



ADAPTATION FUND

AFB/PPRC.5/4
June 6, 2011

Adaptation Fund Board
Project and Programme Review Committee
Fifth Meeting
Bonn, June 20, 2011

PROPOSAL FOR JAMAICA

I. Background

1. The Operational Policies and Guidelines for Parties to Access Resources from the Adaptation Fund, adopted by the Adaptation Fund Board, state in paragraph 41 that regular adaptation project and programme proposals, i.e. those that request funding exceeding US\$ 1 million, would undergo either a one-step, or a two-step approval process. In case of the one-step process, the proponent would directly submit a fully-developed project proposal. In the two-step process, the proponent would first submit a brief project concept, which would be reviewed by the Project and Programme Review Committee (PPRC) and would have to receive the approval by the Board. In the second step, the fully-developed project/programme document would be reviewed by the PPRC, and would finally require Board's approval.

2. The Templates Approved by the Adaptation Fund Board (Operational Policies and Guidelines for Parties to Access Resources from the Adaptation Fund, Annex 3) do not include a separate template for project and programme concepts but provide that these are to be submitted using the project and programme proposal template. The section on Adaptation Fund Project Review Criteria states:

For regular projects using the two-step approval process, only the first four criteria will be applied when reviewing the 1st step for regular project concept. In addition, the information provided in the 1st step approval process with respect to the review criteria for the regular project concept could be less detailed than the information in the request for approval template submitted at the 2nd step approval process. Furthermore, a final project document is required for regular projects for the 2nd step approval, in addition to the approval template.

3. The first four criteria mentioned above are:

1. Country Eligibility,
2. Project Eligibility,
3. Resource Availability, and
4. Eligibility of NIE/MIE.

4. The fifth criterion, applied when reviewing a fully-developed project document, is:
5. Implementation Arrangements.

5. According to the Adaptation Fund Board Decision B.12/10, a project or programme proposal needs to be received by the secretariat not less than nine weeks before a Board meeting, in order to be considered by the Board in that meeting.

6. According to the paragraph 41 of the operational policies and guidelines, a project or programme proposal needs to be received by the secretariat not less than seven weeks before a Board meeting, in order to be considered by the Board in that meeting.

7. The following programme concept titled "Enhancing the resilience of Agriculture and Coastal Resources for Food Security and Livelihoods Protection" was submitted by the Planning Institute of Jamaica (PIOJ), which is a National Implementing Entity of the Adaptation Fund. This is the first submission of the programme, using the two-step proposal process. It was received by the secretariat in time to be considered in the 14th Adaptation Fund Board meeting.

The secretariat carried out a technical review of the programme proposal, assigned it the diary number JAM/NIE/Multi/2011/1, and filled in a review sheet.

8. In accordance with a request to the secretariat made by the Adaptation Fund Board in its 10th meeting, the secretariat shared this review sheet with the PIOJ, and offered it the opportunity of providing responses before the review sheet was sent to the Project and Programme Committee of the Adaptation Fund.

9. The secretariat is submitting to the Project and Programme Review Committee the summary of the programme, prepared by the secretariat, in the following section. The secretariat is also submitting to the Committee the technical review sheet and the responses provided by the PIOJ, in an addendum to this document.

II. Programme Summary

Jamaica – Enhancing the resilience of Agriculture and Coastal Resources for Food Security and Livelihoods Protection

Implementing Entity: *PIOJ*

Programme Execution Cost: USD 415,000

Total Programme Cost: 9,185,000

Implementing Fee: USD 780,000

Project Formulation Grant: 30,000

Financing Requested: USD 9,995,000

Programme Background and Context: Jamaica is a small island developing state, particularly vulnerable to climate related hazards, in particular hurricanes, floods, storm surges and droughts. The programme seeks to improve water harvesting and management and implement erosion and flood control, which improve soil moisture retention. The programme will also support climate resilient coastal management in Negril. In addition, capacity building interventions will be undertaken to complement the other two sector component programmes. The sites selected for programme intervention will cover 7 of the 14 parishes in the country, namely Westmoreland, Manchester, Clarendon, St. Mary, St. Ann, Trelawny and St. Thomas.

The programme **objective** is to protect livelihoods and food security in vulnerable communities by: improving land and water management for the agricultural sector; strengthening coastal protection; and building institutional and local capacity against climate change risks.

To that end, the proposal presents three components:

- **Component 1:** Increasing climate resilience of the Negril coastline
- **Component 2:** Enhancing climate resilience of the agricultural sector by improving water and land management in select communities
- **Component 3:** Improving institutional and local level capacity for sustainable management of natural resources and in disaster risk reduction in the targeted vulnerable areas; and raising awareness for behavior modification

Component 1: Increasing the climate resilience of the Negril coastline (USD 5,000,000)

The coral reefs and seagrass beds in the Negril area are responsible for the production of sand on the beach. A combination of natural and human factors has resulted in the degraded state of both these ecosystems over the past four decades. Recently however, efforts have been ongoing to reduce the human impact and to provide a means through which the ecosystems can recover and therefore become more resilient (with the appropriate maintenance). This programme will be necessary to provide resources to make a positive and meaningful impact.

The objectives of this component will be achieved by installing artificial reefs as well as through the rehabilitation of existing seagrass beds. Two 350m-500m submerged near-shore

breakwater structures will be installed as one of the hard engineering solutions. It is estimated that the beach directly in front of the breakwaters will commence a natural state of replenishment as it will allow for sand accretion. To aid the natural beach nourishment process, soft engineering solutions involving the establishment and rehabilitation of seagrass beds will also be implemented. The breakwaters will assist with the protection of the seagrass beds from storm surges, etc.

Component 2: Enhancing the climate resilience of the agricultural sector by improving water and land management (USD 2,500,000)

This second component will develop water storage and soil conservation infrastructures in vulnerable areas, including the establishment of a micro-dam, reservoirs, flood mitigation infrastructure (such as green gullies). This will help reduce the loss of soil cover associated with extended droughts followed by increased precipitation; and improve water availability to farmers. In some instances, the measures are intended to address water storage and reduce flooding, thereby resulting in soil conservation. In addition, rainwater harvesting and drip irrigation systems will be implemented in six parishes. This would help increase crop productivity in drylands and reduce the damage and loss of rural populations in case of extreme weather events.

Component 3: Improving institutional and local level capacity for coastal and agricultural adaptation and awareness raising for behavior modification (USD 1,270,000)

Activities under this component seek to improve the capacity of key stakeholders, primarily related to agriculture and coastal resources. The interventions are aimed at improving institutional and individual capacities of the identified stakeholders. It involves demonstrating best-practices in climate-resilient agricultural production for sustainable improvement of food security; training coastal resource users on sustainable practices; designing replicable technical standards for beach restoration, creating tools to improve climate resilient development planning and increasing the awareness and access to information about climate change and adaptation options. Additionally, farmers will be better able to understand the need to adapt and to take the necessary steps to implement sustainable farming practices. Through the implementation of this component, the community of Negril will be empowered to integrate climate change concerns into the economic operations of the community in order to promote the area's sustainability as well as safeguard against extreme hazards intensified by climate change (sea-level rise and storm surge). This component is necessary for the overall success in the initiatives to be implemented in Components 1 and 2 and as such, will be implemented concurrently.

Furthermore, the measures described in Component 2 will be complemented by capacity building exercises. Some of the traditional farming techniques have been instrumental in the degradation of some of the watershed. Building the capacity of community based organizations (CBOs) through education and training is one of the measures to address this. CBOs are able to influence communities as they largely comprise of community members who, themselves, may be farmers. A part of this capacity will also be through the use of demonstration plots showing good practices which, overtime, will replace any existing, unsustainable ones.



ADAPTATION FUND

REQUEST FOR PROJECT/PROGRAMME FUNDING FROM ADAPTATION FUND

The annexed form should be completed and transmitted to the Adaptation Fund Board Secretariat by email or fax.

Please type in the responses using the template provided. The instructions attached to the form provide guidance to filling out the template.

Please note that a project/programme must be fully prepared (i.e., fully appraised for feasibility) when the request is submitted. The final project/programme document resulting from the appraisal process should be attached to this request for funding.

Complete documentation should be sent to

The Adaptation Fund Board Secretariat

1818 H Street NW

MSN G6-602

Washington, DC. 20433

U.S.A

Fax: +1 (202) 522-3240/5

Email: secretariat@adaptation-fund.org



PROJECT/PROGRAMME PROPOSAL

■ PART I: PROJECT/PROGRAMME INFORMATION

PROJECT/PROGRAMME CATEGORY:	REGULAR
COUNTRY/IES:	JAMAICA
TITLE OF PROJECT/PROGRAMME:	ENHANCING THE RESILIENCE OF THE AGRICULTURE SECTOR AND COASTAL AREAS TO PROTECT LIVELIHOODS AND IMPROVE FOOD SECURITY
TYPE OF IMPLEMENTING ENTITY:	NATIONAL IMPLEMENTING ENTITY
IMPLEMENTING ENTITY:	PLANNING INSTITUTE OF JAMAICA
EXECUTING ENTITY/IES:	NATIONAL ENVIRONMENT AND PLANNING AGENCY, NATIONAL WORKS AGENCY, MINISTRY OF AGRICULTURE AND FISHERIES, MINISTRY OF TOURISM
AMOUNT OF FINANCING REQUESTED:	US\$9,995,000 (In U.S Dollars Equivalent)

■ PROJECT / PROGRAMME BACKGROUND AND CONTEXT:

Jamaica is a small island developing state located in the Caribbean Sea. The island has an area of 11 000 km² and territorial waters of 16 000 km². Over 30 per cent or 335 900 hectares (ha) of Jamaica’s land surface is covered by natural forests. The island’s topography is characterised by a mountainous interior surrounded by narrow discontinuous coastal plains. The Blue Mountains, the highest mountain chain peaks at 2 256 metres above sea-level. The inland upland areas are susceptible to soil erosion and landslides while for the lowland areas, flooding is the predominant hazard. Jamaica experiences a tropical maritime climate characterised by year round warm and humid conditions. On average, Jamaica receives 1 800 mm of rain each year. Rainfall pattern is highly influenced by the island’s topography and is more abundant in Northeastern Jamaica but the southern sections of the island, lying in the rain shadow of the mountains, have a semiarid climate and receive less than 1 200 mm of rainfall annually. The country has a bimodal rainfall pattern with the primary rainfall in October and secondary in May. Temperatures vary from 26⁰ C in February to a high of 30⁰ C in August.

Based on the latest Population Census (2001), Jamaica’s population has been estimated at approximately 2.7 million. Approximately 70 per cent of the population lives in the coastal zone. The highest agricultural development and industrial and urban centres lie along the

south coast of the island within the coastal zone. A recent risk evaluation¹ estimates that the value of social and economic assets and infrastructure exposed to hazards is US\$18.6 billion. A significant portion of this exposure lies in the coastal zone, highlighting the need for incorporating climate change risk into policies and plans that impact on these areas.

The two key sectors to be addressed by the programme are agriculture (including fisheries and forestry) and coastal resources with spin-off benefits for the tourism sector. Agriculture relies directly and heavily on natural resources. The agricultural sector contributed an estimated 5.6 per cent of real Gross Domestic Product (GDP) in 2009 and provided employment to 20 per cent of the labour force. The tourism sector, the largest foreign exchange earner for the country (US\$1,939.7m in 2009), employed approximately 131 000 and contributed 7.3 per cent of GDP.

Jamaica's total labour force was 1.27 million in 2009. Overall, women account for 43 per cent of the employed labour force but 20 per cent of the agriculture work force and about 26 per cent of the production of domestic and export crops. They are however, the primary vendors of crops, and are most likely to be directly impacted by food security issues. The majority of fisherfolk – about 70 per cent² – are men who are mainly involved in the actual fishing. Women are primarily responsible for vending and the management of operations, including vending sites. Whilst only 6 per cent of registered fisherfolk are women, they are often boat owners and active in fishing cooperatives. Women dominate the employment in the tourism industry, accounting for 58 per cent of jobs in the Hotels and Restaurant sub-section.

While Jamaica's HDI (0.688) puts it among the category of developing countries with high human development, there remains an issue with the level of poverty which has been trending upwards over the last three years. The country has a 16.5 per cent national poverty head count. Women accounted for 47.6 per cent of the poor; 45.5 per cent of households are female headed, about 30 per cent of which had consumption expenditure below the poverty line in 2009. Most (61 per cent) of the poor live in rural areas, are dependent on the agriculture sector and are therefore disproportionately at risk to climate change impacts.

Problem Statement

Jamaica is particularly vulnerable to climate related hazards, in particular hurricanes, floods, storm surges and droughts due largely to its geographical location and the exposure of social and economic assets in coastal areas. This situation is made worse by the country's low adaptive capacity especially in the climate sensitive sectors of the economy.

Data from climate models have indicated that Jamaica will experience significant changes in temperature, precipitation and sea-level rise (SLR) (Table 1). Several projections have also been made regarding tropical cyclones in the Caribbean Region. While these are inconclusive with respect to the overall frequency of cyclone events for the sub region, the forecast is that the North Atlantic region will likely experience an increase in the frequency

¹ Country Specific Risk Evaluation, Catastrophe Risk Profile Jamaica, 2009. Commissioned by the Inter American Development Bank (IDB)

² *Report on Rural Women in Agriculture for the period 2002 – 2008*. (July 2009) Produced by the Ministry of Agriculture and Fisheries in July 2009 for the Jamaica Bureau of Women Affairs in partial fulfillment of the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) report.

of more intense systems (Categories 4 and 5). Insufficiency of data has made it difficult to adequately project SLR for Jamaica but it is assumed that it will follow the trend of global means.³ Given the projections, Jamaica's vulnerability to changing climatic conditions is likely to increase unless early and comprehensive intervention is introduced to stymie such impacts.

Table 1: Summary of Climate Model Projections for Jamaica

Parameter	PRECIS Model	SDM
Temperature	<ul style="list-style-type: none"> - Increase of: 0.4-0.9°C by 2015 0.5-1.0°C by 2030s 0.7-1.8°C by 2050s 1.8-3.5°C by 2080s - South-western Jamaica will experience the greatest change in the 2050s - The latter half of the year will experience the greatest increase in the 2050s. 	<ul style="list-style-type: none"> - Increase of: 0.5-0.7°C by 2015 0.8-1.3°C by 2030s 1.1-1.8°C by 2050s 1.9-2.6°C by 2080s - March - May will see greatest increase
Precipitation	<ul style="list-style-type: none"> - Rainfall decrease in most regions by the 2050s - By 2080s, decrease ranging from 25% to 40% of current rainfall levels will take place in all regions 	<ul style="list-style-type: none"> - General pattern of decreased rainfall over-time - Significant decrease in rainfall starting in 2050s - June - November will have most pronounced decrease - Number of wet days will decrease
Other		<ul style="list-style-type: none"> - Stream flow of some major rivers will decrease due to reduced rainfall

³ This assumption is derived from evidence quoted by Chen et al. (2008) that the Caribbean has experienced changes similar to that of the global mean.

Climate change impacts: The various effects that will result from climate change are likely to impact the country in several ways. An overview of the impacts is given in Table 2.

Table 2: Climate change and potential impacts on Jamaica

	Climate Change Threats	Impacts on Jamaica	Affected Sectors
1	Sea level rise	<ul style="list-style-type: none"> ▪ Flooding of coastal areas ▪ Loss of coastal habitats ▪ Loss of coastal infrastructure – houses, hotels, roads, bridges, utility lines ▪ Loss of beaches ▪ Coastal subsidence/Reduction of land mass ▪ Reduction in freshwater quality due to saline intrusion 	<ul style="list-style-type: none"> ▪ Tourism ▪ Agriculture ▪ Infrastructure ▪ Water Resources
2	Increase in extreme events –precipitation	<ul style="list-style-type: none"> ▪ Increased flooding leading to: loss of lives, property, and income, particularly for small farmers on hillsides and slopes ▪ Increased soil loss ▪ Increased sedimentation of coastal waters ▪ Damage to houses (especially poor quality/in marginal or environmentally sensitive areas) 	<ul style="list-style-type: none"> ▪ Agriculture ▪ Tourism ▪ Fisheries ▪ Health
3	More intense storms and storm surges	<ul style="list-style-type: none"> ▪ Damage to coastal infrastructure ▪ Loss of coastal ecosystems ▪ Increased incidence of landslides and flooding 	<ul style="list-style-type: none"> ▪ Agriculture (including Fisheries) ▪ Tourism
4	Increased temperature	<ul style="list-style-type: none"> ▪ Loss of coral reefs from coral bleaching ▪ Loss of agricultural productivity – fisheries, crops and livestock 	<ul style="list-style-type: none"> ▪ Agriculture (including Fisheries)
5	Longer and more intense droughts	<ul style="list-style-type: none"> ▪ Reduced availability of water especially in dry seasons for agriculture, domestic consumption ▪ Lower soil productivity impacting agricultural output ▪ Loss of heat sensitive crops/animals 	<ul style="list-style-type: none"> ▪ Agriculture ▪ Water Resources

Over the last decade, the frequency of hurricanes and storms has increased with the country averaging at least one storm event per annum. Some of these have been categorized as extreme events leading the Office of Disaster Preparedness and Emergency Management (ODPEM) to indicate that “it is now becoming increasingly evident that the return period for what may be deemed a 100-year event is being experienced within periods of 15-20 year cycles”. The productive sectors of the economy such as agriculture and tourism have been particularly hard hit⁴. In the former both domestic and export agriculture were affected. The impact extended not only to the short-term availability of food items, but also influencing food prices, the country’s earnings from food export and the food import bill as well as the livelihoods of over 200 000 farmers, 30 per cent of whom are females⁵. During the dry spells, access to water for farming and domestic use is severely curtailed. This is compounded by traditional farming practices which contribute to environmental degradation, soil erosion, soil fertility depletion, landslides, watershed degradation, flooding and pollution of water sources. For the tourism sector, damage to beaches, coastal ecosystems and tourism infrastructure have affected that sector with the potential to have long term and long lasting impact on Jamaica’s competitiveness.

Since 1988, the cumulative economic impact of damage and losses due to storm events has been estimated at J\$105 billion. The impact has been heightened by the level of social dislocation to communities and families, especially the poor. This has included the disruption of schools, health services, transportation and loss of shelter. Over the last 20 years, 116 lives have been lost. Environmental damage since 1988 largely reflects the destruction of terrestrial, coastal and marine ecosystems leading to a reduction in the goods and services they provided. Examples include reduced fisheries (impact both livelihoods and food); soil loss (reduced agricultural productivity and pollution of coastal ecosystems), decline in the health of coral reefs and loss of sea-grass bed (see Appendix I). Projections are that climate change will exacerbate the impacts highlighted. Thus, it is estimated that the economic impact will increase from 2-3 per cent of GDP annually to 13.9 per cent by 2025 (based on 2004 GDP), 27.9 per cent by 2050, 42.3 per cent by 2075 and approximately 56.9 per cent by 2100.⁶ Should these projections be realized, they would significantly alter the country’s current and planned development path and further marginalise the poor, thereby increasing their exposure to climate risks.

Following extensive vulnerability and adaptation assessments of five sectors, namely Water Resources; Agriculture; Coastal Resources and Human Settlement; Health; and Tourism carried out under Jamaica’s Second National Communication (SNC) to the United Nations Framework Convention on Climate Change (UNFCCC), it was identified that much more needs to be done to improve climate resilience. The five areas were identified as being priority sectors for climate change adaptation. For this programme, agriculture and coastal resources are the primary sectors being addressed. However, intervention in these sectors will have wider and far-reaching benefits to the other three sectors.

⁴ The banana and coffee industry has been repeatedly impacted. In 2007 Hurricane Dean destroyed 85% of banana crop. Also, approximately two-thirds the total hectareage of vegetables was lost. In 2008, 80% of the banana crop was destroyed due to Tropical Storm Gustav.

⁵ Agriculture Census 2007

⁶ Bueno et al, (2008).

Coastal and Marine Resources: Jamaica has a coastline of approximately 1000 kilometres. The coastal areas comprise a wide variety of ecosystems including bays, beaches, rocky shores, estuaries, mangroves, cays and coral reefs. These ecosystems contribute to biodiversity by providing nurseries and habitats for fish and non-motile species. In addition, they act as defences or buffers against storm surges and hurricanes. They also support numerous livelihood activities, particularly related to fishing and tourism. The coastal and marine ecosystems have been facing numerous natural and human-induced stresses including the impact of storms; coastal development and pollution. These have led to, among other things, coastal erosion, which has increased dramatically over the last 10-15 years. The pace of coastal erosion has been affected to some extent by the degradation of the coastal ecosystems.

One coastal location which has consistently been impacted by climate related hazards is the Negril Beach area which is located along the west coast of Jamaica (see Appendix II). The coastline of Negril consists of two beaches with a total length of 9.1 km (5.6 miles). The southern bay is called Long Bay, and has a coastline stretching over a distance of 7 km (4.3 miles), with the beach width varying significantly from north to south. Persistent coastal erosion, leading to the narrowing of the beach at Long Bay and Bloody Bay has been one of the most challenging problems affecting Negril over the past few years. This has been documented in several studies⁷, the most recent identifying that “some sites in Negril have experienced shoreline retreats of more than 55m over the period 1968 – 2008”. The evidence in these studies has been corroborated by measurements undertaken by the Negril Coral Reef Preservation Society (NCRPS), a local Non Governmental Organisation, and beach profiling carried out by the National Environment and Planning Agency (NEPA). Projections are that unless significant work is undertaken, continued coastal flooding and beach erosion in the Negril area will be significant. Model outputs based on global projections for long term sea-level rise and local predictions for extreme storm waves and surges, indicate that “an extreme storm event with a 50 year return period will result in a total loss of about 35 per cent of the beach (in terms of length) while another 50 per cent of the beach will lose more than half of its present width”.

The IPCC (IPCC 2007) suggests an increase of 10–20 percent in the intensity of tropical cyclones under enhanced atmospheric carbon dioxide conditions. The fact that four of the Atlantic’s six most intense hurricanes that have occurred over the last ten years (Mitch 1998, Ivan 2004, Wilma 2005, Dean 2007) have had a damaging impact on the Negril beach, further underscores the vulnerability of the area. In terms of human impact and the exposure of social and economic infrastructure, the projections are that 2 500 residents are exposed, along with water and waste water treatment facilities, schools, 5 health centres, 63 hotels, one aerodrome, and a market.

The long-term solution to the problem of coastal degradation in Negril requires an integrated approach including the implementation of structural and non-structural adaptation measures

⁷ See Smith Warner Study. Negril Coral Reef Preservation Society. 2007; Risk and Vulnerability Assessment Methodology Development Project (RiVAMP). UNEP/ PIOJ. 2010; Second National Communication to the UNFCCC. 2009; Negril Destination Profile. CARIBSAVE Climate Change, Tourism and Livelihoods Project. 2010; Report on a Survey of Elevations and Beach Changes at Negril, Jamaica. Prepared by the Marine Geology Unit, Department of Geography and Geology, University of the West Indies for Environmental Foundation of Jamaica. 2008).

while simultaneously addressing practices that result in poor coastal water quality, and deteriorating coral reef health.

The Agricultural Sector: The agriculture sector of Jamaica continues to be an important contributor to the GDP, employment, foreign exchange earnings and the livelihood of the rural population (which represents approximately 48 per cent of the total population – ESSJ 2009). Jamaica has over 200 000 crop and livestock farmers. In 2008, local farmers produced 58 per cent of the total value of goods consumed. The major agricultural crops include sugar cane, bananas, and coffee for exports while a wide variety of crops including vegetables, legumes, fruits, plantains, roots and tubers, cereals and condiments are produced for the domestic market. Farming for the domestic market is dominated by small farmers who operate primarily in rugged mountainous areas and on marginalised lands which are highly exposed to climate related risks. Approximately 66.4 per cent of farms are on less than one hectare and 85.6 per cent on less than 5 hectares of land (Agricultural Census 2007). An overwhelming majority of these farms depend on rain-fed systems as irrigation water is only available to 2.8 per cent total land area of Jamaica. The agricultural sector has already begun to experience the increased and more frequent impacts of natural events including drought and changing rainfall patterns. Small farmers have suffered the most from these climate change impacts – floods have destroyed their crops, washed away top soils, eroded river banks; while increased periods of drought have caused wide spread water shortages in many areas of the country, in particular the southern parishes. In 2010, for example, 17 000 food crop farmers and 1,700 livestock farmers suffered losses of crops and animals amounting to \$576.5 million during rains associated with Tropical Depression #16. In 2008, local farmers produced 58.8 per cent⁸ of the total value of food consumed.

The impacts of climate hazards on the agricultural sector have been made worse by the sector's low adaptive capacity and low resilience to hazards related to climate change. The low capacity is influenced by such factors as high levels of poverty among farmers; low levels of technology; and poor water and land management practices. The National Agriculture Sub-Sector Plan, (within the context of Vision 2030 Jamaica - National Development Plan) has identified undue reliance on rain fed agriculture; insufficient harvesting of water resources for storage and conveyance to productive areas; and vulnerability to natural hazards among the main constraints affecting the performance of the agricultural sector.

Governmental Response

Climate change adaptation is fundamental to the country's viability and its achieving sustainable prosperity as outlined in **Vision 2030 Jamaica – National Development Plan**. One outcome of this plan cites hazard risk reduction and climate change adaptation as critical national strategies to be pursued in attaining the healthy environment necessary to foster economic prosperity and social empowerment. To this end, GOJ has been taking steps to mainstream climate change in the planning process. In addition, a number of climate related initiatives have been implemented in response to the adaptation needs that

⁸ Imports – app. \$100 Billion; domestic crops - \$78 billion, fish and meats-\$22 billion

have been identified. However, these initiatives have not had far-reaching impact on the priority sectors due to the high costs and site specific nature of adaptation requirements.

■ PROJECT / PROGRAMME OBJECTIVES:

The proposed activities under this programme will help to build Jamaica's adaptive capacity while filling gaps that have been identified in Vision 2030 Jamaica National Development Plan and Jamaica's Second National Communication on Climate Change. The programme being proposed will involve the establishment of alternative water harvesting methods; training in on-farm water management; efficient water use technologies; and technologies which improve soil moisture retention. The programme will also support climate resilient coastal management in Negril. In addition, capacity building interventions will be undertaken to complement the other two sector component programmes.

Overall Objective: **To increase sectoral resilience and adaptive capacity to cope with the impacts of climate change by: improving land and water management in the agricultural sector; strengthening coastal protection; and building institutional and local capacity.**

The three components of the programme are outlined as follows:

Component 1: **Increasing the climate resilience of the Negril coastline**

Component 2: **Enhancing the climate resilience of the agricultural sector by improving water and land management in select communities**

Component 3: **Improving institutional and local level capacity for sustainable management of natural resources and in disaster risk reduction in the targeted vulnerable areas**

PROJECT / PROGRAMME COMPONENTS AND FINANCING:

Programme Components	Concrete Outputs	Expected Outcomes	Amount (US\$)
<p>Component 1:</p> <p>Increasing the climate resilience of the Negril coastline</p>	<ul style="list-style-type: none"> • Installation of breakwater structures • Planting and rehabilitation of seagrass beds 	<p>Slowed rate of loss beach and restored beach (over-time);</p> <p>Reduced exposure of coastal, social, and economic and environmental assets including the Negril Great Morass against storms and storm surges</p> <p>Restored and improved risk reduction functions/ services of critical coastal and ecosystems – seagrass beds and coral reefs</p> <p>Protected livelihood – fishing, tourism interests (including farmers and locals who depend on tourism for their income)</p>	5,000,000
<p>Component 2:</p> <p>Enhancing the climate resilience of the agricultural sector by improving water and land management in select communities</p>	<ul style="list-style-type: none"> • Establishment of a micro-dam • Establishment and rehabilitation of a reservoir • Implementation of rainwater harvesting and small scale gravity irrigation programme • Rehabilitation and development of flood mitigation (climate change) resilient infrastructure • Establishment and rehabilitation of soil conservation and water catchments infrastructure 	<p>Increased availability of and access to domestic and irrigation water supplies leading to increased productivity and increased food security</p> <p>Reduced downstream flooding and landslide risks in upland communities</p> <p>Decline in soil erosion and improved soil fertility</p>	2,500,000
<p>Component 3:</p> <p>Improving institutional and local level capacity for sustainable management of natural resources and in disaster risk reduction in the targeted vulnerable areas</p>	<ul style="list-style-type: none"> • Communication and awareness programme on sound environmental management, particularly to reduce risks associated with hazards • Training of local communities and entities in disaster risk reduction (DRR) and natural resources management • Development of guidelines/technical standards for beach restoration and shoreline protection • Development of adaptation plans for the most vulnerable 	<p>Increased knowledge of climate change and adaptation options at the local level;</p> <p>Enhanced local capacity for sustainable use of environmental resources</p> <p>Increased knowledge of and participation in disaster risk management as an adaptation to climate change;</p> <p>New traditions of environmental good practices</p> <p>Better informed decision-making among farmers and local residents and reduced exposure to climate-related risks</p>	1,300,000

Programme Components	Concrete Outputs	Expected Outcomes	Amount (US\$)
	<p>areas along the Negril coastline</p> <ul style="list-style-type: none"> • Development of a climate risk atlas – storm surge, sea level rise, etc – to be used in the development planning process • Building capacity of vulnerable farming communities for better land and water management by: <ul style="list-style-type: none"> i. establishing demonstration plots applying effective land husbandry and soil conservation techniques ii. establishing water-user groups; and iii. conducting workshops and field days for farmer training in water and land management 		
Sub-total 1 Programme Cost			8,800,000
Programme Execution Cost			415,000
Total Programme Cost			9,215,00
Project Cycle Management Fee (~8.5%)			780,000
Amount of Financing Requested			9,995,000

PROJECTED CALENDAR:

The calendar of activities will be submitted in the full programme proposal.

PART II: PROJECT / PROGRAMME JUSTIFICATION

The previous section on background and context sets the framework for this programme concept. It will be developed in further detail once endorsed by the Adaptation Fund Board (AFB). This programme is intended to facilitate the implementation of options that are integral to the climate change adaptation initiatives for the country (See Part 1). The activities identified in this programme are largely drawn from the adaptation priorities that were identified in the vulnerability and adaptation assessments for the agriculture sector and coastal resources. A summary of the climate risks facing the Negril and the areas targeted for intervention in the agricultural sector is shown in Table 3.

Table 3: Climate Risks in Negril and the Agriculture Sector

<i>LOCATION</i>	<i>CLIMATE RISK(S)</i>	<i>INTERVENTION</i>
Negril	<ul style="list-style-type: none"> • Storm Surge • Sea Level Rise • Intense Storms 	<ul style="list-style-type: none"> • Breakwaters • Artificial Reefs • Rehabilitation of Sea-grass beds • Local capacity building
Northern Manchester	<ul style="list-style-type: none"> • Drought • Intense Rainfall • Pests 	<ul style="list-style-type: none"> • Micro Dam • Local capacity building • Biological control
South Clarendon	<ul style="list-style-type: none"> • Drought • Flooding 	<ul style="list-style-type: none"> • Reservoir • Increased efficiency in water usage
Rio Minho Watershed, Clarendon	<ul style="list-style-type: none"> • Intense Rainfall • Drought • Bush Fires 	<ul style="list-style-type: none"> • Flood mitigation infrastructure • Land husbandry and soil conservation techniques • Forest management
Trelawny, St. Mary, St. Ann, St. Catherine, St. Thomas and Clarendon	<ul style="list-style-type: none"> • Drought 	<ul style="list-style-type: none"> • Rainwater Harvesting • Drip Irrigation

The proposed programme is also consistent with climate change adaptation priorities that were developed in sector plans that have been developed under Vision 2030 Jamaica – National Development Plan (further details in subsequent sections). Details of the components of the project are provided below:

Description of Components

Component 1: Increasing the climate resilience of the Negril coastline

Resources are being sought from the AFB to:

- install hard engineering structures to control coastal erosion of Negril's beaches from the climate related hazards of sea-level rise, and intense storms; and
- enhance the natural ecosystems of the area (through soft engineering measures) which provide livelihoods, food and recreation for the population in and around the Negril area.

The coral reefs and seagrass beds in the Negril area are responsible for the production of sand on the beach. A combination of natural and human factors has resulted in the degraded state of both these ecosystems over the past four decades. Recently however, efforts have been on-going to reduce the human impact and to provide a means through which the ecosystems can recover and therefore become more resilient (with the appropriate maintenance). This programme will be necessary to provide resources to make a positive and meaningful impact.

Programme resources will be used to extend the current reef structure in Long Bay and Bloody Bay, the most vulnerable area of Negril. This will be achieved by installing artificial reefs as well as through the rehabilitation of existing seagrass beds. Two 350m-500m submerged near-shore breakwater structures will be installed as one of the hard engineering solutions. It is estimated that the beach directly in front of the breakwaters will commence a natural state of replenishment as it will allow for sand accretion. To aid the natural beach nourishment process, soft engineering solutions involving the establishment and rehabilitation of seagrass beds will also be implemented. The breakwaters will assist with the protection of the seagrass beds from storm surges, etc. Data collection and monitoring to aid in future planning and project designs, including beach profiling and improvement in the geographic information systems, will be undertaken by the National Environment and Planning Agency (NEPA) as part of its routine, on-going management of Jamaica's environment.

The installation of breakwaters will be informed by studies which have been done in the area. The recommendations from these studies have outlined the general movement of sand from the beach to off-shore deposits and the source of sand for the beaches. The studies are able to guide the installation of the breakwaters as indicated in the most vulnerable areas without concern for adverse effects. The installation process and choice of breakwater structures will make full use of technical expertise within and external to the public sector. The intervention will correct the issue of beach erosion and will lay the basis for complementary future interventions when funds become available.

One of the prevailing challenges concerning seagrass beds and coral reefs has been pollution of coastal waters from land-based sources. However, steps including the rehabilitation of the sewage plant have been undertaken to reduce pollution in the area. The restored seagrass beds will be better able to thrive, and will be less likely to be uprooted by high energy waves as the installed breakwaters will provide increased protection.

Component 2: Enhancing the climate resilience of the agricultural sector by improving water and land management

Water Storage and Soil Conservation Infrastructure

Several vulnerable areas will be the focus of these adaptation measures. Such measures will: reduce the loss of soil cover associated with extended droughts followed by increased precipitation; and improve water availability to farmers. In some instances, the measures are intended to address water storage and reduce flooding, thereby resulting in soil conservation.

Specific activities include:

- establishment of a micro-dam in Northern Manchester;
- establishment of a reservoir in the South Clarendon Plains;
- rehabilitation of a reservoir in Caymanas, St. Catherine; and
- establishment of flood mitigation infrastructure (such as green gullies) in selected areas including the Rio Minho Watershed.

Northern Manchester: This region is a farming community having over 2 100 households and a poverty prevalence of 23.7 per cent⁹. It is mainly characterized by small farmers who grow Irish potatoes, red peas, and other cash crops such as lettuce and tomatoes. The region produces about a third of the potatoes for the parish of Manchester and is also one of the largest suppliers of Irish potato seeds. Agriculture in the region is primarily rain-fed but the region has begun to experience the adverse impacts of a changing climate. It receives an average of 1 600mm of rainfall each year. However, challenges arise with an abnormally high evapotranspiration rate during the dry seasons (November to March and July), and extended periods of drought followed by intense rainfall. Increased incidence of drought and flooding has not only led to loss and lowering of productivity of crops but has also increased destructive pest activity. The changing rainfall patterns coupled with high evapotranspiration rates have led to water deficits and reduced ability of crops to withstand pests. The water management interventions will therefore assist in controlling water availability during dry periods and reducing the potential for flooding. In so doing, the likelihood of further destruction due to pest infestations will be dramatically reduced.

Clarendon (South Clarendon and Rio Minho Watershed): The Rio Minho Watershed extends from northern to southern Clarendon and is one of the most degraded watersheds in the country. Over the past few years, the rainfall in the region has declined and become more unpredictable (including heavy rainfall events). As such, the watershed has experienced soil erosion, landslides and flooding. This is expected to worsen without the adequate and appropriate intervention. Not only are communities in the watershed area affected, but also farmers in the plains in southern Clarendon. The plains are fertile and used for farming. Floods and drought events however, are adversely impacting crops, and the situation is expected to worsen with changing rainfall patterns. The Bull Head region,

⁹ PIOJ, 2008. Mapping Poverty Indicators: Consumption and Basic Needs in Jamaica, 2001/2002

within the Rio Minho Watershed is one of the areas to be targeted. It is within a forest reserve and is home to some 23 communities with an estimated population of 69 000. Farming is a major livelihood activity in the area where mixed cropping is practised. Both frequency and intensity of the rainfall as well as prolonged droughts occurring in the Bullhead area have exacerbated the degradation of the watershed which has impacted on food security and livelihood.

The interventions in this area will support a hillside to plain approach. Infrastructure such as green gullies will be installed to reduce the likelihood of soil erosion and land slippage within the watershed. A water catchment facility will be established in the plains to receive water during heavy rainfall events. This will not only reduce flooding of farmlands, but also provide water for irrigation purposes during the dry seasons.

Caymanas, St. Catherine: Caymanas is located within the lower Rio Cobre Watershed region, some of which has suffered degradation. This community has over 475 households with a poverty prevalence of 13.0 per cent. Much of the farming is done by small-scale farmers who lease land to produce mainly domestic food crops such as tubers, papaya and sugar cane. The region has experienced changes in rainfall patterns which have, in many instances, resulted in below average rainfall. This, coupled with extended periods of drought and low stream flows, has reduced water availability to farmers during key periods in the production cycle. The activity proposed for this region is the rehabilitation of a reservoir to assist in addressing the water deficit and supplement the water supply to farmers, particularly during the dry seasons.

Rainwater Harvesting and Drip Irrigation

This element is targeted to six parishes namely: Trelawny, St. Mary, St. Ann, St. Catherine, St. Thomas and Clarendon. All, with the exception of St. Catherine, rank among the top seven poorest parishes in the country according to the latest available Poverty Map. A large portion of residents in these parishes derive their income from farming. Agriculture in these parishes experiences the greatest impact in periods of drought.

The specific intervention/activities include the:

- implementation of rainwater harvesting and small-scale gravity drip irrigation projects;
- establishment of approximately 40 rainwater harvesting systems in selected farming communities; and
- establishment of approximately 60 small-scale gravity drip irrigation systems.

Specific communities that will benefit from these activities as well as other pertinent information regarding this section will be presented in the full programme proposal. Appropriate criteria will be developed to assist in the selection process.

Component 3: Improving institutional and local level capacity for coastal and agricultural adaptation

Activities under this component seek to improve the capacity of key stakeholders, primarily related to agriculture and coastal resources. The interventions are aimed at improving institutional and individual capacities of the identified stakeholders. It involves demonstrating best-practices in climate-resilient agricultural production for sustainable improvement of food security; training coastal resource users on sustainable practices; designing replicable technical standards for beach restoration, creating tools to improve climate resilient development planning and increasing the awareness and access to information about climate change and adaptation options. Additionally, farmers will be better able to understand the need to adapt and to take the necessary steps to implement sustainable farming practices. Through the implementation of this component option, the community of Negril will be empowered to integrate climate change concerns into the economic operations of the community in order to promote the area's sustainability as well as safeguard against extreme hazards intensified by climate change (sea-level rise and storm surge). This component is necessary for the overall success in the initiatives to be implemented in Components 1 and 2 and as such, will be implemented concurrently.

Coastal Adaptation

This component will be achieved through the activities outlined below:

- Development of guidelines/technical standards for beach restoration and shoreline protection – In the past, many entities have undertaken individual measures to reduce the beach erosion in Negril. None of these have been comprehensive or have adequately addressed the root cause of the problem. The guidelines and standards will be developed based on technical and scientific information and in collaboration with key stakeholders including hotel and restaurant owners, fisherfolk and community members. In so doing, the stakeholders will have greater ownership of the developed guidelines and standards and will more likely adopt them in future development or expansion.
- Development of a climate risk atlas – storm surge, sea level rise. This will be based on mapping of areas adjacent to the coast to ensure land owners and regulators have the relevant information on climate risks. A climate risk atlas is seen as an important tool in developing the future strategy for the area. It will address two major threats including sea level rise and storm surges. The atlas will therefore form an important aspect of the development process of the area and will guide local and national level activities.
- Communication and awareness programme on sound environmental management, particularly to reduce risks associated with hazards – There is need to continue communication and awareness of efforts of the Negril area. Component 1 will implement breakwaters and also replant seagrass beds. It is therefore important to inform the community of the activities to be undertaken and provide details on why they are necessary. The likelihood of harm associated with users of the sea or the destruction of ecosystems, including the replanted seagrass beds will be reduced through this programme. It will be undertaken in collaboration with local NGOs which will help with the sustainability of the efforts.
- Training of local communities and entities in disaster risk reduction (DRR) and natural resources management – Several persons in communities and entities such as hotel

and tour operators, will be impacted by the projected future changes that are expected to take place in Negril. Training in DRR and natural resource management is a way in which the community and other stakeholders can participate in the management of the resources in Negril. Business continuity planning will also be included under the DRR activities.

- Development of adaptation plans for the most vulnerable areas along the Negril coastline – The adaptation plans will result in a long-term strategy for Negril and will assist in guiding future interventions. It will draw on existing studies.

Agriculture Adaptation

The methodology to be adapted for this section will include educating and training vulnerable farming communities and community groups on better land and water management. This will be achieved through the following sub-components.

- Institutional strengthening of existing community-based organizations (CBOs) and non-governmental organizations (NGOs) – Much of the education and training that will take place at the local (community) level will involve these groups which play a key role in working with communities. CBOs and NGOs are able to translate important information as well as provide on-the-ground assistance to farmers. These groups will therefore be educated and trained in sustainable practices for water and soil management including the transfer of appropriate technology. This will ensure that the community benefits in the long-term and the practices are sustained in future generations of farmers.
- Establishment of water-user groups (WUGs) in the farming communities – The WUGs will have direct responsibility for managing the irrigation assets supported under this programme. This will help to ensure the sustainability of the water catchment systems.
- Establishment of demonstration plots for land husbandry – This represents one of the most effective tools in land management. This measure will practically demonstrate to farmers the effectiveness and efficiency of sustainable farming techniques and practices (land husbandry). In so doing, they will be more willing to adopt good practices.

Social, Economic and Environment Benefits

The programme includes support to: coastal resources management in the community of Negril; sustainable management of agriculture in select areas; and capacity building to support both sectors in building resilience to climate change risks. The programme will have multiple social, economic and environmental benefits, all of which are mutually re-enforcing. An overview is given in Table 4 below.

Table 4: Summary of Programme Impacts

BENEFITS	PROGRAMME IMPACT
Social	<ul style="list-style-type: none"> • Protection of livelihoods in agriculture (including fishing) and tourism • Empowerment of communities through training and awareness building • Food Security and nutrition – fish are a protein source for many in surrounding rural communities • Improved coping strategies/capacity • Poverty reduction
Economic	<ul style="list-style-type: none"> ▪ Water management systems will support farmers in water –starved communities to improve access to water supply thus contributing to increased yields. ▪ Improved land management infrastructure, leading to reduced soil loss and increased quantity of agricultural produce. ▪ Value added to the tourism product with the protection of coastal ecosystems (including coral reefs and beaches). ▪ Protection of the spawning ground and habitat of the fisheries resulting from the rehabilitation of seagrass beds and installation of breakwaters which will help to protect the local economy. ▪ Development of adaptation plans for sections of the Negril coastline will address strategies for protecting and conserving physical and natural assets in the area. ▪ Training in DRR and natural resource management including the development of disaster risk management plans for “climate proofing” communities and entities ▪ Development of a climate risk atlas – to be used to improve decision-making in the development planning process. This will lead to a better siting and retrofitting of developments. ▪ The use of demonstration plots for land husbandry will help to adopt good practices which will be maintained through continued work with community groups and also with public and private entities. ▪ Provision of water for vulnerable rural farmers in the plains, particularly in dry periods to enable them to their agricultural production.
Environmental	<ul style="list-style-type: none"> • Protection to existing coastal ecosystems – beach, coral reefs, seagrass beds, and the Negril Great Morass. • Protection and expansion of habitats and breeding grounds for varying marine and wetland species including fish. • Reduction in the run-off and pollution of water bodies (fresh and marine) • Increased vegetative cover • Reduced downstream flooding and sedimentation due to establishment of flood mitigation infrastructure in selected areas. • Headwaters of the Rio Minho River safeguarded through improved land management.

Contribution to Country's Climate Resilience

Vision 2030 Jamaica – National Development Plan has posited that adaptation to climate change is a critical component of achieving sustainable development, and for building resilience. The country's climate resilience is related to its ability to protect the sectors on which it heavily depends. The SNC has articulated the five priority areas inclusive of agriculture, and coastal resources. These are the primary areas being addressed in the programme.

In previous and subsequent sections, the role of agriculture and coastal resources within the Jamaican society has been articulated. Both are critical to livelihoods; local and national economies; culture and tradition; and food security, particularly for rural communities and persons living in poverty. The climate-sensitive nature of these sectors increases the risk to all involved with the onset of climate change. All the activities within the programme are therefore intended to contribute to the improvement of Jamaica's resilience to climate change.

Component 1 is intended to protect and preserve coastal resources for the tourism industry, fisheries sector and the local communities in Negril which depend on them. Breakwaters will provide increased protection to natural ecosystems (including seagrass beds), hotels, restaurants, beaches, a fishing beach (and associated assets) and other properties. Seagrass beds are important for the fisheries of the region, and also for generating sand for beach replenishment. The country's economy is largely linked to the tourism industry of which Negril plays an important role. This component therefore has national as well as local significance.

Component 2 is protecting the agriculture sector, particularly crops. Water is the most important of the many challenges facing the sector and as such, plays the dominant role in the inventions listed in this programme. Land management (through soil conservation) also plays a key role.

Component 3 complements the concrete activities of Components 1 and 2. Resilience can only be achieved if long-term planning and action are incorporated in all sectors. This is to ensure that unsustainable habits and traditions are substituted with more sustainable ones. In addition, it will create a dynamic system of learning that allows for changes to be made, particularly at the local level, for continued improvement in all sectors.

Cost Effectiveness

Several studies on the Negril shoreline have underlined the urgent need for corrective action. Three possible options are considered: no-regrets, managed retreat and business-as-usual. A "**business as usual**" approach is one in which nothing is done and the erosion of the coastline is allowed to continue unabated and intensify. This would result in damage to beach and coral reef; damage to property due to erosion, and loss of income. Under the "**managed retreat**" option, Negril residents and social and economic infrastructure would have to be moved further inland and outside the zone of coastal flooding and storm surge. This option brings tremendous costs related to physically uprooting long established communities; discarding expensive infrastructure built over time; incurring cost of relocating businesses; development associated with establishing a new town; and loss of the cultural and heritage goodwill built up in and by the area over time. A "no-regrets" option protects

the existing structures and systems and puts measures in place to ensure the benefits are long-term.

The degraded nature of Negril eliminates “managed retreat” and “business-as-usual” as viable or feasible options. In both, beach erosion would continue further exposing humans and assets. Additionally, both options would carry very large price tags in terms of damage and loss of assets, disruption of livelihoods and economic activities.

For this programme, Component 1 is a “**no regrets**” option. It perceives rehabilitating the Negril coastline using a mix of hard and soft engineering methods estimated to cost US\$5 million. The outcomes expected include restored ecosystems and their services, specifically their provisioning, regulating and protective services. There would be little risk of social, environmental or economic loss associated with this option. In fact, it provides an opportunity to build on previous projects, to translate research findings into actual eco-solutions for the benefit of the community, and offers value-added (e.g. dive tourism from improved reefs) while safeguarding important assets such as hotels, road networks, utilities infrastructure and the Negril Great Morass.

For Component 2, the cost-effectiveness of the programme derives mainly from the increase in agricultural productivity and potential lowering of the food import bill to be obtained from improved irrigation, better land management (better husbandry, reversal of soil erosion); and use of more modern and sustainable farming practices. Importantly, rain water harvested for agriculture is a self-managed system for local farmers to gain access to water and therefore contributes to reduced cost of inputs. The use of gravity fed drip irrigation instead of an electrically powered pump-based system also reflects the cost-effective nature of the interventions being pursued. From a sustainability point of view, the technology is simple and easy to install and maintain; is itself a good water management and conservation method; is economical to operate; and is advantageous for pest and weed management. This particular component will build on lessons learnt from a number of other related projects thereby minimising the associated risks.

The investment in institutional strengthening and local capacity building component will have a positive benefit: cost ratio as it will contribute to minimising damage and losses associated with hazard events through increased awareness and know-how; and lowering of demand on the government for recurrent expenditure to manage and maintain investments. The development and use of guidelines will provide a scientific basis for future ecosystem restoration and adaptation works in Negril and can be replicated across the country.

The appropriate economic analysis will be included at the programme formulation stage and the programme will be designed so that its elements can be adapted and replicated in other communities.

Consistence with National Strategies, Programme, Plans

Jamaica has prepared a sustainable development plan entitled **Vision 2030 Jamaica – National Development Plan**, a collaborative effort of stakeholders from all levels of society. The vision statement of this plan speaks to Jamaica becoming “the place of choice of live, work, raise families and do business”. The plan is based on four national goals, one of which is that “Jamaica has a healthy environment”. This goal and the associated national

outcomes recognize the importance of the natural environment to Jamaica's socio-economic well-being.

Under the afore-mentioned goal, there are two key national outcomes:

- National Outcome 13: Sustainable Management and Use of Environmental and Natural Resources; and
- National Outcome 14: Hazard Risk Reduction and Adaptation to Climate Change.

Several strategies have been identified to achieve these outcomes. These are to develop and implement mechanisms for biodiversity conservation and ecosystems management; improve resilience to all forms of hazard; and develop measures to adapt to climate change.

It has been mandated that all ministries, agencies and department of the government must align workplans, policies and activities with this plan. It is within this context that this programme was developed.

As part of Jamaica's SNC to the UNFCCC, vulnerability and adaptation assessments were conducted for five priority areas – Water Resources, Agriculture, Coastal Resources and Human Settlement, Tourism, and Health. The findings of these assessments were important in selecting the components of the programme.

The country is currently preparing a National Climate Change Policy which will be aligned to Vision 2030 Jamaica and other relevant policies. The draft policy recognizes the importance of the sectors identified in this programme as critical to the social and economic welfare of the country.

Jamaica has developed a National Ocean and Coastal Zone Management Policy which articulates five goals:

- 1) Promotion of sustainable development;
- 2) Conservation of ocean and coastal resources and ecosystems
- 3) Baseline Data Collection and Research
- 4) Utilizing the Role of Science and Traditional Ecological Knowledge for Integrated Coastal Area Management
- 5) Providing the Conditions of Governance Required for Effective Integrated Coastal Area Management

The programme as articulated here-in is aligned to this policy including the goals outlined above. Specifically, the programme will address strategies including the conservation of living and non-living coastal resources; protected areas and ecosystem management; and conservation mechanisms and building capacity for integrated coastal zone management in the public and private sectors.

A Draft Beach Access and Management Policy (2008) has been developed for the island. It seeks to address: the use of beaches for recreation by both locals and tourists in an environmentally sound manner; the implementation of measures to ensure the health and safety of coastal resource users; and the protection of natural resource areas that are vital to the preservation of the patrimony of the nation for future generations.

The National Development Plan and the Strategic Framework for Agriculture under Vision 2030 Jamaica consists of five major themes which address the project. They are:

- Competitive Agriculture
- Efficient Commercial Farming
- Application of Technology
- Integrated Rural Development
- Sustainable Environment

The proposed strategies under the themes above, focus on the issue of infrastructure development and specifically mention irrigation and the provision of water. In addition, areas were selected based on the current thrust of the sector to improve select crops such as Irish potatoes which will contribute to increased food security and poverty reduction.

This programme is also aligned to Jamaica's Water Sector Policy. The policy recognises the need for irrigation due to several constraints including inability of the sector to provide the necessary resources for improvements to current irrigation measures. The policy therefore under-pins the need for efficiency, conservation and expansion of existing facilities to ensure the agriculture sector is adequately supplied. Similarly, the Jamaica Irrigation Act (2003) addresses, among other things, the establishment of water user groups, drip irrigation systems and water catchment systems which will ensure that farmers benefit from greater access to water, and participate in good management practices.

The Food and Agriculture Organization (FAO) has collaborated with the Government of Jamaica (GOJ) to produce the FAO National Medium-Term Priority Framework (NMPTF). Ten priority areas have been outlined; chief among them is increased productivity through the provision of adequate water supply. Specifically mentioned are on-farm irrigation systems for small farmers.

The Master Plan for Sustainable Tourism Development articulates environmental sustainability as one of its goals. The preservation of the natural environment is seen as one of the ways through which sustainability of the tourism industry can be achieved, particularly as it is intricately linked to the quality of the environment. The environmental component of the Master Plan also requires the need for, *inter alia*, improved water quality and increased coral cover.

At the international level, the programme is aligned to Millennium Development Goals (MDG), chief among them, Goals 1 and 7 - poverty and hunger eradication and environmental sustainability.

Further linkages with national and sub-national policies, programmes and projects will be discussed in the full programme proposal.

Consultations Process

The Planning Institute of Jamaica partnered with the Hazard Risk Reduction and Adaptation to Climate Change Thematic Working Group (TWG) to solicit ideas for the preparation of the programme concept. (The TWG was established under Vision 2030 Jamaica). This resulted in the establishment of a technical review sub-group which was charged with

reviewing concept ideas submitted in response to calls for concepts. Based on the priority areas of the SNC, other entities of the government were included in the process. Table 5 shows the full listing of agencies.

Table 5: Agencies that Participated in AF Concept Development

Agency	Affiliation	Member of TWG
Association of Development Agencies (ADA)	NGO	Yes
Panos Caribbean	NGO	Yes
Water Resources Authority (WRA)	Government	Yes
Ministry of Agriculture and Fisheries – National Irrigation Commission (NIC) , Rural Agricultural Development Authority (RADA)	Government	No
National Environment and Planning Agency (NEPA)	Government	Yes
Ministry of Health	Government	Yes
Ministry of Tourism	Government	Yes
Environmental Management Division of the Office of the Prime Minister	Government	Yes
Planning Institute of Jamaica	Government	Yes
United Nations Development Programme Country Office	UN Agency	Yes

The development of the concept also benefited from a consultative process involving national and local level stakeholder partnerships. This included a climate change awareness rapid assessment survey of resource users conducted jointly by the PIOJ and ODPEM. In addition, outputs from the Pilot Program for Climate Resilience (PPCR) stakeholder consultations and from the Risk and Vulnerability Assessment Methodology Development Project were also integrated in the development process.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Programme Management

The general organizational structure for the programme is outlined below (Figure 1). This will however, be further elaborated and fine-tuned in the full programme proposal and in the Operations and Procedural Manual being developed to govern the programme. The NIE will operate within a matrix organizational structure comprising a core staff, drawn from three technical divisions of the Planning Institute of Jamaica, namely (i) Sustainable Development and Regional Planning; (ii) External Cooperation Management; and (iii)

Corporate Services. Expertise will be drawn from other divisions within the PIOJ to assist with the work of the NIE, as required.

The NIE will be supported by a Management Committee drawn from a wide cross section of stakeholders in the development field with particular reference to the priority areas identified. It will also receive technical advisory and project evaluation input from the Hazard Risk Reduction and Climate Change Thematic Working Group, a sub-set of which will be constituted as the Technical Review Committee. Day to day coordination will be maintained with the executing agencies through a Programme Management Unit.

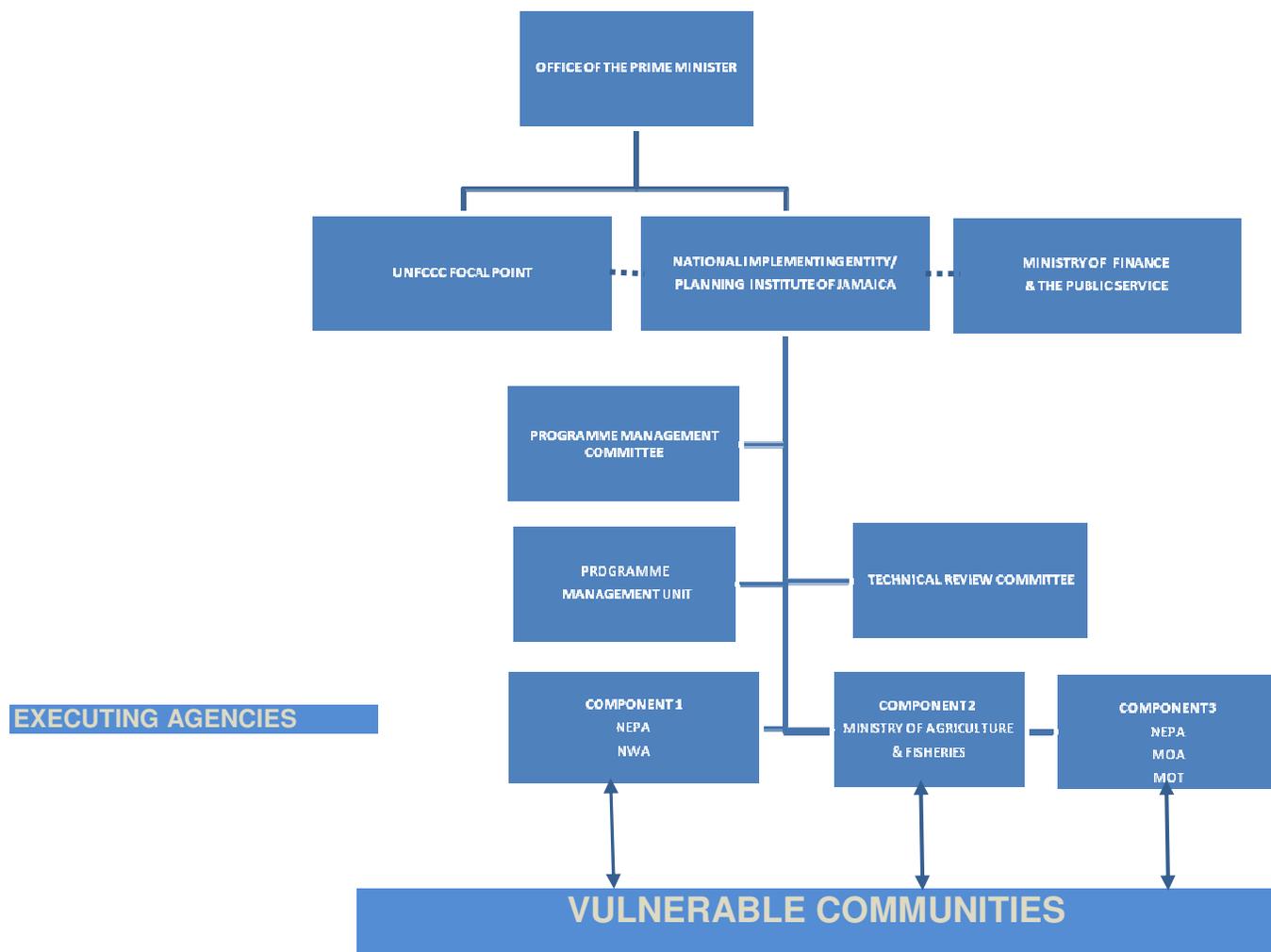


Figure 1: Indicative Organizational Outline

B. Financial and Programme Risk Management

A detailed financial and programme risk management framework will be developed during the programme development phase and will be outlined in the Operations and Procedural Manual. For financial risk management the framework is expected to draw heavily on the budgetary and fiduciary management arrangements which govern the operations of the

Planning Institute of Jamaica and all public sector agencies, the Government procurement policy, and the AFB financial management requirements. Specific instruments to be observed will include: Financial Administration and Audit Act, PIOJ Accounting Systems and Procedures Manual: International Financial Reporting Standard (IFRS), Generally Accepted Accounting Principles (GAAP) and the GOJ Public Sector Procurement Procedures (October 2010).

C. Monitoring and Evaluation

Monitoring will be conducted in accordance with the programme monitoring approach practised by the External Cooperation Management Division, PIOJ which manages a large portfolio of programmes funded by the development community. There will be ongoing annual reviews which will involve the Project Management Unit, Project Management Committee, Executing Agencies and representatives from beneficiary communities. Independent mid-term reviews as well as a final review and evaluation will also be conducted. The monitoring undertaken by the programme will be supplemented by the programmatic and financial monitoring carried out, on the Capital B programmes within the annual budget, by the Public Expenditure Division, Ministry of Finance and the Public Service.

A detailed programme Logical Framework will accompany the full proposal. A programme monitoring and evaluation plan inclusive of milestones, targets, indicators, and reporting and review schedule will also be prepared and submitted.

D. Results framework

This will be incorporated in the full programme document.

PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. RECORD OF ENDORSEMENT ON BEHALF OF THE GOVERNMENT¹

See Attached letter:

Mrs Sylvia McGill Director, Meteorological Service Jamaica 65 ¾ Half Way Tree Road, Kingston 10. Jamaica	Date: April 12, 2011
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B. IMPLEMENTING ENTITY CERTIFICATION

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (including Vision 2030 Jamaica – National Development Plan) and subject to the approval by the Adaptation Fund Board, understands that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.	
Implementing Entity Coordinator: Kirk Philips Director, Corporate Services	
Signature: 	
Date: April 13, 2011	Tel. and email: (876) 935-5099 kirk_philips@pioj.gov.jm
Project Contact Person: Claire Bernard	
Tel. And Email: (876) 935-5054 Claire_bernard@pioj.gov.jm	

⁶ Each Party shall designate and communicate to the Secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.