the following:

- 50% of the registration occurred in the last 5 years
- Group finances were very poor
- Change in group size – steady increase in membership
- Many groups were not involved in major projects

As it relates to Conflict mechanism, the major challenges were:

- Beach tenure (9/26)
- Ecosystem degregation
- Coastal erosion
- Waste management
- Low fish catch

Some current initiatives being undertaken by the groups are:

- Redevelopment of fishing village
- Revolving loan scheme
- Reef restoration
- Community development
- Sale of fishing equipment
- Annual events
- Turtle monitoring
- Oyster production
- Insurance and welfare programme

Capacity development needed in groups are:

- Group management and leadership training
- New fishing techniques
- Environmental awareness
- Business management
- Access to new fishing gear
- Project development/management

Possible projects:

- Ornamental fishery
- Lobster casitas
- Oyster production, crab raising, irish moss

- Fish sanctuary
- Development of offshore

Person	Comment
Fishers	1. Not seeing much strengthening of aquaculture or regulatory work 2. Why was there No fishing village in Kingston included in the consultation Response: Other investment taking place in these communities 3. Encouraged to see the spread of fisher folk group across the island 4. Fishers are able to contribute to the management of the fishery by collecting fish catch data and give to the fisheries Division. At the end of each year, a report should be produced back to the fishers. 5. Can additional communities be included into the pilot project who did not have any consultation or who did not get the chance to give their ideas. 6. What surety will all the groups have to get their projects approved The end result is for the project managers to analyze the project. It is not a one off project but rather one that will be working towards developing the fishing industry. Information gathered will be used to get sponsorship from other agencies . Partnership could be done through Ministry of Health to get food handlers permit 7. The key governing entity as it relates to food safety is the Vetinerary Division.
Mr. Junior McDonald, Old Harbour Bay	Mr. Negroni was asked what are his experience to successfully implementing these measures in other countries around the world. • Working together • Stimulate the state • Respect the law
Mr. Obsert Stitchell, Portland	Fishers don't see what they are doing as a business. Its time for them to see this. Rural people could also look at aquaculture farming.

"Findings from National Consultations" continued by Ms. Natalie Johnson
Ms. Natalie Johnson gave a brief presentation on the key findings from the island wide consultations with communities and organizations.
"**Proposed Activities" by Mr. G. Negroni**
Mr. Negroni gave a brief overview of the proposed activities under the three project components.
"Environmental Management Framework" by Mrs. E. Jones

Mrs. Eleanor Jones presented on the overview of the Environmental Impact of the proposed activities.

Person	Comment
Mr. Inilek Wilmot, Oracabessa	It was encouraging to know that there is a need for fish sanctuaries
Mr. Shawn Taylor , St. Elizabeth	Chemicals banded in the USA are still being used in Jamaica to help with agriculture Small mesh wire is still being used. Wires are sold in Black River for the purpose of chicken coobs however, fishers buy them to make fish pots. The Government needs to enforce the law as there is a lack of enforcement within the Sector. There was nothing in the presentation that spoke to offline fishing Gill net does more than the wire

	Dishonest fishers are one of the major problems.

BREAKOUT GROUPS

Participants were asked to break out in four separate groups and was tasked to speak on the challenges they faced and to make appropriate recommendations.

Group 1:

Challenges:

- The law has no teeth
- Legislative framework takes too long
- Poor vision in regards to climate change (sometimes, Government agencies don't look beyond tomorrow) – Lack of foresight
- Inter-Agencies lack of enforcement e.g. NEPA, Fisheries, Coast Guard
- Effective planning, inter agency conflict
- Community involvement – All ministries of government – Mitigation training and development community and habitat degradation

Priority:

- Training for young fishers
- Time and money needed
- Government agency need to play a bigger role. Need to develop the infrastructure.

Group 2:

Challenges:

- Lack of enforcement
- Lack of resources – i.e. need to know the source for the resources and How to find it
- Public awareness
    - Climate change
    - Environmental impact (linkages)
    - Legal framework
- Who are our partners - i.e. who can be involved
- Environmental Risk
    - Water bodies
    - Land erosion
    - Sea
    - Aquaculture (water quality)

Priority:

- Assessment of management framework
- Diversification of livelihood and financing
- Training
- Mitigation

    Environmental impact assessment
    Social impact assessment

Group 3:

Challenges:

- Lack of government enforcement

- Funding
- Stakeholders adherence to the law

Priority:

- Regulatory framework and natural action plan i.e. Fisheries
- Climate resilience and climate smart activities i.e. NWC, NEPA
- Financial Products i.e. Lending agencies and funders
- Alternative Livelihood and tourism i.e Hotels

Group 4:

Challenges:

- Decline in fish catch in quantity and quality
- Waste management
- Tenure of fishing areas

Priority :

Component 1:

- Legislative assessment
- Tourism package
- Artificial reef water management

Component 2:

- National development plan
- Coastal mariculture
- Tourism sector
- Deep bottom fishery
- Feed framework for aquaculture

Component 3:

- Training of trainers (Food Safety)
- Outsource aquaculture products
- Assessment of sanitary and quality relevant practices

LESSONS LEARNT

Fishers felt that with the help of other agencies coming on board the fishing industry will go to a higher heights.

Promoting Community-Based Climate Resilience Validation Workshop
February 24, 2017

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APPENDIX III: DISSEMINATION WORKSHOP DOCUMENTS

PROMOTING COMMUNITY-BASED CLIMATE RESILIENCE IN THE FISHERIES SECTOR OF JAMAICA
Disclosure Workshop, Hotel Four Seasons, Main Dining Room, 18 Ruthven Road Kingston 10,
Friday March 17, 2017
AGENDA

Time	Session	Description	Lead Person
8:30	**Registration**		
9:00	**Opening Remarks and Introductions**		Chairperson – Mr. Andre Kong Director of Fisheries, MICAF
9:10	**The PCCR Fisheries Project**	Summary of project objectives, components and methodology	Dr. Donovan Campbell, Project Development Specialist
9:25	**The Project Appraisal Document (PAD)**	Summary of the developed project design, including proposed activities	Dr. Donovan Campbell, Project Development Specialist
10:30	**Coffee Break**		
10:45	**Environmental Management Framework**	Summary of the environmental considerations and an outline of the Environmental Management Framework (including Screening)	Mrs. Eleanor Jones, Environmental Management Specialist
11:15	**Question and Answer Session**		Moderated by Dr. Donovan Campbell
12:00	**Lunch**		
12:45	**Project Implementation**	M&E, Implementation Approach & POM overview	Dr. Donovan Campbell, Project Development Specialist
1:10	**Question and Answer Session**		Moderated by Mrs. Eleanor Jones
1:30	**Summary and Closing Remarks**		Mr. Andre Kong Director of Fisheries, MICAF

PPCR Dissemination Workshop March 17TH, 2017
Four Seasons Hotel, Kingston 10, Jamaica.

THE WORLD BANK

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