UNITED NATIONS ENVIRONMENT PROGRAMME

Programme des Nations Unies pour l'environnement | Programa de las Naciones Unidas para el Medio Ambiente
Программа Организации Объединенных Наций по окружающей среде | برنامج الأمم المتحدة للبيئة
联合国环境规划署

UNEP

PROJECT DOCUMENT

SECTION 1: PROJECT IDENTIFICATION

1.1	**Project title:**	Sustainable Pathways – Protected Areas and Renewable Energy
1.2	**Project number:**	GFL/ GFL-5060-2712-4E04 PMS:
1.3	**Project type:**	FSP
1.4	**Trust Fund:**	GEF
1.5	**Strategic objectives:**	BD1, CC-3, SFM/REDD-1,
1.6	**UNEP priority:**	Climate Change, Ecosystem Management

UNEP Programme of Work (2014-2015) Climate Change Expected Accomplishments

(b) Energy efficiency is improved and the use of renewable energy is increased in partner countries to help reduce greenhouse gas emissions and other pollutants as part of their low emission development pathways: Technical support provided to countries and partners to plan and implement sectoral initiatives and to make renewable energy and energy efficiency projects affordable and replicable

UNEP Programme of Work (2014-2015) Ecosystem Management Expected Accomplishments

(a) Use of the ecosystem approach in countries to maintain ecosystem services and sustainable productivity of terrestrial and aquatic systems is increased: Field projects will also be used to demonstrate the integrated land and water management approaches that help strengthen the resilience and productivity of terrestrial and aquatic systems, the conservation of biodiversity and the value of integrating ecosystem services into national development agenda by national and UN partners on the ground

1.7	**Geographical scope:**	National
1.8	**Mode of execution:**	External
1.9	**Project executing organization:**	Environment Division, Ministry of Agriculture, Lands, Housing and the Environment, Antigua and Barbuda
1.10	**Duration of project:**	48 months Commencing: January 2015 Completion: December 2018

1.11	**Cost of project**	**US$**	**%**
	Cost to the GEF Trust Fund	**2,639,726**	**24.86**
	Co-financing		

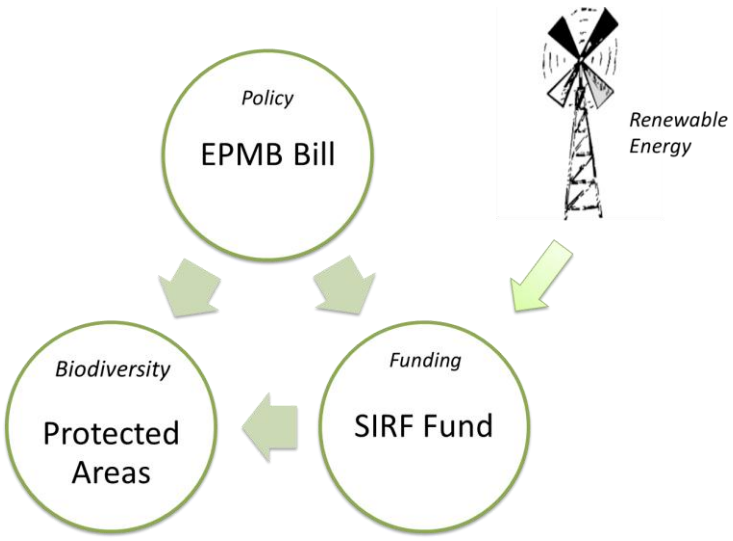
Cash		
Public Works Department	TBC	TBC
Ministry of Finance	6,000,000.00	56.50
Antigua Power Utilities Authority (Water Levy)	1,600,000.00	15.07
Environment Division	100,000.00	0.94
Sub-total	**7,700,000.00**	**72.51**
In-kind		
IRENA*	TBC	TBC
APUA*	TBC	TBC
Environment Division	250,000.00	2.35
UNEP	30,000	0.28
Sub-total	**280,000.00**	**2.64**
Total	**7,980,000.00**	**75.15**
Grand Total	**10,619,726**	**100**

***Letters of Support attached.**

1.12 Project summary

The financial needs to meet the estimated annual operational costs of the biodiversity rich Protected Areas and Forests systems of Antigua and Barbuda is conservatively estimated at $5 million per year. The cash strapped Government is currently meeting approximately $2 million of these costs per year. Important strides are currently being made through the establishing of an enabling environment to raise and receive funds. However, there remains an urgent need to pilot, implement and scale up conventional and alternative financial mechanisms to generate revenue for the SIRF Environment Fund. The proposed project will innovatively and concurrently address a number of environmental priorities through the following components:

1. Formalize an agreement for the SIRF Environment Fund to receive profits from renewable energy systems (see component 2.) and increase revenue for Protected Areas System by $2 million annually;
   2. Pilot installation of 1-4 MW wind and/or solar energy (which would generate an eventual estimated minimum of $700,000/year for PA management) with feasibility scale up of up to 50% of the AnB's energy needs at 25MW.
   3. Improve management effectiveness of a financially sustainable pilot protected area -- Mount Obama National Park, and;
   4. Restore surrounding watershed forests key to improved water management and eventual pumped hydro energy storage (to scale up component 2.). Reduce threat of fire to forested areas.



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ACRONYMS AND ABBREVIATIONS

ABED/PIU	Antigua and Barbuda Environment Division/Project Implementation Unit
ABNEP	Antigua and Barbuda National Energy Policy
ABS	Access and Benefit Sharing
APUA	Antigua Public Utilities Authority
BIOFIN	Biodiversity Finance Initiative
BIOPAMA	Biodiversity and Protected Areas Management
BPoA	Barbados Programme of Action
CBMR	Cades Bay Marine Reserve
CBO	Community Based Organisation
CCCCC	Caribbean Community Climate Change Centre
CDM	Clean Development Mechanism
CEO	Chief Executive Officer
CITES	Convention on International Trade on Endangered Species of Wild Fauna and Flora
COP	Conference of the Parties
CSO	Civil Society Organisation
CV	Curriculum vitae
dB	Decibel
DCA	Development Control Authority
EA	Executing Agency
EAG	Environmental Awareness Group
Eba	Ecosystem Based System for Adaptation
EC-JRC	European Commission - Joint Research Centre
ED	Environment Division
EIMAS	Environmental Information Management and Advisory System
EIS	Environmental Impact Statement
EOU	Evaluation and Oversight Unit
EPMB	Environmental Protection and Management Bill
ESD	Energy for Sustainable Development
FDI	Foreign Direct Investment
GARD	Gilbert Agricultural and Rural Development Center
GCCA	Global Climate Change Alliance
GDP	Gross Domestic Product
GEF	Global Environment Facility
Gg	Gigagrams
GHG	Greenhouse Gas
GIS	Geographic Information Systems
GoAB	Government of Antigua and Barbuda
ha	Hectares

IA	Implementing Agency
IAS	Invasive Alien Species
IBA	Important Bird Areas
IBPOW	Island Biodiversity - Programme of Work
IEC	International Electrotechnical Commission
IMF	International Monetary Fund
IPP	Power Producer
IRENA	International Renewable Energy Agency
IRR	Internal Rate of Return
IUCN	International Union for the Conservation of Nature
IWEco	Integrating Water, Land, Resources & Ecosystems Management in Caribbean SIDS
KAP	Knowledge Attitude and Practices
kha	kilohectares
kWh	Kilowatt hours
LAP	Local Area Plans
LOI	Letter of Intent
M&E	Monitoring and Evaluation
MEA	Multi-lateral Environment Agreement
MoHE	Ministry of Health and the Environment
MONP	Mount Obama National Park
MONPC	Mount Obama National Park Committee
MOU	Memorandum of Understanding
MSI	Mauritius Strategy of Implementation
MW	Megawatt
NAMA	Nationally Appropriate Mitigation Action
NAP	National Action Plan
NBSAP	National Biodiversity Strategy and Action Plan
NCM	National Coordinating Mechanism
NE	Northeast
NEA	National Executing Agency
NEMS	National Environment Management Strategy
NGO	Non-government Organisation
NODS	National Office of Disaster Services
NP	National Park
NPA	National Parks Authority
NPDP	National Physical Development Plan
NPV	Net Present Value
OECS	Organisation of Eastern Caribbean States
OPAAL	OECS Protected Areas and Associated Livelihoods
OTEC	Ocean Thermal Energy Conversion

PA	Protected Areas
PC	Project Coordinator
PCC	Project Coordination Committee
PIR	Project Implementation Review
PMU	Project Management Unit
PPA	Power Purchase Agreement
PPG	Project Preparation Grant
PSIP	Public Sector Investment Program
PV	Photovoltaic
PWD	Public Works Department
RE	Renewable Energy
REGATTA	Regional Gateway for Technology Transfer and Climate Change Action
RFP	Request for Proposal
RRAs	Renewable Readiness Assessments
SCADA	Supervisory Control and Data Acquisition
SCCF	Special Climate Change Fund
SE	Southeast
SFM	Sustainable Forest Management
SGP	Small Grants Programme
SIDS	Small Island Developing States
SIRF	Sustainable Island Resource Framework
SIRMM	Sustainable Island Resource Management Mechanism
SPPARE	Sustainable Pathways - Protected Areas and Renewable Energy
SSA	Special Service Agreement
SWW	Southwest Watershed
TM	Task Manager
TOR	Terms of Reference
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNDESA	United Nations Department of Economic and Social Affairs
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States dollars

SECTION 2: BACKGROUND AND SITUATION ANALYSIS (BASELINE COURSE OF ACTION)

2.1. Background and context

1. The island state of Antigua and Barbuda, which includes several small near shore islands and the uninhabited island of Redonda, is situated in the eastern arc of the Leeward Islands, in the Caribbean (see Appendix 14). The islands are the emergent parts of the Barbuda bank[1], which is one of the largest sub-marine platforms in the Eastern Caribbean (spanning 3,400 sq. km) with water depths ranging from 27 to 33 meters. The islands themselves cover a total land area of 440 sq. km, and are generally low lying, surrounded by white sand beaches, wetlands and mangroves, shallow water coral reefs and sea grass beds. Antigua occupies an area of 280 sq. km while Barbuda is approximately two thirds this size occupying 160 sq. km and Redonda is 1.3 sq. km.

2. Antigua has three distinct geological zones that traverse the island diagonally (northwest to southeast): the hilly volcanic region in the southwest, the flat central plains, and the limestone hills and valleys in the northeast[2]. The highest topographical point on Antigua is Mount Obama (formerly Boggy Peak) in the southwest with a maximum altitude of 405 m. Barbuda is flatter by comparison with a maximum altitude of 40 m and average elevation of 4 m above sea level. The island is entirely formed from coralline limestone and there are three geological zones: the highlands limestone region, the Codrington Limestone region, and the Palmetto Point Series; which overlays the other formations in coastal areas. Redonda, by comparison is a steep sided basaltic island that rises directly to nearly 300 m above sea level

3. The islands are subject to a tropical maritime climate with alternating periods of drought and periods of heavy rains that coincide with the tropical hurricane season. They are in the path of the northeast Trade Winds and fairly steady winds blow off the Atlantic from the NE to the SE. The dry cool season occurs between January to April and wet season between September to November when wind speeds are generally lower. While the variation in daily or seasonal air temperatures[3] and humidity is relatively small, precipitation can be highly variable, and these islands often experience severe droughts (approximately every 5-10 years).

Energy and water desalination

4. Antigua & Barbuda emitted 377 Gg of CO_2 in 2003 – a small fraction of the global emissions. The energy sector, and more specifically the Antigua Public Utilities Authority's (APUA) Electricity Department operations and generation suppliers, accounted for 48% of these emissions. The country depends almost entirely on fuel oil imports for electricity generation making it highly vulnerable to energy price fluctuations. This undoubtedly obligates the country to spend majority of foreign

[1] Harris (1965)
[2] Martin Kaye (1959).
[3] Average monthly minimum temperatures range from 22.4°C in February to 25.4°C in August, while monthly maximum temperatures range from 27.9°C in February to 30.5°C in September

exchange earnings on fuel supply. This situation is exacerbated by the high energy cost associated with the supply of water to the public.

5. The country has been experiencing extended severe drought beyond the normal experienced over the last century and this at a time when the economy – mostly tourism based – needs to expand. Whereas in the past, almost all of the water supply originated from rainfall accumulated in wells and in run off, this does not suffice to meet the present water demands of the country. In addition to the more frequent drought periods, sea level rise has forced the country to result in abandonment of wells in coastal areas due to sea water intrusion to the fresh water lens. To cope with the water shortage, a number of desalination plants had to be installed around the island. In recent years, some of which were extended drought years, as much as 60% of water has been from reverse osmosis – electricity dependent – which requires imported fuel, making both electricity and water the foundation of any economy and health care system doubly vulnerable to climate change and fuel price volatility.

6. Antigua and Barbuda, like many Small Island Developing States (SIDS), is becoming aware that climate change mitigation, through the switching to more efficient energy use, dramatically increasing renewable energy share and reforesting watershed areas, is possibly the best way to adapt to climate change. There are however many barriers which the country has to address before it can embark on such a transition.

Finance and Economy

7. SIDS are economically vulnerable as a result of their dependence on outside sources of fuel, food and income generation related to employment. Antigua and Barbuda is no exception to this rule and its dependence on a limited quality and quantity of products and services within a limited land and coastal area is due mainly to its physical isolation. Important ecosystem services upon which the country is critically dependent include biodiversity, fisheries, landscape values, vegetation cover, and traditional ecological knowledge. As proven in many island systems, the linkages between these ecosystem functions and services, and people are strengthened due to the insular nature of the country[4]. However, these strong linkages can represent a serious threat to ecosystem functions and natural resources where these functions and resources are heavily exploited yet insufficiently valued to warrant focused efforts toward their sustainable management and maintenance.

Environmental Management

8. Antigua and Barbuda supports a range of globally and regionally significant terrestrial and marine habitats and species. Inadequate conservation, planning and management of this small island state's important, yet limited, resources have resulted in both a loss of species diversity and degradation of the functionality of the island ecosystem. These impacts have been compounded by unsustainable agro-pastoral practices, overgrazing and uncontrolled fires. The islands are subject to highly variable climatic conditions and hurricanes that damage both key habitats and infrastructure. Land degradation and loss of ecosystem functionality has already reduced the islands' capacity to sustain and

[4] After the 'Millennium Ecosystem Assessment' Chapter 23 – Island Systems

provide basic needs (water resources, food security, etc.) and increased its vulnerability to changes in climatic conditions. Ensuring the long-term stability and sustainability of resources and ecosystem function, integrity and health demands for an enhanced approach to the establishment, financing and management of protected areas; especially in the face of global climate change.

9. There is an overall acknowledgment that urgent steps need to be taken to preserve the country's natural resources. Since Rio 1992, the Government has joined the international community to ratify several important environmental conventions. These include all of the Conventions supported by the GEF and others such as CITES etc. (see Appendix 15). These conventions have all identified commitments that the Government of Antigua and Barbuda should meet to protect its own environment as well as the support of the global community in Global Environmental Protection.

Financing for the Environment - Sustainable Island Resource Framework (SIRF) Fund

10. In the negotiations for MEAs the financing required for their implementation has been widely acknowledged as not enough and many recent and past studies have highlighted this fact. Funds are required especially for implementing various environmental management mandates including climate change adaptation, biodiversity conservation and sustainable land management. As a result of the lack of investments into the environment, recent reports of UNEP and the GEF have indicated that Environmental Management is still slipping. The declining state of the global environment was a key message in the recent GEF replenishment negotiations. In the case of Climate Change, recent reports from the World Bank suggest that countries have to prepare adaptation scenarios for a 4-degree warmer world.

11. The financial shortfalls coupled with recent economic decline as well as demands from other sectors such as health, education and debt servicing has made it almost impossible for Antigua and Barbuda to implement the conventions while adapting to climate change. This is particularly important when the need to adapt will require large amounts of accessible and predictable resources.

12. Resources from donors, particularly the GEF and others, have in some case buffered the financing shortfall. The access to and flow of these resources however makes it difficult to implement a programmatic approach to adaptation, mitigation, and biodiversity protection. Based on the amount of funds required and the challenges the country faces, the provision of financing must be at the scale with access modalities that fits the nature and of the size of the problem (4 degree world) and the capacity of the country to access the funds. The current flow of donor resources, even though important, lacks the impact and sustainability that the nature and size of the problem requires.

13. Antigua and Barbuda has recently closed a full size GEF project. The Sustainable Island Resource Management Mechanism (SIRMM) project prepared a comprehensive

strategy for the sustainable management of the environment in Antigua and Barbuda and for the implementation of the conventions. This project generated several policy documents (Appendix 16) that provided the baseline for the design of this project. The overall conclusion is that for Islands, a sectorial approach to the implementation of Environmental concerns is not an appropriate strategy to address environmental management. The project indicated that an integrated national approach is required.

14. This present project seeks to advance the Sustainable Island Resource Financing (SIRF) Fund being established by an Act of Parliament by developing the business plan for the Systems of Parks and environmental legislation associated with the Environmental Protection and Management Bill...

15. The creation of the SIRF Fund is at the core of the Environmental Protection and Management Bill (EPMB). This overarching Bill has been drafted by the Environment Division and seeks to address environmental management in its entirety. The Bill has received a Cabinet Decision and is to be passed in Parliament before December 2014.[5] EPMB will provide the enabling environment for the fund and its operation. The expenditures of the fund are guided by the legislation and limited by the provisions within the legislation.

16. The SIRF Fund will raise funds to invest in for-profit renewable energy technology initiatives. This is spelled out in the EPMB. The technologies identified to date are solar, wind and possibly ocean thermal energy conversion (OTEC). The electricity generated will be sold to the utility company (APUA), which has agreed to purchase and the proceeds of this will be channeled into the various thematic windows. The fund has received the necessary permits from APUA and the Government to generate 25MW of electricity.

17. One source of potential international funding is from the Nationally Appropriate Mitigation Action (NAMA) Facility established under the United Nations Framework Convention on Climate Change (UNFCCC). A Policy based NAMA has been developed and submitted to this facility to request financial and technical assistance to implement sustainable financing for environmental stewardship through capital investments in renewable energy. Revenues generated will be used to fund climate change adaptation and biodiversity conservation.

18. In addition to this, the International Renewable Energy Agency (IRENA) has made a commitment to provide this project with in-kind co-financing. Antigua and Barbuda will benefit from this co-financing through the development of renewable readiness assessments (RRAs). An RRA is a holistic assessment of conditions for renewable energy deployment in a country, and the actions necessary to further improve these conditions. An RRA is a rapid assessment of how a country can increase readiness and overcome the main barriers to the deployment of renewable energy technologies. This assistance will greatly benefit the project specifically as it relates to component 3.

[5] Project Inception and first payment will commence only after passage of Bill.

19. This project's first component will design the business strategy of the fund, while components 2 and 4 will create the windows and pilot their operational modalities by generating recurrent funding to benefit two focal areas: biodiversity, particularly protected areas, and sustainable forest management (SFM). The project will pilot these areas by using the returns on investments that accrue under the project to fund one protected area (Mount Obama National Park – MONP) and the development of sustainable forest practices in the Christian Valley Watershed. The latter activity will further identify forestry resources to be protected as sinks as well as their ecosystems services. The intent is to scale these pilots to national level.

20. In summary Antigua and Barbuda, like all of the other OECS countries, are signatories to all of the Rio agreements that the GEF supports. They all struggle with the ability to finance their environmental management programs and experience significant gaps. These gaps are not due to political will or incorrect priorities; these are due to severe macroeconomic realities that the countries are facing. The country is taking a step to manage its environment in an integrated approach and is designing a financial strategy to address this. The SIRF fund, coupled with components supported by this project are expected to generate a significant amount of new resources for environment management and will reduce greenhouse gas (GHG) production while contributing positively to the overall macroeconomic situation of the country.

2.2. Global significance

21. Global environmental benefits accrued by this project are:
    a. Supporting of a sustainable financing mechanism that can fund the commitments of Antigua and Barbuda to its people and to the global community;
    b. Protection and conservation of critically important biodiversity, including endemic and migratory species;
    c. Implementation of renewable energy technology and decreasing the GHG emissions and carbon footprint, and;
    d. Safeguard ecosystem services through conservation and enhancement of key habitats and watershed areas to reduce the vulnerability of adjacent communities and small business from flooding and drought, and to protect scarce potable water resources.

22. The project will directly support Antigua's contribution to the Convention on Biodiversity's (CBD's) Strategic Plan, and the Aichi Targets adopted at the 10th Conference of the Parties (COP) of the CBD. Most directly it will contribute to the Aichi reduction in loss of natural habitats and decreasing degradation and fragmentation specifically of forests ecosystems (Target 5), to the restoration of biodiversity hotspots (Target 15) and contributing to the national protected areas system for management and conservation of biodiversity (Target 11). However, the work of the project will also make material contributions to other targets through, for example, preventing the extinction of known threatened species (Target 12), commencement of the implementation of an effective, participatory and updated national biodiversity strategy and action plan (Target 17) and mobilizing financial

resources for effectively implementing the Strategic Plan 2011-2020 from all sources (Target 20).

23. Baseline emissions from electricity production are 0.37 Mt CO_2 as at 2000[6] with 48% being from the energy sector electricity production. The pledge made at Copenhagen COP was to reduce 25% below 1990 levels by 2020. Based on projections by CAIT-WRI 2010 and World Bank Caribbean Regional Electricity Generation, Interconnection, and Fuels Supply Strategy 2010, emissions from the energy sector have probably increased 50% over 1990 levels by 2014 - well off trajectory. The project cannot bring the energy sector anywhere near to the target during the project period but can break down the most serious barriers to deep renewables penetration so that in the coming decade 25 to 30% could be achieved. The case of Antigua is similar to many island states thus replication potential is huge.

24. Managing forested habitats is key to ensuring a healthy watershed. This has been acknowledged in some of the Multilateral Environmental Agreements (MEAs) such as the United Nations Convention to Combat Desertification (UNCCD). The UNCCD is mandated to implement long-term integrated strategies that focus both on improved land productivity and the rehabilitation of its resources, which will ultimately lead to improved living conditions[7]. This has been acknowledged in the country's National Action Programme (NAP) to that Convention. The NAP recognized that the country's forested areas provide important raw materials for the charcoal-making, fishpot-making and apiculture industries[8]. This project will contribute to the objectives outlined in the NAP by protecting and conserving key forested habitats and watershed areas.

2.3. Threats, root causes and barrier analysis

25. Like many other SIDS in the Caribbean, the economy of Antigua and Barbuda has transitioned from an agrarian to a more service oriented economy. However, the economy is small, in fact, tiny and lacks access to low cost capital and is therefore vulnerable to all global economic shocks as well as environmental impact such as Climate Change and loss of biodiversity. Barriers are mainly high levels of poverty, high debt, poor access to capital, high cost of fuel, environmental degradation, high vulnerability to natural disasters (hurricanes, droughts, earthquakes and recently unexpected rain events) and access to technology. The recovery from frequent storms has caused the country to borrow to recover. The Government strategy to grow the economy out of its current problems was exacerbated by the global financial crisis, which saw the collapse of a number of Foreign Direct Investment (FDI) projects. The country recently completed a standby International Monetary Fund (IMF) program and if the country is hit by a storm it can lose further ground.

[6] Environment Division, 2009. Antigua and Barbuda's Second National Communication on Climate Change submitted to the UNFCCC.
[7] UNCCD, 1994. Final Text of the Convention
[8] Environment Division, 2005. Draft National Action Plan for Antigua and Barbuda for the United Nations Convention to Combat Desertification.

26. Poverty and environmental degradation are considered major issues affecting the future development of Antigua and Barbuda. Poverty is a major concern with the 2005 Country Poverty Assessment estimating 14.6% of the population in this category with an additional 3.7% falling into the indigent poverty class. The indigent poverty is categorised as the group of individuals unable to meet the cost of obtaining the basket of basic food items[9]. The Government is well aware of this situation and is developing strategies to address this. All of these strategies however are linked to additional debt and recent IMF restrictions limits additional debt.

27. National reports such as the National Environmental Management Strategy (NEMS) indicated that there is increasing evidence of coastal degradation which could have adverse impacts on the quality of the environment and the tourism industry. This degradation includes water quality, coastal erosion and saltwater intrusion. This has resulted in the reduction in the quality of the beaches and hotels having access to water.

28. The high cost of fuel and its fluctuations has driven the cost of living and electricity to a level that ranks Antigua and Barbuda in the top 15 highest electricity costs in the World. The cost of rehabilitating the grid after each hurricane (over 5 hurricanes in 20 years as well as a number of tropical storms) have also had a significant impact on the cost of electricity. Furthermore the grid has significant line losses and any investments in renewables will have to take this into consideration. The utility does not have access to the resources to upgrade the generation mix having recently sunk capital into 30 MW of additional heavy fuel oil generators. The IMF 2012 staff review report indicates that the high cost of electricity is one of top three barriers to investment on the island.

29. The fiscal situation of the Country is clearly showing the wear and tear of years of hurricane damage, high cost of imported fuel and resulting high debt to GDP ratio that is around 87% at the end of 2013[10]. Consumers are burdened with high cost of insurance and electricity prices and are not in a position to be taxed any further. The 2012 IMF Country Report indicates that funding for Environmental Management is not enough, and funding for poverty, education and health is contracting. The only sources of funds for these programs are grant funding or borrowing.

30. The economic situation is predicted to get worse before it gets better. Since 2010 the budgets of the departments with responsibility for environmental issues, were cut by over 50%. The budget of the Ministry in which the Environment Division and the Office of the GEF focal Point is situated, was also cut by over 60%. The budgets for education, health and other social programs were also slashed. The prospect for accessing financing from the national budget is not very promising. This situation is not expected to change by 2020.

[9] Kairi Consultants Ltd., 2005. Living conditions in Antigua and Barbuda: Poverty in a Services Economy in Transition.
[10] Ministry of Finance, 2014. Building a New Economy for growth and prosperity – Budget Statement 2014.

31. The only opportunity that is available is to cut the country's high fuel bill by introducing renewable energy generation. The best hope for this is the private sector providing the financial resources. The utility company however presents a high risk for any potential investor. To attract investors the utility needs the Ministry of Finance to underwrite the risk. With the current situation of the government coupled with the real as well as perceived technical barriers to the introduction of renewables into the electricity grid. The involvement of the private sector will have been delayed pending some structural changes at the Utility as well as the government.

32. The SPPARE project will address many of these threats mentioned above through the implementation of the various components. As mentioned previously, the SIRF Fund raises funds by using grant financing from donors to invest into for-profit renewable energy technology initiatives. This project will contribute to this directly through components 1 and 3. The former focuses on the development of the Financial Strategy for the implementation of the Legislation and the Fund. The latter will focus on the installation of renewable energy technology that will ultimately support the pilot protected area.

Threats to Biodiversity protection and management;

33. The threats to biodiversity and land degradation within the country are well documented in the country's National Biodiversity Strategy and Action Plan (NBSAP) and the National Action Plan (NAP) for land degradation. These are similar to many other Caribbean SIDS and include unsustainable management of the natural resources exacerbated by the effects of extreme weather patterns that are being experience more frequently than in the past. This has resulted in a decline in water availability and quality, severe loss to the biodiversity and loss of watershed function (increased erosion brought about by invasive species). The degraded integrity and functionality of the island's ecosystem has reduced its capacity to cope with variable weather patterns. Although Barbuda has so far managed to avoid the same level of development as experienced on Antigua, the pressures are not completely absent. Coastal erosion and salt water intrusion is being experience there as well.

34. Over the past 16 years, almost 20 invasive species have been introduced into the country. Invasive Alien Species (IAS) pose potential problems for the country in a number of areas including commercial sector impacts, fish stock and fisheries industry impacts, agriculture and industry problems, handy craft/similar sectors and livelihood activity impacts, tourism industry and overall GDP/economic impacts as well as impacts on health. Specifically in the southwest area, which includes the proposed site of the Mount Obama National Park (MONP) and the Christian Valley watershed, the presence of IAS is a known threat to the biodiversity.

35. In the last 10 to 15 years there have been a number of introductions of wild species of both plants and animals that have turned out to be seriously invasive. The presence of the lemongrass, specifically in the area mentioned previously, is a prime example of one of these. Another such example is in the case of the Giant African snail. Initially, in both cases, the populations of these IAS were restricted to a small area, however

after several years they have managed to populate other areas. The intervention of the Forestry Division and the Plant Protection Division have somewhat curtailed their spread. Unfortunately, these works include a large investment of resources, which is not readily available and/or accessible by these agencies.

36. Water is essential for human welfare, economic growth and the maintenance of biological resources and ecosystem functions. In Antigua and Barbuda, economic demand and environmental need for water exceed current resource supplies. To meet this demand, the country has resorted more and more to desalination. Desalination is costly and has the potential to create further negative impacts. Antigua and Barbuda has always been a drought prone country, but the lack of care of the watersheds and reservoirs; the failure to plan for climate change has caught the country off guard. This is particularly noticeable in the southwest watershed areas. The high price of oil for water desalination has also added to an already stressful situation. There current water situation in the country is difficult with water rationing occurring within the country for the first time in over 40 years.

37. In addition to the above-mentioned, the introduction of exotic grass species has resulted in loss of vegetative cover in the watersheds. This coupled with overgrazing and land clearance have resulted in the loss of topsoil and increased sedimentation leading to impaired watershed functions. This is exacerbated by intense precipitation following a period of drought. This triggers flash flooding and appreciable topsoil movement and landslides. The sediments clog intermittent stream-ways, coastal estuaries and waters, and surface storage facilities (ponds, dams). Excess storm water runs off to sea. Associated with this loss of vegetation and soil cover are consequent reductions in biodiversity and inevitable losses in ecosystem functions (e.g. land productivity, water retention and storage, etc.). Again, these effects have been very visible in the areas of interventions for this project.

38. The barriers to Biodiversity protection are many; the most important however is the transition of lands from natural uses to housing which results in permanent loss. The systems plan for protected area is the first step in the identification of the systematic approach to reduce the loss of biodiversity. The plan, while highlighting the financial challenges for its implementation, does not however identify any ways to meet the costs associated.

39. This project will address many of the threats mentioned above through the implementation of components 2 and 4. The second component establishes a model managed protected area (National Park) that is sustainably managed and financed. The site selected for this National Park is within an area rich in biodiversity. The fourth component focuses on establishing a carbon sink through restoration of forested areas. This is to be carried out in an area that has suffered from land degradation in the past. Both components will contribute to the conservation of biodiversity and/or the decrease in land degradation.

Institutional arrangements and Capacity management issues.

40. Institutional and capacity barriers for environmental management in SIDS are well known. Quite frequently, the institutional arrangements present are fragmented and it is not uncommon for turf issues to exist. To compound this issue, the legislation for environmental protection can also be fragmented and in many cases outdated; such as the case of Antigua and Barbuda.

41. Capacity issues are normally related to the sheer size of the job compared to the numbers of persons available to work in the country. Furthermore, the salaries and working conditions are most often not attractive enough to ensure that the trained professionals return home to the island to seek employment. Although it is widely accepted that there is no easy solution to the human resource issue, there is an urgent need to address this problem. In the past, attempts to attract more highly trained persons has had limited success.

Climate Change

42. Another threat to the country is the global climate change issues. The islands of Antigua and Barbuda are exposed to natural phenomena such as frequent droughts and occasional tropical storms (including hurricanes). These have negatively affected the habitats and populations of a wide range of species. It has been explained above how periods of drought result in a decline in vegetation coverage of the country's landscape, and this can in turn lead to soil erosion during periods of intense rainfall. However, the effects of these are not confined to the mainland islands; it can have reprehensible impacts on near shore marine and coastal ecosystems as well. While there is little that can be done nationally to reduce the incidence of these events, current lack of predictable and consistent source of financing for planning and contingency at the ecosystem and related infrastructural levels leaves the island vulnerable to much greater threats than should be acceptable. These events can have effects on other sectors such as water, health and agriculture to name a few. While the greenhouse gas emissions of A&B are not large compared to global emissions, integrated approaches to mitigation and adaptation can bring about synergies in terms of investment and planning.

2.4. Institutional, sectoral and policy context

43. There are a large number of different institutions that are involved in environmental management and that are responsible for compliance and enforcement of the various legislations and policies. These include government ministries, statutory bodies, non-governmental organizations (NGO's) and community based organizations (CBOs). At the government level the management of protected areas, forests and watershed areas are divided among a number of different agencies. The key institutions and their involvement and responsibilities with respect to resource management are summarized below (Table 1) and elaborated in further detail in Section IV.

44. The Environment Division is the leading agency for the implementation of the Multilateral Environmental Agreements (MEAs) in Antigua and Barbuda. It is the secretariat for the National Coordinating Mechanism (NCM) for the implementation of MEAs and the focal point for these and the GEF. The Division's broader role is the

integration of environmental management into the development agenda for the country. It carries out its role by incorporating all of the MEAs and other environmental issues into a National Environmental Management Strategy (NEMS). Furthermore, this agency will also act as the national executing agency for the GEF SPPARE Project.

45. The NEMS identifies the roles and responsibilities of several agencies and includes in this, the roles of NGOs and CBOs. This strategy is a five-year policy document and it is the basis for reporting on the Barbados Programme of Action (BPOA) as well as the Mauritius Strategy of Implementation (MSI). It must also be noted that all of the OECS countries should possess a NEMS.

46. As part of the NEMS, a NCM has been created which serves as a forum for coordinated follow-up, at the national level, to all environmental conventions ratified by the Government of Antigua and Barbuda. The role of the NCM is to strengthen communication links between the relevant ministries and departments. It consists of a network of government agencies/ divisions, national focal points, competent authorities, and NGO's, working to together to facilitate a coordinated and timely response to Antigua and Barbuda's treaty obligations.

47. The NCM may be used as a forum for discussions on work-programs for government agencies. This potential has never been explored but the SIRF fund concept may necessitate such a forum to coordinate work programs.

Table 1. Summary of Agency/Institutional Responsibilities

AGENCY	RESPONSIBILITY
Ministry of Health and the Environment: Health care resources and the environment	
Environment Division	Coordinate commitments to MEAs; develop/implement National Environmental Awareness Programmes; rehabilitation and protection of environment; development of environmental legislation; coordinate EIAs for development projects. Collaboration with Forestry Division to address issue of land degradation through national urban reforestation programme (nursery for over 5,000 plants).
Ministry of Agriculture, Lands, Fisheries and Barbuda Affairs: Land and marine-based natural resources.	
Forestry Division	Management of national forest and woodland areas. Establishment of forest reserves. Permits for harvesting and clearing. Biodiversity conservation and eco-tourism development related to forest and woodlands
Development Control Authority	Regulating use and development of land. Implementing a Physical Development Plan with clear directives on further development of natural resources

Fisheries Division	Development of fisheries sub-sector; monitoring fish stocks and marine resources; regulatory and policing role; monitoring and preservation of coastal and marine habitats and species
Land Division	Management and control of all Government lands (including reclamation, land-use and sub-division).
Agricultural Extension Division	Farmer training; allocation of State lands to farmers; leasing arrangements; control of stray stock; land tillage services
Plant Protection Unit	Plant protection recommendations; plant pest monitoring; plant quarantine at Ports of Entry
Ministry of Public Utilities, Civil Aviation and Transportation: Responsible for Antigua Public Utilities Authority (APUA) (water, electricity, telephones), aviation and transport	
Water Division of APUA	Legal control over all water resources; mandated to supply water to meet municipal needs of country; water quality testing; hydrological surveys; planning/digging of wells; construction of dams
Electricity Division of APUA	Primary functions are the transmission, distribution and generation of electricity; plans to provide environmentally friendly reliable and marketable electricity to the consumers
Ministry of Works and Housing: Responsible for Public Works (infrastructure maintenance, sea ports, harbours, port authority)	
Public Works	Roads and drainage (therefore management of flood waters and sediment levels); Beach Protection Act (control and authorisation of removal of material)
Ministry of Tourism, Economic Development, Investment & Energy: Responsible for the Economic Development & National Economic & Social Council, National Parks Authority, Heritage Sites, Tourism Corporation, St. John's Development Corporation, A&B Hospitality, Investment Authority, National Energy Council	
Tourism Authority	Coordinates the functions of the online Integrated Marketing unit, which is responsible for maintaining the new website and the social media accounts; it keeps the online portals updated on all the current activities occurring in the Ministry.
Economic Development Planning Unit	Formulation and implementation of programmes for sustainable development; economic policy review and drafting of new policies; development and implementation of a sound national statistical database to facilitate the economic policy and planning initiatives; translate existing policies into projects and programmes;
Energy	Responsible for articulating the Antigua and Barbuda National Energy Policy and the Sustainable Energy Plan while coordinating and monitoring their implementation.

Ministry of Legal Affairs, Public Safety, Immigration and Labour: Responsible for the Magistrate Court, High Court, Court of Appeal, Industrial Court, Registrar and Provost Marshall, Legal Aide Advice Center, Constitutional Affairs, National Security, Immigration and National Labour Board	
Attorney General's Office	The portfolio of the Attorney General's Office include Constitutional Affairs, Legislature, Law, Director of Public Prosecutions (DPP), Law Reform, Legal Affairs, International Treaties, Courts, Registrar & Provost Marshall, Supreme Court, Magistrates, Industrial Court, Land and Commercial Registry, Intellectual Property, Legal Aid Advice Centre and the Caribbean Court of Justice.
Cabinet of Antigua and Barbuda: This is the executive branch of the Government of Antigua and Barbuda and includes the representative Ministers and Ministers of State from the various Ministries	
Non-profit and/or Private Sector Organizations: The private sector has contributed on important environmental issues and has also been integral in promoting these issues to the numerous travellers who visit Antigua and Barbuda either for leisure and/or business.	
National Park Authority	Financially self-sufficient statutory body established by National Parks Act. Responsible for designation of areas of land/water as National Park.
Mount Obama Committee	The committee consists of volunteers drawn from different government departments, NGOS and the private sector. It has the overall function for the development of the park.
Hotel and Tourist Association	This is a non-government organization and the representative voice of the local tourism private sector with a membership that comprises hotels, airlines and nearly 50 other tourism-related entities.
Cruise Tourism Association	The Association is a non-profit organization made up of approximately 34 members including tour operators, merchants, shipping agents, banks and statutory bodies. The Association's main responsibility is to enable cruise related stakeholders to act as one body when negotiating with the Government and the cruise lines.
Non-Governmental and Community-Based Organisations: NGOs have played an important role in last 10 years in drawing public attention to important environmental issues (e.g. sand-mining, solid waste management, wetland destruction)	
The Environmental Awareness Group	Involved in: issues of sustainable natural resource management; improving community management of coastal resources; training to stakeholders in conservation practices on reefs; offshore island ecosystems; wetlands

2.5. Stakeholder mapping and analysis

48. Several government bodies will be centrally involved in this project; the major agencies involved are the Ministry responsible for the Environment, Ministry of

Finance and APUA. Other ministries that will be involved as recipient agencies from the Fund are: Ministry of Works and Transport (mostly for adaptation projects), Ministry of Agriculture, Lands, Housing and the Environment, National Parks Authority and the Prime Minister's Office. The complete list of these stakeholders is presented below in Table 2.

NGOs, Community group and the Private sector participation;

49. NGOs have played an increasingly important role over the last decade in drawing public attention to a number of important environmental issues, such as sand mining, solid waste management and the destruction of wetlands. These groups are challenged to keep their doors opened due to lack of resources and are therefore not as strong as could be expected. Many of them depend on the Government for resources, which does not place them in the best position for advocacy. The SIRF Fund features a window which provides 15% of the funds generated to a special window for NGOs. This window will be created by statute and will provide the NGO community with a source of funds that will be controlled entirely by them.

50. Stakeholder participation has been an integral part of the development of this project and is now crafted carefully into its outcomes and outputs. They have actively participated throughout the preparatory phases specifically through consultations with targeted stakeholder groups.

Table 2. Complete List of Stakeholders

Environment Division, Ministry of Health and The Environment	**Lead overall Executing Agency**
Ministry of Agriculture, Lands, Fisheries and Barbuda Affairs: Development Control Authority Forestry Division Plant Protection Unit Agriculture Extension Division Lands Division Fisheries Division Ministry of Works and Housing: Public Works Ministry of Tourism, Economic Development, Investment and Energy: Tourism Authority Economic Development Planning Unit Energy Desk Ministry of Legal Affairs, Public Safety, Immigration and Labour: Attorney General's Office	Partner executing agencies and co-financiers
APUA water and electricity divisions, Ministry of Public Utilities, Civil Aviation and Transportation	Operators and beneficiaries
Non-profit Organizations: National Parks	Consultative partner

Authority, Mount Obama Committee	
Farmers, Land owners, Surrounding Communities	Consultative partners
Private Sector: Hotel and Tourist Association and individual hotels, Cruise Tourism Association, Tour Operators	Consultative partners and co-financiers
NGOs: Environmental Awareness Group	Partner executing agency

51. Throughout project implementation, emphasis is to be placed on ensuring and promoting active stakeholder participation. Management systems developed through this project will aim to strengthen stakeholder ability to manage natural resources. This contributes to the sustainability of the project outcomes.

2.6. Baseline analysis and gaps

The preparation of this project started well before the Project Preparation Grant (PPG) phase and it is based on the past ten years of the implementation of the MEAs in Antigua and Barbuda, with the support of the GEF as well as national resources. The baseline is assessed based on the NEMS, the outcomes of the SIRMM project and GEF enabling activities (these documents established baselines and set targets), as well as the outcomes of the PPG phase of the project.

Component 1 – Development of Sustainable Island Resource Financial Plan

52. This project including its concepts was developed from the recently concluded nationally executed GEF-funded SIRMM. That project collected the baseline information required for the accurate assessment and general idea of costs of elements in the national Protected Areas System Plans: (NEMMA park, Codrington Lagoon etc.), the NEMS and the drafting of the national Environmental Legislation. That exercise was designed to look at the country's biodiversity as an island ecosystem and to recommend integrated approaches to its management as a whole. This approach was consistent with the Island Biodiversity Work Program of the United Nations Convention on Biological Diversity (UNCBD). The project's main outputs were the Legislation, the Land Use plan, a wastewater plan, a Geographic Information Systems (GIS) decision-making mapping tool (Environmental Information Management and Advisory System – EIMAS) and the framework plan for financing. During the implementation of that project, the country experienced severe economic decline due to the financial crisis. The country availed itself to the IMF for a Stand- by Facility to help it to adjust. Since then taxes have increase significantly, cost of living has increased and funding from central government for Biodiversity management and other environmental issues has declined by over 50%.

53. The SIRMM project noted that environmental management must be an integrated approach and that any other approach will result in gaps and inefficiencies. It demonstrated how the country's capacity is strained by the current sectorial approaches to its environmental management. Taking into consideration current

macroeconomic realities the final report of the SIRMM project recommended the establishment of the SIRF Fund and that the financing from the fund be designed to be an integral part of easing the macroeconomic problems of the country.

54. The SIRF fund is intended to provide a consistent and dedicated source of funds for all areas of MEA implementation, and also provide the focus for the coordination of results and the use of targets and indicators to assess their work. The key finding of the project was developed as the SIRF Fund Concept and the resources of the GEF 5 were all allocated to make the fund a reality.

55. During the PPG phase the following baselines were collected:
    a. All of the outputs of the SIRMM project (including relevant biodiversity baselines for SPPARE project sites) were collated and reviewed;
    b. A technical analysis of the potential renewable energy that the SIRF Fund could possible invest;
    c. The necessary Cabinet and APUA permissions to engage with the fund;
    d. Stakeholder consultations on developing the structure of the fund.

56. These included consultations with the Caribbean Challenge project and the ability of the ABBCAT to be integrated into the overall national fund:
    - **The legislation was finalized and submitted to the Attorney General Office,**
    - **The finalization of the formal protection of the Obama Park;**
    - **Conducted Consultations on the priority actions for Sustainable Management of Forest**
    - **The Cabinet Agreement on a Fundraising strategy for the SIRF Fund.**

57. During the PPG, other processes related to the project but not funded are: the finalization of the NBSAP and draft national report to the CBD, the drafting of the Third National Communication for Climate Change, and the approval and subsequent PPG phase for the GEF Special Climate Change Fund - Building Climate Resilience through Innovative Financing Mechanisms for Climate Change (SCCF) project.

Financing for Environmental Management - Establishment of the SIRF Fund.

57. The EPMB reforms the laws relating to environmental protection and resource management, and sees to the creation of new legal frameworks and effective administration mechanism for EIAs, pollution, integrated natural resource management, biodiversity conservation, and national parks management[11]. It also contains provisions for leading international multilateral environmental agreements. This Bill further provides a mechanism to declare protected areas in tandem with the Physical and Planning Act, providing a more mindful and comprehensive alternative to the outdated 1984 National Parks Act.

[11] Environment Division, 2013. The Environmental Protection and Management Bill.

58. The SPPARE project is intended to contribute to the implementation of the bill by providing the enabling environment for advancing the financial sustainability for its protected areas system.

59. The SIRF Fund is the centerpiece of the means of implementation for the Bill. The SIRF is not intended to be a statutory body but a department within the Government system. This basic design allows for the fund to use a minimum of its resources for administration unlike statutory bodies in Antigua and Barbuda, which have typically used the majority of their resources for salaries and wages. The fund is designed to avail itself of the resources of the central government without mixing its resources with the government. The legislation also allows for the fund to have its own accounts and be independent of the treasury. The budget allocates only 10% of the funds to salaries and administration. The Fund is designed in a way that it will be able to receive grants from international donors, private sector, NGOs and the Government. It has the ability to borrow or enter into joint ventures with the private sector.

60. The fund features several funding windows including: general environmental management, protected areas, NGOs and CBOs. The key area of the fundraising strategy is to negotiate technology and financial grants to invest into renewable energy technology.

61. The legislation features a window for NGOs. This section of the fund is directed by a board comprised totally of NGOs making funding decisions. This window is funded from 15% of the return on renewable energy investments. During the PPG phase, the Environment Division worked closely with NGOs and the GEF Small Grants Programme (SGP) to understand the needs of this group and the issues to be addressed for the full implementation of that window of the fund. What was discovered was that there is capacity of groups to implement their own projects, but the co-financing requirements and slow rates and proportions of disbursements can make the process much more difficult than it needs to be. Although this project is not directly related to the NGO window, the use of NGOs and CBOs are part of the solution for SFM and these limitations will have to be taken into consideration.

62. Receiving the necessary permissions from the Government and APUA is a step towards activating the Fund. This is a prerequisite simply because the Fund acts as a Power Producer (IPP). During the PPG phase the Cabinet approved the fund becoming an IPP up to 25 MW of electricity. It is the intention of the Cabinet that 20 MW will be sold to the utility under the PPA arrangement while the other 5 MW will cover the cost of water generation and the Government's electricity usage.

63. The purchase of the 20MW has been discussed with the Utility and a draft Memorandum of Understanding (MOU) has been agreed. This MOU will be with the SIRF Fund.

64. The sale of the 5MW and the conditions for this is still under discussion. The Government has agreed to institute a water levy where these funds will be used to

address watershed management. This water levy is to come into effect in July 2015. Arrangements are being explored to have the levy paid to the Fund from APUA. The total expected investment return for the fund would be one of the major outputs and the first outputs of the project. If the reverse osmosis facilities are modulated according to the availability of wind power, the average consumption for desalination 2 MW could be mostly covered from lower cost intermittent renewable energy.

65. The decision making process of the SIRF Board is explained in sections 86, 87 and 88 of the EPMB which addresses procedural matters.

Component 2 – Pilot expansion of Sustainable Island Resource Protected Areas: Mount Obama National Park

66. Prior to the PPG of the project as mentioned earlier numerous studies have demonstrated that there is a significant funding gap for protected areas. In the case of marine protected areas the GEF-funded Caribbean Challenge project indicated that The Nature Conservancy (TNC) and USAID Study on Parks in Peril demonstrated a gap in funding requirements and availability. In response to this, a project was designed to establish a regional Fund to support Marine Protected areas. Another study under the GEF OPAAL project also demonstrated that for OECS parks in general, with the inclusion of Antigua and Barbuda, funding gaps do exist.

67. At the national level the National Parks Authority (NPA) relies on returns on its investments, hotel rooms, yachting facilities and Sailing Week to fund its operations. Over the past 5 years however the Park has not been able to meet its commitments and is now relying on a subvention from central government to meet its shortfall. Since the IMF program however, these subventions have been discontinued. The NPA, which is primarily responsible for areas with cultural and historical significance, is seeking international funding to meet its funding gaps. The Authority has been successful to some extent but it still experiences challenges.

68. The country as part of its commitment to the CBD prepared a National Systems of Protected Areas Plan and this is the basis for the work of this project. The Systems Plan provided an approach to protected areas that will include all areas of Biodiversity protection, this is *in situ* and *ex situ*, watershed and its associated waterways and wetlands, forest areas, marine parks, botanical gardens and the legal and institutional arrangements for the management of the system. The Systems Plan was drafted and will be updated as part of the process of the Third National Communication for Climate Change to include areas that will be protected as part of an Ecosystem based system for Adaptation (Eba).

69. In its entirety the Systems Plan identified the institutional arrangements and management of the range of Parks as the responsibility of several agencies (see stakeholder analysis).

70. The Plan calls for an effective management systems that are based on a coordinated approach of existing agencies and legislation.

71. Where the plan identified gaps the EPMB was designed to address these with the responsibility left up to the Division

72. In addition, the Systems Plan has proposed the Mount Obama area as a National Park. This area is located mainly in the Christian Valley watershed but extends into a portion of the adjacent watershed. Both of these watersheds are in the southwestern area of the country and have long been identified for their biodiversity richness. This area of the country is also home to some of Antigua's most rare birds and is also a haven for many migrants on their annual migrations from the arctic and temperate zones in the north.

73. It must also be noted that the country's only two International Birding Areas (IBAs) are situated within this zone, namely; the Christian Valley IBA (AG009) and the adjoining Walling's Forest IBA (AG008). Together, they represent Antigua's wet forest ecosystem and are ecologically important in that they support populations of nine of the eleven Lesser Antilles IBA restricted-range birds. As a matter of fact, four of these are entirely confined to these IBAs, to include; *Geotrygon mystacea*, *Euphonia musica*, *Margarops fuscus* and *Margarops fuscatus.* Furthermore, the near-threatened white-crowned pigeon, *Patagioenas leucocephala* also occurs in these IBAs.

74. Past projects around Mount Obama National Park have completed a bird survey and a study of the vascular plants in the area. These studies can serve as a foundation to build a biodiversity baseline. A voluntary ad hoc Mount Obama Committee has been active since 2010 and has developed a draft Business Plan and also a draft Concept Plan for the Park. Unfortunately, the issue with these documents is that they both lack conservation elements. Tentative park boundaries have also been proposed for the park. Complemented with the relevant ecological data of the area, these can be used to define the ecologically sensitive areas. With respect to the financing of the protected area, the OECS Protected Areas and Associated Livelihoods Project (OPAAL) noted that the goal of Antigua and Barbuda's Protected Areas System Plan will be to achieve adequate funding for protected areas management. This could be achieved through direct government support and income generated from these areas through entry fees, licenses, concessions, general environmental service fees, voluntary contributions and/or other similar devices to be established. This was re-iterated in the NBSAP where it assumes that resources, both human and financial**,** need to be made available nationally, and mobilized externally, for the implementation of the activities required to achieve the activities outlined under the strategic goals[12].

Component 3 – Renewable Energy with longer term support of Protected Areas Systems Pilot

[12] Environment Division, 2014. Antigua and Barbuda National Biodiversity Strategy and Action Plan

Energy and Climate Change

75. One of the focal areas for this project is Climate Change and the aim is to increase investments in renewable energy technologies and also to decrease GHG emissions. The major source of GHG is in two areas: transportation and electricity generation. This project will focus on reducing GHG emissions from the generation of electricity. The high cost of petroleum should have driven renewable energy investments; however financial (including existing and longstanding contractual obligations), institutional and technical barriers have dissuaded these investments thus far. The country has taken steps to reduce barriers by introducing net metering for customers with small photovoltaic power systems. The other barrier is related to grid stability and the need to have considerable diesel spinning reserves to facilitate scale up of wind and solar. This project will be able to pilot the installation of ~1.5 MW of wind generated electricity into the grid in an effort to assess the technical issues. Once the establishment of a mechanism for wheeling and a technical solution for storage is identified, the potential for private/public partnership expansion of renewable energy will follow. The demonstration effect of the project will not only meet the objective of increasing investments in renewable energy technology but will also contribute to the decreasing of the GHG emissions from electricity generation by 50% by 2020.

76. During the PPG phase the project investigated the economic environment for the investment into renewable energy in Antigua and Barbuda. The findings as outlined in the Norplan report, which suggests that the cost of petroleum at +/-29 cents US/kWh plus an additional ~7 cents/kWh for private sector Independent Power Producer peak generation should have driven renewable energy investments, but this is not the case in a small economy[13]. As pointed out earlier, market forces require the necessary access to finance for investments to move where there are clear opportunities for profit generation. Other factors that are typical of small economies are political, institutional (necessary government or private monopolies) and technical barriers (energy storage and perceptions), which have dissuaded investment thus far.

77. The publically owned utility (a government instituted monopoly) in attempting to approach 15% intermittent renewable energy has offered net metering for up to 50kW per connected customer. Over production is not compensated and the connection charge is not waived, nevertheless this is highly attractive to the individual consumers installing up to their average consumption level of perhaps 4-10 kW. The utility is in effect buying wholesale electricity at retail price up to the consumer's total consumption. This situation is attractive only to the consumers with access to capital. However, these are the same consumers that can afford to pay the high electricity rates. The largest consumers of electricity are businesses many of which are in default and are "too big" to be disconnected. Some of these include large hotels that are challenged to meet their energy bills.

78. The remaining consumers are small businesses and individual consumers. There is a high rate of disconnection among lower income homeowners many of whom are

[13] Norplan, 2014. Ministry of Agriculture, Lands, Housing and the Environment – Pumped Hydro in Antigua and Barbuda: Report on prefeasibility assessments.

single parent homes. As the utility loses more profits due to default and disconnection the unit cost of electricity will have to increase until more structural changes can be attempted. This will leave a small number of customers to shoulder the bulk of the utility's operating costs. This is of course is not sustainable.

79. The existing net metering policy is therefore likely to be changed since it is not sustainable. This project will be designing the arrangement with the utility to provide a fair price for renewable energy. The actual cost and potential revenue for photovoltaic (PV) will be determined after pilot projects are implemented in several different kinds of buildings. These pilots will be implemented under the GEF Energy for Sustainable Development in the Caribbean (ESD) project. The results of those project demos will be used during the first year of the SPPARE project to negotiate a rate for PV with the APUA. The rates for wind-generated power are much easier to assess as they are well below the cost of fuel.

80. It is recommended that beyond an initial demonstration period, the costing of PV production be based on cost of production, financing, installation (where PVs are used), maintenance and using the grid as storage. This feed in tariff may be more than the current cost of fuel but can be locked in for periods of 10 to 20 years mitigating fuel price risk to the economy.

81. Under these attractive market conditions for PV electricity and with proposed wind power investments (15-18 MW); APUA recognizes that they will encounter a grid stability issue and their ability to cope with fluctuating demand and supply. They have therefore set a threshold of 15% of peak capacity (~8 MW) beyond which they would not approve grid connection of intermittent renewables. United Nations Department of Economic and Social Affairs (UNDESA) therefore proposed energy storage be explored to enable elimination of diesel spinning reserve against renewable solar and wind power and thus be able to exceed 15%. The use of pumped hydro was explored during the PPG phase and, although it cannot be ruled out, the cost of this option was found to be very expensive. The NORPLAN pumped hydro report indicated that since there were not grid instability issues during the ~1.5 MW pilot, instead only a test using the Reverse Osmosis plant as a modulated sympathetic load should be carried out which would cut the cost of desalination as well as develop the capacity within APUA to manage dump loads and energy storage. The full feasibility of pumped hydro for the scale up. It is also recommended that during the project implementation phase the issue of grid stability be addressed to facilitate scaling up.

82. Sixty percent of water for domestic use is generated by reverse osmosis requiring a continuous average 2 MW of electricity. Water desalination is the largest single use of energy on the island. Much of the precipitated water falls on the highland around the protected areas and collected through the Bendal's water treatment plant. Water benefits from the protected areas will thus reduce energy cost.

83. An additional 1 MW reverse osmosis plant was constructed but is currently idle. Prolonged drought cycles are occurring that would require full operation especially if

the reservoirs and watershed are not improved. The country has experienced three droughts in six years. This frequency in drought is unusual. The UNCCD NAP for Antigua and Barbuda has indicated that a one in ten year drought is not uncommon, but the incidences of dry spells and droughts are occurring too quickly for the country to cope.

84. While under institutional and fiscal review of the IMF, Antigua and Barbuda's debts have been over 100% of its GDP and the likely hood of the country underwriting future debts of APUA is not realistic. The formulation of this project with an overall public good and global benefits motive is more likely to move forward than a purely private sector engagement. Once the financial mechanism is established, the potential for private/public partnership expansion of renewable energy should follow.

85. During the PPG phase of the project the APUA prepared and signed a letter of intent to engage with the SIRF fund as a Power Producer once it is established. During the project development phase the APUA will engage in a Power Purchase Agreement (PPA) arrangement. This will be a necessary step in the development of the overall Business Plan of the Fund.

Component 4 – Enhanced Forestry Management

86. The fourth and final focal area for the SPPARE project is Sustainable Forest Management (SFM). Historically during the colonial era, most of the original forest in Antigua and Barbuda was cleared to establish sugar plantations. After the decline of this industry, the natural vegetation was allowed recover across the country. The first National Communication to the UNFCCC in 1990 reported 13.45 kilo hectares (kha) of forest cover. This total area had decreased to 5.60 kha when submitting the second report in 2003. However, in 2010 the forestry data was obtained for the first time by mapping this resource from aerial photos in GIS[14]. This indicated that Antigua now has a modest forest cover of 8.7 kha.

87. Most recently, the Government has taken the decision to manage the forestry sector as watershed units. It has been widely accepted that the health of the watershed as directly related to the vegetation cover. Therefore by managing and maintaining the vegetation cover within the watershed, this gives an indication of the overall health and performance of the watershed. Presently, the forest ecosystems are under threat particularly due to the lack of fire control and public awareness of the problem. According to the Antigua and Barbuda Fire Department, the occurrence of bush fires have increased to about 85% from the year 2011 to 2012[15].

88. The encroachment of the invasive Citronella grass in the watershed creates an erosion problem for the area. This grass is considered to be a fire ecotype, which burns very fiercely and recovers quickly. This leads to the destruction of all other vegetation and at the same time slowly invades the forest edges due to it burning /along with the

[14] Environment Division, 2013. National Inventory of Greenhouse Gases for Antigua and Barbuda
[15] Fire Department, 2013. Antigua and Barbuda Fire Department - Bush Fire Statistical Data: 2011-12.

grass. The lemon grass, as it is also known, grows in clumps and causes the soil around these clumps to erode after a fire. As documented under another the GEF SIRMM project, the invaded areas are critical for the watersheds and are also prohibitively expensive to restore. Approximately $390,000 USD was spent under that project to combat the eradication of the lemon grass in the Body Ponds watershed area[16].

89. The previously mentioned project undertook initiatives in the past focusing on the management of the forestry resources. This project commissioned the comprehensive mapping of the southwest region of Antigua identifying key natural features both terrestrial and marine. The boundary area used for the South West Watershed (SWW) Area extends from Proctor Point near Falmouth in the south, heading north and west to the vicinity of Coco's Restaurant at Valley Church Bay. The whole area includes places such as Cades Bay Marine Reserve (CBMR), Mount Obama and Wallings Forest Reserve. The area is commonly referred to as the Shekerley Mountains, a chain of volcanic hills in the southwestern part of the island; from Sugar Loaf Mountain and Cherry Hill in the east, to Valley Church in the west. The vegetation communities were mapped using the vegetation classification of Antigua, Barbuda and Redonda. The mapping team also used the results of a Body Ponds vegetation communities map as a foundation for mapping the wider South West Watershed. The similarity between the natural communities, resources, issues and land-uses of the Body Ponds Watershed and the wider SWW allowed for a great deal of transferability of methods and approaches.

90. The table below summarizes the financial resources needed to achieve the goal of this project.

Table 3. GEF Funding and Co-financing by Component

Component	Increment ($USD)		Total ($USD)
	GEF	Co-finance	
Component 1	50,000.00	50,000.00	100,000.00
Component 2	616,667.00	380,000.00	996,667.00
Component 3	1,260,752.00	6,000,000.00	7,260,752.00
Component 4	586,606.00	1,300,000.00	1,886,606.00
PMC	125,701	250,000	375,701

2.7. Linkages with other GEF and non-GEF interventions

91. The project will be carried out in close coordination with other recently approved and relevant GEF-5 projects in the UNEP/GEF Portfolio, such as the ESD in Caribbean Buildings project. The ESD project is commencing activity in 2014, focussed on the buildings sector with energy efficiency of equipment in buildings – fans, refrigerators, air-conditioners, and lights as well as building integrated renewable energy photo-

[16] Environment Division, 2008. Operational Work Plan – Demo One: Rehabilitation of the Body Ponds Watershed.

voltaic panels and solar water heaters. The project would therefore nicely complement the grid connected renewable energy proposed in this project and reinforce the increase in distributed power generation at small scale.

92. The SPPARE project will also work in close collaboration with the recently approved UNEP/GEF project: Building Climate Resilience through Innovative Financing Mechanisms for Climate Change (SCCF). This is a four-year project that is aimed at increasing the climate resilience of vulnerable communities and sectors in Antigua and Barbuda by improving access to innovative financing mechanisms for climate change adaptation, and implementing cost-effective adaptation interventions focused on ecosystems[17]. The SCCF project, however, has a main focus on climate change while the SPPARE seeks to also include the biodiversity and sustainable forestry management focal areas. The two projects are very much related in terms of the SIRF Fund upon which both are linked. Execution arrangements will fully take into account possible synergies in their respective management.

93. With respect to the GEF/World Bank Project Sustainable Financing and Management of Eastern Caribbean Marine Ecosystem Project (Caribbean Challenge) the funds raised under this project as well as future projects that support the SIRF Fund will be used to provide matching funds to the Antigua and Barbuda NCTF. The SIRF Fund of course has much broader mandate than protected areas and its design is such that it can facilitate the conditions set by various funding streams since as the CBF. The SPPare project is designed to assist the SIRF fund to achieve its mandate of funding protected areas while reducing GHG. Investments generated by this project will also be used to cofinance or provide match funds generated by the CBF. This mandate is required by the legislation and can only be changed by an act of Parliament. The NCTF will be created as part of the SIRF fund financing mechanism but using different parent legislation for their creating. This model is expected to be used to create future funding "windows" of the SIRF Fund. This model to meet the requirements of the CBF is the same being use by St. Lucia. It is expected that the Antigua and Barbuda NCTF will be established by the end of 2014.

94. There are several other regional projects being implemented in which Antigua and Barbuda is participating. These include the UNEP Integrating Water, Land, Resources and Ecosystems Management in Caribbean Small Island Developing States (IWEco); the UNEP Regional Gateway for Technology Transfer and Climate Change Action (REGATTA) and the Caribbean Community Climate Change Center (CCCCC) Global Climate Change Alliance (GCCA) Projects[18]. The outcomes of these projects will contribute to the implementation of the SPPARE project and, where possible, their successes will be further strengthened by this project.

95. In addition to these projects, the SPPARE can also contribute to the Biodiversity and Protected Area Management (BIOPAMA) programme being implemented by the

[17] ED, 2013. Project Identification Form: Building climate resilience through innovative financing mechanisms for climate change adaptation (SCCF) Project

[18] Office of the National GEF Focal Point, 2012. National Portfolio Formulation Exercise (NPFE)

International Union for Conservation of Nature (IUCN), the EC-JRC (European Commission Joint Research Centre) and the multi-donor ABS (Access and Benefit Sharing) Capacity Development Initiative. This programme aims to address threats to biodiversity in African, Caribbean and Pacific (ACP) countries, while reducing poverty in communities in and around protected areas. Specifically, the programme will enhance existing institutions and networks by making the best available science and knowledge available for building capacity to improve policies and better decision-making on biodiversity conservation, protected areas management and access and benefit sharing. The lessons learnt and best practices from this project can be shared with this initiative and, in such, contribute to their online repository of data and information.

96. The recently concluded Sustainable Island Resource Management Mechanism (SIRMM) project produced key data to the proposed national park under its Ridge To Reef Demonstration Project[19]. This included, among other things, the establishing of the proposed boundaries of the park. The SPPARE project, through its second component, will build upon the work of the SIRMM project. In addition to this, the regional OECS Protected Areas and Associated Livelihood (OPAAL) project resulted in a draft Protected Areas System Plan for Antigua and Barbuda. Component 1 of the SPPARE will seek to strengthen this plan by identifying financial strategies that can be included in the plan.

97. In addition to these, the UNEP has developed the UNEP Live web-based platform aimed at supporting the growing demand for substantiated, contextualized knowledge about the environment. As UNEP's information and knowledge service provider, especially in the delivery of information and evidence to support the SDGs and post 2015 agenda, UNEP is fulfilling it role by facilitate the exchange and sharing of up-to-date data, providing open access to information datasets and providing a range of visualization tools. The SPARRE project will be contributing to this initiative by providing for dissemination on this platform all data and information collected under the various components.

[19] Environment Division, 2008. Project Document: Sustainable Island Resource Management Mechanism (SIRMM) Project

SECTION 3: INTERVENTION STRATEGY (ALTERNATIVE)

98. The proposed Alternative Scenario is to pilot a new protected area with the necessary legislative, institutional and financial mechanisms to achieve a self-financing protected areas system plan. This will be accomplished through the instituting of an associated fee system and linking financial sustainability to the returns on investment of renewable energy installation -- innovatively stabilized through energy storage capacity of resevoirs in key watersheds. Without a GEF intervention, there is no systemic or specific financially sustainable model of a terrestrial park, no revenue-earning renewable energy installation, and there will be continued degradation of forest ecosystesm through fires and invasives. Four components are proposed to link Sustainable Pathways for Protected Areas and Renewable Energy. The third component is a cross cutting effort to manage forests both for biodiversity benefits in the protected areas, to restore watershed management services and innovatively, as a source of energy storage through pumped hydro through existing reservoirs…

3.1. Project rationale, policy conformity and expected global environmental benefits

99. This project is directly linked to the NEMS for Antigua and Barbuda. Specifically the project will seek to address the implementation of the MEAs through the development of a sustainable financing strategy. It will reduce GHG emissions, promote protection and sustainable use of biodiversity and improved forestry management, which supports sustainable land management. These objectives and outputs are consistent with the objectives of the various Conventions to which the GEF supports.

100. The project supports the policies and programs outlined within the Draft National Protected Areas System Plans, The National Energy Policy, the National Land Use Plan and the other policy decisions identified in section 2 above. The Project will also seek to raise funds for the protection of the environment in a manner that will not further strain the current macroeconomic and social challenges being faced by the Government.

101. The Second National Communication to the UNFCCC identifies a scenario for solar and wind electricity penetration at a significant scale. The project will seek to use the mitigation actions as a means to fund adaptation and other issues. The project will seek to also establish the institutional and legal basis for the protection of forest as carbon sinks.

102. The project will also promote the conservation and sustainable use of biodiversity and the maintenance of ecosystem goods and services through the improved management of protected area systems with a view towards long-term positive impacts in representation of terrestrial and marine ecosystems, and threatened species. Specifically the project will address the following Aichi targets as set out in the most recent NBSAP:

103. Aichi Targets:

- Target 5. By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.
- Target 11. By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.
- Target 12. By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained
- Target 15. By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhance, through conservation and restoration, including restoration of at least 15% of degraded ecosystems, there by contributing to climate change mitigation and adaptation and to combating desertification.
- Target 17. By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan
- Target 20: By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties.

104. The project will pilot innovative and homegrown approaches to sustainable financing this is consistent with the calls from the GEF Chief Executive Officer (CEO) and heads of the MEAs that there is a need for new and innovative source of financing.

3.2. Project goal and objective

105. The Project goal is to contribute to the demonstration of an integrated and self-sustaining approach to environmental stewardship in a Small Island Developing State.

106. The Project objective is to enhance financing and management of protected areas through innovations in renewable energy capacity and arrangements in Antigua and Barbuda.

3.3. Project components and expected results

107. The project will achieve its objectives through four main components. These are the components:
    - Component 1 – Development of Sustainable Island Resource Financial Plan
    - Component 2 – Pilot expansion of Sustainable Island Resource Protected Areas: Mount Obama National Park

- Component 3 – Renewable Energy with longer term support of Protected Areas Systems Pilot
- Component 4 – Enhanced Forestry Management

108. ***Component 1 – Development of Sustainable Island Resource Financial Plan***
This component will focus on the implementation of the Environmental Legislation and the management of protected areas through the establishment of relevant strategies. Below is a summary of the outcome and output for this component:

Table 4. Component 1 – Outcome and Outputs

Outcome 1	Outputs
Development of the Financial Strategy for the implementation of the Legislation and the Management of Protected area	1. Business Plan for the Systems of Parks and the Legislation

109. Antigua and Barbuda, like most other Small Island States, has struggled to grow its economy due to constraints directly related to its size. As conventional economic wisdom dictates, such a small population lacks an adequate tax base and/or market size to effectively facilitate the fiscal absorption of large-scale projects and initiatives. Notwithstanding this, the country still faces the challenge just like every other nation. This is particularly true with respect to the management of its environment and the implementation of the international environmental agreements to which it is a party. As such, one of the main activities of this component will be to prepare a costed strategic plan for the implementation of the Rio Conventions and other conventions supported by the GEF.

110. After many years of struggling to identify its environmental issues and to address them in an integrated way, the country has realized that it will need a dedicated source of funding. Such funding needs to be innovative and should not represent a perverse incentive to environmental management (e.g. Taxing pollution and then relying on more pollution to fund environmental management) and at the same time not be a deterrent to economic growth[20]. The country has decided to establish the National SIRF Fund that will provide a framework to channel national and international resources for general environmental management and for the implementation of the various International Environmental Agreements.

111. Innovative financial instruments and programs will be used to grow the fund. These may include debt for climate swaps, a levy for payment for the use of ecosystems services such as water and renewable energy services, low interest loans to consumers for adaptation on buildings and businesses (including farmers and small businesses), as well as traditional entrance and other fees. The Financing of the Fund takes into

[20] ED, 2013. Establishment of the Antigua and Barbuda Sustainable Island Resource Framework (SIRF) Fund

consideration the Macroeconomic circumstances of the Country and will use financial instruments that will grow the fund without further forcing the country into additional debt. The fund is designed to fit into the economic goals of the country and reduce expenditure for central government.

112. This project will specifically develop the business plan for the System of Parks.

113. This will contribute to the PA Systems by identifying Parks and financial strategies to be included in such. To achieve this, research needs to be done to identify all the revenue streams available for each Park and/or Protected Area in the country. Specifically, the project will attempt to identify an efficient and effective system of establishing and collecting user fees. First of all, policies and operating guidelines will be drafted to address the collaboration among managers of the Parks and protected areas.

114. Furthermore, this component will identify the various protected areas (marine and terrestrial) that will be supported under the SIRF Fund and a financial assessment will be conducted on these areas to determine their projected operational costs. To ensure that the strategic plan for the implementation of the Rio Conventions that was mentioned above is fully detailed, a capacity needs assessment will be conducted for the agencies and NGOs involved in the implementation of these Conventions. Particularly, focus will be given to those agencies involved in the implementation of the Aichi Targets for the UNCBD.

115. ***Component 2 – Pilot expansion of Sustainable Island Resource Protected Areas: Mount Obama National Park (MONP)***
This component will focus on establishing a model managed protected area that is sustainably managed and financed. Below is a summary of the outcome and outputs of this component:

Table 5. Component 2 – Outcome and Outputs

Outcome 2	Outputs
Establish a model managed protected area that is financially self-sustaining	1. Obama National Park gazzetted and sustainably managed (inc 3,052 forested hectares of park and buffer areas) 2. Financial Sustainability System piloted at MONP

116. The project will strengthen the protected areas system by developing the necessary legislative framework and biodiversity management requirements for MONP. Preliminary demarcation and zoning of ecologically sensitive areas of the proposed park have been developed (during PPG phase). During this project, preliminary Local Area Plan (LAP), consistent with the Sustainable Island Resource Management and Zoning Plan, will be prepared for the proposed MONP and submitted to the

Development Control Authority (DCA). This will be inclusive of ecologically sensitive areas and watershed areas of importance to APUA.

117. The MONP is to be established as a protected site. It comprises an area just over 1,000 hectares which includes some of the last remaining wet and dry forest in Antigua and Barbuda, plant and bird species of significant biodiversity value. The upper slopes consists one of the country's largest and most productive watersheds, outstanding scenery and genetic material for about 28 species of mangoes and the famous Antigua Black Pineapple. All the genetic material is grown at the Agricultural Research Stations at Christian Valley and Cades Bay[21].

118. Several steps are required in establishing full legal protection of an area. However, prior to this, the necessary feasibility studies will be prepared and/or compiled. These are to include studies on ecological sensitivities, waterways, watersheds, elevation/topography, drainage and/or soils. Once the results of these studies are available then the necessary instruments will be developed to allow for legal protection of the MONP.

119. First, the areas within the MONP will be classified according to their uses and included in LAP. The LAP will be developed via a consultative process facilitated by the DCA and will see the participation of land owners, non-governmental organizations (NGOs) such as the Environmental Awareness Group (EAG) and any other relevant stakeholder. This LAP will typically include park boundaries and broad zones for conservation and sustainable use. Once agreed and accepted, the LAP will then be adopted by the Parliament and changes will only be allowed by the Parliament. The final stage will be for this process to be gazetted.

120. The natural resources, including key indicator species such as *Geotrygon mystacea*, *Euphonia musica* and *Margarops fuscus*, within the park will be monitored on a regular basis and this will be outlined in a biodiversity management and monitoring plan that will be developed. The technical staff of the Ministry of Health and the Environment (MoHE), in collaboration with appropriate scientific bodies, will be in charge of establishing biodiversity tracking protocol taking into consideration the targets developed within the NBSAP under the UNCBD. Specific attention will be placed on the removal and management of invasive species within the Park. Where necessary, surveys will be conducted to ensure that the biological inventory is complete.

121. Included in this monitoring plan will be considerations for ecotourism. Hiking trails will be identified and established throughout the park in an effort to heighten the visitor experience. To ensure that the park is not over-exploited, a capacity study will be conducted that will inform the plan. This will then be submitted for stakeholder review and, once approved, will be implemented. Within this plan, the institutional management arrangements will also be included and it will address the setting up of the board.

[21] Mount Obama Committee, 2012. Draft Business Plan (2012-2014): Mount Obama National Park

122. The Cabinet (Executive branch of government) of Antigua and Barbuda established the Mount Obama National Park Committee (MONPC) to develop the park. Although it has limited resources the committee has achieved a lot including preliminary designs for an interpretation centre, recommendations regarding conservation areas and a draft Business Plan. The committee consists of volunteers drawn from different government departments, NGOS and the private sector. The committee is not established by statute but by the Cabinet decision.

123. Once established, the MONP will be managed through or in close collaboration with the National Parks Authority (NPA). The precise management arrangement is yet to be determined by the Government. Offices will be housed in existing physical facilities owned by the Ministry of Agriculture and employ a total of 15 persons in the first year, increasing to 19 at the end of a five-year period[22]. This project will identify and prioritize human resource and technical capacity needs for the park. This will be accomplished in consultations with surrounding communities. Once the positions and job descriptions have been determined the next step will be to identify training options for the park personnel and key stakeholders. A list of these training opportunities will be compiled with the relevant costs and will be supported by the Fund. This component will also ensure the preparations of training programs for staff for a five-year period. These activities will all be carried out in conjunction with relevant agencies and NGOs.

124. The MONP is being developed as a protected area with sustainable use of the natural resources. However, due to the rich biodiversity that exists within its boundaries there is a need to conduct further scientific research. This project will attempt to identify research partnership with regional and international academic institutions. To accomplish this research, brief packages will be developed based on prior identification of priority thematic areas for research. These packages will be sent to various Universities and scientific research institutions in an attempt to attract scientists to the area. This will see the collaboration of several Government Ministries such as Tourism, Immigration, Agriculture, etc. In developing these packages our obligations under the UNCBD will be taken into consideration along with the provisions stipulated under the ABS protocol.

125. The business plan will be revised to ensure the financial viability of the MONP. The ecosystem services and carrying capacity of the park will be taken into consideration in developing this plan. Also, the revenue and expenditure details for the biodiversity management and monitoring plans will need to fit into this financial plan. A legal framework for the institutional arrangements of the MONP will also need to be developed. After consultations with the relevant stakeholders and consensus approval, the arrangements outlined will be implemented. Considerations will also be made to conduct a willingness to pay survey of the park which will provide insights that could also feed into the business plan.

[22] Mount Obama Committee, 2012. Draft Business Plan (2012-2014): Mount Obama National Park

126. While every effort will be made to develop revenue streams for the park via eco-tourism development, it is understood that the park may not self-sufficient in the short or even medium term. The management of the Park will therefore be funded with proceeds of the SIRF Fund. This distinction is critical to ensure that financial objectives do not compromise the conservation mission for the establishment of this important protected area.

127. Another activity under this component will be to develop an education and public awareness strategy. The project will conduct a public awareness survey which will provide information that will be used in developing the strategy. There are several important stakeholders such as farmers, Antiguan nationals, students, the surrounding community, all of which underscore the importance of the Park. Next, the relevant material will be developed appropriately to reach the target groups. Public consultations will also be organized where information about the park can be disseminated to the public.

58. The MONPC has developed preliminary designs for an interpretation centre that is to be constructed within the park. The project will review these designs and use them to develop more detailed technical drawings for said structure. These designs will be used to arrange the tendering process for the selection of suitable service providers. The project will coordinate the procurement of equipment and material and finally the construction process. The inauguration of the centre will commemorate the official opening of the Park.

128. The final activity under this component is developing a marketing and public relations strategy to promote the park to the international and local markets. The cost implications will be taken into consideration and the most cost-effective strategy will be developed through consultations facilitated by the Ministry of Tourism. Based on the results of these consultations, the strategy will be adopted and implemented

129. ***Component 3 – Renewable Energy in support of Protected Areas Systems Pilot***
This component will focus on the installation of renewable energy technology that will ultimately support the pilot protected area established in the previous component. As previously mentioned, the Cabinet approved the SIRF fund becoming a Power Producer up to 25 MW of electricity. The SIRF fund will in turn provide financing for the managements costs of the protected areas management system. This will be elaborated as part of Component 1. It is the intention of the Cabinet that 20 MW will be sold to the utility under the PPA arrangement while the other 5 MW will cover the cost of water generation and the Government's electricity usage. Below is a summary of the outcome and outputs of this component:

Table 6. Component 3 – Outcome and Outputs

Outcome 3	**Outputs**
At least 100,000 tonnes of CO2 equivalent emissions avoided as	1.Financial and Technical Feasibility for the pilot phase 2.Capacity Building on grid

direct impact of the pilot with immediate plans for ~1,000,000 tCO2.	interconnection and control of Reverse Osmosis as dump load 3.Policy and regulation for feed-in by SIRF as Power Producer to APUA 4.Feasibility study for 10 to 20 MW wind power integration with storage of nominally 10MWh (or max) 5.Initial pilot installation >1 MW wind power installed with ~1 MWh modulated reverse osmosis

130. The importance and relevance of converting to renewable energy is clearly highlighted in the Antigua and Barbuda's National Energy Policy (ABNEP). It states that the Government will explore the viability of alternative energy sources in order to ensure the nation's energy diversification; cheaper and cleaner utilization targets[23]. It goes on to add that relevant institutions (e.g. Ministries in charge of Public Utilities Energy, of Environment, the Tourism Authority, the Chamber of Commerce, APUA, the Investment Authority and others) will strengthen their respective roles in the contribution to a sustainable and efficient planning of the energy sector by:

- Taking advantage of available international funds and grant schemes;
- Promoting appropriate foreign direct investment;
- Participating in regional and international research activities;
- Setting in motion capacity building programs in fields related to energy generation and distribution; and

131. Furthermore, the ABNEP has identified Environmental Protection as one of its Strategic Objectives. It calls for the introduction of regulations that define and clarify the Environment Division's role and authority in coordinating all national energy permits and environmental reviews for energy related projects. It also recognizes the need to establish appropriate legal and institutional frameworks to enable Antigua and Barbuda to capitalize on the various opportunities associated with the Clean Development Mechanism (CDM) of the Kyoto Protocol and other related facilities[24].

132. To this end, the Division has developed the present project to fulfill its obligations both at the national and international levels. The third component of this project aims to increase the investment in renewable energy technology. The main deliverable is the installation of renewable energy to support the pilot protected area systems. To deliver on this, there are several outputs aimed at achieving various targets.

133. The first output is directly related to the financial and technical feasibility. Activities under this output include the updating of the wind studies carried out at Crabbs, Freetown and McNish mountain. Also, a study of readiness of the grid needs to be conducted to determine the implications of upscaling for APUA, the local electrical

[23] GoAB, 2011. Antigua and Barbuda National Energy Policy
[24] GoAB, 2011. Antigua and Barbuda National Energy Policy

utility. Included in this output is the validating of the business model that was developed during the PPG phase. The information forthcoming from this will be included in the PPA to be developed later under this component.

134. The second and third output relates to the capacity building on grid interconnection/control and policy and regulation for Power Purchase Agreement feed-in from SIRF assets to APUA. There is a need to develop the technical capacity and knowledge base to enhance grid interconnection and control at the Electricity Business Unit. The systems control operators, along with other relevant technicians, will need to be trained in generation control and also in the Supervisory Control And Data Acquisition (SCADA) software application that will be used to full automate grid interconnection. Currently only transmission and distribution is SCADA while generation and energy storage or dump loads will yet need to be integrated.

135. These outputs will lay the foundation for developing and finalizing the PPA between the SIRF Fund and the APUA. The outputs from the pilot established under the ESD Project to install renewable energy technology will provide the information necessary to establish an appropriate price per kwh. That project will also produce lessons learnt with respect to the installation and maintenance of the equipment. In consultation with the APUA, the SIRF Fund will develop a maintenance agreement with APUA or another provider to run the renewable energy. The Fund will also negotiate and enter into agreement with the central government and statutory bodies to provide electricity to key government buildings. Once all the agreements have been drafted and agreed upon, the next step would be to then provide the electricity directly for the government agencies. Finally, a model PPA and/or other financing models will be created for APUA to use in subsequent agreements...

136. An important output of component 3 would be conducting feasibility studies f or scale up. This involves conducting studies relating to land acquisition, environmental impact assessments, grid dynamics, SCADA specifications, Geo-technical studies, civil, mechanical and electrical engineering designs, wind farm layout and hydro engineering design layout for upscaling to 20 MW. Other activities under this output include the refining of the pumped-hydro report developed during the PPG phase to reflect the costing of chosen locations; identifying potential contractors, developing the specs and quotes for the appropriate assets, developing request for proposals (RFP) for pumped hydro installation and renewable energy installation.

137. The result of this will inform the optimum mix of renewable energy sources that would provide the least grid instability. This output will also investigate the resilience of the energy mix to extreme weather events and provide an analysis of the knowledge gaps. This information will be used to prepare training manuals as well as provide the data to revisit the energy policy. The result of this work will also assist the government in navigating further private sector involvement in renewable energy investments.

138. The final output will see the procurement of the renewable energy plant. Once the details are finalized for the selection of the service providers and the planning approval for site selection, the next step would be the procurement and installation of the plant's equipment. It is expected that this plant will deliver 1.5 MW of wind mill and/or solar power energy. The operational component will allow for an assessment of the electricity generated that will be converted into a cost billing to APUA. The integration of this into the grid will be tested and once fully functional, the Fund will begin to bill APUA. The lessons learned from this arrangement will provide a template for upscaling to 20MW. As mentioned previously, during the PPG phase of the project the APUA prepared and signed a letter of intent to engage with the SIRF fund as a Power Producer.

139. For the pilot project of ~1.5 MW wind power, GEF funds would be used as public equity to initial investment at 25% of the total cost with assets retained by the Sustainable Island Resource Fund. The 1.5 MW could be in the form of 8 WES 250kW turbines. Solar PV investment by consumers is assumed to continue and government may seek donor provision of solar or other technology but these are not included in this analysis

Technico-economical Annexes:

- Appendix 17. Analysis of the benefit of pumped hydro energy storage with wind and solar power on Antigua (UNDESA)
- Appendix 18. Pumped Hydro in Antigua and Barbuda Report on Prefeasibility Assessments (NORPLAN)
- Appendix 19. Wind Power Micrositing Assessment for the Pilot Scale (UNDESA)
- Appendix 20. Crabbs Wind Farm Report (UNDESA, APUA, A&B Meteorological Service)
- Appendix 21. Financial Scenarios for Wind Energy

140. ***Component 4 – Enhancement of Forest Systems***

This component will focus on developing a public awareness strategy aimed at reducing fires in forest ecosystems and establishing a carbon sink through restoration of forested areas. Below is a summary of the outcomes and outputs of this component:

Table 7. Component 4 – Outcomes and Outputs

Outcome 4	Outputs
Fires reduced nationwide by 20% by project end.	**1. Stem degradation of forest ecosystems: Obama Nat'l Park Watershed, inclusive Wallings Forest Reserve through nationwide fire prevention demonstations (overall 3,052 hectares)**
Restoration efforts and avoided degradation lead to projected annual	2. Restoring the forest above watershed conservation areas: the Bendals Valley, Wallings and

tons CO_2 savings	Blubber Valley through reforestation to stop erosion of soil into the reservoirs (160 hectares)

141. In Antigua and Barbuda, a watershed is understood to be a geographical term used to describe drainage processes on the land. The boundaries of watersheds tend to be the centre ridges of hills or mountains, where the drainage divides, going one way one side of the ridge and the other way on the other side of the ridge. Watersheds are therefore very important in the management of water resources[25]. Watershed includes forested areas, homes and water catchment sites. For the purpose of this project the activities will focus in the forested areas.

142. One of the main objectives of component 4 is to encourage good management practices of forested areas. As mentioned earlier, Antigua's original forest cover was almost completely removed for sugarcane production and much of the original soil cover lost. Some re-growth of secondary forest has taken place especially in the wetter and least accessible areas, but Antigua remains depleted in true forest cover[26]. There has only been one attempt at reforestation on any significant scale. This was at Wallings and involved the planting of approximately 5 hectares of trees in 1912 to protect the watersheds supplying water to the Wallings reservoir. The government is embarking on a cohesive approach to watershed management. The SPPARE project will focus on the watershed while SCCF project will focus on the waterway leading away from the watersheds.

143. It has been established that the prevention or significant reduction in wildfires is a pre-requisite for any successful watershed rehabilitation programme. Attempts to reforest or rehabilitate degraded forest or watershed lands have little chance of succeeding unless the fires can be controlled[27]. Several previous attempts by government and regional agencies at reforestation of parts of the main Body Ponds hills have not succeeded because the lack of control of wildfires which eventually destroyed the replanting efforts and the programme was abandoned.

144. This information needs to be transmitted to the public in an effort to sensitize them about the value and impact of fires on watersheds and forest ecosystems. For this reason, one of the main activities is to prepare a Terms of Reference (TOR)/Creative Brief to develop a media campaign. This campaign would focus on proper management of carbon sinks and water generation areas. It should involve the participation of radio, newspaper, television and any and all other means of communication channels. To ensure that there is full participation the project will provide incentives for media houses and NGOs to play pivotal roles.

[25] GARD Centre, 2010. SIRMM Body Pond (BP) Demonstration Project; Section D4 – Alternative /Sustainable Farming Techniques for the BP Watershed

[26] Environment Division, 2005. Draft National Action Plan for Antigua and Barbuda for the United Nations Convention to Combat Desertification.

[27] Cooper B., 2008. Body Ponds Watershed Demonstration – Assessment of Rehabilitation Options.

145. To get an understanding of the public's awareness on this important subject, studies will be conducted to gauge the perception, knowledge, awareness and attitude of the communities. This will be done periodically to monitor progress. In addition, a series of sensitization workshops with the Fire Department need to be conducted on the importance of reducing and/or removing wildfires. The community groups also need to be included in this initiative as well. The community members of Bendals, Wallings, Blubber Valley and other surrounding communities need to be incorporated in the National Office of Disaster Services' (NODS) community mobilization program. A fire monitoring template will be developed to accurately record the occurrences of these wildfires and the community mobilization program will train the community members on reporting and recording this data.

146. The second output of this component is aimed at restoration efforts and avoided degradation that will lead to projected annual CO_2 savings. A National Watershed Management Committee (NWMC) will monitor the progress of this. One of the first activities under this output will be to identify the relevant agencies to participate in the NWMC. Once this has been achieved the next step will be to formally establish this committee. Once established, the work plan will be developed.

147. As mentioned earlier, the main objective is to manage and restore forests critical to watersheds. In addition to this, plans will be made to put in place a monitoring system to measure carbon benefits. This output will also be concerned with identifying the ideal areas for these restoration efforts. Once all the previously mentioned factors are in place the final step would be to commence implementation of these efforts. Before the closure of this project, the entire study area will be mapped to identify the areas where reforestation efforts took place, noting in particular the type of vegetation planted.

148. During the PIF phase of this project carbon calculations were done to estimate the projected annual carbon savings and also the estimated total carbon savings over a 30-year period (Appendix 24). Based on these carbon calculations the project will build upon this using the carbon monitoring methodology. Once the study area has been re-mapped to reflect the reforestation efforts, similar calculations will be carried out. This baseline will in fact be the basis for the monitoring system to measure carbon benefits.

149. The basis for the carbon monitoring system will be adopted from the Forestry Carbon Stock Calculation Method[28] that is present in the Antigua and Barbuda GHG inventory final report. This methodology calculates the annual increase in carbon stocks in biomass to include above-ground and below-ground biomass (Appendix 24).

3.4. Intervention logic and key assumptions

Component 1

[28] Environment Division, 2013. National Inventory of Greenhouse Gases for Antigua and Barbuda (Inventory year 2006).

150. This intervention logic breaks new grounds. Like most SIDS, Antigua and Barbuda has very limited capacity to finance and support biodiversity and ecosystem stewardship based on government funding and unpredictable international funding. It is estimated that there is an annual $5 million shortfall to fund the island's Protected Areas system. The situation is further complicated by the deteriorating government fiscal situation which has resulted from the IMF programme. Without a predictable and stable financing mechanism, biodiversity losses will continue to mount.

151. Environment stewardship is not the repose of government only. NGOs have a significant role to play. For the first time in Antigua and Barbuda, the role of the NGOs will be institutionalized as active partners by the creation of the NGO window. This will secure their involvement in the implementation of the Conventions particularly the Aichi Targets for the CBD.

152. Key Assumptions for this component include:

- **Consultations for the strategy and supporting legislation generate required support**
- **The SIRF Fund concept continues to enjoy strong political support and remains independent**
- **Consensus established for the SIRF Fund to be self-sustaining financing mechanism for Environment**
- **Buy-in from the NGO community and that they have the institutional capacity to adequately programme resources**
- **The local electrical utility APUA makes consistent payment to the SIRF Fund**

Component 2

153. Most of the island's valuable ecosystem and protected areas are highly undervalued. In fact, nationals and visitors (800,000 annually) enjoy the benefits of protected areas free of cost. Mount Obama is one such area and is frequented annually by thousands of bird watchers and nature lovers. This project seeks to pilot a self-sustaining protected areas system in MONP where the fees collected for use of the park are invested in protection of its rich biodiversity.

154. Key Assumptions for this component include:

- **Adequate institutional capacity to manage MONP**
- **Tourism actors agreement to the payment for ecosystem services**
- **Adequate support for University-level studies on various aspects of the park including cataloging its inventory and ecosystem management assessments**
- **The Fund has financial capacity to begin disbursement during the life of the project**

Component 3

Escaping the syndrome of demonstrations that stagnate and do not scale up, the project assumes scale up will take place and addresses thes post-demonstration

barriers from the beginning with energy storage feasibility and scale-up feasibility work.

155. It is assumed that private sector will engage for short periods in financially attractive arrangements while long term profits can be diverted to public purpose.

156. It is recognized that the typical life-span of interventions by projects follow the usual four year term. After the four-year period, the benefits fall away due to the government's inability to take up the slack left by the project. One of the distinguishing features of this project is that it will invest in RE assets, which should in turn raise revenue to be used to conduct future activities. Unlike the four-year life cycle of projects, renewable energy assets have a 10-20 year life cycle. This will create predictable funding for the long-term.

157. Key Assumptions for this component include:

- **APUA Board and policy approved by the previous government do not change**
- **Public funds domestic or foreign grants are insufficient for renewable energy investments needed**
- **Win-Win long term PP agreement between APUA and the SIRF Fund agreed**
- **APUA provides several technicians to be trained and maintains documentation of the product and continues to upgrade SCADA generation**
- **APUA grid remains stable enough to receive renewable energy from SIRF Fund assets**

Component 4

158. It has been long recognized that it is important to maintain and manage the forested ecosystems within the watersheds. Lessons learnt from previous initiatives in this sector suggest that an integrated approach be considered with the management of watershed resources. Undoubtedly, this requires huge financial resources that unfortunately the government cannot support. This project aims to create a public awareness strategy focused on sustainable forest management and also to develop a sustainable finance mechanism to fund forestry management.

159. Key Assumptions for this component include:

- **Buy-in of other relevant agencies such as Forestry, NODS, APUA Water Division, Fire Department etc.**
- **Strong buy-in from farmers in the watershed area**

3.5. Risk analysis and risk management measures

160. A series of risks that the proposed project faces in trying to reach its objectives was considered during the PPG phase. The risks and some of the measures for mitigation considered for the project are listed in the following tables.

161. Component 1: Development of Sustainable Island Resource Financial Plan

Table 8. Component 1 – Risks and Mitigation Measures

RISKS	MITIGATION MEASURES
Getting the SIRF Fund operational	Continued discussion and collaboration with the Ministry of Finance to ensure that the Fund is established
All costs not accurately assessed due to external factors such as the mounting cost of climate change	Use best estimates available based on previous studies such as Climate Change Centre and other sources plus contingency
Flow of resources to the management of protected areas not sustainable due to pressure to reduce energy costs	Profits from RE will be reinvested profitably in additional RE investments. A feasibility study coupled with a negotiated APUA agreement under output 3.4 will provide balanced guidance for the government. The SIRF fund features multiple sources of income. The Water Levy, referenced in co-financing letters, those to be defined under the Business Plan for the Systems of Protected Areas and Legislation under output 1.1 (financial projections) Sources of financing for protected areas to be identified under output 2, will complement the profits from the RE.

162. Component 2: Pilot expansion of Sustainable Island Resource Protected Areas: Mount Obama National Park

Table 9. Component 1 – Risks and Mitigation Measures

RISKS	MITIGATION MEASURES
Delay in getting buy-in from the private land owners	Land owners to be actively involved in the stakeholder consultations facilitated by the DCA to develop plan for MONP
Delays in construction of the MONP interpretation centre due to weather and other events	Construction should start six months before the hurricane season (June – September).
Volume of visitor traffic could adversely affect biodiversity	Management plan will provide direction on carrying capacity to guide the level of park traffic

163. Component 3: Pilot Sustainable Island Resource Financial Plan – Renewable Energy in support of Protected Areas System

Table 10. Component 3 – Risks and Mitigation Measures

RISKS	MITIGATION MEASURES
Delay in placement of wind equipment due to need for better quality wind data	Output 1 must be activated as soon as initial funds are received or GIZ will be approached to upgrade the measurement campaign with a new and different consultant
Feasibility is not positive	RETScreen analysis shows the project has a positive NPV. APUA has indicated an interest in purchasing all the output from the pilot at about half of the cost of fuel in electricity production. Project options allow for achieving global benefits with equivalent technical and location options.
Proximity of RE installation to Important Bird Areas	A Preliminary EIS was conducted on the Crabbs site and shows that it is not an Important Bird Area (IBA). As per the Physical Planning Act, the siting of the RE and enhanced hydro storage would trigger an environmental impact assessment, at which time the siting of the infrastructure would be evaluated vis a vis IBAs and migratory pathways. Consistency with guidelines of the American Bird Conservancy is to be ensured with respect to siting and operation of wind turbines as documented under Risk Mitigation. Crabbs is now considered one of three sites all of which are intended for wind power development, two with pumped hydro options and Crabbs with Reverse Osmosis modulated dump load.
Government Lands are not designated in a timely manner for establishment of the wind farm	Opinion at this point is that the Government will be cooperative since the area is not highly populated by sensitive biodiversity.
Competition for up-scaled investment in RE from developers.	Up scale will account for only 30% of demand. The capital structure of the fund will enable it to offer a competitive price without any market distortion. APUA

	also acknowledges that proceeds from the fund will enhance protected areas a benefit not provided by developers.
Late payment by APUA	The feed-in tariff is about one half the cost of fuel in electricity production and can be reduced later in the project. The possibility of wheeling power over the grid to a large purchaser (hotel) would avoid payment from APUA as the only off-taker.
Delay in supply due to manufacturer lead time	Order will be placed to coincide with appropriate lead time
No Agreement for 10MW to be developed over long term, by the Environment Division to generate funding (through the SIRF fund) for the protected areas system.	APUA has indicated a willingness to scale up with the Fund. This is indicated in the LOI.
Intensified storms due to climate change	Retractable or protected wind turbines prioritized as technology choice. Rebuilding and strengthening dams' structures for resiliency. Forest restoration enhancement efforts take into consideration resiliency.

164. Component 4: Enhancement of Forest Ecosystems

Table 11. Component 4 – Risks and Mitigation Measures

RISKS	MITIGATION MEASURES
Dry weather patterns and lack of public awareness result in increased fires in forest ecosystems, increasing vulnerability to establishment of invasives	Improved fire management integrated into protected areas management plans, will increase sustainability of forest ecosystem services and decrease the spread of invasive species into valuable forest ecosystems.
Illegal crops in intervention area present potential danger to rangers work and visitation.	Public outreach to inform all stakeholders of proposed park activities. Illegal crop activity taken into account in planning and implementation process.

3.6. Consistency with national priorities or plans

165. Antigua and Barbuda, along with much of the international community, participated in the United Nations Earth Summit in 1992 in Rio de Janeiro, Brazil. The country also

became party to the Convention on Biodiversity which was one of the principal outcomes of summit. The country's first NBSAP report was prepared in 2001[29].

166. Like many SIDs, Antigua's economic and social well-being is inextricably linked to the preservation of the natural environment, including its biological resources. Notwithstanding the importance of biodiversity, severe pressure has been put on these resources as a result of rapid economic development fuelling demands for residential and commercial space.

167. The proposed project is connected to several national priorities and plans:

Food and Nutrition Security Policy for Antigua and Barbuda; 2012:

168. This Policy targets the critical food and nutrition security problems in Antigua and Barbuda. An analysis of the current situation has indicated that these problems relate to all four components of food and nutrition security: availability, accessibility, consumption/utilization and stability of supply[30].

169. It notes that "there is … a critical need for disaster preparedness and mitigation strategies to protect agriculture, social infrastructure, **the ecosystem**, and housing - all factors which ultimately impact food access nationally"[31]. With regard to the protection of natural resources the policy recognizing that the **forests** and fisheries constitute substantive resources for food and nutrition security **to be protected** through adaptation to climate change.

170. The policy further emphasizes the need to pursue climate resilient development which focuses on adaptation as well as mitigation strategies for the food and agriculture sector. In respect of mitigation, priority focus shall be placed on coastal management (which affects the fishing industry) as well as **sustainable forest management for reducing emissions** while improving livelihoods and ensuring their stability over time. This will also support **a reduction in deforestation, improved watershed management and protection of carbon reservoirs.** This indicates that the Component 4 is in sync with the high priority Food and Nutrition Security of the country.

Sustainable Island Resource Management Zoning Plan for Antigua & Barbuda (including Redonda); 2011:

171. This project also has a close synergy between the Sustainable Island Resource Management approach, piloted by GEF funded SIRMM project of 2008-2012, the NEMS and the OECS regional agreement the St. Georges Declaration from which the NEMS evolved. All of them proposed policies that advocate for the ultimate establishment of mechanisms for integrated ecosystem management and enhanced civil society participation. One of the SIRMM's major outputs was the Sustainable

[29] Office of the Prime Minister, 2001. National Biodiversity Strategy and Action Plan for Antigua and Barbuda.
[30]GoAB, 2012. A Food and Nutrition Security Policy for Antigua and Barbuda.
[31]GoAB, 2012. A Food and Nutrition Security Policy for Antigua and Barbuda.

Island Resource Management Zoning which has since become law. One of its major goals is the maintenance and enhancement of ecosystem integrity[32].

172. It is this Zoning Plan that by law reserved areas of Crabbs, Freetown, Mc Nish and Guinea Bush as Environment Resource Areas i.e. renewable energy. This plan also highlights and proposes the Mount Obama National Park to become a protected area.

173. In 2003, the government enacted the Physical Planning Act. The act provides for the establishment of Environment Protection Area. It is this Act that will be used to declare the Mount Obama National Park a Protected Area. Section 53 of this Act states that "The Town and Country Planner may and if so directed by the Minister shall cause a survey to be made of the whole or any part of the country, either independently of or as part of a development plan made under Part I11 of this Act, with a view to determining whether any area of the country ought to be declared an environmental protection area" [33]. The Act makes it clear that biodiversity is a key consideration by stating that the flora and fauna of the area and the natural features and beauty of the area should be the criteria for the decision.

National Energy Policy

174. In 2010, the Government of Antigua and Barbuda adopted its National Energy Policy. It was created based on widespread stakeholder consultation and is the government's premier road map to a sustainable energy future. Two of the goals of this policy are electricity reliability and diversification and efficient use of energy sources.

175. With regard to electricity reliability the policy intends to strengthen the grid stability to reduce the number and duration of operational disturbances and strengthen the energy infrastructure to enable faster recovery from disruptions to the energy supply.

176. Output 3.1.1 for Component 3 seeks to develop technical capacity and knowledge base to enhance grid interconnection and control. This will be achieved by conducting a study on the ability of the grid to accommodate 25MW of Electricity and the training of relevant staff on software application (SCADA) to manage grid interconnection.

177. The policy envisaged that among other things, the goal of diversification and efficient use of energy source will be achieved by [34]"develop*ing* plans to add utility scaled solar power facilities as an approved renewable energy source to add 15% to the utility supply grid by 2025." Component 3 of the project will contribute to this goal to install a plant that delivers 2- 5 MWh of utility grade wind and/or solar power energy.

3.7. Incremental cost reasoning

[32] Genivar, 2011. Sustainable Island Resource Management Zoning Plan for Antigua and Barbuda (including Redonda)
[33] Antigua and Barbuda National Physical Development Act 2003, Section 53
[34] National Energy Policy, 2010 Edition, Pg 16.

178. **The baseline:** The baseline analysis indicates that the financial needs to meet the estimated annual operational costs of the biodiversity rich Protected Areas and Forests systems of Antigua and Barbuda is conservatively estimated at $5 million per year. The cash strapped Government is currently meeting approximately $2 million of these costs per year. The GEF investment will innovatively and concurrently address a number of environmental priorities through the formalizing of an agreement for the SIRF Fund to receive profits from renewable energy systems and increase revenue for Protected Areas System.

179. The baseline situation includes very limited activities to address the biodiversity rich Protected Areas and Forests systems of Antigua and Barbuda. This would inevitably result in continued decline in biodiversity such as the local native species and at the same time increase the proliferation of invasive species in forested areas. Furthermore, if left alone there would be an ongoing loss and degradation of natural habitats. These changes would in turn further negatively impact on local communities who depend on them for their ecosystem services such as watershed protection and water supply. In the absence of the project there would be some limited work on threatened fauna and flora species, but with the project the conservation of these species should be significantly advanced in the forested areas. The further development of terrestrial protected areas has been acknowledged by the Government; however steps to achieve this have been slow. This project will have a significant impact on the establishment of a National Park which will contribute to the IBPOW and CBD-COP targets in terms of area coverage. The baseline also includes very limited capacity to address protected areas and forest systems. Presently there are not many opportunities for staff training in related areas outside of the project. In addition to the previously mentioned, there is a shortage of reliable funding to execute activities directly related to environmental priorities. There remains an urgent need to pilot, implement and scale up conventional and alternative financial mechanisms to generate revenue for the SIRF Fund to which this project will contribute. Overall, the baseline would see Antigua and Barbuda unable to significantly increase or enhance their biodiversity rich Protected Areas and Forest systems work, which in turn would likely see a continuing decline in its natural resources.

180. **The GEF Alternative:** As described in sections 3.1 and 3.3 (and Appendix 3) the GEF-funded intervention will meet many priorities identified by the country. Component 1 addresses the setting up of the business plan for the Fund that addresses the implementation of the EPMB and the management of Protected Areas. Component 2 aims to establish a model managed protected area that is to become financially self-sustaining. The third component will focus on reducing the amount of CO_2 emissions through the installation of a pilot intervention. The fourth and final component will reduce the presence of invasive species and the occurrence of wild fires nationwide. These interventions will enable the country to address the above mentioned activities in areas that have previously received minimal attention. The GEF alternative will see Antigua and Barbuda advance its biodiversity rich Protected Areas and Forest systems work to levels found in better resourced countries in the region. This in turn will allow them to participate fully in any future regional

programmes within this area. It will also assist them towards meeting some of the exciting, challenging targets developed at the recent COP of the CBD.

Table 12. Incremental Cost Reasoning by Component

Component	Increment ($USD)		Total ($USD)
	GEF	Co-finance	
Component 1	50,000.00	50,000.00	100,000.00
Component 2	616,667.00	380,000.00	996,667.00
Component 3	1,260,752.00	6,000,000.00	7,260,752.00
Component 4	586,606.00	1,300,000.00	1,886,606.00
PMC	125,701	250,000	375,701

181. **Incremental benefit:** From a baseline of limited activity, the benefits of this GEF-funded intervention can be identified at several levels.

182. At the country level there will be specific benefits which should lead to improvement in the conservation of ecosystems and the species therein. There will also be more strategic benefits that can only arise through a project like this one such as the issue of realizing funding to address environmental priorities. It will also expose the staff of the environment agencies to the full range of biodiversity conservation activities that one would expect. Furthermore, there will be interactions among agencies with related mandates and expertise hence allowing for a wider range of technical expertise. This will undoubtedly build closer relationships which in turn will have benefits of facilitating mainstreaming of activities into the work of other agencies.

183. The project aims to allow the lead agency to meet the objectives set out in the country's NBSAP and increases its ability to meet targets in the IBPOW. This includes legislation, policies, information management, education and public awareness.

184. At the regional level, this project will serve as a pilot for other countries in the region exhibiting how efforts aimed at the management of Protected Areas and Forest systems can have a dual benefit, i.e. also contributing to sustainable financing. The project will allow consultants working within the region to research this issue thoroughly so that they can benefit at the outset from an analysis of what has worked and not worked in the past. In addition to this, there should be new insights at project end that will be of regional if not international benefit, whereas such insights would not have necessarily been derived if the country was working independently without the GEF-funded intervention.

185. At the international level the project will increase the number of officially declared protected areas and help to achieve global targets of areas under conservation management. Establishing a protected area also has a direct benefit on the conservation of the fauna and flora species that are present within the National Park.

These two aspects alone are great consequences of global significance. A further benefit will be the decreasing of GHG emissions into the atmosphere which is a high priority of the UNFCCC.

186. The project scale-up will be a highly innovative and replicable energy storage option for all SIDS with abrupt topography

Table 13. Summary of Incremental Cost Analysis

Baseline		Cost of fuel displaced over life of equipment $47 M USD
Increment	GEF	$2,639,726USD
	Co-finance	$ 7,980,000 USD
	Total Increment	$10,619,726 USD
Alternative		$47,000,000 USD

3.8. Sustainability

187. The foundation for the long-term sustainability of this project lies in the transformative benefits it brings to its diversified stakeholders at every level.

188. At the local level, the establishment of the NGO window under the SIRF Fund enlists these organizations as partners for the advancement of environment stewardship. Many of these are well intentioned and staffed with committed volunteers but lack the financial resources to implement their projects. In addition to the sources such as the GEF Small Grant, there will be a local window. The singular window also increases the opportunity for collaboration since the SIRF Fund will be privy to many NGO initiatives and will be able to encourage joining of efforts to bring synergies.

189. The development of the MONP into a protected area and its strong emphasis on conservation of its rich biodiversity brings not only ecological but economic benefits to the park as well as to tour operators. For the first time, there will be a national park with a fully developed, comprehensive eco-tourism management system with bird trails and interpretation centre. MONP will therefore deepen the visitor experience and provide more utility/value for which visitors are willing to pay. The government and tour operators have an opportunity to gain a larger share of the visitors' wallets while vacationing in Antigua and Barbuda. This constitutes an important incentive for continuing to support the training and institutional development of this and other Protected Areas that are integral to the project. It also builds private sector support for conservation long after the completion of the project.

190. There is a compelling business motive for APUA to partner with the SIRF Fund. Currently, for every GWh of energy produced by fossil fuel, APUA has to import US$290,000 in fossil fuel. It therefore stands to reason that with every GWh produced

through RE systems it will prevent APUA from having to import the equivalent value of fossil fuel. It is this saving that will be shared with the SIRF Fund.

191. Building and funding the capacity of APUA to operate the resulting infrastructure is built into project design. The design also includes building the knowledge base and providing the technology for automation of the grid interconnection. As the title of the project indicates, both of these components will put Antigua and Barbuda on the path towards building a sustainable protected areas system and meeting these fundamental financing requirements by linking proceeds from the RE component through the SIRF Fund, which will own the RE as per agreement.

192. The project also provides a further pathway for scaling up the amount of RE supplied by the SIRF by examining the feasibility to pumped storage which will enable the grid to accept more RE, well beyond the current threshold of 15% established by the utility. The findings in the PPG phase that sea water would be a feasible option for pumped storage is a key sustainability factor. This means that there will no longer be the need to use ground water which is a scarce commodity in Antigua which is subject to drought conditions.

193. Turbines and service turbine sites even with updated generator every 15 years are long-term high profit activities. Antigua Barbuda is confident that if it can adequately prepare technical, social and environmental feasibility studies of the wind and solar PV installation sites and grid integration plans that subsidized technology will be made available from donors that are focusing such support on SIDS. A fundraising strategy is already in operation seeking to secure the technology from development country partners and bilateral and multilateral institutions.

194. Should grant technology be only partially secured, a mix of finance would be used whereby the GEF grant portion earns its share of profit while the others are paid out. Since the SIRF Fund is a public service facility, it would not pay royalties for utilizing wind energy and its revenue will be free of taxes. As a non-subsidized finance scenario, a feed in tariff of 0.16 $/kWh, 80% financed at 4% interest yields IRR 20% on assets and 6 % on equity or 7 years simple payback. In addition a water levy for maintenance of the water shed is to be instituted. As mentioned previously, this is to take effect in July 2015. Every effort will be made to structure the flows to the PAs to as start before the project ends.

195. At the regional level, the OECS Secretariat has long advocated for the sustainable financing of Protected Areas in the region. The regional OECS Protected Areas and Associated Livelihoods (OPAAL) Project highlighted the paucity of resources for protected areas and the need for innovative financial mechanisms to achieve this. Given that the SIRF Fund is based on the OECS model Environment Management Legislation and its innovative design which incorporates renewable energy, it could easily become a pattern/proof of concept for other OECS countries and this would greatly validate the work of the Secretariat. Second and most importantly, the SIRF

Fund will become the single window for shared regional project resources since it greatly simplifies institutional arrangements including financial stewardship.

196. Finally and very importantly, the project creates a great opportunity for coherence among the various government actors with responsibility for protected areas (Fisheries, Forestry, Environment Division, National Park etc). As the government's premier financial mechanism it could bring the following benefits that will only come from cohesion:

- A coordinated approach to Protected Areas (PA) management and development in Antigua and Barbuda, where costs and human resources sharing can be effected[35]; it is a specialised branch of conservation, where human management practices and skills are needed as well as technical skills in biodiversity management.
- A system to collect, retain and re-invest all the revenue it generates from user fees, licences and permits at its component sites.
- An integrated PA System comprising the existing (and at least some of the many proposed) PAs that is much better able to attract external funding, as well as gifts from private donors, as long as it is well managed.
- An integrated PA System with some centralised services to promote the whole system (as well as individual Pas) to the general public and to visitors. This will also provide better educational programmes on specific aspects of biodiversity or ecosystem functions that involve more than one PA.

3.9. Replication

197. Several factors augur very strongly for the replicability of this project. These include:

- The project concept and implementation lends itself to media interest due to the unique use of RE assets and the name of the targeted protected area
- The long-term nature of the designed interventions has long been sought after by many SIDs
- The development of the demonstration site as basis for lessons learned in protecting a protected area from invasive species while encouraging reforestation
- The transition of the environmental stewardship agenda in Antigua and Barbuda from capacity development and information gathering to implementations of the findings and recommendations from various reports and studies gathered over several years
- The potential for systemizing protected areas management among various government agency actors
- Potential for scaling up to include Protected Areas other than MONP as well as the acquisition of more RE assets. The seed of sustainability using RE will

[35] OECS Protected Areas and Associated Livelihoods Project OPAAL) A Systems Plan for Protected Areas in Antigua and Barbuda (Final Draft)

make it attractive to international organizations who want their efforts felt long beyond the project cycle
- Ability for sharing experiences with other SIDs who face similar ecological and financial sustainability challenges
- All SIDS face grid stability issues and intermittancy problems with wind and solar energy that can be solved with energy storage

Fit with the Convention on Biodiversity

198. Decision X/3 on the Strategy for Resource Mobilization, Parties committed to "substantially increasing resources (financial, human and technical) from all sources, balanced with the effective implementation of the Convention on Biological Diversity and its Strategic Plan for the period 2011-2020, against an established baseline." That decision also invited Parties, relevant organizations and initiatives, such as the World People's Conference on Climate Change and the Right of Mother Earth, to submit information concerning innovative financial mechanisms that have potential to generate new and additional financial resources as well as possible problems that could undermine the achievement of the Convention's three objectives."

199. Traditionally, efforts to stem biodiversity loss and promote the use of ecosystem services sustainably and intelligently have been thwarted by the lack of adequate, timely and predictable financial resources; this has also been compounded by inefficient use of existing resources[36].

200. At the ninth meeting of the Conference of the Parties (COP 9) to the Convention on Biological Diversity, Parties adopted a strategy to enhance international and domestic funding for biodiversity. As part of this strategy, Parties were invited to come forward with new and innovative financing mechanisms. In Nagoya in 2010, COP 10 resulted in the adoption of the 'Nagoya Package' that contains three key elements: the Nagoya Protocol on access to genetic resources and the fair and equitable sharing of the benefits arising of their utilization (the Nagoya Protocol on Access and Benefit-sharing); the Strategic Plan for Biodiversity 2011-2020 and its twenty Aichi Biodiversity Targets; and the decision referring to the Strategy for Resource Mobilization. The CBD Secretariat is presently compiling and presenting a synthesis of this information.

201. The SCCF project for Antigua and Barbuda focuses on adaptation to climate change. One of its key outputs is the piloting of an adaptation window that provides financing in collaboration with local financial institutions to provide lower cost funds for residents to adapt to climate change. The institutional modalities developed will become policy for the fund and help to direct its adaptation efforts. The synergistic linking of projects to provide practical solutions to communities is a model for ensuring the most effective use of shrinking external assistance. This is especially important for non-African developing countries since Africa is earmarked to receive a high proportion of funds being pledged for climate change etc.

[36] http://www.cbd.int/financial/quitoseminar/

202. This project represents a significant leap forward by a small island developing state struggling under the burden of fiscal consolidation and an IMF programme.

203. The project's goal and objectives are fully consistent with the NBSAP and this contributes to financial stability beyond the project. It also comes at a time when many countries are completing their NBSAP and looking for innovative financial approaches. The CBD is piloting an approach called BIOFIN that contains many of the processes that led to the creation of the SIRF Fund.

3.10. Public awareness, communications and mainstreaming strategy

204. Strategies at local and national levels will support awareness, communication and mainstreaming by establishing effective links with relevant partners. An important element of public awareness and communications will be the capacity building in the area of biodiversity management and grid interconnection and control. Enhancing awareness among park personnel is important to ensure that the staff is adequately trained in biodiversity resource management processes. The training that they will receive will not only increase their knowledge base but will also teach them how to solicit the participation of visitors and/or the surrounding community in managing the biodiversity in a systematic way. Developing the awareness of the technicians who will be directly involved in the installation and management of the renewable energy technology is also important. Participating in these trainings will allow these technicians to gain the skill and knowledge necessary to manage grid interconnection.

205. In addition to the capacity building initiatives, efforts will also be directly aimed at raising the awareness of the public to certain issues. The visitor/interpretation centre to be established within the national park will provide educational information about the area and the biodiversity richness that is present there. There are also plans to develop a public relations strategy to promote the park. This strategy will focus on attracting attention both from the local and international markets. The project also has scope to implement a public awareness strategy in the fourth component. This will be directed towards sensitizing key stakeholders about the value and impact of fire on watersheds and forest ecosystems.

206. The NEMS adopts a management approach that includes conservation, sustainable use and the equitable sharing of benefits that accrue from the use of natural resources. Main objectives include, among others, increasing capacity building and strengthening environmental education and awareness. This project will seek to finalize this document, which will be mainstreamed as the strategic plan to the implementation of the Rio Conventions.

207. Over the last few years, many biodiversity management practices have been developed in order to sensitize the public on the value of the importance of the country's natural resources. This project will use various types of awareness practices to continue educating the public on diversity and conservation issues. These will include printed media, radio advertisements and television infomercials. These efforts will be directly

targeting the promotion of the park and the prevention of fires in the watersheds and forest ecosystems. The project will collaborate closely with the media houses and networks to ensure wide dissemination of the information.

208. A major additional commitment that is planned for public awareness activities is relating to the Environmental Cadet Programme. This is an extra-curricular programme, implemented within the schools and coordinated by the national executing agency that encourages youths to engage in activities that may have a positive impact on the environment. It is undertaken in a total of twenty-six primary and secondary schools throughout the country. The initiatives mentioned above will be extended to this programme and also to an After-School Programme scheduled for launch shortly. The latter will encourage those students, who have no such environmental programmes in their schools, to become environmentally aware and active. In addition to these two programmes, the Division also organizes a yearly summer camp aimed at teaching students about their environment in an interactive manner. The educational awareness of this project will also extend to this activity.

209. Feedback from the capacity building activities will be collected from participants attending the training courses on biodiversity management and grid interconnection. On completion of these courses, the participants will be required to complete an evaluation form that will be analyzed and included in a final report. The effectiveness of the visitor/interpretation center in achieving its goals will be assessed by simple surveys distributed to visitors and/or community members. The final NEMS will be shared with community members, local governmental agencies, researchers, policy-makers and non-governmental environmental organizations. Their contribution and feedback to the document is essential for maintaining long-term collaboration, for sustaining the biodiversity management process and for influencing policy-making. To ensure that the educational issues are transferred to the educational programmes, this will be included in any evaluations that are conducted by the coordinators and lecturers.

3.11. Environmental and social safeguards

210. In Antigua and Barbuda a planning application is submitted to the Development Control Authority (DCA) for issuance of a development permit. The EPMB seeks to institute the procedure that, if an environmental impact assessment (EIA) is required, the development plan is then submitted to the ED for the development of the TORs for the preparation of the EIA[37]. The applicant shall submit the EIA on the proposed development to the ED in such form and containing such information as may be prescribed in the TORs.

211. The locations for the wind farm are well away (>500 metres) from residential settlements. The Social and Environment Impact Review conducted during the PPG phase notes that “during operation, the wind turbine gears may generate some noise at lower speeds but noise levels are expected to remain below 50dB outside a 200m

[37] Environment Division, 2013. Environmental Protection and Management Bill.

radius (a normal conversation is 60dB). Furthermore, Antigua does not have any noise standards that could be identified". They are also well within the World Bank recommendations for noise levels (see table below).

Table 14. World Bank recommendations for noise levels

Receptors	Noise Level	
	Daytime	Night Time
Residential; institutional, educational	55	45
Institutional; Commercial	70	70

212. No community should be impacted negatively by the noise taking into consideration the noise level that will be produced from these turbines and the distance of the site from any residential areas.

213. The only potential impact could be minor deaths to bird life and bats in the area. Crabbs Peninsula, one of the potential areas, "is a corridor used by waterfowl and waterbirds during the migratory season as they move between wetlands. These birds fly at relatively low altitudes. White-crowned pigeons and Laughing Gulls fly over the peninsula daily during the breeding season. The peninsula's extensive wetlands (along with the wetlands of Parham and Fitches Creek) may act as a refuge or stop over for migrating birds, as Antigua is part of the Atlantic Flyway. Shorebirds which frequent the wetlands are major users of this flyway" [38].

214. Some potential mitigation strategies include:

- **Installation of radar and ultrasound devices which repel bats.**
- **Raising the 'cut-in' wind speed as most deaths appear to occur at low blade speeds.**

There could be some concerns that hurricane winds may cause the turbines or parts of them to damage structures or cause harm. However, wind turbines are manufactured to different engineering standards which equate to their ability to survive a storm. "The International Electrotechnical Commission Standards (IEC) develops standards for wind turbines that are rated based on their abilities. One aspect of certification is the ability to withstand wind speeds considered for a "50 year extreme gust." An IEC "Class 1″ turbine is designed and certified to withstand a 50 year extreme gust of 70 meters-per-second, or 156 miles per hour, meanwhile an IEC "Class 3″ turbine is certified to withstand an extreme gust of up to 52.5 meters-per-second, or 117 miles per hour.

215. The plants on the peninsular do not form unique or rare habitat types. There is however, a rare species of black mangrove which grows in the wetlands which are considered to be in excellent health as they are relatively undisturbed. The clearing of vegetation will lead to habitat loss. Every effort should be made not to install turbines

[38] Crabbs Environment Impact Review, *Prepared for the Sustainable Pathways Protected Areas Renewable Energy Project* by Joseph Prosper

in or near the wetlands to avoid habitat destruction. Consultations with the NEMMA management would be necessary as the jurisdiction of the NEMMA would include the wetland areas of this peninsula.

216. Regarding solar PV systems, the ability of the panels to hold up in a storm is a function of the quality of roof and installation. Industry certification standards exists for solar panels which call for an ability to withstand 2400 pascals when it comes to wind; a pressure equivalent to constant winds of 130 kilometers per hour for a solid hour and even higher. Ultimately, the quality and condition of the roof is dependent on the building codes that exist and their enforcement.

217. The development of the NGO/CBO window seeks to ensure that the project has a strong socially inclusive orientation. Organizations such as GARD and the Red Cross that focus on the marginalized sections in Antiguan society will benefit from the window which will provide the resources to improve the lives of their constituents. The simplified approach of the fund and its promised use of simplified templates will ensure that technical barrier to access grant funding is lowered.

218. Component 2 of the project which develops the Mount Obama National Park into an eco-tourism site will have several benefits for women and other groups. When the interpretation centre is opened the talents of the local craft industry will find a new market and a new opportunity will be created to provide MONP branded crafts. The park will also become a new destination for taxi drivers (male dominated) who ply their trade in the tourism industry. Also, the demonstration area designed to protect MONP will not only assist the park but also some of the farmers in its nearby environs who are faced with the same challenge. The reforestation activities will help to reduce run-off and therefore reduce flooding in the surrounding villages of Jennings, Bolans, Bendals etc.

219. By focusing on remote rural communities and smallholders, especially women farmers as target beneficiaries, supporting sustainable production practices and linking farmers to markets, the project ensures the involvement of a high percentage of the marginalized population in the four selected landscapes that otherwise might not have access to subsistence income. Restoration efforts also offer gender neutral opportunities by involving women in nursery operations, and afforestation efforts, something which is already happening through specific NGO pilot operations. Strong farmer alliances coupled with project focus on governance, capacity building, gender equity and social inclusion at all levels of organizational setup should guarantee participation of women and socio-economically marginalized individuals in decision making process as well as ensure more equitable distribution of income from marketing. Strengthening their income base, as well as their empowerment and social capital and linking them to relevant agencies and initiatives, can be seen as a social safeguard in its own right. The project will generate gender data and input gender monitoring data, especially into the delivery of Component 4 and in the detailing of annual budgets and work plans. Gender considerations, particularly in the Caribbean, are not solely a women's issue. As such the project looks at yielding advantage to

whole communities and benefitting both genders and vulnerable groups. Finally, the project has the provision of farmer representation in National Steering Committee and policy making bodies thus ensuring that their voices are heard, which could serve as a strong social safeguard for beneficiaries.

SECTION 4: INSTITUTIONAL FRAMEWORK AND IMPLEMENTATION ARRANGEMENTS

220. There are a large number of different institutions involved in environmental management that include government ministries, statutory bodies, NGO's and CBOs. At the government level the purview of climate change issues, biodiversity and sustainable forestry management is divided among a number of different agencies. The key institutions and their involvement and responsibilities with respect to the aforementioned are described below:

Ministry of Health and the Environment

221. The Environment Division was initially set up within the Ministry of Tourism and Environment and has changed ministries several times. It was once housed under the Ministry of Works, Transportation and the Environment but later transferred to the Ministry of Agriculture, Lands, Housing and the Environment. It presently rests in the Ministry of Health and the Environment. It is mandated to (i) identify and coordinate the implementation of national commitments to Multilateral Environmental Agreements, (ii) develop and implement a national environmental awareness program, (iii) establish projects related to the rehabilitation and protection of the environment, coordinate the development of environmental legislation; and (iv) coordinate the process of conducting EIAs for development projects (such as those involving dredging, shoreline or marine construction, removal of mangroves, and large-scale land clearing although such EIAs are not a legal requirement). The Division serves as the Secretariat for Antigua and Barbuda's National Coordinating Mechanism for Environmental Conventions.

Ministry of Agriculture, Lands, Fisheries and Barbuda Affairs

222. The Development Control Authority (DCA), has responsibility for regulating the use and development of land for urban, economic and infrastructure development. The DCA was set up after the first attempt to establish a National Land Use Plan was rejected by the Cabinet in 1974. Although the DCA had relatively effective legislation the agency itself was not very effective in addressing land use issues, due to the lack of political will to implement the legislation. The DCA has responsibility to implement the recently approved Physical Development Plan, which gives clear directives on how further development of natural resources should be accomplished and could have significant implications for integrated ecosystem management.

223. The Forestry Division has responsibility for managing the country's forest and woodland areas and for reforestation. The Division has been restricted by the lack of adequate legislation to support its activities and is seriously under staffed and under budgeted. The primary instrument for management of the upper watersheds is the Forestry Act (cap 178), which provides for the establishment of forest reserves, the granting of permits for harvesting forest resources, and clearing. Apart from the prohibition of forest clearing on steep slopes, the regulations of the Forest Law are almost completely ignored and exploitation for fuel, wood and charcoal on both government and private lands is virtually uncontrolled. However, the Forestry Division does not have the manpower for enforcement, even assuming that there was a supportive policy. In recent years, the Division has taken on activities more related to

biodiversity conservation and to eco-tourism development, reflecting a more environmentally conscious thrust from the newly trained staff. Forest officers now regularly lead groups of cruise-ship passengers on forest hikes.

224. The Plant Protection Unit has responsibility for plant protection recommendations and provides pest scouting in the field for crops such as cotton. The Plant Protection Unit also has responsibilities for Plant Quarantine functions at the Ports of Entry.

225. The Agricultural Extension Division has the major responsibility for farmer training and assistance and is also involved with allocation of state lands to farmers for agricultural purposes. Plots of up to 2 ha can be leased out under the authority of the Chief Extension Officer. The Extension Division is also responsible for control of stray cattle and provides land tillage services. Years ago when the Soils and Water Conservation Unit was still in existence, the Agriculture Extension Division assisted them in successfully transferring soil conservation technologies to farmers.

226. The Lands Division is responsible for the management and control of all Government lands, including land reclamation, land use and the sub-division of land. Since a little less than half of the land is government owned this Division has a key role in determining the conversion of land to non-agricultural uses.

227. The Fisheries Division has responsibility for development of the fisheries sub-sector, monitoring fish stocks and marine resources, as well as a regulatory role in policing fishing practices. The Division is given powers to restrict fishing in certain areas and to preserve habitats, flora and fauna, natural beauty or shipwrecks in marine areas. These powers however, have not been exercised to any large extent due to inadequate resources.

Ministry of Works and Housing

228. Public Works Department is responsible for roads and drainage structures throughout the country. As such, the Department can have considerable influence on sedimentation management as part of road construction and maintenance and the management of flood waters. The Director of Public Works is also responsible for the Beach Protection Act, which is supposed to prevent the unauthorized removal of material from beaches or foreshores and for granting permits where permission is approved. However, it has no control over how the removal is carried out and is not able to regulate the quantities removed.

Ministry of Tourism, Economic Development, Investment & Energy

229. The Ministry has responsibility for the Ministry Headquarters, St. John's Development Corporation, Antigua and Barbuda Tourism Authority, Overseas Tourism Offices, Tourism Corporation, Deep Bay Development Corporation, Antigua Isle Limited, new Port (Antigua) Limited, Corbkinnon Limited, Antigua pier Group Ltd., Beach Protection, Vendors, National Parks Authority, Antigua & Barbuda Hospitality, Training Institute, Heritage Sites, Botanical Gardens, Citizen by Investment Unit,

Antigua & Barbuda Investment Authority, Petrocaribe, PDV Caribe Antigua and Barbuda Ltd. And West Indies Oil Company Ltd.

230. Economic Development Planning Unit, whose functions are: i) to formulate and implement the programmes for sustainable development with a novel approach to managing and directing the process of national socio-economic development; ii) to enunciate sound economic policy, exercise strategic planning and provide reliable statistical indicators to inform the decision-making and advise the Minister; iii) to undertake economic policy review and formulation to ensure economic stability; iv) to draft new economic policies as directed by the Cabinet, with ensuing inter-sectoral partnerships and appropriate linkages in the process; v) to translate existing policies into projects and programmes; vi) to manage the project development cycle from the perspective of financial resources, allocation, use and accountability; vii) to ensure successful project preparation and implementation through the collaborative efforts of the public and private sectors and the wider civil society; and viii) to develop and implement a sound national statistical database to facilitate the economic policy and planning initiatives.

231. The National Parks Authority (NPA) is a financially self-sufficient statutory body with a Steering Committee of Directors established through the National Parks Act. This act provides procedures for the designation of any area of land or water as a national park. The NPA is mandated to 'preserve, protect, manage and develop the natural physical and ecological resources and the historical and cultural heritage of Antigua and Barbuda'. The NPA has responsibility for managing the Nelson's Dockyard (NDNP). This is focused on providing a world-class tourism destination based on the historical and natural resources within the park area. In addition to the NDNP, the NPA also manages Greencastle NP, Devil's Bridge NP and Fort Barrington NP. Generally, the country's natural landscape is largely unprotected.

232. Energy is the responsibility of the Minister of Tourism, Economic Development, Investment and Energy. This mandate under this Ministry has responsibility for articulating the Antigua and Barbuda National Energy Policy and the Sustainable Energy Plan while coordinating and monitoring their implementation.

Ministry of Legal Affairs, Public Safety, Immigration and Labour

233. Attorney General Office is charged with the legal affairs of the Government. Their responsibilities include the ministry of legal affairs, which is responsible for drafting and reviewing legislation, national security and justice. The portfolio of this office includes Constitutional Affairs, Legislature, Law, Director of Public Prosecutions (DPP), Law Reform, Legal Affairs, International Treaties, Courts, Registrar & Provost Marshall, Supreme Court, Magistrates, Industrial Court, Land and Commercial Registry, Intellectual Property, Legal Aid Advice Centre and the Caribbean Court of Justice.

Ministry of Public Utilities, Civil Aviation & Transportation

234. The Water Division of APUA has legal control over all water resources in the country and is mandated to provide supplies of water to meet the municipal needs of the country. However, agricultural needs are not dealt with under the Act and are therefore not officially part of its remit. At times of drought, wells and reservoirs have been utilized for municipal supplies to the detriment of agricultural needs. The Division has made some concessions to agricultural water needs but there has been no active development of water supplies specifically for agriculture by the Authority. The Division is responsible for water quality testing and routinely tests water for residual chlorine levels and sediment. The Planning and Development section of the Division is responsible for hydrological studies, planning and digging of wells and building of dams. A water development plan that encompasses both municipal and agricultural needs does not currently exist although its requirement is recognised. Furthermore, the Water Division has no mandate or resources to manage the watersheds which supply the water.

235. The Electricity Division of APUA is a department within the Antigua Public Utilities Authority (APUA), a quasi-government establishment. This department coordinates the installation of electrical services to most of the island. Other services include:

- Response to electrical faults on APUA's electrical network.
- The construction, maintenance and expansion of the nation's electrical transmission and distribution network.

In 2008, APUA installed a 30 mega watt Power Plant at the Crabbs Peninsula. This plant was commissioned in August of 2011. The mission of the division is to provide customers and the public in general, with electrical power services that are safe, of international quality, environmentally friendly, reliable and affordable.

Non Governmental and Community Based Organizations

236. Non-Governmental Organizations (NGOs) have played an important role in the last ten years or so in drawing public attention to a number of important environmental issues, such as sand mining, solid waste management and the destruction of wetlands.

237. The Environmental Awareness Group (EAG) has consistently raised issues of sustainable natural resource management and has become involved in efforts to improve community management of coastal natural resources, providing training to stakeholders in practices that conserve reefs, off-shore island ecosystems and mangrove wetlands. EAG has also been active in improving education of teachers and students with respect to environmental matters including coastal issues.

Private Sector

238. The Antigua Hotels and Tourist Association is a private independent body aiming to improve the tourism product in Antigua and Barbuda. The primary function of the association is to market the hotels and products of their members both locally and internationally. The association is managed by a board, with and elected president,

which rotates every two to four years via a democratic voting process. The association also works in collaboration with the Ministry of tourism on related projects.

239. The Antigua Barbuda Cruise Tourism Association is a non-profit organisation, which is funded by its members, by means of membership dues. The Association was formed to enable cruise related stakeholders to act as one body when conducting discussions with the Government and cruise lines.

National Coordinating Mechanism for Environmental Conventions

240. The Government has decided the GEF projects will be managed by National Executing Agency, the Environment Division and assisted by other agencies via structures such as Technical Advisory Committees and Project Management Committee. This approach will allow for the projects to meet the GEF 5 - 10% project management cost requirement established by the GEF as well as consultation and project sustainability. This structure will be utilized in the management of GEF projects funded under GEF 5 and 6.

241. The overall project management structure for GEF projects are: Project Manager and Deputy Project Manager (Government Co-financing). The overall tasks of these persons are to ensure that the projects are progressing as per the log frame, workplan and budget. They will be responsible for the financial management of the project and all related reporting. They will also be responsible for linking project outputs with national government activities and priorities. The latter will include liaising with the Minister and the Cabinet to ensure that relevant policy and legislative actions are taken. This connection of the Project Management to policy makers will be via the Project Management Committee (PMC);

242. The Project Management Committee (PMC) will be established to provide general oversight and guidance to the project, facilitate interagency coordination and monitor national-level activities. The PMC will be comprised of personalities representing key sector and institutions and will ensure the project fits within local, national, and international needs. The PMC will consist of at least five members. PMC will be comprise of personalities representing key sector and institutions and will ensure the project fits within local, national, and international needs. The PMC will be composed of: Permanent Secretary of the MoHE (Chair); Permanent Secretary of other relevant Ministries; Project Manager; Project Coordinator; A private sector representative from one of the co-financers, and; A member of the NGO community. There will also be representation of the Ministry of Finance. This representative is normally from the Budget Director's Office. Other representatives are the signatories of the accounts[39] and a secretary. The PS responsible for the Environment Division chairs the PMC. The PMC meets quarterly and the signatories to the accounts meet monthly. UNEP, as a member of PMC+, will participate physically in the PMC once per year to review work plans, budgets, implementation progress; to coordinate with other like projects and region and to provide strategic advice. Furthermore, UNEP will be invited to

[39] Signatories to accounts are normally the PS for Environment, the Deputy PS of another Ministry and the Project Manager.

review quarterly agendas, provide substantive input and be copied on quarterly minutes.

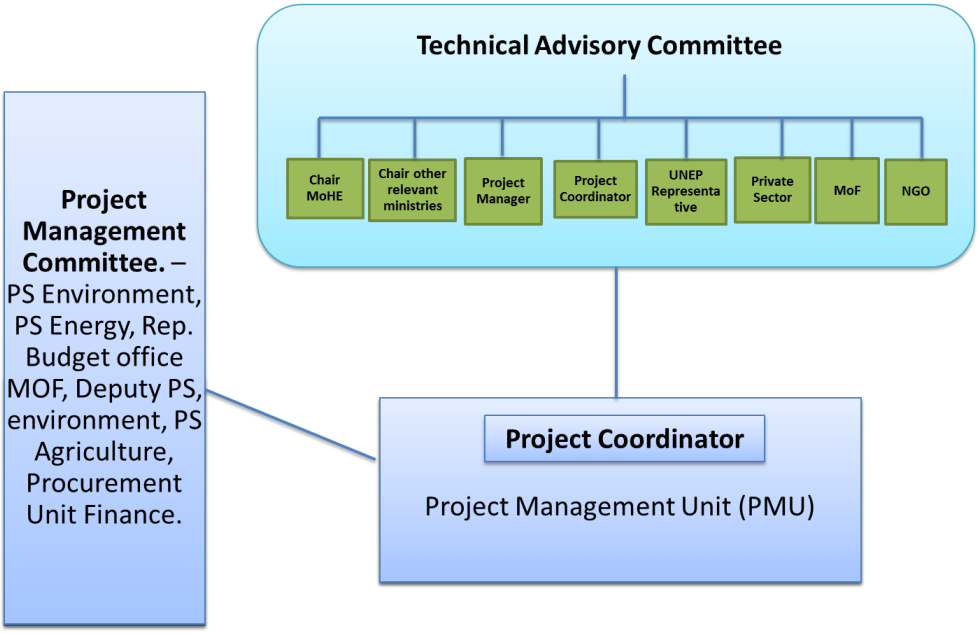
243. The Project Manager will report project progress, oversee project procurement and report to the PMC. The Project Manager prepares reports to the monthly and quarterly meetings as well as the agenda. The policy for procurement of goods and services is included within Appendix 13.

244. The project will have a project coordinator. The Project Coordinator (PC) will be responsible for the day-to-day operations of the Project. The PC will lead a Project Management Unit (PMU), which will consist of the technical officers that are working directly on the project. These officers will be hired directly by the project and some will be co-financing from the Government. The PMU will meet monthly to provide reports of each of its meetings to the Project Manager.

245. The PC and the PMU will seek technical guidance via consultation with a Technical Advisory Committee (TAC). The TAC will be established by the Ministry and will comprise of representatives of Government, Private sector as well as NGOs. The TAC is expected to be over 21 members who will select a chair from among them. The TAC will meet quarterly to provide advice and technical guidance on all GEF projects. They will also assist with the development of Terms of Reference (TOR's) for procurement activities as well as to evaluate proposals. The PMU provides secretarial support to the TAC.

246. A Public Awareness and Community Outreach Officer as well as a full time Procurement Officer will be procured jointly by the Projects being implemented by the Environment. The Public Awareness and Community Outreach Officer will report to the Project Manager and the Project Management Unit. The Procurement Officer will report to the Chair of the PMC and will be required to liaise with the Procurement Unit within the Ministry of Finance. Both these person will be paid for by the project

247. The project accounts will be managed by a dedicated project administrative assistance that is based in the accounts department of the Division. Private auditors who will be procured via competitive bidding process will audit the accounts.



+ UNEP

UNEP will participate as annually as a full member of PMC.

Figure 1. Project Management Arrangements

Execution of the Renewable Energy Component:

Features of the RE execution arrangement are that SIRF as the asset holder, using GEF, government and donor grant funds would administrate the facilities with an external advisory board's input. A technology provider would be engaged to install commission and operate the wind farm for an initial period of 5 years. Payment would be geared to production (Power Purchase Agreement between SIRF and APUA). Should it be desirable to have third party off-taker(s) the off-takers could pay an up-front fee to SIRF's equity and receive wholesale power plus a wheeling charge from APUA. APUA would be paid the wheeling fee to deliver the power to the third parties.

SECTION 5: STAKEHOLDER PARTICIPATION

248. The project will work collaboratively with stakeholders and beneficiaries across several sectors at the national and local level. Stakeholders were identified through consultation and are based on multi-institutional and multi-disciplinary approach at national and local project site level. Stakeholder participation and collaboration with beneficiaries includes farmers, land owners, CBOs, NGOs, surrounding communities, tourism industry partners and government ministries, agencies and local authorities.

249. Primary stakeholders to, and beneficiaries of, the project will be government agencies with responsibility for climate change related issues, biodiversity, sustainable forest management, land use, and biodiversity concerns, communities in local project sites, NGOs and CBOS with a focus on these issues, and resource users who will benefit from targeted training within the project. However, given that the project addresses protected areas and the generation of renewable energy in Antigua and of Barbuda; all communities can expect to benefit from this initiative. Similarly, because of the strong replication potential of this project, other island communities, in particular within the Caribbean, are potential beneficiaries and stakeholders. Throughout project implementation, emphasis is to be placed on ensuring and promoting active stakeholder participation. Management systems created and developed under the recently concluded SIRMM project will be replicated throughout the life of this project. This is viewed as a cornerstone of effective execution and a guarantor of the sustainability of project outcomes.

250. In Antigua and Barbuda, the project builds upon the fact that stakeholders and civil society have already advanced in developing and defining their roles in environmental management, and in making use of opportunities for contributing to decision-making processes in resources management and environment, through projects funded by international donor agencies. Although governmental management agencies may have viewed this development with some concern, successful initiatives through which stakeholders groups, NGOs and CBOs have developed good working relationships with government agencies and made significant contributions to the management of natural resources, have laid a good basis for greater partnering. This process of co-management needs to be supported as much as possible, for the long term good of both the stakeholders and appropriate resource management.

251. Several **government bodies** will be centrally involved in this project, including: Ministry of Health and the Environment, Ministry of Agriculture, Lands, Fisheries and Barbuda Affairs, Ministry of Works and Housing, Ministry of Tourism, Economic Development, Investment and Energy, Ministry of Legal Affairs, Public Safety, Immigration and Labour and the Ministry of Public Utilities, Civil Aviation and Transportation. Their respective mandates are described in Table 1 (Section 2.4) and Section 4.

252. **Non-Governmental Organizations** (NGOs) have played an increasingly important role over the last decade in drawing public attention to a number of important environmental issues, such as Biodiversity protection, forestry management and the destruction of wetlands. One NGO in particular is expected to participate actively in project execution. The Environmental Awareness Group (EAG), a national, voluntary, non-profit, non-governmental organisation, focuses on environmental education, awareness, and advocacy. The EAG is active in the promoting the development of policy frameworks that underpin sustainable use and management of natural resources values of and threats to natural resources, and to promote their sustainable use and management. The EAG also supports and undertakes natural resource conservation projects that develop a better understanding of the use and management of natural resources and include endangered species conservation, eco-tourism and training, wetlands conservation, community forestry, and environmental education.

253. With regards to the **private sector** as well as **resource use sectors**, it will be fundamental to project success to ensure that they understand from the outset that the key objective of SPPARE is to contribute to the demonstration of an integrated and self-sustaining approach to environmental stewardship in a Small Island Developing State. SPPARE specifically strives to enhance financing and management of protected areas through innovations in renewable energy capacity and arrangements in Antigua and Barbuda. This concept is fundamental to the MDGs, the CBD and the St. Georges Declaration as well as the Barbados and Mauritius PoAs. These stakeholders must be given the necessary tools and awareness to appreciate that this project will contribute to ensuring the sustainability of livelihoods and to providing for an adequate resource base (e.g. enhanced biodiversity and forestry management, viable landscape values, etc.) for sustained economic growth.

254. **Resource use and farmer communities** are a key stakeholder group given the need to address unsustainable practices as well as the fact that many members of these communities engage in activities across several sectors. These communities, for examples, often derive other income from activities such as farming, or work in the tourism industry. The project aims to provide targeted training to complement sustainable resource use practices. The farmer communities were actively engaged in the SIRMM project and were able to adopt sustainable agricultural practices. This project will provide further training to these individuals related specifically to invasive species and wildfire prevention.

255. In the **private sector**, key trades are related to tourism. The Tourism Sector established the Hotel and Tourist Association in the 1960s to enable hotel owners to present a unified voice when dealing with Government and unions. With the rise in environmental awareness in visitors, the HTA have increased their activities in this area. The hotels would be expected to play an important role in sensitisation of their guests to national and local environmental issues and needs, especially in relation to parks and sensitive areas. Of all stakeholders, Tour Guides are the most environmentally aware, and can play an important role in sensitization to project objectives and outcomes. However, with the influx of cruise tourist there is a need to ensure that emerging ecotourism attractions, such as the proposed Mount Obama National Park and the Wallings Forest, are properly managed and that considerations such as carrying capacity are addressed. Another group of stakeholders relates to the construction industry that is closely associated with tourism development. There will be several construction opportunities under this project and this sector will be actively involved to ensure that any developments are in line with the recently passed NPDP.

256. Stakeholder participation has been an integral part of the development of this Project and is now crafted carefully into its Outcomes and Outputs. Stakeholders participated actively in throughout the preparatory phases. In addition to targeted consultations with specific stakeholder groups, several events ensured wide-ranging stakeholders participation. An initial project consultation workshop was held in May 2014 and a Logframe Validation meeting followed in June 2014. Both events provided all stakeholders with an opportunity to review proposed design strategies and to share specific concerns or recommendations.

SECTION 6: MONITORING AND EVALUATION PLAN

257. The project will follow UNEP standard monitoring, reporting and evaluation processes and procedures. Substantive and financial project reporting requirements are summarized in Appendix 8. Reporting requirements and templates are an integral part of the UNEP legal instrument to be signed by the executing agency and UNEP.

258. The project M&E plan is consistent with the GEF Monitoring and Evaluation policy. The Project Results Framework presented in Appendix 4 includes SMART indicators for each expected outcome as well as mid-term and end-of-project targets. These indicators along with the key deliverables and benchmarks included in Appendix 6 will be the main tools for assessing project implementation progress and whether project results are being achieved. The means of verification and the costs associated with obtaining the information to track the indicators are summarized in Appendix 7. Other M&E related costs are also presented in the Costed M&E Plan and are fully integrated in the overall project budget.

259. The M&E plan will be reviewed and revised as necessary during the project inception workshop to ensure project stakeholders understand their roles and responsibilities vis-à-vis project monitoring and evaluation. Indicators and their means of verification may also be fine-tuned at the inception workshop. Day-to-day project monitoring is the responsibility of the project management team but other project partners will have responsibilities to collect specific information to track the indicators. It is the responsibility of the Project Manager to inform UNEP of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely fashion.

260. The Project Management Committee will receive periodic reports on progress and will make recommendations to UNEP concerning the need to revise any aspects of the Results Framework or the M&E plan. Project oversight to ensure that the project meets UNEP and GEF policies and procedures is the responsibility to the Task Manager in UNEP-GEF. The Task Manager will also review the quality of draft project outputs, provide feedback to the project partners, and establish peer review procedures to ensure adequate quality of scientific and technical outputs and publications.

261. At the time of project approval approximately 50% percent of baseline data is available. Baseline data gaps will be addressed during the first 18 months of project implementation. A plan for collecting the necessary baseline data is presented in Appendix 5. The main aspects for which additional information are needed are addressed by activities 1.1.2, 1.1.3, 1.2.2, 1.3.1, 2.1.1, 2.1.3, 2.1.5 – 2.1.7, 3.1.1, 3.1.2, 3.3.2 and 3.4.4.

262. Project supervision will take an adaptive management approach. The Task Manager will develop a project supervision plan at the inception of the project which will be communicated to the project partners during the inception workshop. The emphasis of the Task Manager supervision will be on outcome monitoring but without neglecting

project financial management and implementation monitoring. Progress vis-à-vis delivering the agreed project global environmental benefits will be assessed with the Steering Committee at agreed intervals. Project risks and assumptions will be regularly monitored both by project partners and UNEP. Risk assessment and rating is an integral part of the Project Implementation Review (PIR). The quality of project monitoring and evaluation will also be reviewed and rated as part of the PIR. Key financial parameters will be monitored quarterly to ensure cost-effective use of financial resources.

263. The project will be reviewed or evaluated at mid-term (i.e. 24 months after project start). The purpose of the Mid-Term Review (MTR) or Mid-Term Evaluation (MTE) is to provide an independent assessment of project performance at mid-term, to analyze whether the project is on track, what problems and challenges the project is encountering, and which corrective actions are required so that the project can achieve its intended outcomes by project completion in the most efficient and sustainable way. In addition, it will verify information gathered through the GEF tracking tools. The review will be carried out using a participatory approach whereby parties that may benefit or be affected by the project will be consulted. Such parties were identified during the stakeholder analysis (see section 5 of the project document).The project Steering Committee will participate in the MTR or MTE and develop a management response to the evaluation recommendations along with an implementation plan. It is the responsibility of the UNEP Task Manager to monitor whether the agreed recommendations are being implemented. An MTR is managed by the UNEP Task Manager at DEPI. An MTE is managed by the Evaluation Office of UNEP. The Evaluation Office will determine whether an MTE is required or whether an MTR is sufficient.

264. An independent Terminal Evaluation (TE) will take place at the end of project implementation. The Evaluation Office of UNEP will be responsible for the TE and liaise with the UNEP Task Manager at DEPI throughout the process. The TE will provide an independent assessment of project performance (in terms of relevance, effectiveness and efficiency), and determine the likelihood of impact and sustainability. It will have two primary purposes: (i) to provide evidence of results to meet accountability requirements, and (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP and executing partners. The direct costs of the evaluation will be charged against the project evaluation budget. The TE report will be sent to project stakeholders for comments. Formal comments on the report will be shared by the Evaluation Office in an open and transparent manner. The project performance will be assessed against standard evaluation criteria using a six point rating scheme. The final determination of project ratings will be made by the Evaluation Office when the report is finalised. The evaluation report will be publically disclosed and will be followed by a recommendation compliance process." An independent terminal evaluation will take place at the end of project implementation. The Evaluation and Oversight Unit (EOU) of UNEP will manage the terminal evaluation process. A review of the quality of the evaluation report will be done by EOU and submitted along with the report to the GEF

Evaluation Office not later than 6 months after the completion of the evaluation. The standard UNEP Terms of Reference of the Mid Term Evaluation/Review and Terminal Evaluations will be adjusted to the tailored needs of the project.

265. The GEF tracking tools are attached as Appendix 23. These will be updated at mid-term and at the end of the project and will be made available to the GEF Secretariat along with the project PIR report. As mentioned above the mid-term and terminal evaluation will verify the information of the tracking tool.

SECTION 7: PROJECT FINANCING AND BUDGET

7.1. Overall project budget

Table 15. Summary GEF budget for the four years of project implementation.

Components	Amount Requested from GEF	2015	2016	2017	2018
Component 1	50,000.00	50,000.00	0.00	0.00	0.00
Component 2	616,667.00	12,000.00	582,757.75	21,909.25	0.00
Component 3	1,260,752.00	1,092,752.75	80,000.00	75,999.25	12,000.00
Component 4	586,606.00	0.00	220,000.00	186,749.25	179,856.75
PMC	125,701.00	31,425.25	31,425.25	31,425.25	31,425.25
Totals	**2,639,726.00**	**1,186,178.00**	**914,183.00**	**316,083.00**	**223,282.00**

Table 16. Project Management Costs for GEF Funds

Project Management Costs						
UNEP Budget Lines		**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Total**
1100 1102	**Project Personnel** National Project Coordinator	15,000.00	15,000.00	15,000.00	15,000.00	60,000.00
1300 1301	**Administrative Support** Administrative Assistant	6,425.25	6,425.25	6,425.25	6,425.25	25,701.00
3300 3302	**Meetings/conferences** Stakeholder Technical Meetings	2,500.00	2,500.00	2,500.00	2,500.00	10,000.00
4100 4101	**Expendable equipment** Office supplies	1,250.00	1,250.00	1,250.00	1,250.00	5,000.00
5200 5201	**Reporting Costs** Reports	1,250.00	1,250.00	1,250.00	1,250.00	5,000.00
5500 5503	**Evaluation** Audit Reports	5,000.00	5,000.00	5,000.00	5,000.00	20,000.00
TOTAL		**31,425.25**	**31,425.25**	**31,425.25**	**31,425.25**	**125,701.00**

7.2. Project co-financing

266. A total of US$ 7,980,000.00 is committed as co-financing from various sources. The sources of these commitments come from other GEF projects, GEF Agency, bilateral sources, multilateral sources, the Government of Antigua and Barbuda, the private sector and the utility company. The sources of co-finance are described in terms of UNEP budget lines in Appendix 2. The sources and type of co-financing mobilized is indicated in the table below.

Table 17. Co-financing by source and type.

Components	Total Co-financing	Co-financing	Source	Co-financing	Source
		In – Kind		Cash	
Component 1	50,000			50,000	Environment Division
Component 2	380,000	30,000	UNEP	350,000	Environment Division, APUA
		TBC			APUA, Public Works Department
Component 3	6,000,000	TBC	APUA, CTCN, IRENA	6,000,000	Ministry of Finance
Component 4	1,300,000			1,300,000	APUA (Water Levy)
		TBC	APUA		
PMC	250,000	250,000	Environment Division		
Totals	**7,980,000**	**280,000**		**7,700,000**	

7.3. Project cost-effectiveness

267. Effective mainstreaming depends on addressing the Antiguan concerns, with respect to biodiversity management, sustainable forestry management and the supply of renewable energy, in relevant and realistic ways. In the first instance, this project is expected to be cost-effective as a result of its ability to bring together various stakeholders from the environment, agriculture, forest, national economic development and energy sectors. The representatives from these different Ministries will be contributing to the project by participating in the Project Steering Committee and in certain instances the Project Management Unit. This will allow them to bring their own different perspectives, skills and experiences to ensure that the environmental management agenda is addressed in ways that reflect the experience, interests and concerns of the widest possible range of stakeholders.

268. The involvement of different Ministries, government departments and other relevant partners (see Section 2.5) will maximize the technical cost effectiveness of the activities. This will be demonstrated in the realistic appreciation of trade-offs between conservation and energy generation. The project aims to employ renewable energy in support of the protected areas systems pilot and the participation of the utility company will ensure that the technical capabilities are available for the smooth mainstreaming of these activities.

269. Two other major elements of this project are (i) the establishment of a National Park and (ii) the enhancement of forest ecosystems. The involvement of NGOs and local community-based organizations, in each respective component, will ensure that the outputs reflect the realities of the communities and by extension the entire nation. In addition to this, the involvement of these bodies will provide an appropriate cost effective framework for linking formal and informal sectors. The involvement of these groups will play an important wider role in ensuring that project outputs become more widely known and recognized in Antigua and Barbuda, both by the public and by those involved in developing and implementing policy.

270. Finally, the cost-effectiveness of the project is guaranteed by the involvement of the Environment Division as the Executing Agency. The Division has had much experience in managing UNEP GEF projects and has been extremely successful in project execution. In addition to this, their co-funding commitment ensures that the administrative, financial and technical oversight of the project is strengthened.

271. As mentioned previously, the intervention logic of this project's design breaks new grounds. Like most SIDS, Antigua and Barbuda has very limited capacity to finance and support biodiversity and ecosystem stewardship based on government funding and unpredictable international funding. The GEF investment will innovatively and concurrently address a number of environmental priorities through the SIRF Fund's ability to receive profits from renewable energy systems and increase revenue for Protected Areas System. The project will pilot, implement and scale up a unique stream of revenue generation for the SIRF Fund. Overall, the baseline would see Antigua and Barbuda unable to significantly increase or enhance their biodiversity rich Protected Areas and Forest systems work, which in turn would likely see a continuing decline in its natural resources.

272. The typical life-span of interventions by projects follows the usual four year term. After the four-year period, the benefits fall away due to the government's inability to take up the slack left by the project. One of the distinguishing features of this project is that it will invest in RE assets, which should in turn raise revenue to be used to conduct future activities. Unlike the four-year life cycle of projects, renewable energy assets have a 10-20 year life cycle. This will create predictable funding for the long-term. See Section 3.8 on Sustainability

Appendix 1 and 2- separate files

Appendix 3: Incremental cost analysis

The incremental costs and benefits of the proposed project are summarized in the following incremental cost matrix. The incremental cost of the project, USD$ 11,414,025 is required to achieve the project's global environmental benefits. Of this amount USD$ 2,514,025 (representing 22 %) is being requested from GEF. The remaining amount of USD$ 8,900,000 (78 %) of the total cost will come from the Government of Antigua and Barbuda and other national and international donors. The figure includes both in-kind and cash contributions.

Component	Baseline (B)	Alternative (A)	Increment (A-B)
Component 1. Development of Sustainable Island Resource Financial Plan			
OUTCOME 1 Revenue for protected area systems increased by $2million annually	• A financial strategy for the implementation of the Legislation and the management of protected areas needs to be in place. Presently this is not the case.	• The SIRF Fund Business Plan for the implementation of the Legislation and the management of Protected areas is developed	
Output 1.1 Business Plan for the Systems of Parks and the Legislation	• The Environmental Legislation is presently being reviewed in the Ministry of Legal Affairs. The cost associated with its implementation is not available as yet. • Funding for environmentally related projects in the country comes from projects and the central government.	• The costs associated with the implementation of the legislation and systems of parks quantified • The business strategy to support the system of parks and the implementation of the legislation is drafted	Total Cost $100,000 Cost to GEF $50,000 Co-financing $50,000
Component 2. Pilot expansion of Sustainable Island Resource Protected Areas: Mount Obama National Park			
OUTCOME 2 Improved management effectiveness of new protected areas (1,719ha)	• There is a need to establish a model-protected area for effective management. Of the officially declared protected areas none presently fit these criteria.	• A model managed protected area is established. • The management plan outlines the means by which it will accomplish financial self-sustainability	
Output 2.1 Obama National Park (NP) gazzetted and sustainably managed	• MONP is only a proposed protected area and does not have a biodiversity management or monitoring plan for the area. • The MONP also lacks a public awareness and education strategy. • The funding for activities in the MONP is presently uncoordinated.	• Instrument presented to Parliament requesting official declaration of the area • A comprehensive biodiversity management and monitoring plan is developed • A public awareness and education strategy is developed • A business strategy to support the park is developed	

Component	Baseline (B)	Alternative (A)	Increment (A-B)
Output 2.2 Financial sustainability system piloted At MONP	• The management of protected areas is presently funded by the Central Government. There is a lack of dedicated source of financing to address this. • An interpretation centre is needed at the MONP. • The MONP lacks a marketing strategy. • There is no protected areas window in the SIRF Fund	• Sources of financing for protected areas identified • Construction of a park headquarters and other supporting infrastructure at the site A marketing strategy to be developed • The guidelines for a protected areas window drafted and submitted to the SIRF Fund	Total Cost $996,667 Cost to GEF $616,667 Co-financing $380,000
Component 3. Renewable Energy in support of Protected Areas Systems Pilot			
OUTCOME 3. At least 100,000 tonnes of CO2 equivalent emissions avoided as direct impact of the pilot with immediate plans for 1,000,000 tCO2.	• A considerable amount of CO_2 emissions will be avoided as a direct impact of the pilot. APUA has signed a LOI to purchase the power that is generated from the establishment of a RE plant.	• An IPP agreement to purchase the power that is produced to be signed between APUA and the SIRF Fund	
Output 3.1.1 -Financial and Technical Feasibility for the Pilot phase -Feasibility and Environmental Impact Assessment -Renewable energy dynamic fluctuations and grid integration - (SFM) -Grid interconnection	• Wind studies have been done in the Crabbs site and an EIS has been conducted there as well.	• Financial and technical feasibility studies to be completed • Environmental impact assessment also to be conducted for the identified sites	
Output 3.2 Capacity Building on grid interconnection and control of Reverse Osmosis as dump load	• Regarding grid interconnection and control, capacity building needs to be addressed. There is already a fiber optic infrastructure in place to network substations.	• Capacity building conducted on grid interconnection and control • The SCADA software to be installed and the technicians trained in its use	
Output 3.3 Policy and regulation for feed-in by SIRF as Power Producer to APUA	• A LOI and a co-finance letter from APUA have been signed regarding policy and regulation.	• PP agreement covers Policy and regulation focusing on opportunities to scale up	Total Cost $7,260,752 Cost to GEF $1,260,752 Co-financing

Component	Baseline (B)	Alternative (A)	Increment (A-B)
Output 3.4 Feasibility study for 10 to 20 MW wind power integration with storage of nominally 10MWh	• In anticipation of generating wind power integration with storage, preliminary studies have been carried out using RETScreen. • The pumped hydro study also provides useful information for this.	• Full costing of scale up to be known including ideal energy mix	$6,000,000
Output 3.5 Initial pilot installation >1 MW wind power installed with ~1 MWh modulated reverse osmosis	• The utilization of RE to generate power that will feed into the grid has been long discussed and considered. Presently no utility grade RE is been fed into the grid.	• RE plant is installed	
Component 4 Enhancement of Forest Systems			
OUTCOME 4 Fires reduced nationwide by 20% by project end.	• Fires have consumed forest ecosystems in the past; a national wildfire prevention strategy does not exist. • Related public announcements are currently still being aired on local media.	• Awareness of approaches to fire prevention increased	
Output 4.1. Stem degradation of forest ecosystems: Obama Nat'l Park Watershed , inclusive Wallings Forest Reserve through nationwide fire prevention initiative	• Attempts have been made to stem the degradation of forest ecosystems, however the fire prevention initiatives that were implemented have not been successful.	• Implementation of fire prevention demonstrations to important target audiences	
Outcome 4.2 Restoration efforts and avoided degradation lead to CO_2 savings	• Considerable CO_2 savings is projected through restoration efforts. Previous knowledge has proven that funding for reforestation is inadequate. • No forest restoration efforts in place.	• 800-1200 trees per hectare target density for 160ha, achieved • Commencement of National Watershed Strategy	Total Cost $1,816,606 Cost to GEF $586,606 Co-financing $1,300,000

Appendix 4: PROJECT RESULTS FRAMEWORK

Project Strategy	Indicators	Baseline	Mid Term Targets	End of Project Targets	Sources of Verification	Risk and Assumptions
Project Objective: Enhanced financing and management of protected areas through innovations in renewable energy capacity and arrangements	BD METT Tracking Tools and Financial Sustainability Scorecard. CC - Investment in Renewable energy technologies increased GHG Emissions avoided, SFM – Good management practices in forests.	METT Assessment Score - 28 Financial Sustainability Scorecard – 11 LOI signed. Agreement for 6000 MWh being negotiated. No forest restoration efforts in place in the target areas.	METT Assessment Score - 32 Financial Sustainability Scorecard – 35 By end of Year 1 APUA will sign PP Agreement with the SIRF Fund. By Mid Year 2 technical study for scale up will be completed. Specific target restoration areas identified, nurseries established, work plan developed and monitoring system in place. Wildfire prevention strategy developed.	METT Assessment Score - 40 Financial Sustainability - 75 Investment in Renewable energy technologies increased by $4.5M GHG Emissions avoided, 100,000 Tonnes of CO2 with scale up to 1MtCO2 near term. Good management practices applied in 3,502 hectares forests and by relevant economic actors (Antigua Public Utilities Authority). Wildfire induced invasives decreased in and around protected areas.		
COMPONENT 1. Development of the Financial Strategy for the implementation of the Legislation and the Management of Protected areas						

OUTCOME 1 Revenue for protected area systems increased by $2million annually	The SIRF Fund Business Plan is submitted by the SIRF Fund Board for approval by the end of Year 1	SIRF Fund is created under the Finance Administration Act. No financial strategy in place. The Legislation has not yet been passed. Protected areas are funded by the Central government	The business plan is approved by Cabinet. The financial business plan is adopted by the SIRF Fund Board	The SIRF Fund begins to accept applications for funding and making small disbursements to cover 10% of recurrent costs	Cabinet minute indicating approval; Business Plan Document; Minutes of SIRF Board indicating strategy implementation. Applications to the SIRF Fund	**Risk:** Legislation is not passed **Assumption**: Consultations for the strategy and supporting legislation generate required support
Output 1.1 Business Plan for the Systems of Parks and the Legislation	By end of year 1 costs associated with the implementation of the legislation and system of parks quantified	Legislation implementation not costed	All strategies and policies to be funded under the SIRF are reviewed, approved and costed	The SIRF Fund begins small disbursements to cover 10% of recurrent costs	Minutes of consultation, Budgets and supporting work plans for parks and other areas identified	**Risk**: All costs not accurately assessed due to external factors such as climate change
	By first quarter of Year 1 the business strategy to support the system of parks and the legislation is drafted	Funding unco-ordinated. Comes from projects and the central government	Financial projections prepared and validated and incorporated in business plan	Financial projections prepared and validated	SIRF Fund Business Plan Document	**Assumption**: Consensus established for the SIRF Fund to be self-sustaining financing mechanism for Environment

COMPONENT 2. Pilot of Sustainable Island Resource Protected Areas – Mount Obama National Park						
OUTCOME 2 Improved Management Effectiveness of new Protected Areas.	• Increased financial sustainability of Mount Obama National Park • METT Tracking Tools and Financial sustainability Scores.	No model of managed protected area exists Funding levels inadequate METT Assessment Score - 28 Financial Sustainability Scorecard - 11	• Conservation areas zone. • Interpretation Centre construction begins • Management plan developed and implementation begun METT Assessment Score - 32 Financial Sustainability Scorecard - 35	50% of the implementation of the Management plan will be funded by Park receipts and the SIRF Fund by the beginning of Year 4 METT Assessment Score - 40 Financial Sustainability - 75	Management Plan document, Copy of DCA Approved Zoning Plan for MONP, Applications to the SIRF Fund, Park statistics and audited financial reports	**Risk**: Delay in required approvals

Output 2.1 Obama National Park (NP) gazzetted and sustainably managed	• Instrument for gazzettement of NP developed for parliamentary approval by middle of Year 2 • Threats from farming and grazing as a result of agricultural expansion decreased by year 2 (measured by METT Tracking Tool)	• Park is not officially declared. • No biodiversity management or monitoring plan for the area • No public awareness and education strategy • METT Assessment Score - 28 1.	• Legally declared as a protected area • A Comprehensive Biodiversity Management and monitoring plan for the MONP developed by Year 3 • Baseline established for public awareness • Education and public awareness strategy to be developed by end of Year 3 • METT Assessment Score - 32: 1.	Legally declared as a protected area. A Comprehensive Biodiversity Management, enforcement and monitoring plan for the MONP implemented Education and public awareness increased by 20% over the baseline METT Assessment Score - 40 1.	• Gazetted copy of legislation • Education and public awareness materials	
	By first quarter of Year 1 the business strategy to support the system of parks and the legislation is drafted	Funding uncoordinated. Comes from projects and the central government	Financial projections prepared and validated and incorporated in business plan	Financial projections prepared and validated. Commence implementation of biodiversity management and monitoring plan Protected Area regulations in place to control land use and activities	• Business Plan Document	

Output 2.2 Financial sustainability system piloted At MONP	• Sources of financing for protected areas identified by Year 1 • Construction of park headquarters/ interpretation center and other infrastructure begins by Year 1	• No dedicated source of financing exists • No interpretation center exists	• Dedicated revenue streams quantified. Green card product being piloted • Construction of the Interpretation Centre begins	• Green card product in operation collecting park fees and covering 10% of MONP's recurrent costs • Interpretation Centre is accepting visitors and infrastructure in place	• Vendor agreement. Consultant report on revenue streams • Project manager reports	Risk: Delays in construction due to weather and other events Assumption: Timely delivery of road and other infrastructure by the government
	• Marketing strategy and collaterals ready for deployment by the middle of year 2 • Guidelines for Protected Areas window drafted and submitted to the SIRF Fund Board	• The park is not marketed at all • No protected areas window exists	• Initial advertising of the MONP for the next tourist season. • Guidelines for protected areas window submitted to the SIRF Fund Board for approval	• MONP tour packages being sold to internal and external tour operators • Increase of tourist visitations to the site by 20% • Protected Areas window accept one application (as minimum)	• Marketing collaterals. Tour packages documentation from internal and external tour operators • Policy guideline approved by the SIRF Fund Board. MONP application document	Assumption: The SIRF Fund has financial capacity to begin disbursement
OUTCOME 3		LOI signed.	Begin negotiations	Negotiations for scale	Copy of signed PP	**Assumption**: Board and

At least 100,000 tonnes of CO2 equivalent emissions avoided as direct impact of the pilot with immediate plans for 1,000,000 tCO2.	Avoided emissions of CO2	Agreement for 6000 MWh being negotiated	for scale up By end of Year 1 APUA will sign PP Agreement with the SIRF Fund By Mid Year 2 technical study for scale up will be completed	up are complete. Reduction of 100,000 tons of CO2 emissions by project end as indicated through GHG inventory calculations	agreement. Technical reports	govt policy do not change
Output 3.1.1Financial and Technical Feasibility for the pilot phase -Feasibility and Environmental Impact Assessment -Renewable energy dynamic fluctuations and grid integration -Reverse Osmosis as dump load - (SFM) -Grid interconnection	By end of Year 1 relevant feasibility studies identified	Wind studies conducted. EIS conducted for Crabbs. Pumped hydro study conducted and recommends sea water as the first option	All technical studies are completed	N/A	Technical reports and EIS reports	**Risk**: Delay in placement of wind equipment on Mc nish and other sites **Risk:** Feasibility is not positive **Risk**: Proximity of RE installation to Important Bird Areas
Output 3.2 Capacity Building on grid interconnection and control of	Technical capacity enhanced	Process of systems control is manual. Fiber optic infrastructure in	By end of year 1 software installed and training conducted on SCADA	N/A	Invoices, screen shot, training report	**Assumption:** APUA provides several technicians to be trained and maintains documentation of the

Reverse Osmosis as dump load		place to network substations	By middle of Year 2 SCADA is part of APUA's generation operations			product and continues to upgrade SCADA **Risk**: Software integration or installation issues
Output 3.3 Policy and regulation for feed-in by SIRF as PP to APUA	Necessary agreements in place	Letter of intent. Co-finance letter	By end of Year one APUA Board signs PP Agreement with SIRF Fund with an opportunity to scale up Signed PP agreement between the Fund and APUA	Power Purchase Agreement between SIRF Fund and APUA been implemented	Letter of approval of policy by APUA Board, Signed PPA with APUA	**Risk:** Delay due to new parliamentary term **Risk**: Compatible Government Lands are not made available for siting of RE
Output 3.4 Feasibility study for 10 to 20 MW wind power integration with storage of nominally 10MWh	By end of Year 2 the full costing of scale up known including ideal energy mix	Preliminary business done using RETScreen and the Pumped Hydro study	Feasibility study completed with financing options	Agreement with APUA to proceed with scaling up	Letter of approval of policy by APUA Board, Signed PPP with APUA	**Risk:** Competition for upscaled investment in RE from developers. **Risk**: High level of RE adoption by residents and businesses
Output 3.5 Initial pilot installation **>1 MW wind power installed with ~1 MWh modulated reverse osmosis**	By the end of Year 2 RE plant is installed	No utility grade RE is been fed into the grid. Pumped Hydro study proves installing pumped hydro not feasible at pilot stage	Renewable Energy plant installed	Plant operational	Certificate of Completion. Tender documents. Activity reports from APUA. Electricity purchased from APUA, Documented fossil fuel savings	**Risk:** Delay in supply due to manufacturer lead time **Assumption**: BOT or other financing to bridge GEF Funding gap **Risk:** Intensified storms due to climate change

OUTCOME 4 Fires reduced nationwide by 20% by project end.	Fire induced invasives reduced by 20% in the pilot area CO_2 avoided	No national wildfire prevention strategy exists. SIRMM public announcements still running No forest restoration efforts in place in the target areas	Baseline for awareness of fire prevention approaches established. Wildfire prevention strategy developed in consultation with relevant stakeholders incorporating the control of invasive species. .	Awareness of Approaches to wildfire prevention increase by 25%. Forested areas sustainability managed to achieve carbon sequestration goals of CO2 savings	KAP Survey report.	**Risk**: Dry weather patterns and lack of public awareness result in increased fires in forest ecosystems, increasing vulnerability to establishment of invasive **Assumptions**: Buy-in of other relevant agencies
Output 4.1. Stem degradation of forest ecosystems: Obama Nat'l Park Watershed , inclusive Wallings Forest Reserve through nationwide fire prevention initiative	Implement fire prevention demonstrations to important target audiences by mid Year 2	Fire prevention initiatives have not been successful	Baseline of fire occurrence established and tracked. Fire prevention seminars held for 50% of farmers in the project areas. Fire and Forestry Officers trained to deliver the training	Forestry/Fire Department report a 25% reduction in wildfires in the project areas over baseline.	Seminar reports, Certificates issued	**Assumption**: Strong buy-in from farmers in the area
Outcome 4.2 Restoration efforts and avoided degradation lead to Co2 savings	CO2 savings	Forested areas are partially degraded due to damage by fires and presence of invasive species	National Watershed Management Committee established.	Intervention area re-mapped to represent the efforts achieved. Forested areas sustainability managed to achieve carbon sequestration goals.	Inventory of trees. Reports from Watershed Committee meetings	**Risk**: Lack of collaboration among agencies

				Annual tons CO_2 savings achieved		
Output 4.2 Restoring the forest above watershed conservation areas: the Bendals Valley, Wallings and Blubber Valley through reforestation to stop erosion of soil into the reservoirs	CO2 savings	No forest restoration efforts in place in the target areas	Specific target restoration area identified, nurseries established, work plan developed and monitoring system in place to address the restoration plans by end of Year 1 25% of 800-1200 trees per hectare target density for 160ha, achieved by end Year 2.	Intervention area re-mapped to represent the efforts achieved. Forested areas sustainability managed to achieve carbon sequestration goals. Annual tons CO_2 savings achieved 100 % of 800-1200 trees per hectare target density for 160ha, achieved	Inventory of trees Watershed Committee minutes	**Risk:** Delay in payment of levy by APUA

Appendix 5: Workplan and timetable

ACTIVITIES	Year 1	Year 2	Year 3	Year 4
Component 1: Development of Sustainable Island Resource Financial Plan				
Outcome 1.1 Development of the Financial Strategy for the implementation of the Legislation and the Management of Protected areas				
Output 1.1 Business Plan for the Systems of Parks and the Legislation				
Strategy Refinement and Costing				
Activity 1.1.1 Prepare costed strategic plan for the Implementation of the Rio Conventions and other conventions supported by the GEF.				
Activity 1.1.2 Identification of the protected areas (both marine and terrestrial) to be funded and supported under the SIRF Fund and the projected operational cost				
Activity 1.1.3 Conduct a capacity needs assessment of agencies and NGOS involved in the implementation of the Conventions particularly the Aichi Targets for the CBD and outlined in the draft NBSAP;				
Business Plan/Strategy Finalization				
Activity 1.2.1. Prepare overall long and short term business strategy/plan for the Fund with projected income and expenses;				
Activity 1.2.2. Identification of the management and operation structure of the fund;				
Activity 1.2.3. Complete the Fundraising strategy for the fund and its institutional arrangements;				
Activity 1.3.1 Identification of Funding streams including financial products that could be developed and supported by the fund. This will include funding from the investments into renewable energy.				
Component 2: Pilot expansion of Sustainable Island Resource Protected Areas: Mount Obama National Park				
Outcome 2.1 Establish a model managed protected area that is financially self-sustaining				
Output 2.1 Obama National Park (NP) gazzetted and sustainably managed				
Activity 2.1.1 Prepare and/or compile Feasibility studies				
Activity 2.1.2 Develop instruments to allow for full legal protection of MONP				

ACTIVITIES	Year 1	Year 2	Year 3	Year 4
Activity 2.1.3 Preparation and implementation of a Comprehensive Biodiversity Management and monitoring plan for the MONP				
Activity 2.1.4 Revise the business plan and commence its implementation taking into account biodiversity sensitivities, ecosystem services and carrying capacity of the protected area.				
Activity 2.1.5 Develop an education and public awareness strategy				
Activity 2.1.6 Identify and prioritize human resource and technical capacity needs for park, in consultation with surrounding communities				
Activity 2.1.7 Identify research partnerships with regional and international academic institutions in thematic areas relevant to the MONP				
Output 2.2 Financial sustainability system piloted At MONP				
Activity 2.2.1 Design and construct the park headquarters/interpretation centre and other infrastructure at MONP.				
Activity 2.2.2 Develop a marketing and public relations strategy to promote the park to the international and local markets				
Component 3: Renewable Energy in support of Protected Areas Systems Pilot				
Outcome 3 At least 100,000 tonnes of CO2 equivalent emissions avoided as direct impact of the pilot with immediate plans for 1,000,000 tCO2.				
Output 3.1.1Financial and Technical Feasibility for the pilot phase				
Activity 3.1.1 Update wind studies on Crabbs, Freetown and Mc Nish (at least three months)				
Activity 3.1.2 Conduct study of readiness of Grid to undertake upscale of RE				
Activity 3.1.3 Validate business model developed during PPG phase for input into power purchase agreement				
Output 3.2 Capacity Building on grid interconnection and control of Reverse Osmosis as dump load				
Activity 3.2.1 Develop technical capacity and knowledge base to enhance grid interconnection and control				
Activity 3.2.2 Install SCADA at APUA Systems Control				
Output 3.3 Policy and regulation for feed-in by SIRF as PP to APUA				

ACTIVITIES	Year 1	Year 2	Year 3	Year 4
Activity 3.3.1 develop and finalize the PPA agreement and other potential agreement between the SIRF fund and the APUA; Enter into an agreement to provide electricity directly for Government agencies;				
Activity: 3.3.2 Create model PP and other financing models for APUA to use in subsequent agreements				
Output 3.4 Feasibility study for 10 to 20 MW wind power integration with storage of nominally 10 MWh				
Activity 3.4.1 Conduct feasibility (Land acquisition, EIA, Grid dynamics study, SCADA specification, GEO technical Studies, Civil engineering design, electrical engineering design, wind farm layout and hydro engineering design layout for up scaling to 20MW) and design model for RE around the grid				
Activity 3.4.2 Refine pumped-hydro report to reflect price cost of chosen locations				
Activity 3.4.3 Develop RFP for pumped hydro installation				
Activity 3.4.4 Identify potential list of contractors for pumped hydro and RE installation and obtain quotes for the upgrade				
Activity 3.4.5 Develop specs of RE assets and obtain quote for RE upgrade based on the ideal mix				
Output 3.5 Initial pilot installation >1 MW wind power installed with ~1 MWh modulated reverse osmosis				
Activity 3.5.1 Procure RE plant that delivers 1.5 MW of wind mill and/or solar power energy				
Component 4: Enhanced Forestry Management				
Outcome 4.1 Fires reduced nationwide by 20% by project end. Reduce associated invasive spread of Citronella grass in key watersheds and protected areas (3,052 hectares).				
Output 4.1. Stem degradation of forest ecosystems: Obama Nat'l Park Watershed, inclusive Wallings Forest Reserve through nationwide fire prevention initiative and targeted invasive control (Citronella grass) measures.				
Activity 4.1.1 Implement a public awareness strategy aimed at sensitizing key stakeholders about the value and impact of fire on watersheds and forest ecosystem				
Outcome 4.2 Restoration efforts and avoided degradation lead to CO_2 savings				

ACTIVITIES	Year 1	Year 2	Year 3	Year 4
Output 4.2. Restoring the forest above watershed conservation areas: the Bendals Valley, Wallings and Blubber Valley through reforestation to stop erosion of soil into the reservoirs				
Activity 4.2.1 Relevant agencies identified to participate in the National Watershed Management Committee for the management of the carbon sinks and watershed based on the EMPB and other legislation				
Activity 4.2.2 National Watershed Management Committee established				
Activity 4.2.3 Work Plan developed for the National Watershed Management Committee				
Activity 4.2.4 Identify area for restoration efforts within the Christian Valley Watershed (3,052 hectares) to enhance carbon stocks and watershed management				
Activity 4.2.5 Implement reforestation efforts within the Christian Valley Watershed where appropriate practices for fire prevention can be implemented. Lessons learnt and best practices will be captured used to guide future resource allocation.				

Appendix 6: Key deliverables and benchmarks

Component	Deliverables	Benchmarks
Component 1. Development of Sustainable Island Resource Financial Plan		
OUTCOME 1 Development of the Financial Strategy for the implementation of the Legislation and the Management of Protected areas	• The SIRF Fund Business Plan for the implementation of the Legislation and the management of Protected areas to be developed	• The business plan is approved by Cabinet and adopted by the SIRF Fund board • The SIRF Fund begins to accept applications for funding
Output 1.1 Business Plan for the Systems of Parks and the Legislation	• The costs associated with the implementation of the legislation and systems of parks to be quantified • The business strategy to support the legislation and the system of parks to be drafted	• All strategies and policies to be funded under the SIRF are reviewed, approved and costed • Financial projections prepared and validated and incorporated in business plan
Component 2. Pilot expansion of Sustainable Island Resource Protected Areas: Mount Obama National Park (MONP)		
OUTCOME 2 Establish a model managed protected area that is financially self-sustaining	• The implementation of the management plan to be funded by park receipts and the SIRF fund	• MONP is established as a model managed protected area
Output 2.1 Obama National Park (NP) gazzetted and sustainably managed	• Instrument to be developed for parliament • A comprehensive biodiversity management and monitoring plan to be developed • Education and public awareness strategy to be developed	• MONP legally declared as a protected area • Carrying capacity, ecosystem and technical assessments completed • Biodiversity management and monitoring plan implemented • Education and public awareness strategy implemented
Output 2.2 Financial sustainability system piloted At MONP	• Sources of financing for protected areas to be identified • Construction of park headquarters/interpretation centre and other infrastructure to begin • Marketing strategy and collaterals to be deployed • Guidelines for protected areas window drafted and submitted to the SIRF fund	• Dedicated revenue stream quantified • Interpretation centre accepting visitors and infrastructure in place • MONP tour packages being sold to internal and external operators • MONP making submissions to the protected areas window
Component 3. Renewable Energy in support of Protected Areas Systems Pilot		
OUTCOME 3. At least 100,000 tonnes of CO_2 equivalent emissions avoided as direct impact of	• PP agreement to be signed between APUA and the SIRF fund • Technical studies for scale-up to be done	• Negotiations for scale-up is complete • Reduction of 100,000 tonnes of CO_2 emissions

Component	Deliverables	Benchmarks
the pilot with immediate plans for 1,000,000 tCO_2.		
Output 3.1 -Financial and Technical Feasibility -Feasibility and Environmental Impact Assessment -Renewable energy dynamic fluctuations and grid integration - Reverse Osmosis as Dump load designed -(SFM) -Grid interconnection	• Financial and technical feasibility studies to be completed • Environmental Impact Assessment (EIA) also to be conducted for the identified sites	• Financial and technical feasibility studies completed • EIA conducted
Output 3.2 Capacity Building on grid interconnection and control of Reverse Osomosis as dump load	• Capacity building to be conducted on grid interconnection and generation control • The SCADA software to be installed and technicians to be trained in its use	• SCADA is part of APUA's operation
Output 3.3 Policy and regulation for feed-in by SIRF as Power Producer to APUA	• PP agreement covering Policy and regulation focusing on opportunities to scale up to be developed	• PP signed between APUA and the SIRF Fund and being implemented
Output 3.4 Feasibility study for 10 to 20 MW wind power integration with storage of nominally 10MWh	• Full costing of scale up to be developed that will include descriptions of ideal energy mix	• Feasibility study completed with financing options • Agreement reached with APUA to proceed with scaling up
Output 3.5 Initial pilot installation >1 MW wind power installed with ~1 MWh modulated reverse osmosis	• The operations of a RE plant to be developed	• RE plant installed and operational
Component 4 Enhancement of Forest Systems		
OUTCOME 4. Fires reduced nationwide by 20% by project end.	• The presence of invasive species to be reduced by 20% in the pilot area • The awareness of approaches to fire prevention to be increased	• Wildfire prevention strategy developed to incorporate the control of invasive species • The awareness of approaches to wildfire prevention increased by 75%

Component	Deliverables	Benchmarks
Output 4.1. Stem degradation of forest ecosystems: Obama Nat'l Park Watershed , inclusive Wallings Forest Reserve through nationwide fire prevention initiative	• Fire prevention demonstrations to be implemented to important target audiences	• Fire prevention seminars held for 50% of farmers in the project areas • Fire and Forestry officers trained to deliver the training • A 25% reduction in wildfires in the project areas reported by the Fire and Forestry departments
Outcome 4.2 Restoration efforts and avoided degradation lead to CO_2 savings.	• Fire resistant trees to be planted • Reforestation efforts conducted in 50% of affected watershed areas	• Watershed Committee to be established and a work plan developed • Forested areas sustainability managed to achieve carbon sequestration goals • Trees to be planted to achieve carbon sequestration goals

Appendix 7: Costed M&E plan

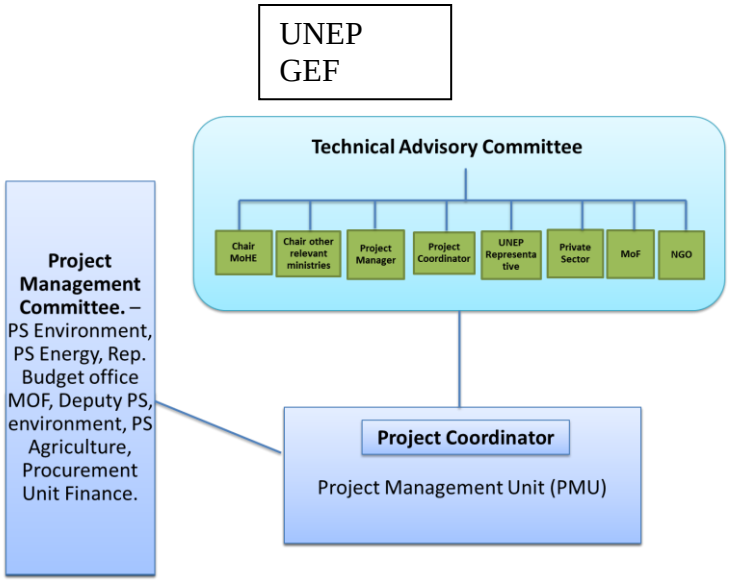
Type of M&E Activity	Responsible Parties	Budget (GEF & co-finance)	Time Frame
Inception Workshop	• Project Manager/Project Coordinator/Project Management Unit (PMU) • UNEP	$1,500.00	Within 2 months of project start-up
Inception Report	• Project Manager/Project Coordinator • PMU	None	1 month after project inception meeting
Measurement of project indicators (outcome, progress and performance indicators, GEF tracking tools) including baseline data collection	• Project Manager/Project Coordinator • PMU/Project Technical team • Consultants	$26,500.00	Outcome indicators: start, mid and end of project Progress/performance indicators: annually
Semi-annual Progress/Operational reports to UNEP	• Project Manager • Project Coordinator • PMU	None	Within 1 month of the end of reporting period i.e. on or before 31 January and 31 July
Project Management Committee (PMC) meetings	Permanent Secretary of the MoHE (Chair); Permanent Secretary of other relevant Ministries; Project Manager; Project Coordinator; A representative of UNEP; A private sector representative from one of the co-financers, and; A member of the NGO community. •	$6,000.00	Once a year minimum
Reports of PMC meetings	• Project Manager • Project Coordinator with input from PMU and other relevant stakeholders	None	Annually

Type of M&E Activity	Responsible Parties	Budget (GEF & co-finance)	Time Frame
Project Implementation Review (PIR)	• Project Manager • Project Coordinator • PMU • UNEP	None	Annually, part of reporting routine
Mid Term Review/Evaluation	• Project Manager • Project Coordinator • PMU • Domestic & External consultant(s) • UNEP	$18,000.00	At mid-point of project implementation
Terminal Evaluation	• UNEP • External consultant(s)	$25,000.00	Within 6 months of end of project implementation
Audit	• Project Executing Agency	$40,000.00	Annually
Project Final Report	• Project Manager • Project Coordinator • PMU	None	Within 2 months of the project completion date
Co-financing report	• Project Manager • Project Coordinator • PMU	None	Within 1 month of the PIR reporting period, i.e. on or before 31 July
Publication of Lessons Learnt and other project documents	• Project Manager • Project Coordinator • PMU	$9,800.00	Annually, part of Semi-annual reports & Project Final Report
Total M&E Plan cost		Total $126,800.00	

Appendix 8: Summary of reporting requirements and responsibilities

Reporting Requirements	Due Date	Responsibility of
Procurement plan (goods and services)	2 weeks before project inception meeting	Project Manager Project Coordinator
Inception Report	1 month after project inception meeting	Project Manager Project Coordinator
Expenditure report accompanied by explanatory notes	Quarterly on or before 30 April, 31 July, 31 October, 31 January	Project Manager Project Coordinator
Cash advance request and details of anticipated disbursements	Quarterly or when required	Project Manager Project Coordinator
Progress report	Half-yearly on or before 31 January	Project Manager Project Coordinator
Audited report for expenditures for year ending 31 December	Yearly on or before 30 June	Project Executing Agency
Inventory of non-expendable equipment	Yearly on or before 31 January	Project Manager and Project Coordinator
Co-financing report	Yearly on or before 31 July	Project Manager and Project Coordinator
Project Implementation Review (PIR) report	Yearly on or before 31 August	Project Manager and Project Coordinator, UNEP-GEF Task Manager (TM), Fund Management Officer (FMO)
Minutes of Steering Committee meetings	Yearly (or as relevant)	Project Manager Project Coordinator
Final Report	3 months after project completion date	Project Coordinator
Final inventory of non-expendable equipment		Project Coordinator
Equipment transfer letter		Project Manager and Project Coordinator
Final expenditure statement	4 months after project completion date	Project Manager Project Coordinator
Mid-term Review of Mid-term Evaluation	Midway through project	TM, Oversight Unit (EOU) (as relevant) Project Coordinator
Final audited report for expenditures of project	6 months after project completion date	Project Executing Agency
Independent Terminal Evaluation Report	6 months after project completion date	EOU

Appendix 9: Decision-making flowchart and organizational chart



Appendix 10: Terms of Reference – Project Personnel

TERMS OF REFERENCE FOR PROJECT MANAGER (PM)

The Executing Agency in collaboration with the Implementing Agency will appoint a suitably qualified person to provide primary support to the Project Unit for the implementation of the UNEP/GEF supported project "Sustainable Pathways – Protected Areas and Renewable Energy." The appointee will be based at the Environment Division, St. John's Antigua and Barbuda.

Functions

The Project Manager will:

- Provide technical support and administrative leadership to the national project team;
- In consultation with national partners, prepare national work plan and annual updates, including national budget allocations;
- Facilitate development and signing of the Letters of Agreement (LoA) with appropriate national partners to undertake activities specified in the work plan;
- Work in collaboration with different project partners from relevant national institutions for the implementation of national project components;
- Ensure efficient and effective communication between and amongst activities at national and global levels;
- Maintain close communication with national project team, Deputy Project Manager and Project Coordinator;
- Organize, conduct and participate in the Management Committee Meetings where the work plan and budget of national project component will be agreed by project partners;
- Serve as Executive Secretary and provide support to Project Management Committee in coordinating policy related project implementation at national level;
- Prepare project status reports for the Project Management Committee and ensure that project is executed in accordance with relevant UNEP/GEF and in-country requirements;
- Monitor the financial and budgetary status of the national components of the project
- Be responsible for approving and endorsing all financial documentation of the national components of the project;
- Ensure the delivery of in-kind and in-cash contributions for implementation of project components;
- Assist consultants in their work on project the implementation of project activities;
- Approve terms of reference and conduct hiring procedures for national consultants;
- Supervise nation project support administrative staff;
- Supervise the Project Coordinator and the Deputy Project Manager
- Oversee public relations for the project;
- Maintain good communication with the other relevant projects implemented in Antigua and Barbuda as well as with project stakeholders;
- Contribute relevant information of implementation to a project website;
- Work to ensure political and policy level buy-in.

Outputs

- Project Management Arrangements are in place and fully functional;
- At least four PMC meetings held each year;
- Scheduled project activities completed successfully;
- Project component implementation well coordinated;
- Project implementation maximizes synergies with other relevant projects in the country;
- Annual Operational Work plan and budget prepared by and PMU and submitted to PMC for approval on a timely basis;
- Quarterly and annual technical and financial reports prepared and submitted to PMC within stipulated deadlines;
- Transfers of GEF funds to sub-contactors efficiently accomplished;
- Project objectives successfully met;
- UNEP/GEF norms for monitoring and evaluation of project performance, output delivery and impact applied;
- Nationally contracted consultants and national project staff supervised;
- Effective public relations;
- Project activities are sustainably funded;
- Project web-site well maintained.

Relationships

The Project Manager will:

- Be accountable to Executing Agency for the achievement of project objectives, results, and all fundamental aspects of project execution;
- Maintain regular communication with the Project Management Committee (PMC);
- Maintain regular communication with the UNEP GEF Project Management Officer;
- Supervise the work of the Project Coordinator;

Qualifications

- Advanced university degree (Ph.D. or Master's) in ecology, environmental sciences, climate change studies and evidence of training in the field of Natural Resource Management (NRM);
- Minimum of five years experience in administration/management of national/international projects;
- Proven experience in project management and administrative management;
- Proven experience in facilitating meetings or discussions;
- Experience with GEF policies and procedures including logframe and similar project planning tools;
- Willingness and ability to travel frequently within country and to partner countries;
- Ability to work with senior government officials, research institutes, non-governmental organizations (NGOs), and local communities, etc.;
- Proven ability to manage budgets;
- Fluency in written and spoken English and strong communication skills.

TERMS OF REFERENCE FOR DEPUTY PROJECT MANAGER (DPM)

The Executing Agency in collaboration with the Implementing Agency will appoint a suitably qualified person to provide primary support the PM for the implementation of the UNEP/GEF supported project "Sustainable Pathways – Protected Areas and Renewable Energy." The appointee will be based at the Environment Division, St. John's Antigua and Barbuda.

Functions: To support the PM (see PM Functions)

Outputs: (see PM Outputs)

Relationships: (see PM relationships)

Qualifications: (see PM Qualifications)

TERMS OF REFERENCE OF PROJECT COORDINATOR (PC)

The National Executing Agency in collaboration with the UNEP will appoint a suitably qualified candidate to fill the post of National Project Coordinator of the SPPARE Project.

Functions

The Project Coordinator (PC) will:

- Provide technical and administrative leadership to the project team and act as the national representative of the project at regional and international levels;
- Observe agreed project management procedures in order to facilitate project implementation and ensure delivery of high quality outcomes;
- In consultation with local partners, prepare national work plans and annual updates including national budget allocations;
- Facilitate communications and linkages at local and national levels as well as with the Project Manager;
- Participate in PMC meetings and provide support as required;
- Organize national meetings, draft the agenda, and record decisions of national meetings;
- Coordinate work among Project Management Unit (PMU) staff and the national teams;
- Supervise the management of the project budget in accordance with the agreed work plan and approved disbursal of project funds, taking into account the decisions of project committees;
- Assist the Project Manager in developing monitoring and evaluation reports:
- Participate in the public relations activities for the project in the country;
- Maintain good communication with project partners and others in the country;
- Coordinate country provision of committed in-kind and in-cash contributions for the project.
- Coordinate the national scientific and technical team;

- Coordinate and contribute to the preparation and publication of national scientific and technical outputs from the Project;

Outputs

- Project management units fully functional;
- 12 Project Management Unit meetings held each year;
- At least 4 Technical Advisory Committee meetings held each year;
- Scheduled project activities completed successfully;
- Project activities well coordinated with other relevant projects at national level;
- Project implementation well coordinated with PMU;
- Annual operational plan including budget prepared and submitted on time to the Executing Agency;
- Quarterly and bi-annual technical (Progress Reports, Project Implementation Reports) and financial reports (GEF fund and Co-financing) prepared and submitted to the Executing Agency completely and timely;
- National, local and site level workshops and other monitoring meetings as needed convened;
- Assist UNEP GEF Senior Project Management Officer and the independent evaluator (to be appointed by UNEP in the Mid-Term Review and Final Evaluation of the project;
- Project objectives successfully met;
- Effective public relations and public awareness at country level;

Relationships

The Project Coordinator (PC) will:

- Be accountable at national level for the achievement of project objectives, results, and all fundamental aspects of project execution;
- Report to the Project Management Unit(PMU) and Project Management Committee (PMC)
- Be accountable to the Project Manager for the achievement of project objectives, results and all technical aspects of national component execution;
- Maintain regular communication with the local and national project partners that may be interested in furthering the project outcomes;
- Maintain regular communication with project site offices and the PM;
- Supervise the work of the national Technical project support staff;
- Supervise the work of the national consultants and project partners.

Qualifications

- Advanced university degree in an Environmental field and evidence of training in Natural Resource Management. The candidate must demonstrate a familiarity with the circumstances related to NRM in SIDS;
- A good understanding of environmental and natural resource issues in Antigua and Barbuda the social circumstance that surround the same.
- A working knowledge of the Antigua and Barbuda National Environmental Management Strategy

- A good knowledge of the United Nations Convention on Biological Diversity and the United Nations Convention to Combat Desertification
- Minimum of 5 years experience in administration/management of international projects;
- Experience in project management and administrative management;
- Experience in facilitating meetings or discussions;
- Experience with working with regional and international partners
- Willingness and ability to travel frequently within and outside the country
- Ability to work with senior government officials, research institutes, non-governmental organizations (NGOs), and local communities.
- Fluency in written and spoken English and strong communication skills.

TERMS OF REFERENCE FOR ADMINISTRATIVE ASSISTANT (PA)

The Executing Agency in consultation with the PC will appoint a suitably qualified person to provide support to the execution of the national aspects of the UNEP implemented, GEF supported SPPARE project.
This will include:

Functions
The Project Assistant will undertake the following duties:

- Provide support to the PM and PC in the financial and administrative management of the project;
- Act as secretary to the PMU
- Assist in project administration by assembling and preparing necessary documentation; helping to prepare letters of agreement for research and consultancy services; monitor budgets and liaise with accounting staff about payments and financial reports; interact with external agencies on non-technical and administrative matters;
- Assist in recording and monitoring project expenditures and funds availability in close consultation with the PM;
- Assist PM and PC in preparing quarterly financial reports and reimbursement claims for submission to the Executing Agency;
- Undertake office fixed assets inventory and its reporting to the Executing Agency;
- Format reports, proceedings and other relevant documents;
- Assist PM and PC in organizing and conducting PSC Meetings and National Workshops;
- Assist Project Coordinator in communication with national partners and local authorities by phone, fax and other correspondence;
- Update project website;
- Assist PM assembling necessary information to prepare reports;

Outputs

- Project activities are implemented successfully;

- Annual operational plan including budget prepared and submitted in timely manner;
- Quarterly and annual technical and financial reports prepared and submitted in timely manner;
- UNEP/GEF norms for monitoring and evaluation of project performance, output delivery and impact applied;
- PMU functions effectively;
- Project website is developed and maintained.

Relationships

The National Administrative Assistant will:

- Report directly to the PM and PC;
- Maintain regular communication with the PMU, PM and PC;
- Be accountable to the PM and PC for the functioning of the PMU;
- Provide administrative assistance to the PMU.
- Will act as the focal point in information gathering/dissemination from/to national partners.

Qualifications

- Minimum of two years of professional experience relevant in international or government organizations;
- Proven ability to manage budgets;
- Experience in word processing and other relevant office applications software packages;
- Fluency in written and spoken English.

TERMS OF REFERENCE FOR TECHNICAL FIELD STAFF

Technical Field Staff will perform the following activities:

• Implement of project activities on site;
• Ensure feedback from farmers;
• Build relationship between farmers and national teams;
• Organize farmers training and cross site visits;
• Assist in conducting on-farm trials and demonstration;
• Ensure feedback from relevant community organizations;
• Ensure delivery of all recommendations and suggestions of PM;
• Ensure that local stakeholder's interests are addressed by project's objectives;
• Ensure that lessons learnt are captured and shared with national and regional level operations;
• Ensure delivery of all recommendations and suggestions of PMU;
• Where necessary:

- Provide minutes of all official and informal consultations, meetings and interviews.
- Act as rapporteur for all workshops and training sessions.
- Be responsible for all the records of the project (Electronic and Hard Copy)
- Act as the projects lead research assistant

- Be responsible for drafting an framing all correspondence to project stakeholders
- Liaise with project team to ensure that all documentation is provided to the PMU on schedule
- Manage the project files
- Prepare and maintain a Project Library with all relevant documents
- Perform any other duties as so assigned by the Project Coordinator

TERMS OF REFERENCE OF PROJECT MANAGEMENT COMMITTEE (PMC)

The Project Management Committee (PMC) will be established to provide general oversight and guidance to the project, facilitate interagency coordination and monitor national-level activities. The PMC will be comprised of personalities representing key sector and institutions and will ensure the project fits within local, national, and international needs.

The PMC will be composed of:
Permanent Secretary of the MoHE (Chair);
Permanent Secretary of other relevant Ministries;
Project Manager;
Project Coordinator;
A representative of UNEP;
A private sector representative from one of the co-financers, and;
A member of the NGO community.

The PMC will hold its meetings at least one time per year and its primary activities are to:
• Provide general oversight and guidance to the project;
• Facilitate interagency coordination;
• Review and approve the annual work plans and annual technical reports;
• Review budget and co-financing status;
• Supervise the evaluation, monitoring and reporting aspects of the national component;
• Review and advise on implementation of national project component, as defined in the project logframe and work plan, through the evaluation of bi-annual reports, records of meetings and other relevant documents;
• Monitor inputs of international and national partners, ensuring that project obligations are fulfilled in a timely and coordinated fashion;
• Review and approve national components outputs.

TERMS OF REFERENCE OF PROJECT MANAGEMENT UNIT (PMU)

The project coordinators and key technical staff working directly on the various projects being executed by the Executing Agency (EA) will form the PMU. The PMU will act as an advisory body to all projects providing high-level technical guidance, policy input and support. The PMU will have a role in facilitating communication, technical cooperation and coordination among stakeholder agencies and other project partners. The PMU reviews technical documents and provides advice and information to consultants working to complete project activities. The Project Management Unit (PMU) will provide secretariat support to all

PMC meetings, including recording of minutes and distribution of the minutes at least two weeks in advance of the next meeting to all participants and invited observers.

The PMU will assist the EA with inter alia:

- Recruitment of international and national consultants, including candidate search/selection;
- Development of terms of reference;
- Supervision of consultants and technical officers;
- Peer review of documents and reports,
- Project coordination, including organization of regular meetings with project implementing agency; ensuring completeness and timeliness of reporting; technical reporting including preparation of progress reports; monitoring and evaluation;
- Organization of training/workshop activities;
- Facilitation and participation in workshops, consultations, public awareness and training activities.
- Provide secretarial support to the Technical Advisory Committee (TAC)

The PMU will meet monthly and coordinate quarterly technical update meetings with a wide range of project stakeholders. The members of the PMU are responsible for reporting on the projects being implemented by the ED to the agencies they represent.

TERMS OF REFERENCE OF TECHNICAL ADVISORY COMMITTEE (TAC)

The Technical Advisory Committee (TAC) is comprised of representatives of Government, Private Sector and NGOs. The TAC will select a chair from among the group. This group will provide advice and technical guidance to the PMU on all GEF projects.

The PMU will assist the EA with inter alia:

- Provide advice and technical guidance on all GEF projects;
- Assist in developing TORs for procurement activities;
- Assist in the evaluations of proposals;
- Peer review of documents and reports,
- Assist in the planning of training/workshop activities;

The TAC will meet quarterly and produce minutes from these meetings. The members of the TAC are responsible for reporting on the projects being implemented by the ED to the agencies they represent.

Appendices 11 and 12: Co-financing and Support letters and Endorsement letter of GEF National Focal Point - sep files

Appendix 13: Antigua and Barbuda Procurement Policy (plus separate file)

Antigua and Barbuda has developed guidelines for procurement through contract. The purpose of the guidelines is to establish a consistent set of approved project contracting procedures for the procurement of goods and services, financed by operating and project resources. These are further explained in Chapters 8 (Procurement and Contracting) and 9 (Procurement through Contract) of the Antigua and Barbuda Environment Division's Project Implementation Unit (ABED/PIU) – Accounting Procedures Manual of 2007[40]. An excerpt of Chapters 8 and 9 are included as separate attachments (Appendix 13). The ABED/PIU document is presently been updated.

[40] ABED/PIU, 2007. Accounting Procedures Manual.

Appendix 14: Map of the Lesser Antilles indicating location of Antigua and Barbuda & Proposed Protected Area and Wind Park Sites

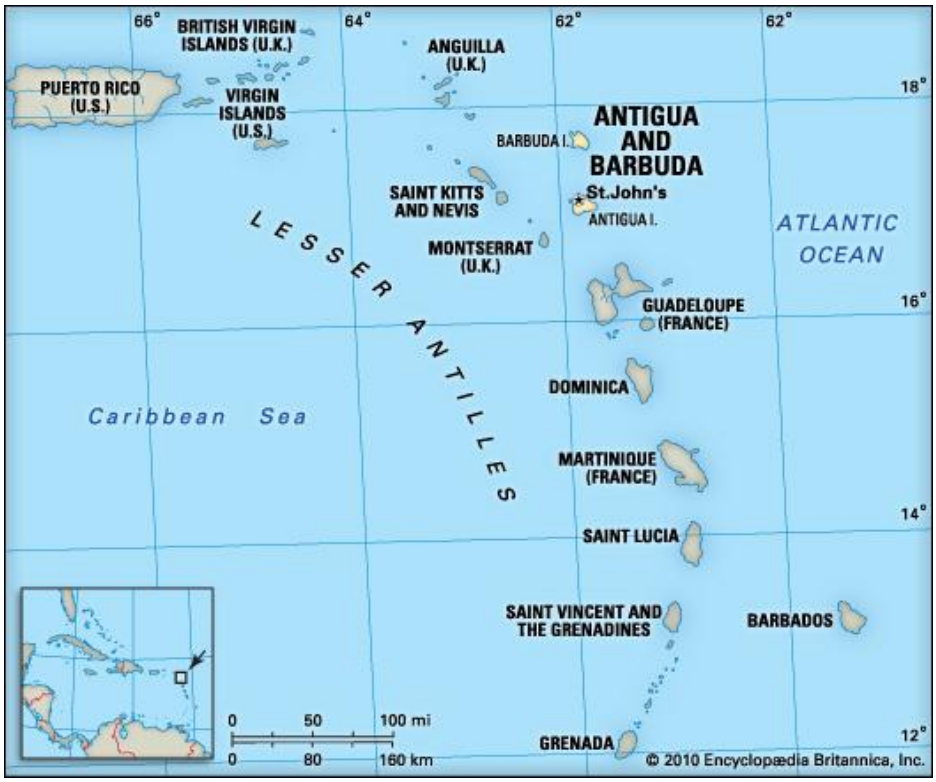


Figure 2. Map of the Lesser Antilles indicating location of Antigua and Barbuda

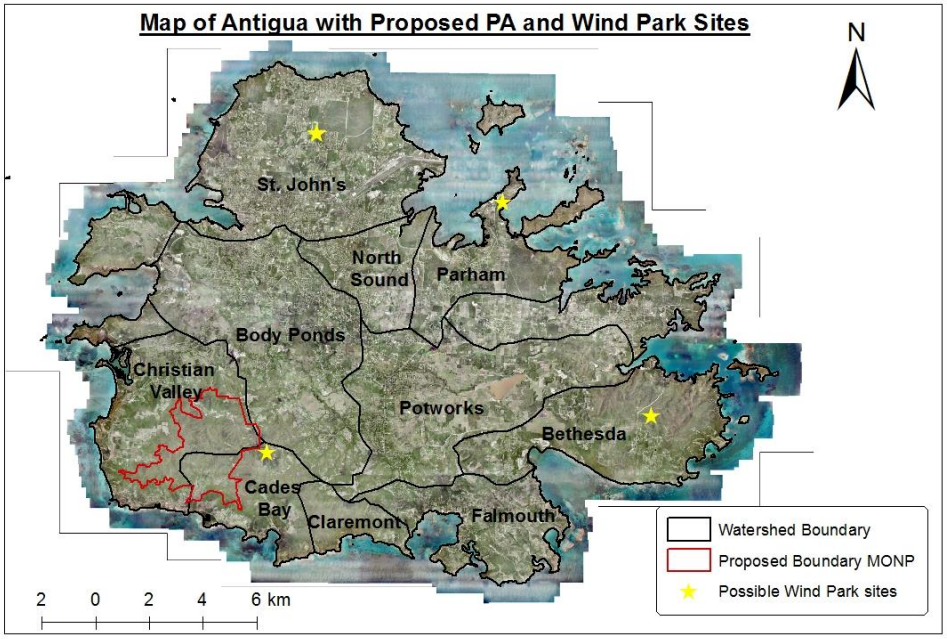


Figure 3. Map of Proposed Protected Area and Wind Park Sites

Appendix 15: Antigua and Barbuda's ratification to International Environmental Conventions

Table 1. Status of Antigua and Barbuda's ratification to the International Environmental Conventions

Instrument & Title	Ratification	National Legislation
UN Convention to Combat Desertification In Those Countries Experiencing Serious Droughts and/or Desertification Particularly Africa	June 6th 1997 Ratification	
UN Convention on Biological Diversity	March 9th 1993 Ratification	
Cartagena Protocol on Biosafety to the Convention on Biological Diversity	May 24th2000 (signature)	
Nagoya protocol on access to genetic resources and the sharing of their benefits	Not yet Ratified	See Draft EPMB
Cartagena Convention	September 11, 1986	
Protocol Concerning Pollution From Land Based Sources And Activities in the Wider Caribbean Region (LBS Protocol to the Cartagena Convention)	Ratified	
Protocol Concerning Specially Protected Areas and Wildlife (SPAW Protocol to the Cartagena Convention)	January 18th 1990 Signature, Not yet ratified	
Protocol Concerning Oil Spill (Oil Spill Protocol to the Cartagena Convention)	September 11, 1986	
Convention on International Trade in Endangered Species (CITIES)	October 6th1997	
International Convention For The Regulation of Whaling	Still some work to do with enacting legislation for this agreement	None
Convention on migratory species (CMS)	01st October 2007.	Draft EPMB
United Nations Convention on the Law of the Seas (UNCLOS)	February 2, 1989	
The United Nations Convention on Wetlands (RAMSAR Convention)	October 2, 2005	
United Nations Framework Convention on Climate Change (UNFCCC)	June 4, 1992	See Draft EPMB
United Nations Convention on the Transboundary Movement of Hazardous waste and their disposal (Basel Convention)	May 4th 1993	

Appendix 16. Policy Documents developed under the SIRMM project

Outcome	DOCUMENT TITLE	AUTHOR
Outcome 1	Draft Report on Indicators and Baseline Assessment (SIRMM)	Dr. Janil Gore-Francis
	Indicators for the Assessment of the Impact of the SIRMM Project	Dr. Janil Gore Francis
	GPS/GIS Trainings in Support of Environmental Information Management Advisory System [EIMAS] in Antigua and Barbuda March, 2013	Rebecca Boger Assistant Professor Department of Earth and Environmental Sciences Brooklyn College 2900 Bedford Avenue Brooklyn, NY 11210 718 – 951 – 5000 ext. 2159 Email: beckyboger@gmail.com
	The Geospatial Dimension of Sustainable Development-A Case for Investment in a National Infrastructure for Geospatial Information- September 7, 2009	Prepared by: GIS User Group
	Assessment &mapping of Antigua & Barbuda's Ecosystem Resources • Antigua and Barbuda Data List • Antigua and Barbuda EMIAS methodology • Barbuda Natural Resource Mapping List • Natural Resource Baseline • Antigua and Barbuda Data Gap Analysis • Antigua and Barbuda EIMAS and Map Products-Thematic Maps • National Action Plan and Publicity Campaign • Long Term Monitoring Targets and Indicators • Final Project Report	
	Data capture report. UWI Undergraduate Student Interns – Pilot Agency Capacity Building Exercise	Kyle Alexander and Rowmell Grosvenor Department of Geomatics Engineering and Land Management, at the University of West Indies
	INTEGRATING GIS, GPS AND DATABASE:TEMPORAL VARIATIONS IN THE WATER QUALITY ON THE NORTH-WEST COAST OF ANTIGUA,	Jason Williams, Data Manager Environemnt Division

	W. I.	
	ENVIRONMENTAL VARIABILITY & EXTREME EVENTS FORECASTING	Esal and Associates (2009)
Outcome 2	Sustainable Island Resource Management Zoning Plan for Antigua and Barbuda (including Redonda)	Genivar (Trinidad and Tobago) 2011
	State of the Country Report	Genivar (Trinidad and Tobago) 2010
	DRAFT ANTIGUA & BARBUDA NATIONAL AGRICULTURE POLICY (ABNAP- 2010)	Comiittee
	Methodology for the Preparation Local Area Plans	Kevin Edwards, Shaun George, Delamine Andrew
Outcome 3	Review of institutional structure and mandates for SIRMM implementation	Philmore Hughes
	Sustainable Island Resource Framework Fund Brief	Diann Black Layne
	The Antigua and Barbuda Environmental Protection and Management Bill 2013	Judy Daniel
	Regulations for the Antigua and Barbuda Physical Planning Act 2003	Judy Daniel
	Regulations for Marine Protect Areas	Judy Daniel
	THE PUBLIC HEALTH (WASTEWATER MANAGEMENT) REGULATIONS	Mykl Fuller
Body Ponds Demo	Body Ponds Watershed Land Use zoning and Local Area Management Plan	Lucia Mings (Environment Tourism Consulting Ltd.) 2010
	Sustainable Land Management Practices in Body Ponds Watershed	Esal and Associates (2009)
	Review and recommendations on administrative and legislative requirements for the Integrated Watershed Management	Esal and Associates (2009)
	Water Quality Guidelines for Watershed	Esal and Associates (2008)
	Ecological Characterization of the Body Ponds Watershed, Antigua	Kevel C Lindsay, Jean-Pierre Bacle (2009)
	Assessment of Rehabilitation Options (Body Ponds Watershed Assessment)	Brian Cooper (2008)
	Body Ponds Site assessment and Demo Site Indicators report	Lucia Mings (2010)
	Proposed Long-term monitoring system for the BPW and Related areas	Lucia Mings (2010)
	Cost Benefit Analysis for the Demonstration Study Area, Body Ponds Watershed	Lucia Mings (2010)
	BPW Stakeholder Involvement Report	Lucia Mings (2009)
	Environmental and Social Impact	Lucia Mings (2010)

	Assessment for the Body Ponds Watershed	
	Qualitative Assessment of Sediment Sources and Guidelines for the Design of a Runoff and Sediment yield monitoring strategy for BPW	Dr. Carlos E Ramos Scharron (2009) Island Resources Foundation
	Drainage Considerations for BPW-Sustainable Farming	ESAL and GARDC
	Environmental Impact Statement For Development Work Within the Body Ponds Demo Site	ESAL
	Report on Organic Farming Workshop	Aljoscha Wothke, Eco Project Ltd. # Springfield Avenue, Valsayn, Trinidad, Trinidad & Tobago W.I. Marcus Braun, Eco Livity, Jamaica
	Alternative Agriculture/Sustainable Farming Techniques for the Body Ponds Watershed	The Gilbert Agricultural and Rural Development Centre
Ridge to Reef	Terrestrial Field Characterizations and Assessments for the Assessment and Mapping of the South West Region of Antigua for the Ridge to Reef Demonstration project of the SIRMM	Island Resources Foundation: Kevel C Lindsay, Brian Cooper etal. (2011)
	Marine Biodiversity and Natural Resource Assessment for the Assessment and Mapping of the South West Region of Antigua for the Ridge to Reef Demonstration project of the SIRMM	Island Resources Foundation: Kevel C Lindsay et. al. (2011)
	Literature Review for the Assessment and Mapping of the South West Region of Antigua for the Ridge to Reef Demonstration project of the SIRMM	Island Resources Foundation: Kevel C Lindsay et. al. (2011)
	Indicators for Ridge to Reef	Tricia Lovell
	Stakeholder Analysis & Co-management feasibility	ESAL Esal and Associates
	Ridge to Reef Brochure	Mykl Clovis
	Ridge to Reef Public Awareness Plan	Mykl Clovis
	Ridge to Reef Posters	Mykl Clovis
	SIRMM Ridge 2 Reef Educators Resource	Mykl Clovis
	Proposal for the co-Management of the Wallings Visitor Centre Wallings Reservoir	Adriel Thibou, Tricia Lovell and Ruleta Camacho.

	Fig tree DriveSt. Mary's, Antigua	
Ridge To Reef (Cofinancing from OECS)	Wallings Forest Conservation Area Management lan VolumeI: Current Conditions and Management Prescriptions Volume II: Annex	Dr. Arthur Mitchell
Ridge to Reef and Codrington Lagoon	Biodiversity Inventory and Status Assessment Report for the Proposed Wallings Forest Protected Area (Antigua) and the Codrington Lagoon National Park (Barbuda	Island Resources Foundation
Codrington Lagoon Barbuda	Codrington Lagoon National Park Management Plan 2009-2019	Allen Putney
	Management of Biodiversity Management and Conservation Issues: Codrington Lagoon National Park	Kevel Lindsay and Brian Cooper (2009)
	Preparation and Implementation of a Public Awareness Strategy for the Codrington Lagoon National Park	Search Antigua Inc.
	Codrington Lagoon National Park Manual of Biodiversity Management and Conservation	Kevel C. Lindsay & Brian Cooper, PhD.
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	Sustainable livelihoods Plan for the Codrington Lagoon National Park	Effinah Norbert
Northwest Coast	DEVELOPMENT OF A WASTEWATER MANAGEMENT STRATEGY FOR ST. JOHN'S WITH SPECIFIC FOCUS ON THE NORTH WEST COAST TOURISM ZONE	Caribbean Water Treatment Ltd.Lower Dickenson Bay Street, P.O. Box W219, St. John's, ANTIGUA Tel: (268) 462-6565 Fax: (268) 460-9929 Email: cwt@candw.ag
	FINAL REPORT AND IMPLEMENTATION PLAN -PROPOSED WASTEWATER MANAGEMENT SYSTEM FOR HOTELS UNDER THE SIRMM DEMONSTRATION FOUR PROJECT Developed for the Sustainable Island Resources Management Mechanism Project (SIRMM) of the Environment	Mykl Clovis April 2013

	Division of Antigua and Barbuda	
	DOCUMENTED STRATEGIES FOR IMPROVEMENT OF WATER AND WASTE WATER CONTROL SYSTEMS	HARCON
	DEVELOPMENT OF A COSTING AND IMPLEMENTATION PLAN FOR THE PROPOSED NATURAL TREATMENT SYSTEM	HARCON
	REPORT ON RECOMMENDATIONS TO REFINE POLICIES AND LEGISLATION WITH RESPECT TO WASTE WATER RE-USE	HARCON
	HE ENVIRONMENTAL INFORMATION MANAGEMENT ADVISORY SYSTEM (EIMAS) COMPONENT OF THE ANTIGUA WASTEWATER PROJECT.	HARCON
	Report on recommendations to refine policies and legislation with respect to waste water reuse	HARCON

Appendices 17-25 (separate files)