



ANTIGUA AND BARBUDA

NATIONAL REPORT ON THE IMPLEMENTATION OF THE CONVENTION TO COMBAT DESERTIFICATION JUNE 2000

SUBMITTED BY

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I. EXECUTIVE SUMMARY

This document is a report produced in compliance with decision 11/COP.1 of the UNCCD with the specific purpose to inform the parties on the progress made towards achieving the objectives of the convention and to enable them to make appropriate recommendations to better pursue these objectives. Nationally this report will act as a guide to the development of the national action plan to combat desertification and land degradation.

Antigua and Barbuda is a twin island nation in the West Indies. When the early settlers arrived in the 17th Century, they were deterred by a scarcity of water though, Antigua was noted as a heavily forested island. This dense vegetation was, however, almost completely removed by the time sugar cane cultivation became the dominant feature of the economy.

Today, the islands are still trying to cope with the effects of poor soil types and soil erosion caused by poor agricultural practices. The frequency of droughts and the economic shift to tourism have further complicated the issues and accelerated the rate of degradation. Additionally, recent early stages of land degradation as a result of the passage of hurricanes since 1995 have compounded the situation.

Although desertification is not considered imminent in Antigua and Barbuda, land degradation is a reality. The development of the Convention to Combat Desertification and Antigua and Barbuda's ratification in 1997 will define a more sustainable path for future development in the country. It is in this spirit that the National Report was compiled.

Section 2 outlines the main factors affecting land degradation in Antigua and Barbuda. These factors relate to natural rainfall patterns and poor land management practices such as soil and sand mining; residential and industrial activities in watersheds; land preparation practices for farming and construction; naturally occurring land and mudslides; degradation of forested areas and other impacts from recent hurricanes.

The national strategies and priorities established within the framework of sustainable development plans; priorities and conventions affecting environment and natural resources are discussed in Section 3. The section defines the National Co-ordinating Mechanism for national environmental action within in which the activities to execute the obligations to the Desertification Convention exists. The process of meeting and reporting as part of this mechanism, serves as a forum to *mainstream* the issues of Desertification and land degradation in other conventions and national environmental action planning.

Section 4 details the institutional measures to implement the Convention to Combat Desertification and land degradation. The discussion in this section covers the institutional frameworks that exist to execute action and how they have developed. It outlines the approach being taken, and organizational structure.

This section also includes a table that outlines existing and potential stakeholders involved or that will have to become involved in addressing land degradation and their roles and responsibilities in this area. It also defines the current legal and judicial nature of the existing executing mechanism and details the human, material and financial resources available.

The National Action Plan to combat degradation is laid out in section 5. It takes into consideration public opinions on land and water resource use and stewardship. The proposal also recognises the widely held cultural beliefs and abuse of land and watershed resources.

Section 6 addresses the financial mechanism for the implementation of the CCD. Also addresses the constraints to implementing environmental activities in Antigua and Barbuda. Section 8 looks at the benchmarks and indicators for land degradation and the urgent need to address the lack of information on the extent of land degradation.

1. INTRODUCTION

Antigua and Barbuda became a Party to the United Nations Convention to Combat Desertification (UNCCD) in 1997. One of the objectives of the Convention is to provide a framework for national, regional and international co-operation in the effort to combat the causes of land degradation and the negative consequences of drought. This objective is to be achieved through an innovative mechanism of National Action Plans (NAPS) in affected countries and partnership agreements between affected countries, the donor community and intergovernmental and non-governmental organisations. The guidelines provided by the convention require that country produce a report on the status of land degradation and the implementation of national activities.

Antigua and Barbuda lies about 250 miles southeast of Puerto Rico in the northern section of the Caribbean archipelago. The islands lie at latitudes 17° North and longitude 61° West. Antigua being the larger of the islands is 108 sq. miles (280 sq. kilometres) and approximately 14 miles (22.5km) wide and 12 miles (19.3km) long. It is mostly flat with a hilly region in the southwest and a jagged coastline characterized by alternating bays and rocky headlands.

Barbuda, which lies 28 miles (45km) north of Antigua, is a coral island of 62 sq. miles (161 sq. km). Most of the island is only 13ft (4m) above sea level and primarily consists of limestone and sand. Barbuda is known for the largest saltwater lagoon in the Caribbean and it extends along the west coast of the island. Since the last census of 1990, the population of Antigua was counted as 65,000 while that of Barbuda was 1200.

The climate in Antigua and Barbuda is characterized as moderate arid, tropical maritime. The average high temperature year round range from 75° in December to January to 84° in August and September. The annual rainfall for Antigua ranges from 24 to 49 inches (60 to 125 cm), one of the lowest in the Caribbean. Generally the rainy season is from August to November and the dry season is from May to July. Barbuda has a lower rainfall average which ranges from 20 to 39 inches (76 to 39 cm). Barbuda's rainy and dry seasons are similar to the periods on Antigua.

Like most other Caribbean countries, Antigua was once a colony of Britain and a source of sugar and rum for the British Empire. To maintain the agricultural economy the country had to address the issue of land degradation. Baker [1997:19] commenting on the development of Antigua noted:

Centuries of deforestation, plantation, slavery and sugar culture produced a legacy of erosion, watershed damage, declining yields and species extinction. The intensity of monoculture and unsustainable farming practices (clean weeding, debris burning) degraded 'the vegetation and landscape of Antigua...more significantly and more dramatically than on almost any other Caribbean island' (Coran, 1993:167). Because of its gentle topography and the historical imperatives of overseas sugar demand, the island was virtually clear of forest from the 1760s (Watts, 1993:136).

The small size of the islands makes the issue of land degradation critical for the economy. Thus the country has been addressing this issue for centuries. In addition to low rainfall, and small size the island has some of the poorest soil types in the Caribbean. In spite of these characteristics, Antigua was at one time, one of the most productive sugar producing countries in the Caribbean.

Historically, Antigua and Barbuda has been forced to cope with the issues of land degradation and has therefore developed limited institutional and cultural practices to cope with this phenomenon. Current initiatives for the prevention of land degradation are therefore an extension of activities initiated hundreds of years ago. Over the past three decades the economy has changed from a dependency on agriculture to that of the service economy, mainly tourism. This shift in the economy has created new challenges and issues. Unfortunately the institutional capacity necessary to manage these changes has not been developed. There is therefore the need to develop new strategies and improve institutional capacity to cope with these challenges.

Recognizing the threat of land degradation to the economy and the new challenges being faced, the Government has renewed its commitment to addressing this issue. Antigua and Barbuda ratified the United Nations Convention to Combat Desertification and made a national commitment to implement its principles. This is the first national report on the state of the implementation of the conventions and that of land degradation for Antigua and Barbuda.

2. Land Degradation in Antigua and Barbuda

For the purpose of this report, desertification is defined as the degradation of land in arid, semi-arid, and dry sub-humid areas that is caused primarily by human activities and climatic variations. The Meteorological Office of Antigua and Barbuda does not consider desertification as a threat but have recognized that the country has a long history of coping with land degradation. Land degradation is defined as the reduction in the soils capacity to produce in terms of quantity, quality of goods and services.

There is a general consensus that the main issues related to land degradation in Antigua and Barbuda are drought and land use management. These issues are not adequately addressed due to poor institutional framework and weak legislation.

2.1. Drought

Antigua and Barbuda, along with Guadeloupe and Barbados, form the outer arc of limestone, low-lying drought-prone islands of the Caribbean archipelago [Baker, 19]. Antigua's average annual rainfall is 40.74 inches while the average relative humidity is 82 percent.

Drought implies rainfall of less than 32.5 inches annually. Since 1874, Antigua has experienced many consecutive years when the average rainfall has been much less than 30 inches. The last two periods of drought were between 1983-85 and 1993-94. The former was categorized as the worst drought to hit the island in over 50 years.

The drought of the 1980's had a severe effect on the economy, especially the tourism sector. The agricultural sector experienced the death of hundred of livestock, and a cessation of work by farmers. During this period of time, the Government imported water from neighbouring countries to meet the needs of the island.

Interspersed with the drought years were a number of high rainfall periods. This is largely because Antigua and Barbuda are both located within the Tropical belt and are affected by systems such as tropical waves and hurricanes during the rainy season. For example, in the past ten years, the islands were affected by five hurricanes and four tropical storms. Each of these systems can bring from 10 to 30 inches of rain in a few days, Tropical Storm Lenny dumped 22 inches on Antigua in 3 days.

The alternating wet and dry periods have led to the removal of topsoil, formation and deepening of gullies and general soil erosion. The impact had been greatest on land located in the south of the island particularly areas previously cleared for human activities such as farming, landscaping or construction. Deposition of soil removed in erosion has caused siltation downstream, degradation of coastal areas, watercourses, and marine and aquatic breeding areas.

The islands vulnerability to droughts need to be addressed since it had a direct impart on the tourism industry, for example, is relatively water intensive with the daily use of water by visitors

being twice that used by nationals. To meet the water needs of the country, the Government invested in a desalination plant. The plant has been in operation for over ten years and has had a significant and positive impact on the water situation.

However, the desalination plant is not the only source of water. The Antigua Public Utilities Authority, the agency responsible for water, electricity and telecommunications, also uses surface and ground water to supply some of the rural areas of the country.

In addition to portable water, many households meet their water needs by harvesting rainwater from roofs and storing it in cisterns in the foundation. A 2000 square foot area can capture 10,000 gallons of water, which can meet the needs of a household for up to three months. All new concrete homes are required by national standards to have a cistern or alternating water storage system.

In Barbuda, fresh water is limited to rainwater collection. Abstraction from the Palmetto Sands aquifer is now producing only brackish water which is not suitable for drinking. Whether this is due to the mining of sand that has been ongoing for the past 20 years and has left the water table close to the surface, or to the over-abstraction, resulting in the mixing of the fresh and saline layers, it is not known.

Although the water being abstracted in Barbuda is not used for drinking, it is used for other household purposes. Future development plans for Barbuda include the halting of further abstraction and the construction a desalination plant.

The fact that the country is prone to drought has slowed the rate at which reforestation can occur after a natural or man-made disaster. Consequently, rehabilitation of degraded land is a long-term and expensive project. Protection of vegetation cover is therefore one of the main and preferred options to address land degradation.

2.2. Land Use Management

The shifts in the economy from agriculture to tourism compounded land degradation issues in Antigua and Barbuda. Agriculture fell from the major source of revenue for the country to just 3.8% of the GDP. Tourism now accounts for 72% while industry is responsible for the remaining 18%. While it has been recognized that agriculture was a major cause of degradation, it is generally agreed that the results of the change in the economy had a more dramatic effect. Activities such as land clearing, destruction of mangrove swamps, sand mining, and water pollution are a direct result of this shift. These activities have caused permanent degradation in land and created conflicts with other users. In addition, the rate at which degradation occurred far exceeded that of the pre 1980's period.

The major land management issues can be classified as the following activities: unsustainable farming practices, poor watershed management, soil and sand mining, and uncontrolled grazing by livestock.

2.2.1. Unsustainable farming practices

Many farmers continue the practice of completely clearing the land for agriculture. In some areas, the farms are located on gentle slopes where soil conservation methods such as terracing are not used. Still others use the slash and burn method to promote the growth of forage vegetation. These have become a part of the normal cycle in the farming calendar and consequently, the land degradation process.

Additionally, the Central Marketing Corporation noted that Antiguan farmers import the highest amounts of pesticides and fertilizers in the Leeward Islands. These pesticides cause the degradation of soils due to the breaking down of soil structure by the chemicals.

2.2.2. Poor watershed management

The Bendals River is considered the only seasonal river in the twin-island nation. However, during drought periods it becomes completely dry. This river is fed mainly by one of the largest watersheds in Antigua located in Sherkley Mountain range. McMillian (1985) identified six major watersheds in Antigua. Watersheds occupy 43 percent of the land area and sustain 50 percent of the islands total forests, 90 percent of crops and 60percent of livestock production. The watersheds also contain 80 percent of the ground water supplies and 90 percent of water reservoirs.

Even with this heavy dependence on the watersheds, Antigua is known primarily for its coastal areas rather than its forest. Over 50 percent of the population live in and around the city and many nationals do not appreciate the importance of forests to the country. These areas are therefore being cleared for wood, housing and agriculture. The burning of grass by livestock farmers further threatens the forests.

The Forestry Unit of the Ministry of Agriculture, Lands and Fisheries, is responsible for the monitoring of activities that impact on the forest. This agency is however severely understaffed and is not adequately financed.

2.2.3. Uncontrolled livestock grazing

The increase in the service sector brought prosperity to the average Antiguan and Barbudian citizen. This meant that more persons could afford to purchase meat. In addition to increased market opportunity, large areas of farmland were being left overgrown as more persons moved into the service sector to find jobs. Consequently, more land became available for animals to roam. Over the past few years the number of livestock in the country rose by over 100%. Meat production is an important part of the economy (approximately 6% GDP) and the cultural practices of nationals. This practice of free grazing on the islands however has severely degraded some areas and caused damage to vegetation cover. In addition to poor soil and lack of water, uncontrolled grazing is one of the greatest threats to natural and controlled regeneration efforts.

2.2.4. Soil and Sand mining

Over the past 25 years, Antigua and Barbuda has witnessed an unprecedented increase in hotel and residential construction. Most of these new properties are constructed from concrete blocks. This has led to an increase in the demand for sand. To a lesser extent, this has also led to an increase in the demand for topsoil, ghaut sand and mature trees for landscaping. The

unsupervised and sometimes illegal removal of topsoil and ghaut sand is becoming a major issue since the practice has compromised streams and watersheds, thus making them unstable.

During the 1980s, other Eastern Caribbean countries also experienced the construction boom. Baker [27], noted that the demand for sand increased ten percent per year, during this decade. The main source of this aggregate was Palmetto Point, "a unique ecological area in southwest Barbuda, noted for its sand dunes and palmetto forests" [ibid, 27]. The results of this 20 year practice included the creation of a large crater 7 meters deep that has damaged the island's freshwater aquifers. The mining has also caused widespread clearance of palmetto forests and associated stands of sea grape and mangroves and the undermining of lands in nearby areas.

In Antigua there has been an increase in illegal sand mining. The incentive to steal sand is great since the price of sand is relatively high (35USD per cubic yard). The demand for concrete housing has increase since the destruction of over 50 percent of the wooden housing stock during hurricanes Luis in 1995 and George in 1998. In addition, the fines and rates of conviction if offenders are caught are very low.

These and other practices have occurred at a pace that has far outreached the ability of the Government to manage its resources. This is largely because of a weak legal and institutional framework.

2.3. Institutional Capacity Of Agencies Involved In Land Management

The institutional capacity of agencies responsible for land use is generally considered weak. Agencies lack adequately trained staff, enabling legislation and enforcement capability. With respect to water and drought mitigation (see section ...), the situation is generally much better since this resource is managed by a single statutory body (APUA).

The control and development of land is fragmented among a number of agencies, which include the DCA, the Ministry of Agriculture, Lands and Fisheries and the Ministry of Public Works (Table 1). Consequently, there is no clear legislation or policy for integrated land use management and even more importantly, there is no mandate by responsible agencies to coordinate their activities. It is hoped that the new Land Use Plan (see below) will address the issue of overlap and fragmentation.

¹Table 1. Government Agencies with Physical Planning Functions

AGENCY	MINISTRY	LEGISLATION	FUNCTIONS
Development Control Authority (DCA)	Prime Minister's Office	Land Development and Control Act, No 15 of 1977	Development application review and approval; development surveillance.
Lands Division	Ministry of Agriculture	The Crown Lands (Regulation) Act (Cap	Planning and allocation of government lands for residential, agricultural and other land use purposes; administration of Government of Antigua and Barbud

¹ Taken from the draft Land Use Plan, 1999.

		130) of 1917	land leases and rentals.
St. John's Development Corporation	Prime Minister's Office	St. John's Development Corporation Act of 1986	Upgrading of downtown St. John's through urban renewal and implementation of other development projects (e.g. Heritage Quay, a tourism complex including shopping, hotel and cruise ship berthing facilities).
National Parks Authority (NPA)	Ministry of Tourism	National Park's Act of 1985	Development and management (including development control) of national parks, at present limited to Nelson Dockyard National Park.
Antigua and Barbuda Port Authority	Ministry of Finance		Development and management of lands at St. John's Deep Water Harbour.
Central Housing and Planning Authority (CHAPA)	Prime Minister's Office	Slum Clearance and Housing Act (Cap 277) of 1948	At one time CHAPA functioned as Government's primary residential land allocation agency, but some of its functions have been assumed by the Lands Division Ministry of Agriculture; Implementation of low income housing schemes.
Industrial Development Board	Ministry of Trade, Industry and Commerce	Industrial Development Board Act (Cap 379)	The Board's main function is to facilitate the economic development of Antigua and Barbuda. It is responsible for management of the Industrial Estate at Coolidge and for providing assistance to small businesses.

In an effort to compliment the development of the various plans, the institutional capacity of key government agencies is being strengthened to facilitate the implementation of activities. These agencies include the Development Control Authority (DCA), and the Ministry of Agriculture.

Although the staff of the Ministry of Agriculture receives adequate training, the legislative framework and enforcement capacity are inadequate. For example, the Ministry is a major user of land and water, but does not have the controlling legislation to manage either. The Ministry, however, has successfully developed techniques that have encouraged sustainable land use practices and have implemented policies that encourage the reduction in the use of water (e.g. economic incentives for using irrigation).

The DCA on the other hand has the necessary legislation to prevent and minimize land degradation. The Chief Town and Country Planner is not required by the Act to take environmental concerns into consideration when evaluating development plans. Environmental considerations are entirely within the discretion of the Authority.

The DCA and the Ministry of Agriculture have been making efforts to improve its capabilities for the effective and efficient management of land. The rate of improvement is not adequate and cannot keep up with the current demand. These agencies are therefore considered a priority for capacity building.

2.4. Legislative Framework

The fragmented approach to land degradation is reflected in the various legislation that addresses the issue. The general flaw related to the enforcement of the legislation is the requirement of most of the Acts that even the most minor cases must be taken to court. This process is time consuming, inefficient and requires highly trained police and technical officers. Other deficiencies include:

- Failure to define key terms, e.g. the Beach Control Act does not define the term beach
- Authorized officers are not held accountable for failure to enforce legislation
- Current fines are not effective deterrents
- Offenders are not required to pay the cost of rehabilitation.
- Responsible agencies are not required to prepare management plans for natural resources
- In cases where employees of companies commit an environmental crime the employee is held accountable.

A detail analysis of relevant legislation is available in Annex 3.

3. National Strategies and Priorities

The late 19th Century witnessed the transformation of the agricultural based economy to that of tourism. The resulting transformation saw a shift in land use practices and a new set of challenges for the conventional Government structure in Antigua and Barbuda. These challenges include:

- the proliferation of housing outside of the villages (deforestation),
- the development of the coast for tourism
- A decline in the use of agricultural lands
- An increase in use of land for livestock farming
- An increase in mining of sand and soil for the construction industry

In addition to the shift in the economy, the auxiliary services have also proven to be a threat to land availability and quality. These include increase use of water, solid and liquid waste management, and road development.

Within recent years, the country has been slowly positioning itself to address the latest issues of land degradation. These measures were in response to national needs rather than the signing of the Convention to Combat Desertification. The activities are, however, consistent with the spirit and text of the convention. They include:

- Development of National Land Use Plans
- Development of Water Use Policies (development of the Public Utilities Act)
- Development of sustainable agricultural practices
- Rehabilitation of degraded areas
- Increased institutional capacity of relevant agencies
- Become a party to the United Nations Convention to Combat Desertification

3.1. Land Use Strategies - Prior to 1980

To address the new challenges facing the country, the Government felt that the first step was the development of a national land use plan. In 1974, with the assistance of the United Nations Development Programme, a National Land Use Plan was developed and submitted to the Cabinet of Antigua and Barbuda for approval. This is a necessary step for the development of the supporting legislation and presentation to Parliament for passage into law. The plan was not approved by the Cabinet. This effort, however, resulted in the creation of the Development Control Authority (DCA) and the Land Development & Control Act, which was passed in 1977.

The DCA's mandate is to control land development and the setting of building standards. At this time, attempts were made to incorporate the Ministry of Agriculture, Lands and Fisheries in the process of parceling and sale of lands. This was successful but it resulted in the further fragmentation of agencies with responsibilities for land. Although the DCA had relatively effective legislation for that period of time, the agency was not very effective in addressing land use issues. This lack of effectiveness was primarily due to the lack of political will at that time to implement the legislation.

Unsustainable farming practices and watershed management were given national priority during this period. The Ministry of Agriculture, through its Agricultural Extension and Soil Conservation Units, with the assistance of the international community, was successful in transferring soil conservation technologies to farmers. This resulted in a significant reduction in soil loss due to poor farming practices.

3.2. Land Use Strategies - 1980 to Present

At the national level, technical assistance was given to the Physical Planning Unit for the preparation of a second Physical Development Plan and for institutional strengthening. Additional funding was received for a number of projects including the preparation of policies and guidelines and draft legislation for several aspects of land use planning and management.

In 1995, the funding provided by United Nations Development Project and United Nations Centre for Human Settlements (UNDP/UNCHS), started the development process of a National Land Use Plan. In 1999, the plan was completed and is now being considered by Government for enactment into law during the year 2000.

In order to ensure the sustainable use and development of land, the plan includes:

- zoning for sectoral activities
- identification and conservation of areas of environmental, cultural and agricultural importance
- the requirement of environmental impact assessments for new developments, before approval is granted for development activities
- restructuring of the DCA board to include a more appropriate cross-section of society
- Development of local area plans.

Additionally, the land use policies in the National Physical Development Plan will, among other things seek to:

1. Conserve and allocate quality agricultural land and water resources so as to minimize the loss of agricultural land to build development and to facilitate sustainable and productive agricultural development.

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2. Facilitate the exploitation and allocation of natural and man-made resources to meet the needs of the tourism industry and other legitimate users, within the context of sound environmental and resource management practices.
 3. Protect the natural flora and fauna to maintain the integrity of terrestrial ecosystems while preventing further environmental degradation.
 4. Protect and promote the sustainable use of the country's forest reserves.

Due to the difficulty in coordinating activities among agencies, there has been a proliferation of plans and strategies that address some of the issue of desertification. The new land use plan is, however, more comprehensive and all-inclusive and since other national plans are subject to its provisions, it is not the intention to address these other plans in detail in this report. Other plans being developed are listed in Annex 1.

3.3. Specific Activities Related to the implementation of the Convention

Since the ratification of the UNCCD in 1997, the Government has only implemented a few additional activities related to the land degradation. The signing of the Convention has resulted in discussions on the institutional arrangements and related issues that impact on land management.

The fragmented approach to the management of land and water resources has been the subject of much debate since the signing of the Convention. The formation of the National Coordinating Mechanism (NCM) (see below) is one of the few forums that brings together all the technicians from the various agencies to discuss these and other issues and to encourage networking.

The ongoing activities related to the land degradation being implemented by various agencies are outlined below.

3.3.1. The Ministries of Foreign Affairs & Agriculture, Lands and Fisheries

In 1999, the Ministry of Agriculture, Lands and Fisheries in collaboration with the Ministry of Foreign Affairs, initiated a public awareness programme in the national print media. The main objectives were to raise awareness of land degradation issues and to address the resulting impacts. This was a follow-up to a National Awareness Workshop carried out by the Ministry of Foreign Affairs in 1998. This activity was part of the process leading to the development of a National Action Plan.

3.3.2. The Ministry of Tourism and Environment

The Environment Division in the Ministry of Tourism and Environment is the national coordinating agency for all international environmental treaties including the UNCCD. The

Division serves as the Secretariat for Antigua and Barbuda's National Coordinating Mechanism for Environmental Conventions.

To address the issue of land degradation, the Division has embarked upon a national urban reforestation program to raise awareness of deforestation. The program involves the building and maintenance of a nursery, which is designed to house over 5000 plants. The nursery is also used by the Forestry Unit within the Ministry of Agriculture, Lands and Fisheries, to care for endangered forest species.

In 1999, the Division initiated a project to increase the capacity of relevant agencies to develop and manage their own databases on natural resources. This project is ongoing and will seek to include information related to land degradation.

3.3.3. Fisheries Division

The Fisheries Division of the Ministry of Agriculture, Lands, Fisheries has been involved in a number of activities that impact on land degradation since 1998 and which continued into 2000. The activities included:

- Monitoring and inventory of all mangrove forests to ensure continued growth and health
- Efforts to declare more areas as mangrove reserve
- Monitoring of beach changes
- Working with the Development Control Authority on environmental impact assessments (EIAS) for coastal areas.

The overall long-term work programme that will impact on land degradation is aimed at:

- Protecting and managing all mangrove forests on Antigua and Barbuda
- Raising awareness of beach erosion.

3.3.4. Soil & Water Conservation Unit/Forestry Unit

The Soil & Water Conservation Unit of the Ministry of Agriculture, Lands and Fisheries as well as the Forestry Unit have been involved in the following activities since 1998, with some aspects to be completed by the end of the year 2000:

- Reforestation of areas around major bodies of water
- Review and update of topsoil and ghaat sand mining policy
- Bench terracing in major watershed areas
- Dam construction and monitoring
- Encourage the use of zero tillage for specific crops
- Replanting of mixed trees in mudslide areas which developed after the 1998 and 1999 hurricanes
- A long-term programme plan for the Unit is to establish assessment criteria for the degree of impacts of various media and phenomena such as stones, hurricanes, and fires, as factors of land degradation.

3.3.5. Non-Governmental Organisations

Gilbert's Agricultural and Rural Development Centre (GARDC or the Centre) and the Environmental Awareness Group (EAG) have also been active in conducting training programmes related to land use. The Environmental Awareness Group has been working with the Ministry of Education to include environment awareness in the curricula of primary and secondary schools.

The Centre has also provided training in agro-forestry practices to farmers and agricultural extension officers. The objective of the training was to increase the use of trees in livestock systems, hillside crop farming, and fire prone areas, using multipurpose trees for live fencing, fire/windbreaks and fodder production. The Centre also established a demonstration site in alley cropping on its compound. The GARDC has increased its collaborative efforts with the Forestry Unit of the Ministry of Agriculture, Lands and Fisheries in a watershed protection project, to establish buffer strips around a major water reservoir (Potworks Dam). The Centre is also involved with the Environmental Awareness Group in producing trees for communities and school projects.

In 1999, with assistance from an Organic Farming Consultant, the Centre established a number of farm projects that were more environmentally friendly (i.e. composting, use of green manure crops, cover crops, mulching, bio-pesticides). For the year 2000, they are currently involved in a collaborative effort with the Environment Division in the Ministry of Tourism & Environment in a national tree planting project.

Following are the main programming objectives of the Centre:

- To upgrade the Centre to be a regional centre to train and demonstrate the use of sustainable agricultural technology and processes that protect and enhance the environment;
- To provide resources, input, information of development and use of other types of agro-ecological farming practices; and
- To promote and train persons in the use of local natural resources for rural based, small entrepreneurial, cottage type industries.

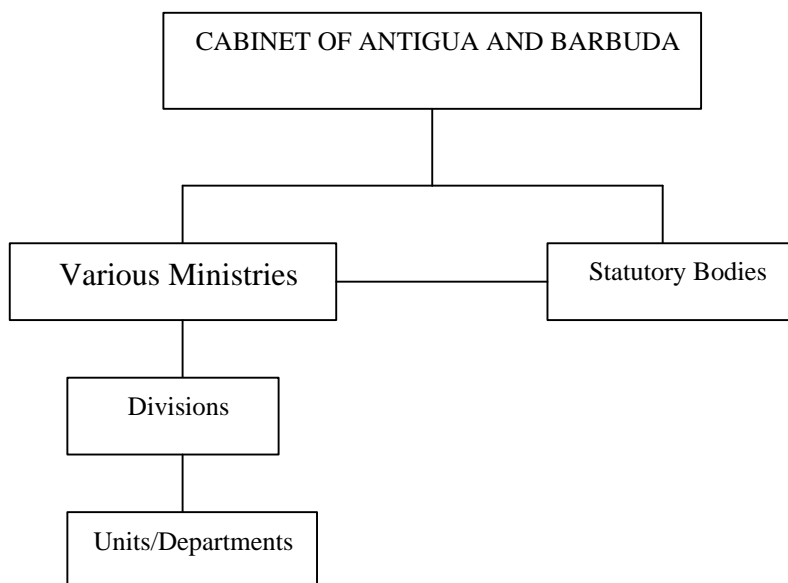
4. Institutional Measures Taken to Implement the Convention

4.1. Land Use Management

Since the ratification of the Convention, there has been the development of a national coordinating body to address all issues related to international environmental agreements. Fragmentation of responsibilities related to land use has made the issue of institutional changes extremely complicated. In the case of drought and water related issues, the situation is much less complicated since the legal responsibility for water management is assigned to one agency only.

The institutional framework of the Government of Antigua and Barbuda is outline below in Figure 1. According to this chart, the Government sector is divided into several Ministries. Each Ministry consists of Divisions and Units/Departments. A Ministerial Portfolio may also include statutory bodies. A Permanent Secretary manages the day-to-day activities within each Ministry.

Figure 1: Existing Institutional Framework within the Government of Antigua and Barbuda



As mentioned earlier, the changes in the economy brought with it new challenges which the British-type system of operation could not cope. In order to adequately manage its resources, the Government decided to created more Divisions, Units and Statutory Bodies with similar and in some cases overlapping responsibilities with existing Divisions and Units. This proliferation of agencies that occurred in the 80's and 90's has resulted in the duplication of efforts by several

ministries and in some cases created conflicting land use policies. In Antigua and Barbuda, responsibility for land use and spatial planning for example, involves five separate Ministries (Table 1). Due to the fragmented nature of the agencies with responsibility for issues related to land degradation, it was necessary to design a mechanism to facilitate coordination between agencies.

4.2. National Co-ordinating Mechanism for Environmental Conventions

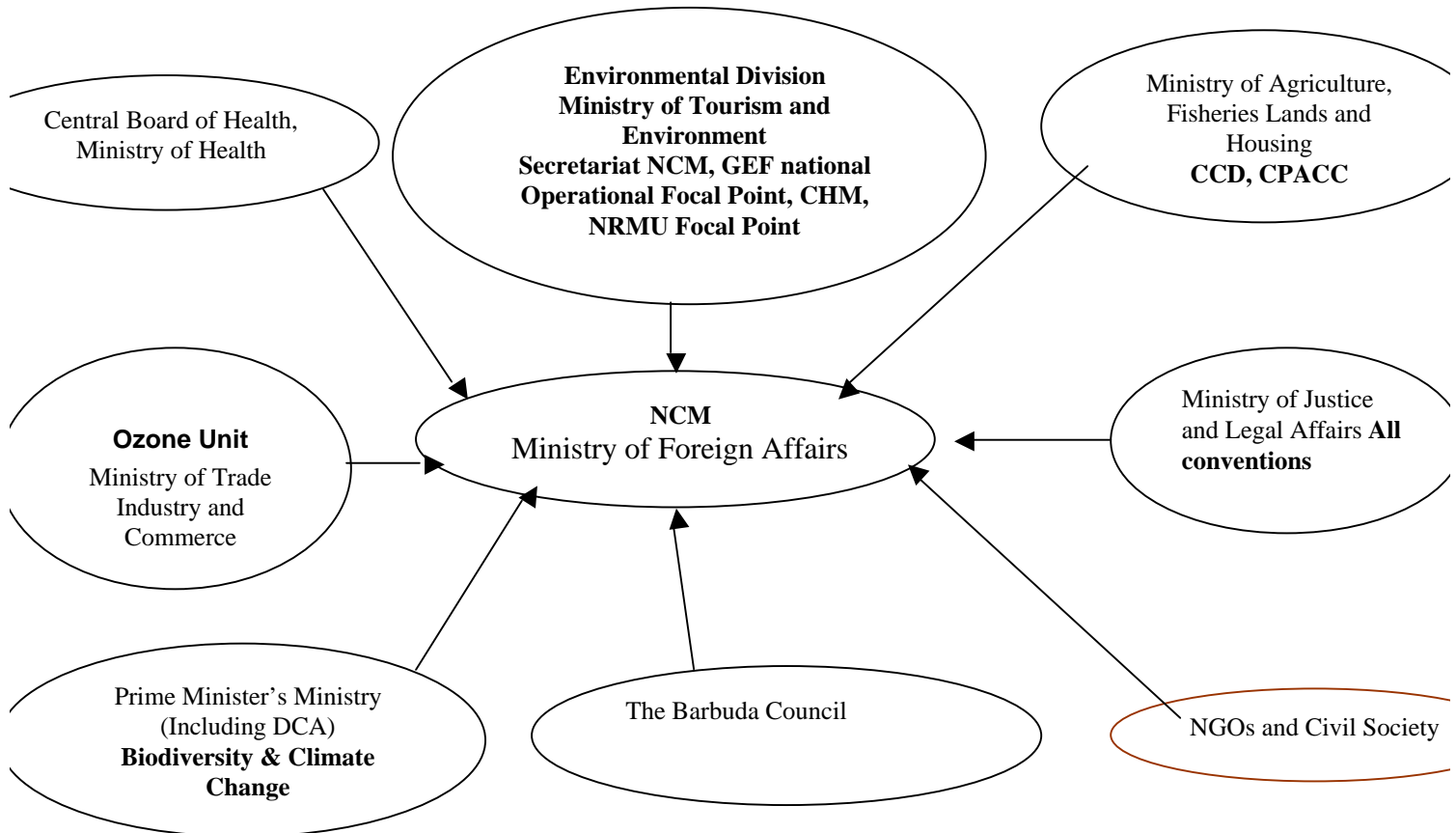
The National Coordinating Mechanism (NCM) is a forum for the coordinated follow-up, at the national level, of all Environmental Conventions ratified by the Government of Antigua and Barbuda. The role of the NCM is to strengthen communication links between the relevant Ministries and Departments in Antigua and Barbuda directly involved with the implementation of the Conventions. It consists of a network of Government Agencies/ Divisions, National Focal Points, Competent Authorities, and Non Governmental Organisations (NGOs) working together to facilitate a co-ordinated and timely response to treaty obligations of Antigua and Barbuda.

The NCM's organisational chart illustrates the communication links, information exchange and the availability of human and other resources. All resources within specific agencies are available for the implementation of activities related to the conventions. For example, as the Operational Focal Point of the UNCCD, the Ministry of Agriculture has access to technical expertise and other resources available within the NCM. The Environment Division performs the function of locating and making available the necessary resources required within the NCM. If resources are not available locally, this is communicated to the Ministry of Foreign Affairs for appropriate action at the international level.

This mechanism although not specifically established for the purpose of the CCD, has been effective in the implementation of Antigua and Barbuda's commitments under the Convention. Meetings are held three times per year at which time, the Operational Focal Points and project managers report on their activities to other members of the NCM. The agency responsible for treaty negotiations, The Ministry of Foreign Affairs chairs the meetings while the Environment Division in the Ministry of Tourism and Environment is the Secretariat for the Mechanism.

In general, the Operational Focal Points (OFPs) are responsible for the implementation of activities related to their respective Conventions. They are required to report on meetings attended, projects implemented and resources required for the effective implementation of their duties. The OPFs are required to attend technical meetings and where necessary assist in project development, implementation and review.

Diagram on National Coordinating Mechanism



The UNCCD's Operational Focal Point is currently within the Ministry of Agriculture. The role of the OFP is:

- to report on national activities at regular meetings of the NCM
- to provide advice to the NCM on actions that need to be taken
- to assist the Focal Point to maintain a database of Land Degradation indicators
- to assist with the development and implementation of the CCD National Action Plan
- to represent Antigua and Barbuda at regional and international meetings

The OFP time is not fully allocated to activities related to the Convention. It is therefore difficult at times to accomplish the tasks listed above. Where this occurs, the National Focal Point would request assistance from other agencies.

The Political Focal Point (PFP) is Antigua and Barbuda's Permanent Representative for Sustainable Development to the United Nations. The role of the PFP is to attend international and regional meetings to negotiate the terms of treaties. The PFP is provided with feedback from the NCM and thus can negotiate terms that Antigua and Barbuda can implement.

The Secretariat of the NCM, the Environment Division, co-ordinates the activities within the NCM and provides a communication link between agencies and secretariats of the various conventions. In the event that OFPs are not in a position to perform their duties, the Environment Division takes over, for as long as necessary.

Reports generated from the meetings are submitted to the Cabinet for approval and discussion. The recommendations of the meetings form a substantive portion of the work program of the various focal points, the Environment Division and the Ministry of Foreign Affairs. The process of meeting and reporting as part of this mechanism serves as a forum to encourage synergies between other conventions and national plans.

4.2.1. Level of Participation

The meetings of the NCM are attended by permanent secretaries, senior technicians from various agencies/ministries and statutory bodies. Other participants included several NGOs and community groups. The meetings are usually attended by over 30 participants and last for an entire day. All sectors related to the implementation of the UNCCD are represented at this meeting.

4.2.2. Legal Status

The NCM was formed by the Cabinet of Antigua and Barbuda in 1999 and does not have a legal framework for its operations.

4.2.3. Financial Autonomy

The NCM is financed by the budget of the Environment Division, in the Ministry of Tourism and Environment. Although there is no budget line item specifically for the NCM, the Division has access to approximately USD2000.00 per year for meetings and exhibitions. Equipment allocated to the NCM includes all the equipment available within the Environment Division and the Ministry as a whole. These include computers, photocopying facilities and multimedia presentation systems.

4.2.4. Communication Network

Within the NCM, technicians communicate primarily by telephone and facsimile. This is changing, however, as more agencies are being provided with access to the Internet as part of the Biodiversity Clearing House Mechanism. The NCM has a website and has provided all participants with generic e-mail addresses.

Electronic mail is still being used for informal communication since the government system does not recognise this form of communication as official.

Communication and networking amongst agencies is still voluntary, thus making the implementation of activities difficult.

4.2.5. Institutional Review

In general, there is a need for an institutional review to assess the needs of agencies responsible for land degradation. During the compilation of this report, it was recognised that the DCA and the SWCU are the agencies with the greatest institutional needs if the new land use plan and the proposed NAP are to be implemented effectively.

Details of the institutional capacity of the Ministry of Agriculture are outlined in Annex 1. The strengthening of this Ministry's human resource is a priority in the area of database management. This database will enhance the Ministry's ability to monitor the impacts of desertification for purposes of management and policy making. Natural resource management and the use of technology such as Geographic Information System (GIS) deserve special attention. Currently both the DCA and the Ministry of Agriculture do not have adequate facilities for training in database development and management.

At the time of the preparation of this report the, UNCCD National Action Plan is yet to be developed. It is hoped that this plan will address the issue of the institutional framework for the implementation of this convention in more detail. In the interim, however, there are no plans to develop a special body or committee to address issues related to land degradation. Existing agencies will instead be strengthened to facilitate the process of networking and data management.

5. The National Action Plan to Combat Land Degradation

Based on experiences with the other conventions and the contemporary experiences with land and watershed matters, a proposal has been drafted for consideration. It takes into consideration public opinions on land and water resource use and stewardship. The proposal also recognises the widely held cultural beliefs and abuse of land and watershed resources. These include:

- Poor husbandry of trees in public places;
- The cutting of wood for charcoal and fish-pots, which are not replaced by the users;
- The uncontrolled and sometimes unnecessary removal of trees to facilitate construction, illegal sand and soil mining;
- The improper disposal of waste (and other such activities) that contaminates watersheds and streams.

No action plan can be completed and its objectives fully achieved if the framework for implementation is not in place. Whereas prevention and mitigation measures have taken place long before Antigua and Barbuda's ratification of the Convention, it was limited to the agencies and stakeholders with specific and in some cases mandated commitment. Ratification of the UNCCD provides an environment for the institutionalising and mainstreaming of action through the entire public, private and civil sphere.

5.1. The National Action Plan

5.1.1. Stage I: Public Awareness

The first and most important step in the process of preparing the action plan for Antigua and Barbuda is to identify and categorise the stakeholders and interest groups. They should be from all levels: public and private sectors as well as civil society. The resulting peer groupings will form the basis for awareness and consensus building on the need to combat land degradation and prevent desertification in Antigua and Barbuda.

5.1.2. Stage II: Inventory of Current Practices, and Status of Interest/Needs, Resources and Expertise

This stage uses the institutional commitment (developed in stage one) to carry out the inventory. Because so much of the origins and impact of improper land use are seated in personal attitude, it is important that the inventory process is participatory. Therefore to ensure the involvement of all stakeholders key institutions should carry out the activities. This would be better achieved through institutional processes rather than individual consultancies. This ensures that there is the broadest involvement of all levels of stakeholders, and additionally, it facilitates mainstreaming

of the programmes that will ultimately be developed. The inventory and assessment process should include the following assessments:

1. Status and types of land use practices and the state of land degradation or rehabilitation as a result of these practices.
2. Status of water harvesting and processing capacity and processes utilised.
3. Water resource needs in all the water user sub-sectors (domestic, industrial, recreational and agricultural)
4. Vulnerability of land use zones and the land capability zones to drought and land degradation
5. Development inventory and categorise current land and water use practices (best and worst practices)
6. Prioritise *at risk* and compromised (degraded/damaged) land and water resources for rehabilitation.
7. Ability of the various stakeholders or the resource to adapt or respond to threats or encounters of drought or land degradation.

5.1.3. Stage III: Programme Development and Project Identification

The following four main programme themes are suggested as being critical to any strategy to combat land degradation and mitigate the effects of drought, namely:

- **Rehabilitation of Land and Water Resources;**
- **Creation of a Facilitative Legislative Environment;**
- **Building of Institutional Framework for Combating and Mitigation;** and
- **Budgeting and Fundraising for combating and mitigation**

Any sub-programmes, projects or activities developed in action planning fall into any or all of these three main programme areas. Once concrete action begins and the gains become obvious, the programming could and should be changed. It is conceivable that once the facilitative legislative environment is achieved, Programme II would evolve to “**Monitoring, Evaluation and Enforcing of Land Degradation and Desertification Prevention and Rehabilitation Activities**”. However, in these early stages these three programme areas remain important to the process.

5.1.4. Programme I : Rehabilitation of Land and Water Resources

1. Reverse of watershed and coastline damage caused by the recent hurricanes and the increase in soil, sand and ghaut mining for construction and landscaping activities

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2. Establish model watershed use projects to test methodologies and develop guidelines for supplying rehabilitation, restoration and management mechanisms for residential, industrial, agricultural, recreational and resource (water, land, aggregate, sand, etc.)

5.1.5. Programme II: Creation of a Facilitative Legislative Environment

Critical to any action to combat desertification is a legislative environment that empowers its host institution to monitor and enforce rules and regulations under its purview. The following are important actions in this programme:

1. Inventory and review of all laws that impact on drought and land degradation
2. Strengthen or update weak legislation and where necessary amalgamate sections of laws into a sole comprehensive legal instrument
3. Complete and enact draft legislation that have been pending for extended periods
4. Draft and enact new legislation where required

5.1.6. Programme III: Building Institutional Frameworks for combating and mitigation

Antigua and Barbuda's obligations as a Party to the Convention, require, among other things, sustained action to ensure that it continues to function within the guidelines of the convention. Sustainability and continuity can only be achieved within a framework of institutions. At this stage, the action plan is critical to the ability of the country to maintain its obligations.

1. Establish mechanisms and agencies responsible for "assessment and maintenance" of vulnerable and potentially vulnerable coastal, watershed and agricultural land resources. Where mechanisms or agencies exist for similar or related action, and where it is appropriate, these could be strengthened to accommodate the required actions.
2. Develop and implement an information and education network and to transfer appropriate technology and best practices on protection, conservation and mitigation. The information sharing should be aimed at providing support for enforcement of regulatory and control activities, promoting laws, changing individual personal and collective behaviour, etc.
3. Create the regulatory and control structures and mechanisms to foster a legislative environment that is supportive and responsive to the other institutional frameworks.
4. Develop the networks within civil society to promote popular action for educational and other activities for prevention and mitigation.

Actions such as user fees services supplied by Government ministries, agencies and authorities may need to be considered. In other cases where the threat of land degradation affects an

economic sector directly and compromises its productivity, the private sector may have to be given some incentive of fund some of the actions. International funding will also be critical for national or regional projects. This programme area should also facilitate the development of networks among governmental and non-governmental agencies to facilitate financing of the three programme areas.

6. Financial mechanism for the implementation of the CCD

The budgetary system for the country and the fragmentation of responsibilities related to the UNCCD does not allow for the specific creation of a budget line item call land degradation. There are, however, budget line items in the several agencies and ministries that fund activities related to the prevention of land degradation.

Typically, 75 percent of the funds were allocated to salaries and transportation. The remaining 25 percent is allocated to purchase equipment and materials. Most agencies reported that of the funds allocated to non-salary expenditure, only 40% of it was actually provided by the Treasury. This meant that although some agencies are adequately staffed, the funding required for the successful implementation of activities was not provided.

The problems related to funding in Antigua and Barbuda are not peculiar to environmental activities. The country is still trying to recover financially from four devastating hurricanes within the pass five years. The Government has had to relax its system of taxation to facilitate the necessary reconstruction of homes and businesses. This has left the treasury financially strapped and the Ministry of Finance has to review its tax measures to improve collection. The Government is therefore unable to finance the necessary rehabilitation of lands degraded by hurricanes.

Consequently, the Soil and Water Conservation Unit has completely halted its dam construction and maintenance work due to lack of resources. The Forestry Unit and the Environment Division have had several delays in the reforestation programs and other activities such as the further development of the national database and the environmental capacity building activities are on hold.

The prevention of land degradation is predominantly a private sector driven effort today. Many farmers and landowners, have implementing measures to address rehabilitation and prevention of land degradation. On Crown land, however, the government is still struggling with its responsibilities.

Assuming that the country is not affected by another hurricane, these financial constraints are anticipated to last another five years. For Antigua and Barbuda's action plan to be successful, it is important that innovative approaches to financing be developed.

To adequately monitor and implement activities that prevent land degradation, Antigua and Barbuda will need assistance with the implementation of the several priority activities. These include:

- Development of a national information system on land degradation
- The development of the National Action Plan
- Development of guidelines for soil and sand mining

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- National Reforestation program
 - The development and implementation of an awareness program that addresses key areas of sustainable land use.

With respect to Antigua and Barbuda is yet to develop its National Action Plan. International donor agencies such as the Global Environment Facility (GEF) have not been contacted to fund national projects. A regional project for the Organisation of Eastern Caribbean States (OECS), however, has been identified and will be initiated in 2000.

Antigua and Barbuda has not been the recipient of significant amount of funding of its national environmental program from the international community, with a relative high Per. Capita income of almost 7,000 USD, the country is not eligible for traditional International assistance, in the form of grants or loans. The country must therefore fund its own Environmental and Hurricane rehabilitation program.

The country is making efforts to attract GEF funding, but this has proven to be challenging since the process is relatively lengthy and the fact that projects are assessed on the "Global Significance" of the economical system has restricted nation assistance from the GEF to the funding of enabling activities.

The UNDP has provided significant funding for the development of a national land use plan, however there is limited funding for its implementation, (which includes capacity buildings).

7. Benchmarks and Indicators for Land Degradation

At the time of the production of this report, there has been no consensus on the suite of indicators to be used to monitor land degradation. It is anticipated that this will be determined during the development of the NAP. The process of developing the NAP will also identify issues such as reporting and development of information systems.

Although considerable amount of information has been collected on land use and degradation, there is no existing single database. A number of agencies, however, routinely collect land use data but this information is not readily available. The Antigua Public Utilities Authority (APUA) in association with several Government agencies in the process of developing a cadastral map of the country to adequately map, among other things, water resources and land use. The development of indicators for land degradation is an integral part of this exercise.

The primary agencies involved in the collection and maintenance of information related to land degradation are, the APUA, Ministry of Agriculture, Ministry of Tourism and the Development Control Authority.

8. Annex 1. Summary of National Stakeholders and their Role

Institution/Organisation/Stakeholder Group (Government)	Role
Barbuda Council	Barbuda Local Government/development and land degradation issues in Barbuda.
Citizens Welfare Division	Poverty assessment, this is especially significant in relation to the large number of immigrant population.
Development Control Authority	Guiding land use and spatial development decisions and the development of local area plans.
Fisheries Division	Guidance in protection and management of all mangrove areas on Antigua and Barbuda; protection of beaches for nesting turtles and the prevention of further beach erosion.
Ministry of Planning, Implementation and Civil Service Affairs	Linking land degradation and desertification to national Economic Development Planning
Office of Meteorological Services	Research on weather systems with the potential to cause desertification and land degradation
Ministry of Education Natural Science Curriculum Development and Planning	Integrating concepts of land use management for the prevention of land degradation into primary, secondary and post-secondary technical and vocational curricula
National Parks Authority	Integrating land degradation policies into the programming, implementation and monitoring mechanisms of the Parks system; and to extend the parks system where its implementation controls or prevents land degradation without hampering the economic benefits derived by traditional users of the lands within the park system.

Annex 1 (Cont'd.)

Institution/Organisation/Stakeholder Group (Government)	Role
Antigua State College	Integrating concepts of land use management for the prevention of land degradation into post-secondary technical and vocational curricula
Antigua Public Utilities Authority	Policy development, implementation and monitoring land use practices in the development of public utility all public, and private utility companies.
Ministry of Public Works	Assess the impact of the infrastructural development government on land degradation.
Lands Division	Assess the impact of land administration on prevention or promotion land degradation.
Central Housing Authority	Assess the impact of land distribution and housing development prevention or promotion land degradation
Extension Division	Assess the impact of agriculture systems on prevention or promotion land degradation
Livestock Division	Assess the impact of livestock rearing and aquaculture on prevention or promotion land degradation
Ministry of Tourism and Environment	Assess the environment impact of land degradation desertification and meeting Convention Obligations

Annex 1. (Contd.)

Institution/Organisation/Stakeholder Group (Non-Governmental Organisation and Private Sector)	Role
Representatives of sports groups, youth groups, recreation and naturalist groups, etc. (civil society)	Their activities and other rituals as they impact land degradation or as they are impacted by land degradation.
Representatives of churches and religious groups (civil society)	Their specific worship, membership and burial rituals as they impact land degradation or as they are impacted by land degradation.
Antigua Hotels and Tourists Association (Private Sector)	Issues of the impact of hotel industry development on land degradation and the impact of land degradation on the hotel industry.
International Technical Assistance Organisation in Agriculture/Natural Resources (Non-Governmental Organisation) National Representative	Support for technologies for agriculture, fisheries, forestry, and aquaculture production systems, which prevent and minimise land degradation in their national programming.
Gilbert Agricultural & Rural Development Centre (Non-Governmental Organisation)	Use of the Centre to promote and train persons in the use of local natural resources for rural based, small entrepreneurial, cottage type industries, sustainable agricultural technology and processes that protect, enhance the environment and development and use appropriate types of agro-ecological farming practices.
Representatives of producer groups and organisations in agriculture, livestock, fisheries and charcoal making (private sector and civil)	Represent indigenous knowledge in prevention and mitigation of land degradation and desertification. Economic activities that have the potential to cause degradation.
Disagreed	Role
University of the West Indies School of Continuing Studies (Non-Governmental Organisation)	Maintaining a link with the University of the West Indies as a means to influence tertiary level programs to which Antigua and Barbuda students may have access as they impact on land degradation.
Barbuda representatives of producer groups and organisations in agriculture, livestock, fisheries and charcoal making (private sector and civil society)	Represent indigenous knowledge in prevention and mitigation of land degradation and desertification. Economic activities that have the potential to cause degradation (as it pertains to Barbuda).
Environment Awareness Group (Non-Governmental Organisation)	Represents the civil society and NGO interests in environmental integrity as an agency actively involved in protecting bio-diversity.

9. Annex 2. - List of Relevant National Plans

9.1. Agriculture Sector Plan

The Ministry of Agriculture is presently involved in a process of developing a national agriculture sector plan. As part of the process, a working group in the natural resources sub-sector has been formed. This working group is responsible for identifying the issues in the plan that relate to the use of the land, soil, watersheds, forests, fisheries and marine and coastal areas for food production and developing programmes. This plan is to be completed by the end of 2000. As the largest group of professionals involved in desertification activities is located in the Ministry of Agriculture, it is expected that desertification and land degradation will be mainstreamed into this plan. In the recent sector planning activities, a sub-committee with specific focus on this issue was formed.

9.2. National Economic Planning Process

In 1999, the Ministry of Planning and Implementation prepared a set of recommendations for an economic sectoral planning process. The plans are to be circulated to all Government ministries and other stakeholders by July 2000 for review and comments, in preparation for ratification by Cabinet. Fifteen (15) sectoral sub-committees representing all relevant public, private and civil society stakeholders and interest groups are being formed. It is anticipated that they will be formalised and activated with clear terms of reference by the end of April 2000.

The Sub-Committees will be mandated to develop a strategic framework for socio-economic development of the various sub-sectors of the economy, for approval by Cabinet of Antigua and Barbuda. The process is expected to generate a Sustainable Development Plan for the period 2001 to 2004. Issues of desertification and land degradation will be addressed in the Subcommittee/s mandated to address environment, agriculture and sustainable natural resource development. However, some processes should be grafted into the economic planning process to ensure that all players in the process are acquainted with the concepts and definitions of land degradation. It is especially important to ensure the interest and stakeholders outside of natural resources and environment areas are adequately appraised of its relevance to the national economic planning process.

9.3. OECS Education Reform Programme (Antigua/Barbuda Initiatives)

The Education Reform Strategy has as one of its objectives, the mobilisation of Governments and peoples of the OECS to make the transition from developmental strategies based on the exploitation of natural resources to strategies based on the development of human resources, and the mastery and production of knowledge and technology.

The science and technology initiative, which is yet to come on stream, will seek to harmonise curricula in the sub-region and in the process seek to provide the educational materials and tools necessary to meet the stated objective. One strategy is to promote environmental education at

both the primary and secondary levels through the method of infusion into several subjects in the curriculum.

At present, Agricultural Science is taught in both Primary and Secondary schools where land degradation issues are loosely addressed. Although there is no specific land degradation initiative, the science education thrust is such that, necessary mechanisms such as workshops, science fairs and exhibitions etc. can be utilised to highlight and focus on this issue. Issues of land degradation and desertification can be integrated into the curricula for Agricultural Science, Integrated Science and Geography.

9.4. National Disaster Preparedness Plan (Sectoral Planning)

9.4.1. National Office of Disaster Services

National disaster planning is the responsibility of the National Office of Disaster Services, whose functions fall under the Office of the Prime Minister. The Office also operates a National Disaster Committee on which stakeholders from all levels of public, private and civil society are represented. The technicians from the Ministry of Agriculture and other agencies involved in land use and land use management are represented on this committee.

One of the elements of its plan of action and work programme is *sectoral disaster planning*. The aim of this programme element is to ” *develop a culture of disaster preparedness, mitigation, response and recovery with specific reference to hazard specific awareness, preparation and response activity in the workplace*”; also the major activities of the Office that impact land degradation relate to preparation of vulnerability and risk maps. Other ministries of Government have developed national disaster plans since becoming members of the committee. However, in some cases the plans are limited to workplace disasters and disasters caused by the impact of hurricanes on human lives.

Because of the frequency of major tropical weather systems (hurricane and tropical storms) over the past ten years, of necessity, the Office has had to concentrate on post disaster response to hurricane victims, and reduction of the impact of these events on human settlement. Until recently, it had not addressed prevention of the secondary impacts as a result of compromised natural resources, such as landslides on human settlement. Consequently, it has not been charged with any role that relates to broad scale disaster prediction and early warning systems, as mitigation measures.

This limitation, in part, has probably been limited by the lack of resources. However, the overarching factor may be the limited concept of the role of a disaster management agency in our environment. The Office could have a role to play collaboratively, with the agencies responsibility for the management of lands and land use, in monitoring of negative practices, preparing vulnerability and risk prediction models and lobby for mitigation of vulnerability.

The role also has implications for supporting bio-diversity action, as it information to facilitate mitigation of the effects of various potentially disastrous natural phenomena on loss of indigenous flora and fauna. This would serve to reduce their disaster response activities and a response of increased mitigation in the pre-event stages. If such a role would evolve for this unit, they would be an essential unit in the prevention of desertification and land degradation. The process of mainstreaming the prevention of desertification and land degradation could facilitate the broadening of the perception of the role of disaster preparedness, mitigation and prevention at the national level.

The Office has very close links with the public and private agencies involved in issues of land degradation and desertification. As a consequence the Office of National Disaster Services has recommended the following as measures to combat land degradation, evidence of the broadening perception of its own role. The recommendations are:

- Reforestation to replace the tree cover lost over the past 10 years in hurricanes;
- Developing and implementing watershed protection plans;
- Developing and implementing public awareness and conscious raising programmes on land and land use management;
- Developing an improved collaborative framework between the Ministries responsible for agriculture, fisheries, environment, national planning and the Office on the issue of land degradation.

9.4.2. Agriculture Sector Disaster Plan

The Ministry of Agriculture, Fisheries, Lands and Survey began a process of disaster planning in November of 1999 as part of an FAO funded disaster in agriculture mitigation plan. The plan is aimed at preparedness, mitigation, impact assessment and remedial action planning for hurricanes, floods, drought, seismic activity and miscellaneous disaster such as outbreaks of exotic pests. The mission statement of the plan is: - *to prepare a plan that ensures preparedness mitigation, assessment and relief in the event of a disaster (natural or man-made.)* Three of the main areas of concern in this process are the effects of disasters on the forestry, fisheries and agriculture sub-sectors. The main responsibility for land degradation impact assessment lies with the Soil and Water Conservation and the Forestry Units. In the November 1999 workshop, impact assessment was a major focus of discussion. The plan, which is the ultimate responsibility of the Permanent Secretary of the Ministry of Agriculture, has the support of the highest levels of the Ministry and is expected to be completed before the next hurricane season.

9.4.3. Plans in other areas

The analysis of plans as outlined in this section is not exhaustive. It represents the plans that are obviously related to implementing our national obligations under the Convention. It is essential in the first phase of the action planning process, that as other relevant plans are identified their

host organisations and institutions brought on board, in the awareness building process. Such plans may include programmes to address human settlement, migration, youth development, industrial development, and other such areas.

10. Annex 3. Analysis of Relevant Legislation

10.1.1. Beach Control Act

The Beach Control Act seeks to prevent the public of Antigua and Barbuda from utilising the foreshore or the floor of the sea for both stand for “any public purpose or in connection with any trade, business or commercial enterprise.” This Act does not however, extend to certain lands including those set aside for agricultural usage.

There are stringent penal provisions under this Act for persons who contravene its provisions. For example, section 4(2) of the Act imposes a term of imprisonment not exceeding one (1) year with or without hard labour for persons who violate the provisions of this Act. This Act also imposes a fine for each day during which any contravention continues. A Magistrate can fine a violator as much as EC \$500.00 per day in such instances.

Section 4 (3) of this Act also makes directors and officials of companies liable to penalties where it can be proven that they were “knowingly a party of the contravention.” The Cabinet of Antigua and Barbuda has the power to make regulations to facilitate the proper operation of this Act.

The power to grant licenses under this Act is vested in the Minister of Government, whose responsibility it is to consider the public interests that may be affected by the granting of any such licence. The public is also afforded an opportunity to express their views on any such application of a licence.

The most persistent is that the general public is often unaware of these applications for licences. Many citizens do not see the notices of applications for licenses when they are published in the country’s Official *Gazette*. Additionally, the public is largely unaware of their powers to influence the decision making process regarding such applications. Thus, applications are usually primarily based on the Ministerial advice available with little input of the public.

10.1.2. Sand Mining

Antigua and Barbuda boasts some three hundred and sixty five (365) beaches. Barbuda is surrounded by the most beautiful pristine pink sand beaches, and is believed to have abundant sand reserves. It has traditionally been the practice for nationals to obtain the sand needed for construction from these beaches.

Today, illegal beach sand mining is a major environmental problem affecting Antigua and Barbuda. The Beach Protection Act Cap 46 of the revised laws of Antigua and Barbuda only addresses the issue of beach sand mining on the island of Antigua.

A different situation regarding sand mining obtains in the sister island of Barbuda. In Barbuda, a Council of elected members carries out local governance. Under the Barbuda local Government Act, chapter 44 the Barbuda Council has the authority to enter into contracts for and on behalf of the people of Barbuda.

Section 18 2(c) of the Act allows the Barbuda Council to raise and collect revenue to meet its expenses. Since 1996, the Central Government and the Barbuda Council have been parties to an agreement that gives the Council the exclusive right to mine sand on the island of Barbuda. Since then, the Barbuda Council, as a body corporate, has contracted with a private company to mine sand in Barbuda.

The Barbuda Council receives revenue for each cubic metre of sand that is mined. The Barbuda Council has the sole discretion to determine where the sand can be mined and what quantities can be removed. It is still unclear whether there is an official policy of the Council regarding such mining. It is uncommon for the parties involved to consult with personnel from stakeholder government ministries responsible for agriculture, environment and land development.

10.1.3. Deforestation

Antigua and Barbuda's topography today is a direct result of the natural resource exploitation began during this country's period as a colony in the early (17th Records Law established that within the first few decades, much of the natural vegetation of these islands were cleared by colonial settlers to facilitate the cultivation of tobacco, indigo, cotton and later sugar cane. Later (1944) noted that natural vegetation of Antigua and Barbuda radically altered by its mass removal for plantation agriculture and this land clearing had led to widespread erosion.

It has been suggested that extensive deforestation was caused by wood being cut for users fuel evaporators used in sugar production. The first laws designed to protect forests in the West Indies was the Body Ponds Act No. 15 of 1721. This Act prohibited the felling of trees within 30 feet of the edge of the Body Ponds in southwest areas of Antigua and remained in effect for over two hundred years.

Today, it is extremely difficult to make a thorough classification of the natural vegetation of Antigua and Barbuda. The Forestry Act, Chapter 178 of Laws of Antigua and Barbuda attempts to impose provisions to prevent deforestation. The provisions primarily address areas that were made forest resources upon the coming into place of this Act. The Forestry Regulations Cp 178 under this Act details how activities should be carried out within forest reserves. This piece of legislation in its present term does not adequately address the needs of the country presently.

It will only be possible to prevent deforestation if a law is designed to meet the peculiar problems that persist in Antigua and Barbuda regarding deforestation. At present, the activities of the Chief Forestry Officers are greatly constrained because this Act does not afford him powers to enforce orders against deforestation. There is clearly need for this Act to be revised to reflect present environmental concerns such as desertification.

Part III of the Act looks at reforestation. The Ministry responsible for Forestry matters has the power to declare any estate or part thereof subject to reforestation schemes. This information is published in the *Gazette* and need to be told in layman's language what these directives mean.

Section 9 of the Act speaks of the Chief Forestry Officer preparing schemes for reforestation, but these can only be successfully implemented with the financial assistance of the Central Government and the cooperation of the citizenry. Presently, this Act does not address the widespread problems that exist with deforestation. There appears to be a need for collaboration between the ministry responsible for Forestry and the agency responsible for granting development approval for residential and commercial construction. It is hoped that such collaboration between stakeholders will reduce the incidences of incorrect land clearance and improper land use.

The maximum fine for any offence committed under this Act is one thousand EC\$1,000.00. This fine is clearly not adequate to be seriously considered a deterrent to any activities contrary to this Act. There is an urgent need for adequate legislation and regulations to provide protection and management for the remaining forest resources in Antigua and Barbuda. Watershed and catchment areas need to be identified, managed and protected. Issues such as the introduction of a forestry fund has been suggested since the 1991 environmental profile for Antigua and Barbuda.

The existing institutional capabilities need to be strengthened to address the protection management, administration and other organisational responsibilities for natural resources management. In the absence of an extensive public education programme to sensitise the public, there will never be any appreciation for the importance of forests and other related natural resources. Thus, the public will never assume responsibilities for their role in the preservation of our forest resources. An informed public that realizes that trees, shrubs and other vegetation serve as noise barriers; removes airborne pollutants and adds oxygen to the environment concern for trees and their preservation will assist efforts in this area in Antigua and Barbuda.

10.1.4. Water

The Public Utilities Act, Cap. 359 established the Public Utilities Authority, which has "the exclusive right to supply, distribute, maintain and sell water within Antigua and Barbuda and to perform service incidental thereto..." Thus, the Public Utility Authority can cause water lines to be laid and carried through, across, over or under any street or after reasonable notice to the owner or occupier, through, over or under any land whatsoever, enclosed or otherwise." The ambit of this piece of legislation is so wide that section 8 (2a) allows them to cut and remove from any street and to enter upon and to cut and remove from any private or public lands, any tree or any branch, bough, or other part of a tree that is growing near to any telephone, electricity or water line.

The Antigua Public Utilities Authority has responsibility for the management of Antigua and Barbuda's water resources. They are also responsible for hydrological and hydro geological studies, the development and construction of wells, the planning and designing of dams, and contracting out major construction projects. The fact that the Antigua Public Utilities Authority has extensive rights to supply water affords them considerable powers of access to public and private lands.

Currently, the Authority is accountable to no other agency regarding the manner in which they remove natural vegetation and forests to lay pipes and carry out repairs. The result is that personnel from the Authority indiscriminately denude tracts of land of vegetation to facilitate their work. There is little, if any, attempt to reforest those denuded areas. This practice has caused large losses of topsoil whenever heavy rains fall.

The Act does provide power to the Minister responsible for this Authority to give policy directions to facilitate the proper performance of the functions of this authority. It may be advisable to sensitise the Board of the Authority and the Minister responsible to the critical role that this Authority must play in the fight against desertification. There is need to educate employees and generally develop a policy for the Authority regarding removal of vegetation.

Section 40 of the Act provides for the Minister to make regulations to authorize employees to "cut, fell or burn any tree.... that is growing.... within thirty feet of any water course." There is clearly need for a revised policy or removal developed in collaboration with the Forestry Division and Soil and Water Conservation Divisions of legislation to be enacted that would stipulate guidelines of policy for the Antigua Public Utility Authority and the other stakeholder ministries of government to follow.

10.1.5. Agricultural Practices

Poor land use and the continued mis-management of watersheds are two of the major environmental problems associated with agriculture in Antigua and Barbuda. Many small farmers employ the "slash and burn" method to clear undesired vegetation to prepare their land for planting.

The Bush Fires Act, Cap 62 has been in existence since 1901. It establishes a penalty for fires to be set without obtaining a license from the commissioner of police or any duty authorized officer. The owner of land where unauthorized fires are set may be charged a fine not exceeding three thousand dollars (EC \$3000.00) or a term of imprisonment not exceeding six months. Occupiers/ tenants of land are subject to the same penalties.

The Act vests the power of inspecting lands upon which fines to be set by the commissioner or a daily appointed competent person. The Act is quite impractical because the commissioner of police or his agents are not trained to appreciate the numerous environmental problems that can arise by the granting of a license to set a fire. The police do not have the manpower to inspect

every site where a person makes an application for a licensed. There is no requirement for consultation with the Ministry of Agriculture before such licenses are granted.

The time has come to development the capabilities of the requisite personnel to enable this country to fulfil its obligation under the Contravention to Combat Desertification. This antiquated Act does not meet the needs of modern day Antigua and Barbuda. In the circumstances, the Ministry of Agriculture would be a more competent authority to deal with this situation. Until such time as the legislation is updated, the Ministry of Agriculture should make representation to the Commissioner of police to offer their assistance in the investigation of premises for fire licenses.

10.1.6. Uncontrolled Livestock Grazing.

In Antigua and Barbuda, uncontrolled livestock grazing is a major area of concern. Such unchecked grazing has been found to adversely affect existing vegetation and watersheds. In fact, Garel (1986) has found that such grazing accelerates - deterioration (especially during wet periods) estuation, deteriorate and general denudation of the land.

Whilst the Cattle Trespass Act, Cap 77 deals with straying animals and has provisions to deal with delinquent owners. There is no prevision for such owners to be charged for any resulting environmental damage. Thus, no law presently addresses the problems that cause land degradation and denudation caused by over grazing of straying animals. Livestock farmers need to be sensitised to proper land use practices to avoid such problems persisting. Presently, the Ministry of Agriculture has officers that train farmers in this regard, but that is a matter of policy and not legislation at this time.

10.1.7. Land Use, Planning

In Antigua and Barbuda, the concept of organized physical planning and development was first introduced in the 1970s under a physical, planning project organized by the United Nations Development Programme. Since then, the Government has allocated land management functions to various agencies. These Government agencies are created and/ or operated under different pieces of legislation. For example, the Development Control Authority and the Physical Planning Office are guided by the Land Development and Control Act Cap 235 and the Town and Country Planning Act Cap 432. The Central Housing and Planning Authority was once the main agency to deal with the allocation of lands, some of these functions have since been assured by the Lands Division, Ministry of Agriculture.

The Development Control Authority created by the Land Development and Control Act Cap 235 has over all responsibility for development control in Antigua. The Development Control Authority is perceived as weak enforcement agency and therefore not taken seriously by the public. There are numerous instances where citizens commence clearing of land and construction of properties without the prior approval of the Development Control Authority.

The penalties that exist under the existing law are too low to facilitate strict compliance. This is also a problem where certain developers seek to deliberately circumvent the authority of Development control Authority. The Development Control Authority Board has representatives from the Ministry of Health, the Public Works Department but does not include any from the Ministry of Agriculture - which has so much dialogue with lands and the Antigua Public Utilities Authority which is responsible for waterways, etc.

There is a clear and urgent need for those agencies that deal with the various aspects of lands use to design a collective approach to land use planning and management. The Development Control Authority has recognized many of its shortcomings under its present legislation. In this regard, the Authority is plotting a new piece of legislation that will hopefully development develop a more hostile approach to land development issues.

Collaboration between the various government departments dealing with land is needed in a formalized structure. It ensures that all Antiguan and Barbudians obligation under the UN Convention combat desertification and addressed on a daily basis. There is need for institutional strengthening with capable personnel to achieve notable results. This new Act being prepared in conjunction with the Development Control Authority may not address all the problems that currently exist, but its guidelines for carrying out proper environmental impact assessments prior to any development will certainly improve the state of land use planning and modes of development in Antigua and Barbuda.

11. Conclusion

Desertification by all definitions is not considered a real threat to Antigua or Barbuda, but land degradation and the ability of the land to remain productive, is recognized as being a real issue for many centuries. As reiterated throughout this report, the Government has made significant efforts to address this issue but the shift in economy has not been complimented with a shift or expansion in institutional responsibilities for the prevention of land degradation. Based on the information gathered in this report, it can be concluded that the prevention of land degradation can no longer be the mandate of the Ministry of Agriculture only. It is necessary that other agencies with responsibilities for land and water management become involved.

The production of this report highlighted several deficiencies in country's effort to address land degradation. The primary deficiency is the lack of information on the extent of and threats to land degradation. Information required was not readily available which indicates that the decision making process is not being provided with the necessary support to address the issue. It is therefore a priority that the key indicators of land degradation are identified and the baseline data collected.

This report was successful in highlighting the number of weaknesses in addressing the country's management of this important issue. Land degradation is pervasive and affects all areas of the economy. The prevention of land degradation will therefore require a broad-based integrated approach that will take into consideration current and future threats such as climate change and ozone depletion.

The legislative framework of the country is clearly outdated. It is clear that there has to be a careful review of the fragmented legislation and attempt to create one comprehensive, framework legislation, which would address all the areas of concern for the environment in general taking into consideration land degradation issues. The framework legislation should include considerations of international obligations of this country under conventions such as the United Nation Convention to Combat Desertification, the Conventions on Biological Diversity and Climate Change. The limited human and economic resources of Antigua and Barbuda, as a small island developing state, demand that they be properly deployed to achieve maximum benefits. It is critical that all these agencies to work together as a unit. The appropriate legislation is needed to facilitate any such cooperation. Thus the roles of each agency will be defined within the context of the national environmental policy.

Although the country has not implemented many activities specific to the UNCCD since 1997, the development of the NAP, which is scheduled to be completed in 2001, will be a very important process to guide national action. The country is signatory to several other international environmental conventions, each of which requires a national plan. The NAP process will seek to promote synergies between the various national action plans and projects. The process of developing and integrating these plans will address similar issues while promoting the efficient use of scarce human and financial resources. This will also increase the possibility that resulting policies are consistent.

The financial ability of the country to effectively halt the rate of land degradation is in doubt. The ravages of hurricanes have been too frequent for the country to adequately recover. In addition it is not likely that a special fund will be created for the implementation of the NAP. It is clear therefore, that the Government needs to develop and implement policies and legislation that encourages the use of preventative measures, and to place the responsibility of rehabilitation on individuals and the private sector. In addition, agencies and ministries will need to renew their efforts to network, thus using their resources more efficiently.