

<b>Demonstration :</b>	One
<b>Project Title:</b>	Rehabilitation of the Body Ponds Watershed
<b>Objective:</b>	To promote sustainable land use and improve the management of the largest watershed (Body Pond Watershed W2) on Antigua.
<b>Key Issues:</b>	Land Degradation, Agriculture, Water Resources, Watershed Management, Stakeholder participation, Public-Private Partnerships.
<b>Executing Agency</b>	Forestry Division - in close collaboration with the Environment Division of Ministry of Works, Transportation and Environment
<b>Time Frame</b>	2 years +

### **Linkage to National Priorities and Programmes**

Antigua & Barbuda has ratified the Convention on Biodiversity and the Convention to combat Desertification, and has met all other eligibility requirements. This demonstration project is consistent with the priorities identified within the National Environmental Management Strategy developed as commitment to the St Georges Declaration. The development of the NEMs is an OECS initiative that seeks to establish national mechanism for the implementation of the Barbados Plan of Action for SIDS. This project is consistent with the following Principles of the NEMS.

- Principle 1: Foster Improvement in the Quality Of Life
- Principle 4: Ensure meaningful participation by Civil Society
- Principle 5: Ensure meaningful participation by the Private Sector
- Principle 6: Use of economic instruments for sustainable environmental management.
- Principle 7: Foster broad-base environmental education, training and awareness.
- Principle 13: Protect and conserve Biological Diversity

The proposal is consistent with the following additional International Regional Multilateral Agreements to which Antigua and Barbuda is a signatory:

- Convention of Biological Diversity
- The Ramsar Convention on Wetlands
- The Cartagena Convention and Protocols
- Convention for the Prevention of Marine Pollution (MARPOL)
- St Georges Declaration of Principles for Environmental Sustainability in the OECS.

### **Pilot Demonstration Objectives and Activities**

#### ***Background / Justification:***

Inappropriate land management on Antigua has reduced the functionality and sustainability of the ecosystem. The island is subject to highly variable climatic conditions with alternating periods of drought (from January to April) and periods of heavy rains (from September to November), which coincide with the tropical hurricane season. The loss and destruction of plant cover, in combination with these cyclical weather patterns, has resulted in severe land degradation (impoverished soils, decreased infiltration) the loss of watershed function (siltation of the water courses, increased runoff) and smothering and pollution of coastal and marine habitats. The integrity and functionality of the island's ecosystem is threatened and this has reduced its capacity to cope with variable weather patterns. This is likely to worsen given the predicted increases in environmental variability with global climate change. The improvement of land use management practices and restoration / maintenance of watershed function are therefore a priority issue.

The degradation of terrestrial resources began during the colonial era when Antigua was economically dependent on the cultivation of sugar. During this time, the island was largely

cleared of native vegetation. Following the collapse of the sugar industry in the 1970s, the livestock industry, particularly the rearing of cattle, achieved prominence. In the absence of a planned land use policy, itinerant farmers allowed the increasing population of ruminants to roam freely in the watershed areas, devouring the already sparse vegetation. In addition >50 ha of grasslands and wood lands are lost every year due to man made and natural fires during the drought season. This issue is compounded by the invasive Lemon grass species (*Citronella* sp.).

The grass was introduced in the 1960s to control soil erosion, but it has spread over vast tracts of land and is now a major factor contributing to soil erosion. The grass is burnt to promote new more palatable re-growth for livestock and to a lesser extent to clear land for cultivation. These fires often spread out of control with devastating effect on the surrounding remnant natural vegetation. Lemon grass is adapted to survive fires and out-competes native species. When the grass is burnt it forms clumps and leaves a significant amount of bare soil exposed to wind and water damage.

The drought season is typically followed by intense tropical rains, when wind-speeds can exceed 160 km per hour and rainfall can exceed 15 cm a day. Such intense precipitation triggers flash flooding and appreciable topsoil movement. The mobilized sediments clog up intermittent stream-ways and surface storage facilities (ponds, dams), and coastal estuaries and waters. These sediments reduce storage and stream-way capacity, while increasing the potential for flooding.

Over the years the loss of top soils has reduced soil quality and increased the use of agrochemicals. So added to the run-off is the chemical wash from farms which pollutes ground and coastal waters with adverse implications for human health and flora and fauna. The loss of the soil/root complex and its absorbent capacities effectively means less retention of rainwater, more rapid run-off and loss of critically important island resources into the coastal area. On reaching the coast the sediments decrease water clarity (lower light levels for photosynthetic, symbiotic organism) and can smother sensitive coastal habitats. This loss of soils is further directly aggravated by uncontrolled and unregulated topsoil and sand mining in the streambeds.

So while the sugar industry had the largest single impact on the land resources of Antigua, the interlinked sequence of events that followed had a cumulative impact on these resources that now pose a serious threat to island ecosystem function, especially with the anticipated changes in the global climate. The present lack of appropriate soil and water conservation practices, in part due to the current inadequate land use policy framework (coupled with the absence of land tenure), creates conflicts among land users. The majority of agricultural land is rented from the government or from private land owners on an annual basis so there is little incentive for farmers to take responsibility for protecting the soils. If leases are granted then they are usually only for a period of 5 years. Long-term leases of 25 years are available, but the application process is time-consuming and costly. Agriculture is no longer as profitable as it was, local farmers have to compete with imported produce, and this situation is likely to worsen with WTO. There is a need to consider alternative agricultural practices and therefore alternative livelihoods based on sustainable farming.

Stemming (reversing) the interlinked sequence of impacts and promoting more sustainable land management will require a cross-sectoral integrated approach with the full collaboration of the various management authorities (land use planning, forestry, agriculture soil conservation and water resources) with the active participation of the primary resource users (e.g. farmers, livestock owners). Since the ratification of the UNCCD in 1997, the Government of Antigua and Barbuda has implemented a few activities related to land degradation. Since signing of the Convention a National Coordinating Mechanism (NCM) has been formed to bring together the technicians from the various agencies to discuss these and other issues and to encourage

networking. The proposed demonstration project will provide the opportunity to further develop a more collaborative participatory approach to rehabilitate one of the 13 main watersheds on Antigua.

The watershed selected for this demonstration is Body Ponds (W2), which is the largest watershed on Antigua (4000 ha) that extends from John Hughes (inland) to Hanson's Bay (on the west coast). This watershed contains a large supply of surface (478,400 m<sup>3</sup> agricultural and municipal storage) and ground water reserves, and yields 390,000 million m<sup>3</sup>/ year. It is an important area for agriculture and livestock farming. Inappropriate land management has left the watershed heavily eroded and overrun by Lemon grass especially in the upper forested hilly areas (John Hughes, Swetes and Sawcolts). The watershed encapsulates all of main issues identified above (degraded forests, congested stream-ways and water storage, invasive species, overgrazing, unsustainable agricultural practices, ground water contamination) and the poor condition of the land has left the watershed vulnerable to extreme climatic events. As a result watershed function is impaired and in need of rehabilitation and protection.

In recognition of the present degraded state of the Body Pond watershed, the potential yield of ground and surface water, as well as the potential of the agricultural lands to contribute to expanding supplies (to the tourism industry), and to the national goal of food security, it is the intention that this project would serve as a model for the management and development of similar watersheds / hydrological units elsewhere on Antigua and in other small island developing states in the Caribbean. The project offers stakeholders the opportunity to actively participate in management activities. It is consistent with the operating principles related to Land Degradation, Biodiversity, and Climate Change and addresses conservation of biodiversity resources through protected area management approaches, invasive species management, sustainable farming, through planning, capacity building and institutional strengthening and promoting active stakeholder participation.

The **objective of the project** is to improve the management of the largest watershed on the island of Antigua, to ensure the survival of remaining biodiversity, to control the invasive species, and to promote sustainable farming practices and restore watershed function for the overall benefit of the nation.

### **Pilot Site Objectives and Deliverables**

#### **Objective A: Development of a Co-Management Strategy for Body Ponds Watershed**

- A.1 Adoption of Steering Group
- A.2 Feasibility study for establishing a long-term co-management body for the watershed
- A.3 Establishment of legal entity for co-management body

#### **Objective B: Baseline assessment and mapping of the watershed completed using field and participatory methods along with existing and historical knowledge and data.**

- B.1. Development of baseline assessment and mapping approaches
- B.2. Mapping and survey activities
- B.3. Reporting and feeding information into a Management Strategy
  - Vegetation surveys and mapping
  - Hydrological surveys
  - Land use surveys and mapping
  - Soil quality and land capability surveys and mapping
  - Land ownership and tenureship
  - Socio-economic and demographic survey
  - Participatory mapping of bio-physical and socio-economic situation
  - Select sites and establish a long term monitoring programme

### **Objective C: Review and reform of management issues leading into proposed strategies and preparation of guidelines for land and watershed restoration**

- C.1 Review of strategies for land and watershed restoration (e.g. soil stabilization) appropriate for small island states in the Caribbean and elsewhere.
- C.2 Preparations of land and watershed restoration and rehabilitation guidelines based on review (above) and revised using the lessons learnt captured from the implementation of the demonstration (below).
- C.3 Review of the land tenure arrangements in Body Ponds Watershed and recommended revisions.
- C.4 Preparation of land use zoning plan with associated regulations and activity guidelines, in participation with stakeholders to include regulations and guidelines for (a) protecting forest reserves and protected areas; (b) rehabilitation and replanting of degraded areas; (c) controlling grazing; (d) sustainable agriculture; (e) urban expansion zones and (f) protection of water courses and water storage.
- C.5 Establishment monitoring program for water quality, soil loss and sedimentation to feed back into the EIMS.

### **Objective D: Implementation of sustainable land management practices in the Body Ponds watershed**

- D.1 Acquisition and implementation of necessary infrastructure to protect woodland and forest reserves (e.g. strengthening of agency surveillance and compliance, community wardens, fencing and signage).
- D.2 Protection of ground water aquifers and water storage facilities (e.g. removing silt and sediments and replanting boundaries).
- D.3 Rehabilitation of degraded areas and restoration of watershed function by demonstrating strategies:
  - To reduce soil erosion
  - To clear, restore and protect stream-ways
  - To understand the process of fire management (especially in relation to *Citronella*)
  - To manage and remove invasive plant species.
  - To control grazing.
  - To replant mangrove system where appropriate.
- D.4 Establishment/adoption of pilot farms (x 2) to promote alternative agricultural practices including alternative livelihoods related to sustainable farming:
  - To minimize the use of agro-chemicals (e.g. crop rotation, double planting).
  - To clear land without the use of fire and / or methods to control fires (e.g. cutting strips)
  - To improve irrigation and water supply (e.g. grey water re-use schemes)
  - To improve product range and yield by using of alternative technologies (e.g. hydroponics)
  - To improve earnings through higher earning crops (e.g. organic)
  - To improve competitiveness and marketing (e.g. establish a farmers cooperative)

### **Objective E: Develop a sustainability mechanism by building private and public sector partnerships to manage the watershed efficiently:**

- E.1 Training and capacity needs assessments across sectors and groups involved in land and watershed management, particularly for the Forestry Division.
- E.2 Cross-sectoral training programme and institutional strengthening for management authority
- E.3 Public awareness and sensitization campaign to improve understanding of the need to prevent further land degradation.

- E.4 Establish public private partnerships to support sustainable land use and agricultural practice
- E.5 Incentives schemes to encourage local companies (e.g. hoteliers) to purchase local produce.

### **End of Project Landscape (Outcomes)**

Up-to-date, relevant and reliable data and information related to the Body Pond watershed. Review and reform of the land tenure arrangements and relevant legislation and preparation of a zoning plan, zoning activities guidelines and management plan. Sustainable land management systems in place for the utilization of land in the watershed, in accordance with capability. Measures in operation to protect water supply, and to ensure reasonable economic returns for farmers. Increased capacity, coordination and strengthened institutions for sustainable management of land use and protection of watershed function.

### **Stakeholders and Beneficiaries**

All stakeholders including the beneficiaries will participate throughout the life cycle of the project. Beneficiaries include the following groups/organizations/entities:

- The Bendals Community Group
- The Environmental Awareness Group (EAG)
- Farmers
- Hotel owners
- Informal market traders
- Tourism industry
- The Environment Division
- Development Control Authority (DCA)
- The Ministry of Agriculture
- Central Marketing Corporation (CMC)
- The Antigua Public Utilities (APUA)
- Gilbert Agricultural And Rural Development Centre (GARDC)

The implementation of the project will collaborate with the Gilbert Agricultural And Rural Development Centre (GARDC), which is the leading NGO involved in training farmers and technicians in production methods. The Antigua Public Utilities (APUA), which manages the nation's water resources, has pledged full support for such an initiative. They will be represented on any management committee related to this project.

### **Long term Sustainability Strategy**

The activities are designed to ensure long term sustainability of the management practices the management arrangements would include community-based groups through training and all soil and water conservation techniques will be within the means of the farmers.

### **Replicability**

Lessons and Best Practices established by the Demonstration will be reviewed and captured through Activities 4.5.5 and 4.5.6 of the Full Project. These activities will identify suitable areas and appropriate technologies/methodologies for replication. Lessons and Best Practices pertinent to the overall Antigua and Barbuda 5 Year SIRM Plan, legislative and institutional reform, monitoring strategies, etc will also be replicated through the SIRM and associated reforms.

### **Monitoring and Evaluation Process**

Through the M&E Plan adopted by the Full Project and through a cross-sectoral Steering Group which will report to the Full Project Coordinator/Director on a quarterly basis

## WORKPLAN FOR DEMONSTRATION ONE

DEMO OBJECTIVE	DELIVERABLE		YEAR 1	YEAR 2					
<b>A. Development of a co-management strategy for Body Ponds Watershed</b>	A.1	Adoption of a cross-sectoral demonstration steering group	X						
	A.2	Assess feasibility for establishing a localised body for management of the Body Ponds Watershed (to evolve from demo steering group)		X					
	A.3	Establishment of a legal entity for co-management within the Body Ponds Watershed			X	X			
<b>B. Assessment and mapping of watershed using field and participatory methods and existing information</b>	B.1	Development of Baseline Assessment and Mapping Approaches and designation of field-teams	X						
	B.2	Mapping and Survey Activities		X	X	X			
	B.3	Reporting on results and feeding into Management Strategy (and into main project Outcome 1 as lessons and best practices for national baseline assessment and mapping)					X		
	B.4	Establish long-term monitoring approach within Demo area				X	X	X	X
<b>C. Land and watershed restoration approaches and techniques as a management strategy</b>	C.1	Review of strategies appropriate or applicable to SIDS in the Caribbean		X					
	C.2	Preparation of guidelines for land and watershed restoration		X	X				
	C.3	Review and recommended improvements to land tenure arrangements		X	X				
	C.4	Preparation of participatory land-use zoning plan				X			
	C.5	Establish monitoring programme linked to A.4 above and main EIMS				X	X	X	X
<b>D. Implementation of sustainable land management practices in Body Ponds watershed</b>	D.1	Procurement and deployment of protection infrastructure for forest reserves		X	X	X			
	D.2	Programme of protection activities for aquifers and water storage facilities		X	X	X			
	D.3	Rehabilitation of degraded areas and restoration of watershed functions		X	X	X			
	D.4	Establishment of pilot farms for alternative agricultural practices		X	X	X			
<b>E. Develop a sustainability mechanism by building private and public sector partnerships for efficient watershed management</b>	E.1	Cross-sectoral training and capacity needs assessments		X	X				
	E.2	Cross-sectoral training and institutional strengthening programmes				X	X	X	
	E.3	Public Awareness and policy sensitisation campaign		X	X	X	X	X	X
	E.4	Establishment of Public-Private partnerships for sustainable land-use and agricultural practices		X			X		
	E.5	Establishment of incentive schemes for local purchase of farm products		X			X		