

**Multilateral Environmental Agreements in the context of Sustainable
Development for the Commonwealth of Dominica,
Eastern Caribbean**

By

Kyle Ross Fargey

A thesis submitted to the Faculty of Graduate Studies of the University of
Manitoba in partial fulfillment of the requirements of the degree of
Master of Natural Resources Management

Natural Resources Institute
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Abstract

The Commonwealth of Dominica, located in the Eastern Caribbean, has become known as the “Nature Island of the Caribbean”. With the advent of becoming a signatory to a growing number of international environmental treaties, Dominica is faced with great responsibility in its effort to implement each of the goals of these treaties nationally. Therefore, how is a small island developing state, such as Dominica, able to implement the multilateral environmental agreements (MEAs) to which it becomes a signatory?

The purpose of my research was to examine the activities of the Government of Dominica’s newly established Environmental Coordinating Unit of the Ministry of Agriculture and the Environment to implement the multilateral environmental agreements (MEA). The first objective involved analyzing how Dominica attempts to fulfill the mandates of becoming a signatory to the growing number of multilateral environmental agreements. In particular, three MEA case studies were selected: 1) Climate Change, 2) Ozone Depletion, and 3) Biodiversity Conservation. My research involved performing work with Dominica’s Environmental Unit in order to meet the mandates of each of these international treaties.

The second objective of my research entailed juxtaposing the experiences, opportunities and impacts from the three seemingly disparate MEA case studies, and providing commentary upon improved MEA implementation from a sustainable development perspective in Dominica, and more generally in other less developed nations. As a small island developing state, Dominica along with other less developed countries is effected by a number of global environmental problems that are caused primarily by more developed nations in the North. International environmental treaties have to address the issue of North-South relationship with regard to weighted responsibility and accountability.

My research clearly indicated the need for an improved mechanism for negotiating MEAs in order to better reflect the economic, environmental and social responsibilities between nations of the North and South, especially with respect to small island developing states. Dominica needs to coordinate with other small island developing states of the Caribbean Community in order to better express its interest in (1) negotiating and (2) implementing international environmental treaties. In addition, Dominica requires a comprehensive sustainable development plan that revolves around the notion of remaining the “Nature Island of the Caribbean”. This sustainable development plan would bridge the gap between the “vision” of Dominica as a pristine paradise and the harsh social, economic and environmental realities.

In conclusion, multilateral environmental agreements present a tremendous opportunity for Dominica to become involved in combating environmental problems locally, nationally, regionally and globally. In order to glean all of the benefits offered under MEAs, however, Dominica must first develop a mechanism to implement MEAs in a more efficient and effective manner.

Acknowledgments

I must admit that conducting the research for this project in Dominica was an experience which I shall never forget, whether it be: the last minute preparations for Hurricane Lenny; getting hopelessly lost in a tropical rain forest; meeting great new friends; or learning about a different culture and way of life. Caribbean living certainly has a distinctive pace that makes all those that visit a little bit envious.

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List of Acronyms

1. ACP	Africa, Caribbean and Pacific
2. CARICOM	Caribbean Community
3. CBD	Convention on Biological Diversity
4. CCA	Caribbean Conservation Association
5. CERMES	Centre for Resource Management and Environmental Studies
6. CFC	Chlorofluorocarbon
7. CIDA	Canadian International Development Agency
8. CoP	Convention of the Parties
9. CORA	Canadian Oceans Research Association
10. CPACC	Caribbean: Planning for Adaptations to Global Climate Change
11. ECU	Environmental Coordinating Unit
12. ENCORE	Environment and Coastal Resources Management Project
13. EPA	Environmental Protection Agency
14. EU	European Union
15. FAO	Food and Agriculture Organization
16. FPC	Focal Point for Convention
17. GCC	Global Climate Change
18. GCSIDS	Global Convention on the Sustainable Development Small Island Developing States
19. GEF	Global Environmental Facility
20. GHG	Green House Gases
21. GIS	Geographic Information System
22. GOCD	Government of the Commonwealth of Dominica
23. IADB	Inter-American Development Bank
24. ICRU	Inventory of Coastal Resources and Use
25. ICZM	Integrated Coastal Zone Management
26. IISD	International Institute for Sustainable Development
27. IMO	International marine Organization
28. IPCC	Intergovernmental Panel on Climate Change
29. LAMA	Local Area Management Authority
30. MEA	Multilateral Environmental Agreement
31. MF	Multilateral Fund
32. MNRM	Master of Natural Resources Management
33. MoAE	Ministry of Agriculture and the Environment
34. MP	Montreal Protocol
35. NBSAP	National Biodiversity Strategy and Action Plan
36. NDC	National Development Corporation
37. NEA	National Environmental Agency
38. NEAP	National Environmental Action Plan
39. NFP	National Focal Point
40. NIU	National Implementing Unit
41. NOO	National Ozone Office
42. NRI	Natural Resources Institute
43. NRMU	Natural Resources Management Unit

44. NSAP	National Strategic Action Plan
45. OAS	Organization of American States
46. OCOD	Organization for Cooperation in Overseas Development
47. ODA	Official Development Assistance
48. ODP	Ozone Depleting Potential
49. ODS	Ozone Depleting Substances
50. OECS	Organization of Eastern Caribbean States
51. PAC	Project Advisory Committee
52. ROTA	Ratification of Treaties Act
53. RPIU	Regional Project Implementing Unit
54. SIDS	Small Island Developing States
55. SIDS-POA	Small Island Developing States Programme of Action
56. SPED	South Pacific Environment Program
57. TFAP	Tropical Forest Action Plan
58. UNCCD	United Nations Convention to Combat Desertification
59. UNCED	United Nations Conference on Environment and Development
60. UNDP	United Nations Development Programme
61. UNEP	United Nations Environment Programme
62. UNFCCC	United Nations Framework Convention on Climate Change
63. USAID	United States Association of International Development
64. UV	Ultraviolet
65. UWI	University of West Indies
66. VCPOL	Vienna Convention to Protect the Ozone Layer
67. WB	World Bank
68. WMO	World Meteorological Organization
69. WTO	World Trade Organization

Chapter One

Introduction

1.1 Background

The sustainability of environmental management practices has increasingly become a very serious consideration throughout all corners of the globe. "Sustainability" is a theoretical concept, which entails meeting the social, economic and environmental requirements of the inhabitants of a country. This particular area has come to the forefront of "International Development". However, there has been difficulty with implementing sustainability into practical international development efforts. Over time, international development and sustainability have jointly evolved to become so closely related and interdependent that a symbiotic relationship has been fostered, in which they are mutually beneficial to one another. International development is an essential tool that must be utilized to achieve the sustainability of the world's populations and environments. Conversely, sustainability is an evolving process which must be established if international development is to occur successfully.

Since the Brundtland Commission in 1987, and its report *Our Common Future*, we have entered a new age where the mandate is to work towards "Sustainable Development". As such, "International Development" and "Sustainability" have become integrated into one common objective. As defined, sustainable development must focus upon meeting the needs of the present without sacrificing the ability of future generations to meet their own needs.

The United Nations Conference on Environment and Development (UNCED), hosted in Rio de Janeiro in 1992, was the largest ever meeting of world leaders. Representatives from each of the 179 countries present attempted to work together to devise a plan on how to make the future development of the world socially, economically and environmentally sustainable (Anderson, 1999).

Agenda 21 is the document that was generated from the Earth Summit, that details the sustainable path into the 21st Century. The premise of Agenda 21 is that population growth, consumption and technology are the core agents behind environmental change and the quest for sustainable development. Agenda 21 provides alternatives for combating degradation of land, air and water, while conserving forests and biological diversity. Issues of poverty, excessive consumption, health, education, urbanization and farming are all addressed. The scope of Agenda 21 is obviously very broad in order to encompass all areas of sustainable development (IISD, 2000).

International multilateral environmental treaties such as the United Nations Framework Convention on Climate Change and the Convention on Biological Diversity were generated through the Agenda 21 proceedings, and are of particular interest to my thesis. All sectors of society from governments, business people, trade unions, scientists, teachers, indigenous people, women, youth and children are called upon to assist in these areas. With the adoption of Agenda 21, more developed countries recognized their responsibility to rectify environmental problems as they are the primary polluters. Less developed countries will also receive resource support to aid them in minimizing their detrimental environmental impacts (Roodman, 1999).

In areas such as the Eastern Caribbean, working towards sustainable development is especially important, as there is such a strong reliance upon their fragile natural environments. Therefore, sustainable environmental management practices have evolved to be amongst the new initiatives being taken in the islands of the Lesser Antilles. In particular, the island of Dominica is faced with the arduous task of meeting the international mandates for a growing number of international multilateral environmental agreements which are currently being addressed and challenged by the global community. Amongst these issues are global climate change, with respect to sea level rise, depletion of the ozone layer, and the protection and conservation of biological diversity.

1.1.1 State of the Environment in the Eastern Caribbean

One of the greatest threats to sustainable economic growth in the Eastern Caribbean is the ever-increasing degradation of the region's natural ecosystems. Agriculture, forestry, fishing and tourism have traditionally been the primary income-generating activities, which the Caribbean countries rely upon to maintain their economic viability. However, the natural resources base that supports these activities has been subject to gross over-exploitation, mis-use and mis-management, and very little has been performed to protect the limited resource base (Howell, 1992).

As a direct result, there has been a concurrent deterioration in the quality of life for Caribbean people. This problem has only been further compounded as it has been accompanied by a steady population increase, and all indications suggest this trend is likely to worsen before any improvements are achieved. Increased knowledge and a better understanding of the region's unique environmental problems will be necessary to help reverse this unfortunate trend. The fragile resource base upon which the Caribbean people rely must be protected and carefully developed in a sustainable manner to prevent any further detrimental impacts (Howell, 1992).

In the spring of 1991, an attempt was made to establish a series of "Country Environmental Profiles" were established for each of the six Eastern Caribbean countries: Antigua and Barbuda, Grenada, Dominica, St. Kitts and Nevis, St. Lucia and St. Vincent and the Grenadines. The Caribbean Conservation Association (CCA) compiled the pertinent environmental information, with funding from the United States Agency for International Development (USAID), and with technical assistance from the Island Resources Foundation (IRF). Each of these Environmental Profiles describes the environmental and conservation issues that represent the most serious threats to sustainable development and conservation of the limited natural resources base (CCA, 1991).

In response to the aforementioned Environmental Profiles, a more concerted effort is now being made both locally and globally (in the form of implementing international

treaties) in order to help remedy the environmental management problems in the Eastern Caribbean. Key environmental problems, constraints and policy directions are now being properly addressed by a growing number of environmental management projects throughout the region. Environmentally sound development planning is being utilized to work towards the various management goals, both in the short and long-term (CCA, 1991).

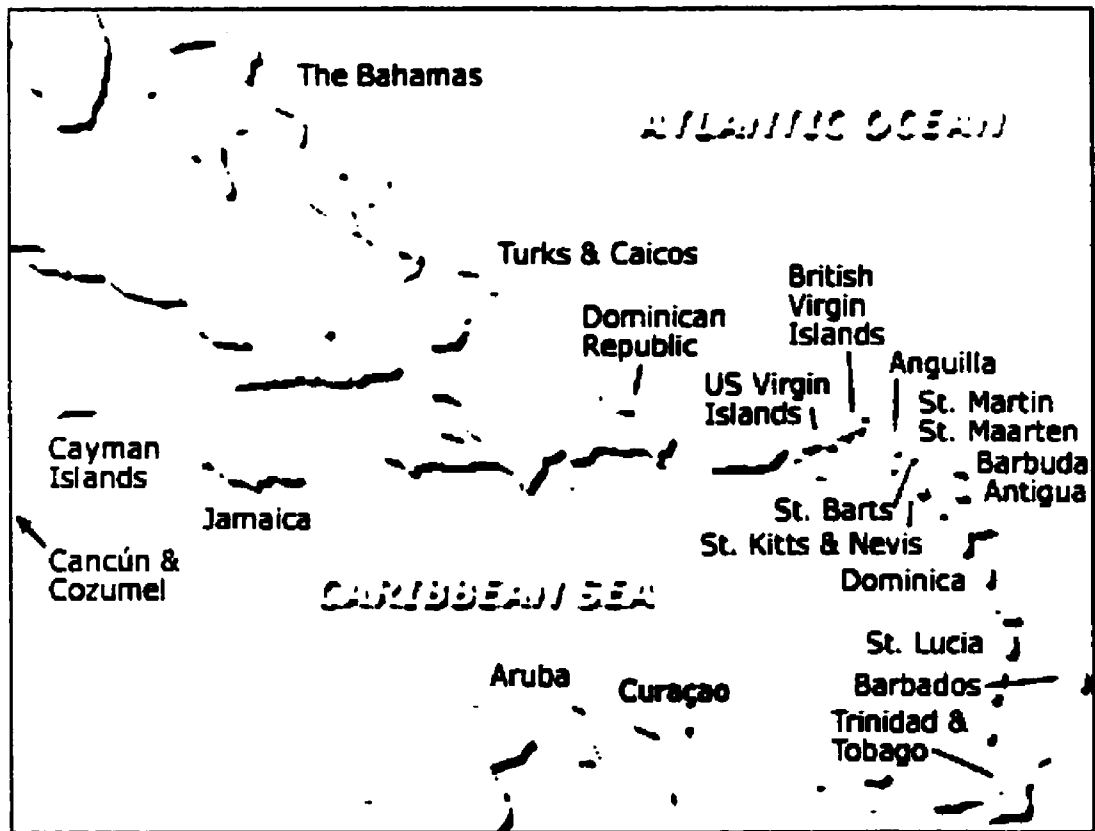


Figure 1: Map of the Caribbean

Source: (Caribbean-on-line site, 2000)

1.1.2 State of the Environment and Economy in Dominica

The country of Dominica is the most northerly and largest of the Eastern Caribbean's Windward Islands (Figure 1). Located between Guadeloupe to the north and Martinique to the south, Dominica is roughly in the middle of the Lesser Antilles: a chain

of Caribbean islands that descends in a graceful arc from the Virgin Islands in the north to Trinidad in the south (CCA, 1991).

Biophysical Environment

Dominica measures 47 kilometers long and 22 kilometers wide, covering 751 square kilometers (Menhinick, 1989). The island's topography is characterized by a very rugged and steep terrain. Mountainous landscapes, extending above 1500 meters elevation, exist over much of the area. The cone of Morne Dialotin (1730 m) dominates the northern half of the island, along with Morne Au Diable on the northern peninsula. In the south of the island, a chain of mountains extends to the coast, including Morne Trois Pitons (1424 m), Morne Micotrin, Morne Plat Pays and Morne Anglais. The peaks of all of the above mountains are within seven km of the sea, which contributes to the island's high relief. This has an important influence on climate, on land use and on the general physical development of the island (CCA, 1991).

Flatter areas are restricted primarily to the river valleys, the coastal areas of the north-east, and an area in the centre of the island referred to as "Bell's Wet Area". The main river valleys are also located in the centre of the island. These include the Layou (Dominica's largest river) and Roseau Valleys on the leeward side of the island, and the Clyde, Pagua, Castle Bruce and Rosalie River Valleys on the windward side (CCA, 1991). The great number of rivers, 365, serves as another distinguishing feature of this unique island (Menhinick, 1989).

Most of the flat and moderately sloped land occurs along the coasts, and thus most urban and agricultural development has occurred in these same areas. Approximately 90% of the population live along the coast, primarily (70%) on the leeward side (West Coast). The leeward side offers greater protection from the wind and other climatic extremes, as well as providing relatively calm seas suited to fishing and navigation. Consequently, the country's two main centres (the capital city of Roseau and the town of Portsmouth), as well as all port facilities, are located along the leeward coast (CCA, 1991).



Plate 1: Dominica's East Coast, near the village of La Plaine

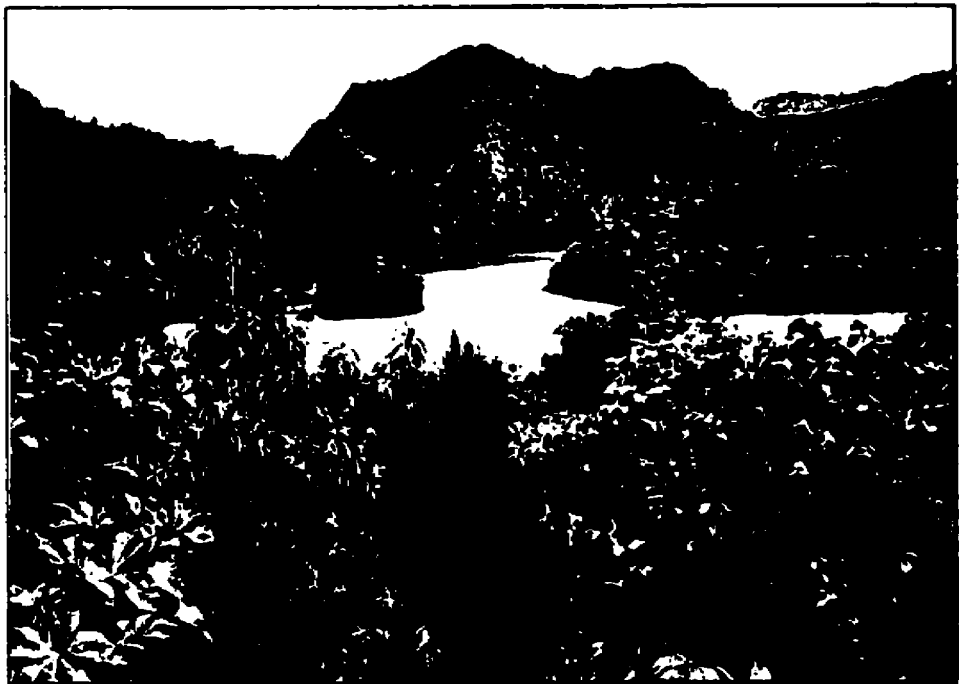


Plate 2: Freshwater Lake, located in the mountainous interior



Plate 3: Scotts Head, separating Caribbean Sea and Atlantic Ocean



Plate 4: Panoramic view of Scotts Head, at the southern tip of the island

Dominica's climate is classified as "humid tropical marine", which is characterized by little seasonal or diurnal variation with strong and steady trade winds (CCA, 1991). These winds blow in a westward direction between the Atlantic - Azores Subtropical High-pressure Zone and the Intertropical Convergence Zone. Wind speeds are generally moderate, averaging 6.4 km per hour at sea level and 14.4 km per hour at 485 metres above sea level (at the Brantridge Meteorological Station) (GOCD, 1985).

The island's rugged topography contributes greatly to micro-climatic variability, which occurs over very short distances throughout the island. The steep topography also contributes to the island being among the wettest in the Caribbean, which in turn gives rise to lush vegetation. Typically, rainfall increases from the leeward side eastward toward the central parts of the island where it reaches over 10 000 mm annually. The leeward side receives substantially less rainfall, approximately 1 200 mm annually. In general, there is small distinction in precipitation between the "dry" season (between February and June) and the "wet" season (between July and December) (GOCD, 1985).

Economic Transition and Importance of Tourism

The economy of the Commonwealth of Dominica has traditionally been based upon a society firmly committed to farming and utilization of the island's natural resources. Historically, products such as vanilla, limes, grapefruits, coconuts and especially bananas have been placed upon the world market. However, Dominica's National Development Council (NDC) states that the structure of the economy is now shifting towards an increase in the provision of services as well as goods (NDC, 1997).

This economic transition is largely due to increased globalization and trade liberalization, and in particular, the World Trade Organization (WTO) ruling against the European Union (EU) system of issuing preferential treatment to banana growers in African, Caribbean and Pacific (ACP) countries, has severely impacted upon the economy of Dominica. Small island states, such as Dominica, are not able to compete with large non-ACP producers, especially Latin America and Central America producers. This problem was only compounded by a weakening in the pound sterling, which served to

further devalue banana prices, resulting in a dramatic reduction in banana prices and export volumes (Douglas, 2000).

Additional global trends have served to further threaten and weaken the Dominican economy. The reduction in the Common External Tariff has meant that the country now faces increased competitive pressure as the rate of trade liberalization further increases. A worldwide recession decreased aid flows to Dominica throughout the 1990s at a time when the prevailing adverse climatic conditions (severe tropical storms and hurricanes) detrimentally affected the economic performance of the country (NDC, 1997).

In 1995, the Government of the Commonwealth of Dominica (GOCD) conducted a National Poverty Assessment that revealed one in three persons may be living below the poverty line. The lowest standard of living was concentrated in rural areas where unemployment rose sharply due to the decline in the banana industry. In February 1998, the unemployment rate was estimated at 23.1% (GOCD, 1997). Since this time, the unemployment rate has presumably increased due to the continued decline in the island's banana industry. The current rate is believed to be above 50% (The Sun, 1999), and as high as 60% amongst the nation's young people (Douglas, 2000). Considering that 60% of the total population in the Caribbean is below 30 years of age (Douglas, 2000), unemployment is a major socio-economic issue (NDC, 1997).

Conversely, the tourism sector in Dominica has performed strongly throughout the 1990s, and recorded a 7.9% growth rate from 1991 to 1996. Economic expansion in this area has been essential to help counter numerous other areas of the economy that are not faring nearly as well. The Government has been stressing the importance of economic diversification, and many have responded by entering the tourism sector. Consequently, tourism has been transformed into the fastest growing sector in the economy with three distinct markets in existence – eco-tourism, the mass market and cruise ship tourists. Even relative to the rest of the Caribbean, Dominica's tourism sector has been very successful of late. Between 1988 and 1996, the annual growth in visitors was 10.60%, comparing favourably to Belize (8.40%), Grenada (8.30%), Guyana (5.20%) and

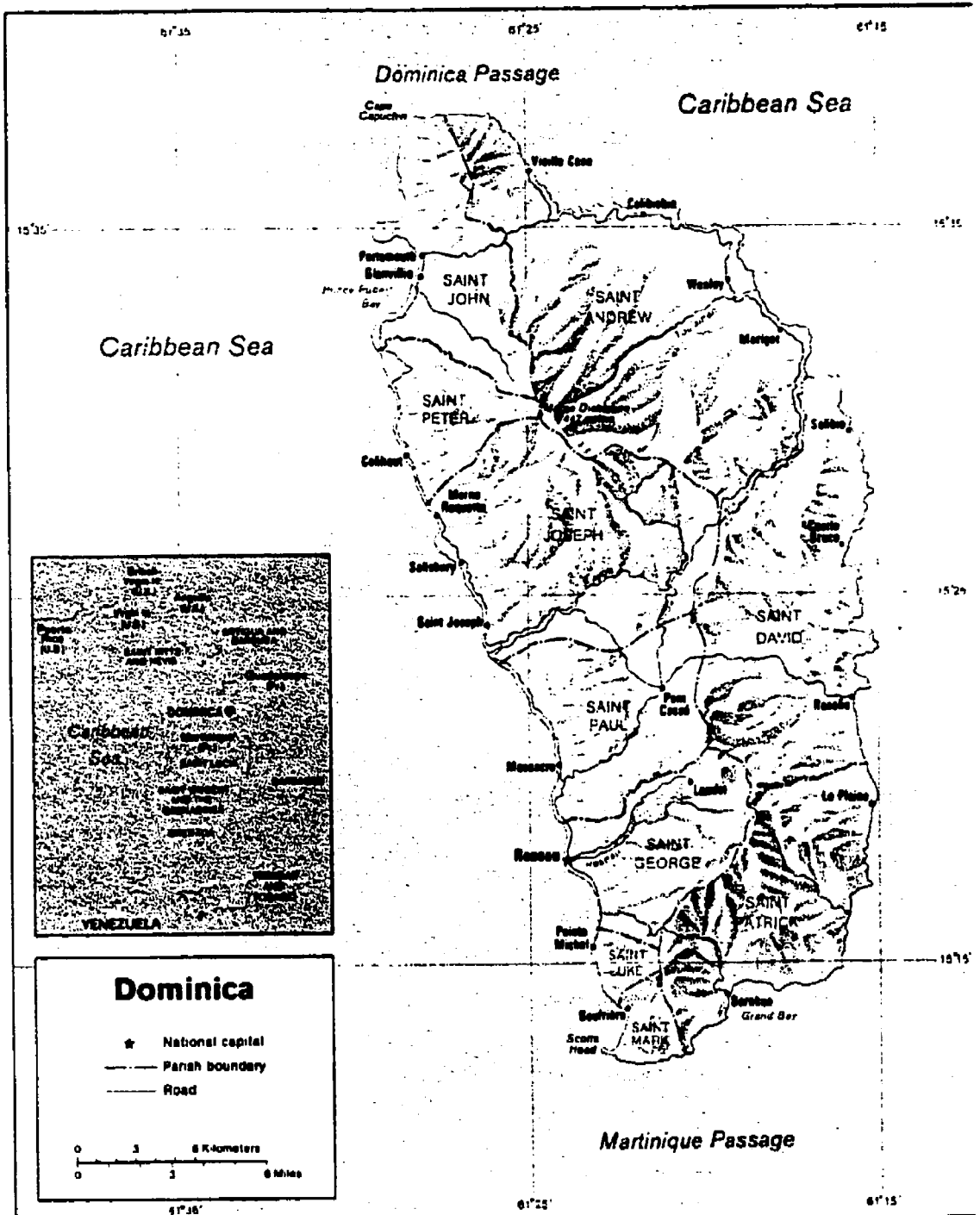


Figure 2: Map of the Commonwealth of Dominica

Source: (PCI. Map Collection. 2000)

St. Vincent and the Grenadines (2.20%). Further increases are expected in this lucrative sector as the Government is planning to construct a new, international airport that would allow much more air traffic and visitors onto the island. Expansion in the hotel industry would also serve as an economic spin-off (NDC, 1997).

The prospects for the future of tourism look very bright for the island of Dominica. Eco-tourism is rapidly expanding globally and Dominica is a prime location with its mountainous topography and largely undisturbed forest landscape. Truly, it is "*The Nature Island of the Caribbean*". Sixty five percent of the island remains covered by forest and the largest rain forest in the Lesser Antilles can also be found in Dominica. Not surprisingly, the World Travel and Tour Council (1998) designated Dominica as a Green Globe Destination.

1.1.3. Multilateral Environmental Agreements in the Caribbean

The United Nations Global Conference on the Sustainable Development of Small Island Developing States (GCSIDS), held in Barbados from April 25 to May 6 1994, affirmed Agenda 21 of the Rio Declaration and adopted the Small Island Developing States Programme of Action (SIDS-POA). As a result, Caribbean signatories to the GCSIDS agreements accepted that sustainable management of environmental resources required acceptance of relevant international treaties in the field of the environment, in addition to the concurrent development of effective legal, institutional and regulatory frameworks (Anderson, 1999).

The record of Caribbean participation in multilateral environmental agreements (MEAs) has improved significantly over recent years. A number of factors have driven this change, including:

- Caribbean interface with the global environmental institutions (UNEP, 1999);
- Demands of international financial and donor institutions and states (UNDP, 1998);
- Emergence of local environmental actors and interests (CCA, 1991); and
- Political willingness (GOCD, 1999).

However, much of the Caribbean is still struggling to meet the mandates of the increasing number of MEAs currently being administered in the region. In many cases, implementation of the MEAs has presented difficulties, which are now in need of remedy.

As a sovereign state, Dominica is a signatory to a growing number of these international treaties and agreements. Meeting the mandates of these treaties is a challenging task for institutions charged with compliance in Dominica and other small island developing states. These institutions often require various forms of support and resources to assist them in meeting the country's commitments under the treaty.

1.1.4 Multilateral Environmental Agreements in Dominica

With the recent establishment of the Environmental Coordinating Unit in 1998 (Williams, 1999), the Government of Dominica has been able to improve its methods of implementing national programs to fulfill the mandates of MEAs. By 2000, Dominica had ratified eight MEAs:

1. United Nations Framework Convention on Climate Change (UNFCCC)
2. Vienna Convention for the Protection of the Ozone Layer (VCPOL)
3. Convention on Biological Diversity (CBD)
4. Cartagena Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region
5. United Nations Convention on the Law of the Sea
6. United Nations Convention to Combat Desertification (UNCCD)
7. Convention on International Trade of Endangered Species (CITES)
8. Special Protected Areas and Wildlife Protocol

Of the eight above-mentioned MEAs, I will be discussing the UNFCCC, the VCPOL and the CBD respectively as case studies for my thesis.

As a small island developing state, Dominica has a great deal of difficulty in implementing and meeting all of the mandates of the above agreements. Improved methods and approaches to implementation are being discussed, examined and attempted as Dominica struggles to fulfill its international environmental obligations.

1.2 Issue Statement

The Commonwealth of Dominica is faced with the daunting task of administering an increasing number of multilateral environmental agreements (MEAs), as an integral part of efforts being made to move towards a sustainable development future. These MEAs fall within the mandate of the newly established Environmental Coordinating Unit. Amongst these international agreements are:

1. United Nations Framework Convention on Climate Change (UNFCCC);
2. Vienna Convention for the Protection of the Ozone Layer (VCPOL); and
3. Convention on Biological Diversity (CBD).

The recurrent theme amongst this diverse array of global environmental management issues is the need for all development to occur in a carefully planned and mandated fashion. This can be achieved by utilizing a standard procedure when attempting to develop environmental management approaches for each of the issues. However, many constraints, obstructions and limitations exist when small island developing states (SIDS) are faced with such complex international problems. Thus, sustainable development must serve as both the ends and the means for any environmental activities.

Despite the enormity of the issues facing the small nation of Dominica, there is certainly reason for optimism. There is a strong network of international funding agencies that assist developing nations, such as Dominica, with the funding and resources necessary for addressing such monumental issues. In this regard, both the Canadian International Development Agency (CIDA) and the Organization for the Cooperation in Overseas Development (OCOD) have intervened with assistance for the Environmental Coordinating Unit (ECU), which is severely understaffed and desperately in need of assistance. My work, and that of Mr. Martin Mullan, has been of great assistance to the ECU in being able to properly administer each of its projects.

Fundamentally, the broad purpose of the internship and project was to assist the ECU in achieving each of its project objectives. Although this remains the primary issue to be addressed, the general welfare and standard of living of the Dominican people are

highly reliant upon the delicate state of the island's natural environment. The precarious balance between the environment, economy and social well-being must be properly acknowledged for sustainable development to ultimately be achieved. Although many of the ECU's projects are of a regional or international scale, their repercussions will greatly affect the sustainable development of Dominica.

As a small island developing state, Dominica has a great deal at stake upon becoming a signatory to an international environmental treaty. Dominica must protect its interests while attempting to maximize benefits socially, politically, economically and environmentally derived from the treaty. Great debate exists when international environmental treaties are being negotiated regarding areas of relative cause-effect relationships, weighted responsibilities and respective obligations. Some global environmental problems, such as climate change or ozone depletion, create a divide between nations of the South and nations of the North. This North-South divide relating to the negotiation of MEAs is explored under this project's second objective as it relates to Dominica's sustainable development.

1.3 Objectives

Project Goal

The primary goal of this project is to explore the manner in which the Commonwealth of Dominica attempts to meet the mandates of multilateral environmental agreements in an effort to progress towards achieving sustainable development. Essentially, this project has two core objectives. One involves the general process employed for the implementation of multilateral environmental agreements (MEAs) in small island developing states (SIDS), and in particular the Commonwealth of Dominica. To help illustrate this objective, three case studies are utilized. The first addresses the United Nations Framework Convention on Climate Change (UNFCCC); the second deals with the findings from the Vienna Convention for the Protection of the Ozone Layer (VCPOL); and the third involves the Convention on Biological Diversity (CBD). The second primary objective involves creating recommendations for improved implementation of MEAs in Dominica from a sustainable development perspective.

First Objective: to analyze, with the use of three case studies, how Dominica attempts to fulfill the mandates of the growing number of multilateral environmental agreements with which it is faced

- *Case Study #1:* compiling an inventory of coastal resources and use for the Caribbean: Planning for Adaptations to Global Climate Change (CPACC) Project
- *Case Study #2:* working towards the phase out of Ozone Depleting Substances (ODS) in order to meet the mandates of the Montreal Protocol
- *Case Study #3:* creating a National Biodiversity Strategy, Action Plan and First Report to the Convention on Biological Diversity

Second Objective: to evaluate the experiences from the three case studies from a sustainable development perspective for the process of implementation of multilateral environmental agreements in Dominica and other developing nations

The above stated objectives are in respect to the Commonwealth of Dominica, located in the Lesser Antilles of the Eastern Caribbean. However, many of the same constraints, obstacles and impediments to sustainable development can be found especially in other small island developing states (SIDS), as well as numerous less developed nations and even some more developed countries.

1.4 Study Approach

1.4.1 Development Process for this Thesis

I began my Master's of Natural Resource Management (M.N.R.M) with the Natural Resources Institute (N.R.I) at the University of Manitoba in September 1998. My intent was to complete my course requirements by April 1999, and develop an international thesis project in areas of ecology, biodiversity conservation and global environmental management. Appendix I displays a timeline charting the events

chronologically throughout the process of development and eventual completion of my thesis

The first, and perhaps most important, event that allowed this project to come to fruition was my being selected as an Organization for Cooperation in Overseas Development (OCOD) International Youth Internship recipient in May 1999. I was awarded a six-month internship position in the Commonwealth of Dominica. My role was to serve as an environmental officer along with another OCOD Youth Intern, Mr. D. Martin Mullan. A brief project description was provided and dealt in large part with biodiversity conservation and wildlife management. Consequently, I prepared my Master's thesis proposal for the Natural Resources Institute (NRI) to be built around this topic for my internship position.

However, upon my arrival in Dominica in August 1999, it became apparent that there was a lack of communication between OCOD (sending agency) and representatives of the Government of Dominica (host agency). The project description which had been provided to me by OCOD was no longer a priority matter of the Government, nor was it an area in which they were prepared to dedicate resources. It was at this time that I met with the Permanent Secretary of the Ministry of Agriculture and the Environment, Mr. Eliud T. Williams. He was wonderfully accommodating as we discussed interests, ongoing projects, priority areas and possible scenarios in order to develop another project outline. During this meeting, I learned of the Environmental Coordinating Unit, of the Ministry of Agriculture and the Environment, which had been recently developed in 1998.

Despite being in its developmental stages and having limited resources at its disposal, the ECU had a number of projects under its mandate that were of immense interest to me. In retrospect, it was a mutually beneficial arrangement as the ECU was in need of skilled human resource support and I was happy to be of assistance. In particular, my interest lies with the work that the ECU, as the lead national environmental agency, performed on the implementation of multilateral environmental agreements. The priority then became to select specific projects that would coincide with my six-month internship



Plate 5: ECU. only building located on the waterside of Roseau's Bayfront



Plate 6: Mr. Mullan on the 3rd story of the ECU during Hurricane Lenny

term and with the requirements that I needed to fill in order to generate material for my thesis.

While collaborating with my Committee, we ultimately decided to select three case studies to analyze in order to determine how Dominica attempts to fulfill the mandates of a growing number of MEA obligations. The MEA case studies were selected in areas of climate change, ozone depletion and biodiversity (Figure 3). Accordingly, my time on the island was divided amongst these projects. Basically, August through October was spent on climate change, November until January was dedicated to ozone depletion and the remainder of my time (January until April 15th) was occupied with the biodiversity conservation project. Both problems and unforeseen benefits arose from this particular grouping of MEA projects. Immense amounts of material existed for this broad scope of environmental management areas, and interrelating them was not always easy. Conversely, however, when juxtaposed these case studies accentuate and help define the similarities and linkages amongst many of the MEA projects. In addition, the roles of North and South relating to MEA negotiation and implementation became more evident, thus allowing for an evaluation of the differing experiences of each case study from a sustainable development perspective for the Commonwealth of Dominica.

Accordingly, the general study approach follows and chronicles the events and activities employed during my time spent with the Commonwealth of Dominica's Environmental Coordinating Unit. My work with the ECU dealt with the efforts made in Dominica for the implementation of multilateral environmental agreements in the case study areas of climate change, ozone depletion and biodiversity conservation. Such a wide scope of project activity is well represented by the breadth of responsibilities, activities and techniques employed during my time with the ECU and in documenting the methodology for this project.

My daily work with the ECU would include such activities as:

- Conducting research, performing surveys, making site and field visits, reviewing literature and formulating project ideas.

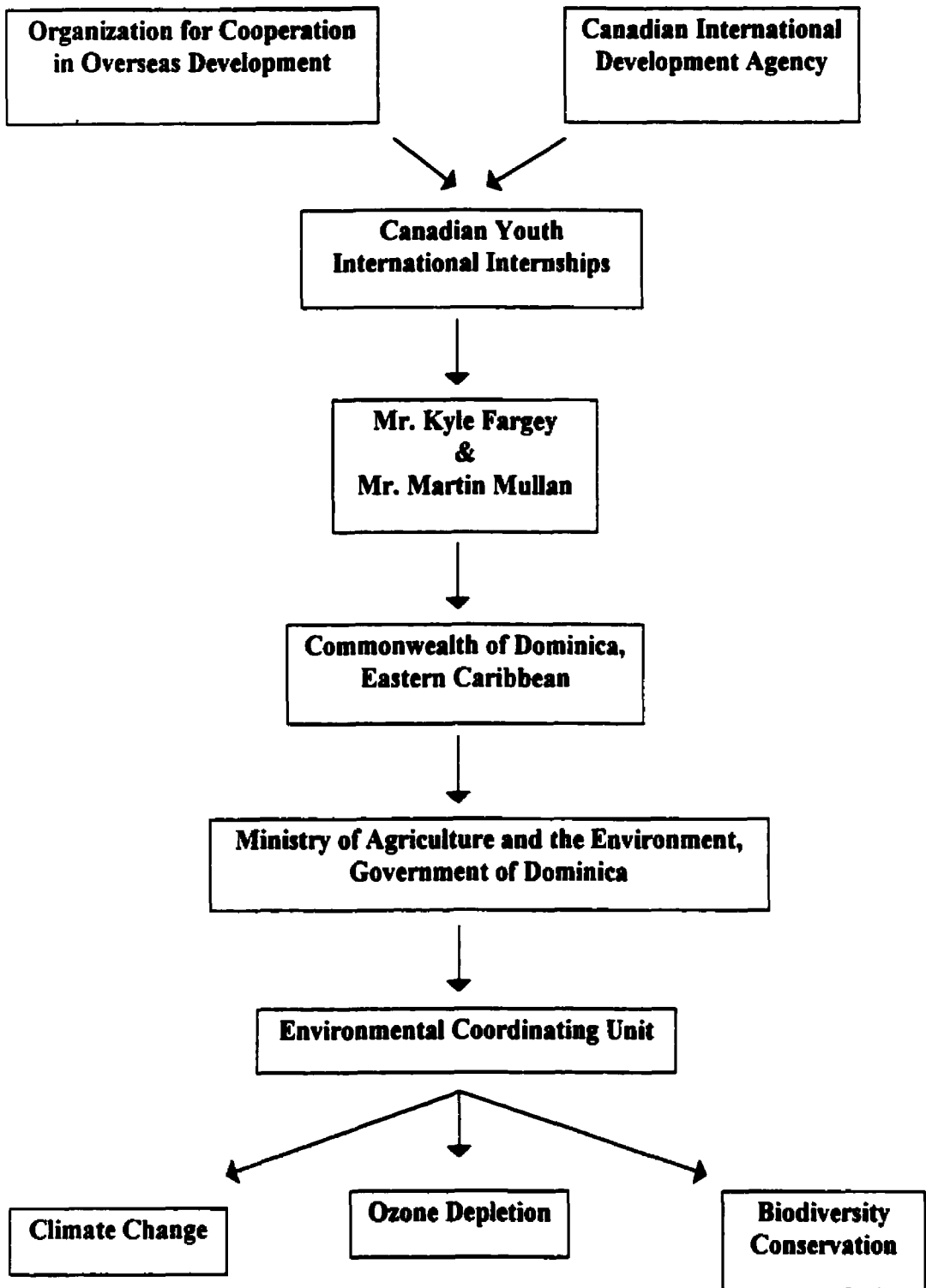


Figure 3: Process of Thesis Development

- Writing policy documents and MEA enabling legislation, to be submitted to Cabinet for approval.
- Meeting with upper Governmental officials, non-governmental organizations, researchers, private industry representatives, community groups, members of the indigenous Carib community and educational instructors to gather information, ideas, insights and recommendations for MEA project implementation.
- Writing reports, memos and speeches for conferences, media (television and radio), multilateral agencies, schools and various departments of the Government.
- Attending and presenting at national, regional and international conferences.

All of the above activities were conducted during my term in Dominica for my work with the ECU. The specifics and context of each methodological approach are provided in greater detail within the methodology section of each of the three MEA implementation case studies (Chapters 3, 4 and 5). A brief overview of the study approach employed for each of the case studies is also provided below.

1.4.2 United Nations Framework Convention on Climate Change

The first phase of the project involves conducting work on the “Caribbean: Planning for Adaptation to Global Climate Change (CPACC)” Project, which is a regional sub-component of the “United Nations Framework Convention on Climate Change (UNFCCC)”. My work, and that of Mr. Mullan, with the Environmental Coordinating Unit (ECU) will relate to the third CPACC project component; “Inventory of Coastal Resources and Use” (CPACC / RPIU, 1999). Principally, the ECU has been given the mandate of data collection and analysis for the third component of the CPACC project. We collected data using a standardized survey format. The survey was produced by the Centre for Resource Management and Environmental Studies (CERMES), which acts as the CPACC Regional Project Implementing Unit (RPIU).

The survey covers 15 different sectors that relate to coastal resources and use. These data categories are listed in the following Table 1:

Table 1: CPACC Project Data Categories

Data Category	CPACC Questionnaire Data Category		Category	CPACC Questionnaire Data Category
Oceanographic	A		Tourism	I
Water Quality	B		Recreation	J
Beach Morphology	C		Industry	K
Marine Communities	D		Infrastructure	L
Rare Species	E		Coastal Sea Defense	M
Fishing	F		Waste Disposal	N
Agriculture	G		Parks Reserves	O
Housing	H			

Upon collecting all of the available data, we analyzed the information and prepared a report for the Unit for Sustainable Development and Environment of the Organisation of American States (CPACC / OAS).

1.4.3 Vienna Convention on the Protection of the Ozone Layer

The second phase of my thesis involves work upon the Government's "*Country Programme for the Phase-out of Ozone Depleting Substances (ODS)*". The Government of Dominica signed the Montreal Protocol on Substances that Deplete the Ozone Layer (1989). Consequently, as an Article 5 (developing) country, Dominica is committed to the elimination of all ODS by 2010. A Country Programme has been created to outline the process of this phase out procedure. The ECU, serving as the interim National Ozone Office (NOO), is to facilitate and administer the Government "*Action Plan*" as outlined in the Programme. Contained within, is the mandate to conduct the second national ODS survey. Data that I gathered from the surveys were utilized to create various other initiatives to reduce the consumption of ODS in Dominica. Mr. Mullan and I were also responsible for submitting an act to Cabinet in order to establish official Government enabling legislation on an "*Action Plan for the Phase-out of ODS*".

1.4.4 Convention on Biological Diversity

The third phase involved my work on the National Biodiversity Strategy, Action Plan and First Report to the Conference of Parties of the Convention on Biological Diversity (CBD). The project aims at providing support to the Government of Dominica in the formulation of a National Biodiversity Strategy and Action Plan (NBSAP) in order to ensure the most effective use of the country's natural resources. I was involved in assisting with the determination of priority actions necessary for the implementation of the project. My work also included increasing public knowledge of the CBD as a key project objective. In addition, the project will ultimately facilitate the first National Report being made to the Conference of Parties on CBD. The preparation of the NBSAP will be participatory in nature, involving stakeholders from various interest areas and from all geographic areas of the country. Public consultation, training and in-depth analysis of issues affecting the biodiversity in Dominica will be implemented.

1.4.5 Improved Multilateral Environmental Agreement Implementation

The second primary objective of the project will require connections to be drawn between the preceding three case studies. The overriding and recurrent theme is the process of implementation of multilateral environmental agreements for the sustainable development of Dominica. Evidence from the environmental management projects that Dominica's Environmental Coordinating Unit is involved with will provide a background for commentary upon this matter. Dominica serves as a representative small island developing state (SIDS) which will allow for parallels to be extrapolated and drawn. Examples of success and failures for implementing MEAs throughout the Caribbean will be examined. While this project shall focus specifically upon the island of Dominica, the above stated approaches can be applied to virtually any developing nation's environmental management area.

1.4.6 Key Agencies involved in the Study Approach

It is vitally important to state and clearly recognize the key agencies involved in my project. An examination of the agencies involved will serve to provide the context and

perspective from which my project was approached, carried out and ultimately completed. In this instance, there was a joint collaborative effort between funding and administrative agencies in Canada with an executing, technical agency located within the field study area of the Commonwealth of Dominica.

A) Commonwealth of Dominica's Environmental Coordinating Unit

In response to the multitude of environmental issues facing the Commonwealth of Dominica, the Government has taken proactive measures to better address environmental concerns. Accordingly, in May of 1998, the Government established an "Environmental Coordinating Unit" (ECU) as part of the Ministry of Agriculture and the Environment. Upon being formed, the ECU is in need of additional institutional strengthening, capacity building and resource support. For the duration of my work with the ECU (August 1999-April 2000), the staff consisted of:

- Mr. Gerard Hill (Interim Unit Head)
- Mr. Kyle Fargey (OCOD/CIDA Intern)
- Mr. Martin Mullan (OCOD/CIDA Intern)
- Mrs. Elanor Samuel (Secretary)
- Mrs. Gene Walters (Messenger)

In spite of its small size and limited resources, the ECU has been formed to fill a number of important mandates as they relate to the environment. These include:

1. To coordinate and facilitate various environmental projects between all of the Governmental Ministries;
2. To serve as a liaison for non-governmental groups (NGOs), community-based organization (CBOs) and members of the general public;
3. To respond to all of the multilateral environmental agreements which the Government of Dominica has become a party;
4. To develop, organize, manage and administer all environmental projects within the island;

5. To produce and disseminate environmental literature and promotional material for the schools and general public; and
6. To develop relationships, submit proposals and access resources through various international organizations that support environmental causes.

With regard to the sixth mandate of the ECU, many of the projects administered by the ECU are also supported by external agencies. Amongst these are the Global Environmental Facility (GEF), Multilateral Fund (MF), World Bank (WB), United Nations Development Programme (UNDP), United Nations Environmental Programme (UNEP), United States Agency for International Development (USAID) and the Canadian International Development Agency (CIDA).

B) Canadian International Development Agency

The Canadian International Development Agency (CIDA) is the federal agency that is largely responsible for Canada's international cooperation program. Official development assistance (ODA) is provided to developing countries in Africa, Asia and the Americas. CIDA's 1995 foreign policy, *Canada in the World*, listed the environment as one of the six selected priorities of ODA. This occurred in response to environmental sustainability becoming a major global concern. Efforts are being made to conserve biodiversity, yet equally important is the effort to make sustainable use of ecosystems and biological resources. Both the 1987 Brundtland Report and the 1992 United Nations (UN) Conference on Environment and Development (Rio Summit) addressed the critical importance of global sustainable development. Numerous environmental issues now transcend national boundaries, including global climate change, depletion of the ozone layer and toxic waste disposal. The United Nations Convention on Biological Diversity of 1992 stressed another vital component to achieve sustainable development. Biological diversity, or biodiversity, encompasses the planet's vast array of living species and ecosystems, as well as the ecological processes of which support life (CIDA, 1996).

In 1992, CIDA also adopted its own "*Policy for Environmental Sustainability*", which served to strengthen the Agency's commitment to integrate environmental

considerations into its development assistance projects. There are three key objectives within the Policy: 1) to integrate environmental considerations into CIDA's activities and decision-making process; 2) to help developing countries improve their ability to deal with local and global environmental concerns; and 3) to work with Canadian and international partners in order to assist them in better integrating environmental considerations into their activities (CIDA, 1996).

With this new mandate to be more environmentally minded, CIDA has been very active in numerous international efforts to prevent further environmental degradation. For example, since 1994, CIDA has been involved with a project at Lake Malawi in Africa to conserve the biodiversity of one of the world's largest freshwater bodies and maintain this essential water source for Malawi, Mozambique and Tanzania (CIDA, 1994). Elsewhere, in the mountainous Arenal region of Costa Rica, CIDA is involved in a development project that relies on the involvement of local communities to protect land, forests and biodiversity from further degradation. Despite only covering 4% of Costa Rica's area, this region contains 36% of the country's biodiversity (CIDA, 1995). Finally, in the South Pacific, CIDA supports a large project for the protection and survival of sea turtles. Five of the six sea turtle species occurring in this area have been placed upon the endangered species list. In conjunction with the South Pacific Environmental Program (SPEP) and the Canadian Ocean Resources Association (CORA), CIDA is helping to rectify this problem (CIDA, 1994).

For my project, CIDA was responsible for funding my internship, while the Organization for Cooperation in Overseas Development was in charge of all administrative duties.

C) Organization for Cooperation in Overseas Development

For many development projects throughout the world, CIDA works in conjunction with numerous other development organizations. One of these is the Organization for Cooperation in Overseas Development (OCOD); a volunteer, non-profit organization whose guiding principle is to improve education in developing countries through initiatives

which were developed and implemented cooperatively. Since its inception in 1973, OCOD has become recognized and well respected for its international development efforts (OCOD, 1998).

OCOD is centred in Winnipeg, Canada, with a regional resource office in the Caribbean at Castries, St. Lucia. CIDA works with OCOD to deliver education and training assistance to countries within the Organization of Eastern Caribbean States (OECS). CIDA provides the primary and majority funding which OCOD requires to operate. In accordance, OCOD addresses each of the six priorities within CIDA's Official Development Assistance Program; Basic Human Needs, Women in Development, Infrastructure Services, Human Rights, Democracy, Good Governance, Private Sector Development and the Environment (OCOD, 1998).

OCOD's focus expanded in 1996 with the introduction of youth programs: both volunteer (3 months) and internships (6 months). The OCOD Youth Program combines working, learning, travel and community involvement that allows Canadian youth to gain valuable international work experience and to enrich their lives. Young people are provided with *"the opportunity to play a significant role in International Development while improving their understanding of the Global Environment"* (OCOD, 1999). In 1997, another significant development was achieved as OCOD began exploring ways in which to provide assistance for managing the environmental issues within the Eastern Caribbean. Consequently, in 1998 the first volunteer to perform environmentally related work was sent to Dominica as an "Ecotourism Facilitator" (OCOD, 1998). Much progress has occurred as there are now 10 new youth interns to be performing environmental work in the Eastern Caribbean starting in July 1999 for a six month duration (returning in February). These projects include:

- 1) Environmental Management and Recycling Officer in Nevis;
- 2) Environmental Researcher and Information's Officer in Trinidad;
- 3) Development and Management of a Sustainable Seamoss Farm in Barbados;
- 4) Environmental and Documentation Officer for Environmental Issues in Anguilla;

- 5) Environmental Resource Information and Field Officer in British Virgin Islands; and
- 6) Environmental Management and Sustainable Development Officer in the Commonwealth of Dominica.

I served as the intern for the Project #6 in Dominica as listed above. The objective of this internship was to work with the Ministry of Agriculture and Environment, and more specifically the newly formed Environmental Coordinating Unit (ECU). Mr. Martin Mullan, a fellow CIDA/OCOD intern, held a similar position with the ECU, although his responsibilities varied slightly from my own. Essentially, my role was to assist the ECU with its wide array of environmental management projects. This work entailed meeting with officials from all the Government Ministries, non-governmental groups, community-based organizations, industry and the general public. Projects included a local, regional, national and international perspective depending upon the nature of the particular problem.

1.5 Organization of Thesis

This chapter, Chapter One, serves to provide a brief overview of the project, a review of the "State of the Environment in the Eastern Caribbean", "State of the Environment and Economy in Dominica" and "Multilateral Environmental Agreements in the Caribbean" as well as the Objectives of the thesis, and the research approach employed.

Chapter Two is an examination of multilateral environmental agreements in Dominica and other nations of the Caribbean. Concentration is placed upon "Establishing Multilateral Environmental Agreement Implementation Mechanisms". Various cases throughout the Caribbean are examined in an effort to devise an improved mechanism for MEA implementation.

Subsequently, the three case studies: United Nations Framework Convention on Climate Change, Vienna Convention for the Protection of the Ozone Layer and Convention on Biological Diversity are to be discussed in Chapter Three, Chapter Four

and Chapter Five, respectively. Each of these chapters includes its own literature review and methodology sections.

The last chapter, Chapter Six, provides “Summary, Recommendations and Conclusions”. In addition, “Guidelines for Multilateral Environmental Agreement Implementation” in Dominica, as well as other small island developing states in the Caribbean are featured. A final set of “Discussion & Analysis” as well as a “Conclusion” provides a closing commentary for the thesis project.

1.6 Conclusion

My nine months spent in the Commonwealth of Dominica were immensely satisfying. Working with the ECU allowed me to be exposed to a number of different topic areas, approaches, ideas and individuals from all walks of life. Additionally, from a personal perspective, Dominica lived up to its illustrious claim of being the friendliest island in the Caribbean. With very few visitors relative to other parts of the Caribbean, Dominicans operate quite differently and are more than willing to make that special effort to make everyone feel welcome and a part of their wonderful community.

Consequently, the time flew by and rarely did I get the impression that I was actually performing work when in such an incredible environment. Walking from my apartment to the ECU, located on the Bayfront in the capital city of Roseau was always a pleasure. Our office was located on the third floor and was perched directly above the vast, clear, blue tranquil waters of the Caribbean Sea (Plate 5). The benefits of such a work environment are obvious, yet on occasion the tranquil waters of the Caribbean would take exception. November 23, 1999 was such a day as Dominica was ravaged by Hurricane Lenny (Plates 6 & 8). The ECU, the only building located on the seaside of the waterfront (for good reason), sustained over \$7.5 million (US) in damages. Much of the other coastal infrastructure throughout the island also suffered extensive damage. Needless to say that my times spent in Dominica were all memorable while also providing all the amenities for an excellent research project.

Chapter Two

Multilateral Environmental Agreements

2.1 Chapter Overview

Chapter 2 concentrates upon providing a thorough understanding of the process of implementation of multilateral environmental agreements in the Caribbean. All areas of MEA implementation are discussed, including; Implementation Mechanisms, Legislation, National Implementing agencies, Focal Points, Project-based Activity, Monitoring Processes and Environmental Treaty Making. This information on MEA implementation will then be juxtaposed with the methods used for MEA implementation for the case studies provided in Chapters 3-6. This Chapter's MEA implementation material will also serve as the foundation for MEA implementation recommendations provided in the final Chapter 6.

2.2 Multilateral Environmental Agreements

2.2.1 Historical Basis

Concern for environmental preservation has been present for a very long time. National laws in the Middle Ages attempted to combat specific pollutants or to protect particular forests or bodies of water. An ordinance of Edward I from 1306 prohibiting the use of coal in open furnaces of London is one of the oldest known environmental protection measures on record (Kiss et al., 2000).

International environmental agreements, or multilateral environmental agreements, have been in existence for over a century. The first international environmental agreement was the Convention for Protection of Wild Animals, Birds and Fish in Africa of 1900. Such early conventions approached environmental subjects from a utilitarian perspective that sought to maximize economic exploitation of the designated resource (Kiss et al., 2000).

By the 1960s, concepts of environmental management were changing fundamentally. Due to increased pressure from international public opinion, governments began to demonstrate concern over the general state of the environment and introduced legislation to combat pollution of inland waters, oceans, and air as well as safeguarding certain cities and zones. Simultaneously, special administrative organizations, ministries and environmental agencies were established to preserve their citizens' quality of life. Development of international environmental law paralleled this evolution in environmental concern (Kiss et al., 2000).

With the adoption of the European Water Charter of 1968 and the realization that "*water knows no boundaries*", an important discovery was made. Not only oceans, but also the atmosphere and biosphere do not know or respect the arbitrary national boundaries dividing the globe. Thus, in order to combat ozone depletion, loss of biodiversity, global warming and other transboundary environmental problems, there must be international environmental agreements that harmonize national efforts throughout the world (Kiss et al., 2000).

Prior to the 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, and the adoption of Agenda 21 by the world community, many nations were not particularly active in the area of multilateral environmental agreement (MEA) implementation. As with many other small island developing states, Dominica has been faced with mounting demands to meet all of the mandates and requirements of various MEAs with the advent of Agenda 21. Thus, it is necessary to establish a set of guidelines, legislative and institutional, to assist with MEA implementation efforts.

2.2.2 Legislative / Institutional Processes

The establishment of legislative / institutional structures and processes for multilateral environmental agreements implementation is an imperative procedure. The following considerations must be accounted for (Anderson, 1999):

- environmental treaty-making;

- requirement for and typology of implementing legislation;
- identification of national implementing agency;
- identification of a focal point for the implementing activity; and
- availability of resources and stimulation of project-based implementing activity.

Upon addressing each of these areas, a nation is better able to implement the MEAs that the national government has ratified. In Dominica, legislative / institutional processes and structures are in need of revision if MEAs are to be efficiently and effectively implemented.

2.3 MEAs in the Caribbean

2.3.1 Effective Implementation Mechanisms

According to the UNEP Caribbean Environmental Outlook (1999), a multitude of diverse problems inhibits the effective implementation of MEAs in the Caribbean.

Amongst these are:

- inadequate funding;
- lack of resources;
- insufficient human resources, coupled with inadequate training;
- technical limitations;
- weak government infrastructure and lack of cooperation / integration amongst ministries; and
- non-compliance with the law (if in existence).

As indicated by the above impediments, Caribbean implementation of MEAs is procedurally flawed and greatly in need of revision. However, certain features that may generally be considered as key components of a successful implementation strategy may already be in existence in the context of ongoing implementation endeavors. Such features are derived from the unique legal, historical, social, economic and environmental characteristics of the English speaking countries of the Caribbean Community (CARICOM). In general, effective MEA implementation strategies combine a coherent

legislative and regulatory framework, identification of national implementing agencies and coordinating focal points with project oriented activity (nationally and regionally). Funding may be supplied externally, when local capacity building provisions are already in place (Anderson, 1999).

2.3.2 Establishing Implementation Mechanisms

Environmental Treaty Making

The general principles of environmental treaty making lie at the core of establishing effective MEA implementation mechanisms. In the Caribbean, Cabinet, on behalf of the State, is responsible for the adoption of all international environmental agreements. Under basic constitutional principles the Executive has a monopoly over treaty making. The Minister of Foreign Affairs typically represents Cabinet in this regard, although there can be exceptions. For example, it may be the Prime Minister (even if not the Minister of Foreign Affairs) that signs on behalf of the State for MEAs with strong global significance. Also, a Minister whose portfolio relates to the particular treaty subject matter may be authorized by Cabinet to adopt that treaty. Finally, other representatives may be empowered to act on behalf of the State by the conferral of "*full powers*" (Anderson, 1999).

In most cases, there is no direct connection between environmental treaty making and any assessment of the institutional / administrative resources and capabilities for implementation. Thus, often the State does not have the institutional capacity to effectively implement the treaty. However, in one select case, the lead environmental agency of St. Kitts and Nevis was empowered by the State to negotiate environmental treaties initiated by regional and international inter-governmental organizations (Government of St. Kitts and Nevis, 1996). In addition, agencies may be authorized by the State to establish and coordinate institutional linkages locally, regionally and internationally. This was the case for the Environmental Management Agency in Trinidad and Tobago (Government of Trinidad and Tobago, 1995).

2.3.3 Implementing Legislation

A) Requirement

The law of the Caribbean, in most all cases, does not recognize self-executing treaties. Therefore, operating legislation is required to give the force of law to the environmental treaty obligations. As an example, although Jamaica is a contracting party to CITES, the Jamaican Natural Resources Conservation Authority (NRCA) could not impose a quota and export permit system to implement that Convention in the absence of specific enabling legislation enacted by the Parliament of Jamaica (Court of Appeal of Jamaica, 1999). A similar scenario occurred in Dominica upon becoming a Party of the Montreal Protocol. The mandates stipulated within the Convention could not be enforced until supporting legislation was prepared and submitted to Cabinet for its approval (Hill, 1999).

In light of the fact that treaty law is not recognized under Caribbean law without the State's implementing legislation, one would expect that upon becoming a party to a treaty, the Caribbean State would expeditiously create implementing legislation. Historically, this has not been the case as it has been a common British practice to have treaties that have not been followed by enacting legislation. The British tradition inherited by the Caribbean is fraught with problems, which are yet to be resolved by these newly independent States. However, select success stories, such as that of Antigua and Barbuda with its pioneering Ratification of Treaties Act (cap. 364) (Government of Antigua and Barbuda, 1996), have begun to emerge.

B) Typology

The speed of legislative response to the international obligation to enact enabling statutes is often directly correlated with the typology of legislation adopted. In many cases, enabling legislation may implement an MEA by re-enactment. Re-enactment entails repeating verbatim, or by paraphrase, the substantive treaty provisions. MEA implementation by re-enactment is the traditional Caribbean approach and lessens the burden placed upon the State's limited legislative drafting resources, familiarity with the

nuances of international treaty law and the sensitivity to the translation of "soft law" treaty obligations into "hard law" State legislative rights and duties (Anderson, 1999).

A more modern alternative to the traditional implementation by re-enactment is the incorporation by reference approach, as has been adopted by St. Kitts and Nevis (Government of St. Kitts and Nevis, 1996). There are, however, many variations of the incorporation by reference approach (Anderson, 1999). The classic form comprises a short statute whose central provision is that the treaties listed have "the force of law" in the country concerned. Incorporation in this manner is an economy for legislative resources required, while also facilitating a more rapid response from Parliament to the responsibilities of the legislative action.

2.3.4 Identification of a National Implementing Agency

In the Caribbean, there is no direct linkage between treaty making and identification or designation of national implementing agencies. Consequently, the Ministry of Foreign Affairs, although often responsible for treaty making, is not usually involved in the designation of national focal points: the exception being MEAs that fall directly under the portfolio of that Ministry. Therefore, problems arise when the political agency responsible for accepting environmental obligations on behalf of the State, and those responsible for designating the technical organizations that are to ensure compliance with the aforementioned obligations are not working together (Anderson, 1999). This non-integrated, procedurally flawed approach creates a system where each agency is unaware of the others' activities. Thus, in much of the Caribbean, many of the environmental agencies are unaware of the nature and extent of international rights and obligations binding to the State.

This problem is rectified by the enactment of implementing legislation. Such legislation does not necessarily resolve the conundrum of identifying the most suitable implementing agency. This is a critical omission in many of these statutes. While in other instances, the legislation may place the responsibility upon an agency which either does not have the necessary responsibility for environmental management or does not have

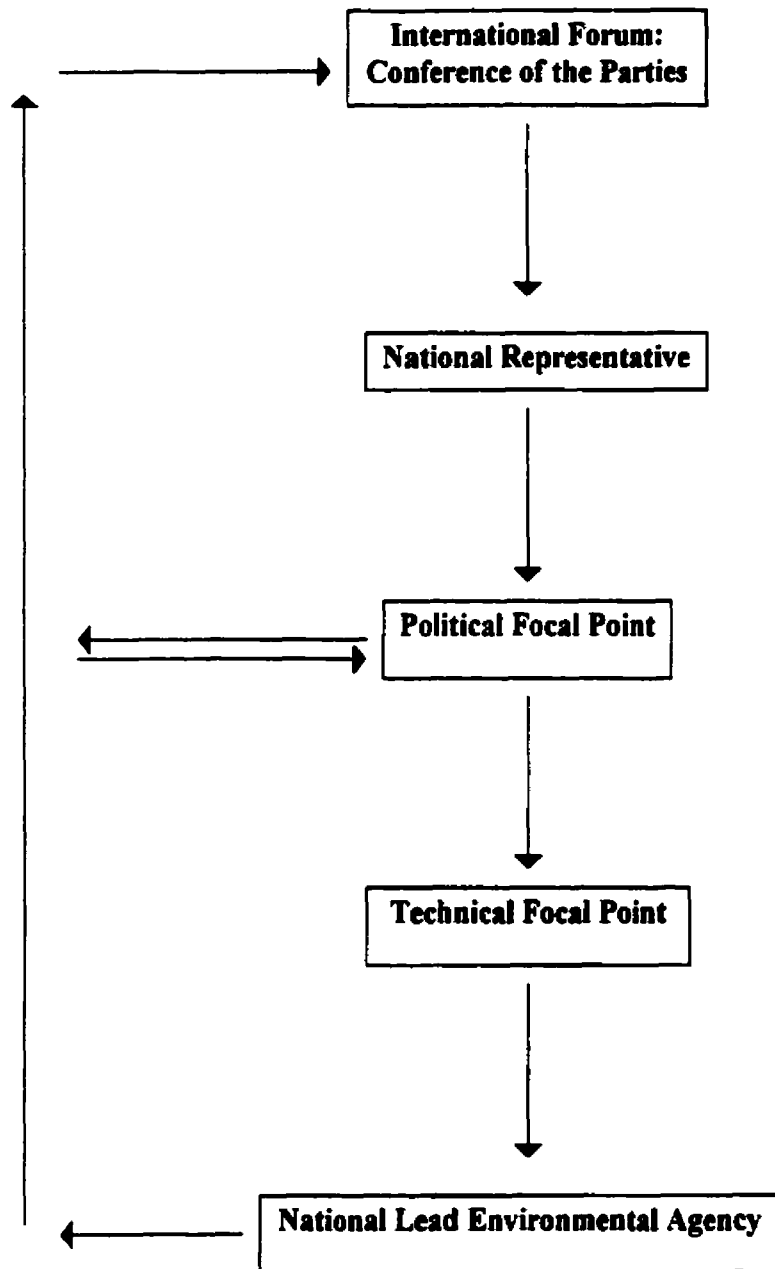


Figure 4: MEA Implementing and Reporting Mechanism

sufficient institutional capacity or resources (GOCD, 1998).

Due to the absence of formal rule or standard practice regarding responsibility for designating national implementing agencies, the simplest approach involves allowing the Ministry responsible for the environment to assume *de facto* the task of assigning implementation of specific MEAs to particular agencies. For example, the Ministry of Housing and the Environment performs this function in Jamaica (Brown pers. comm., 2000). Alternatively, the State's lead environmental agency may interpret its legislative environmental mandate in such a broad manner to encompass the designation of MEA implementing agencies. The Environmental Management Authority of Trinidad and Tobago has adopted this alternate approach (Ploceta pers. comm., 2000). In these instances, an important distinction must be made between the political focal point for MEAs (usually the Ministry of Foreign Affairs) and the technical focal point (usually the Ministry of the Environment and/or the lead environmental agency).

2.3.5 Identification of Focal Points for Implementing Activity

In addition to the designation of the national implementing agency, there must often also be an identification of a specific focal point for implementing activity with respect to specific environmental conventions. The most successful case in the Caribbean has involved the identification of the focal point by the lead environmental agency to other subsidiary bodies over whom the agency exercises some degree of authority. This approach is currently being used in Jamaica, Trinidad and Tobago, and St. Kitts and Nevis (Anderson, 1999).

In the Caribbean, no standard criteria are used for the appointment of focal points so the most appropriate agency is not always appointed. Treaties may be assigned on the basis of recognized specialist competence and qualification (e.g. the assignment of the UNFCCC to the Meteorological Office in Jamaica) (Brown pers. comm., 2000). Alternatively, an MEA whose subject matter was traditionally dealt with by a particular government department may be assigned to that same department. For example, a new MEA dealing with forest conservation would likely be assigned to the Forestry

Department, Ministry of Agriculture, Forestry and Fisheries. However, another new MEA on conservation of biological diversity containing provisions for the protection of intellectual property rights, an area not traditionally covered by the Forestry Department, might nonetheless be similarly assigned. Also, MEAs may be allotted to a particular department on the merit of personal competence, skill and experience of a specific individual. Such assignments typically occur when an individual is relocated to another department or even after leaving the civil service. Such practices occur even when the "new" department / private sector agency might not be capable or appropriate for handling treaty-implementing responsibilities (Anderson, 1999).

Most often, responsibility for implementing MEAs is increasingly assigned to the national lead, or only, environmental agency. The rationale being the existence of the required competence, skills and resources or more likely in default of such qualifications being found elsewhere. The lead agency is often provided external expertise support to complement or fill the internal void (Anderson, 1999). The University of West Indies and the Institute for Marine Affairs (Trinidad and Tobago) are examples of quasi-government institutions that provide expertise in this regard. Non-governmental organizations and private consultants may also be contracted to provide particular assistance. Support may also be available from project activities organized at a regional level. In such cases, agencies such as the Natural Resources Management Unit of the Organization of Eastern Caribbean States (NRMU/OECS) may be of tremendous assistance (Williams pers. comm., 1999).

2.3.6 Availability of Resources and Project-based Activity

Caribbean public sector resources are scarce, and do not allow for the long-term acquisition and retention of scientific, technical and other expertise. Thus, externally funded projects, both national and regional, often represent the foundation of environmental treaty implementation (Hill pers. comm., 1999).

National project-based activity has been used to facilitate the drafting of implementing environmental legislation. The magnitude and diversity of topic areas

covered by this project-based activity are overwhelming. The compilation of inventories for greenhouse gases (GHG) and ozone depleting substances (ODS), as well as the reporting of remedial measures to the conferences of parties (COP) has also been facilitated. Furthermore, inventories have been created for national biological diversity (biodiversity) resources, and remedial National Strategic Action Plans (NSAP) formulated (Hill pers. comm., 1999). Particularly important areas of cultural and natural heritage have been identified, documented and conserved, especially vulnerable species and ecologically sensitive areas have been designated, with management plans formulated. Endangered species of flora and fauna have been identified, protected, and their international trade regulated. Contingency plans have been drafted, assimilation exercises conducted and regional alerting systems established in preparation for dealing with major oil spills. Plans have also been made for the construction of oil and waste reception facilities in all ports (Anderson, 1999). The diversity and scope of these projects and activities provides a glimpse of the tremendous amount of MEA activity in the Caribbean.

Administrative measures are generally sufficient to facilitate most project-oriented activities. For instances where legislation is required, the project formulation may in itself address the development of necessary legislation (Laronde pers. comm., 1999).

External funding for project-based implementing activity is generally considered to be based upon the principle of common yet differentiated responsibility, as stipulated in the Rio Declaration of 1992. Caribbean countries tend to receive financial and technical assistance based on the simple fact that they were far less responsible for the creation of global environmental problems. This is further compounded by the limited resources that Caribbean countries have to deal with these severe environmental problems compared to that of the more developed countries. Projects have been financed by, amongst others: Global Environmental Facility (GEF), World Bank (WB), Inter-American Development Bank (IADB), Caribbean Development Bank (CDB), International Maritime Organization (IMO), United Nations Environment Programme (UNEP), United Nations Development

Programme (UNDP), United States Agency for International Development (USAID) and Canadian International Development Agency (CIDA) (UNEP, 1999).

National Environmental Agencies (NEAs) and/or the Focal Point for the relevant Convention (FPC) are typically responsible for determining possible means of funding, drafting and submitting project proposals, hiring of consultants, monitoring implementation, and compliance of the project within the terms of the Convention. Projects are usually organized on either a national or local basis. However, many successful project-based activities have attempted alternate approaches. For example, implementing agencies have been initiated and largely controlled by international agencies, while projects have been organized on a regional and sub-regional basis (Anderson, 1999). Sustainability is the perpetual problem and goal that must be accounted for with all project-based implementing activity. Creation of a monitoring process can assist with meeting project objectives and moving towards sustainability.

2.3.7 Establishment of Monitoring Processes

Fundamentally, the nature and rules contained within each of the environmental conventions are critical to ensuring that compliance with multilateral environmental agreements is achieved. Most MEAs operate on the basis of each country self-reporting. Provisions may be made for the regularity of reporting, reporting formats and national assistance with respect to international inspection and monitoring. These provisions allow for the national establishment of systems for ensuring the generation of information and data, as well as for monitoring implementation and compliance (Anderson, 1999). The success or failure of a monitoring process often depends upon the initial process of environmental treaty making and all the provisions that are provided.

2.3.8 Environmental Treaty Making

The Ratification of Treaties Act (ROTA) of Antigua and Barbuda was a successful departure from the normal practice of environmental treaty making in the Caribbean. The ROTA was enacted to remedy a fundamental defect in Caribbean law and practice by legislating a role for Parliament in treaty making and thus allowing public participation.

The Act states that certain treaties cannot be accepted by the State unless approval from Parliament is first achieved. Consequently, the Act furthers the process of participatory democracy by giving Parliament, Parliamentarians, and the populace they represent a clear role in the treaty conclusion process. Preliminary reports suggest that the Act has been a catalyst for a significant increase in the general public's understanding, appreciation and involvement with respect to environmental treaties (Government of Antigua and Barbuda, 1996).

2.3.9 Country Profile of National Implementing Agencies and Focal Points

Once environmental treaties are established, the responsibility is then passed to the national implementing agencies (NIAs) and / or focal points (FPs) for the technical implementation of an MEA. Provided within Appendix II are a number of examples of NIAs / FPs from throughout the Caribbean that have adopted various procedures for MEA implementation. Examples were selected from an examination of the differing approaches to MEA implementation throughout the Caribbean conducted in 1996 by Dr. Anderson, a professor of law at the University of the West Indies.

2.4 Conclusion

Having discussed the general process of MEA implementation in the Caribbean during this chapter, the following three chapters shall concentrate upon the background, process of implementation and significance of three specific MEA case studies in the Commonwealth of Dominica. The general implementation framework has been provided in this chapter, and the specifics of each case study will be covered in their respective chapters, starting with the MEA case study of climate change (Chapter 3).

Chapter Three

Climate Change

3.1 Chapter Overview

Chapter 3 focuses upon the efforts made by the Commonwealth of Dominica to implement the United Nations Framework Convention on Climate Change (UNFCCC). Upon becoming a member party of the UNFCCC, Dominica's efforts have been restricted primarily to the Caribbean: Planning for Adaptations to Climate Change (CPACC) Project. Results from the CPACC Project will be used in the Initial Communication on Climate Change for the UNFCCC Project. In Dominica, the Environmental Coordinating Unit (ECU) of the Ministry of Agriculture and the Environment serves as the National Implementation Coordinating Unit for the CPACC Project. Consequently, as a member of the ECU staff, much of my work entailed implementing the CPACC Project in Dominica. More specifically, I administered: 1) CPACC Component 3 National Survey, "Inventory of Coastal Resources and Use"; 2) CPACC Component 3 Data Assessment Survey; and 3) CPACC Component 7 "Economic Valuation of Coastal and Marine Resources" project development and site selection.

3.2 Global Climate Change

Human activities have resulted in large amounts of gases, including carbon dioxide, being released into the atmosphere. These gases have served to magnify the earth's natural greenhouse effect, and trap more heat in the lower atmosphere. There is a large-scale concern that the addition of such gases will cause increased warming of the earth's surface and atmosphere. As of 1999, 1998 was the warmest year on record with the highest frequency of natural disasters and atmospheric carbon dioxide levels reaching a 160 000 year high (Financial Times, 1999). This warming, or global climate change, will

have detrimental effects upon humans and the general health of the earth's natural ecosystems (IISD, 2000). Climate change by the definition of Jepma et al. (1998), is "*a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods*".

The global nature of climate change requires the widest possible cooperation of all countries in an effective and appropriate international response. In 1988, an Intergovernmental Panel on Climate Change (IPCC) was established through the United Nations system. The IPCC consists of the foremost experts in the field of climate change, whose primary task is to provide sound scientific evidence to assist in the decision-making process (Jepma et al., 1998). Countries then need to enact environmental legislation that controls greenhouse gas emissions, while ensuring the proper functioning of natural processes that aid in removing these dangerous gases from the atmosphere (IISD, 2000).

3.3 United Nations Framework Convention on Climate Change

The United Nations Framework Convention on Climate Change (UNFCCC) was approved by the heads of states of more than 150 countries at the United Nations Conference on Environment and Development (UNCED), or Earth Summit, in Rio de Janeiro in June 1992 (Carstanjen, 1999). The general objective of the UNFCCC, as described in Article 2 is to: "*... stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system ... within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner*" (UNFCCC, 1992). During the Kyoto Convention (CoP3, 1997), industrialized countries have agreed to reduce their emissions of greenhouse gases by, on average, 5.2 percent relative to 1990, during the commitment period 2008-2012 (UNFCCC Secretariat, 1999). The Commonwealth of Dominica is a

Party to this agreement, yet subject to different requirements as a developing nation and ratified the UNFCCC on June 21st 1993 (UNEP, 1999).

Dominica's immediate national objective of the UNFCCC project is to facilitate the preparation of the first national communication, that details the state of preparedness for the potentially harmful effects of climate change, to the Conference of Parties (CoP) in accordance with the Article 12 of the UNFCCC (UNDP, 1999). In addition to meeting the communication obligations, the project is considered as an essential exercise to enhance awareness and knowledge of climate change related issues in Dominica. Thus, the country will be able to take these issues into account in the general planning and strategy formulation for various economic, social and environmental sectors. Dominica's role in international scientific forums and negotiation processes related to climate change will also be positively influenced. More informed decision-making, with regard to climate change issues, will be amongst the more important project objectives. Achieving project objectives will require dialogue, information exchange and cooperation amongst all of the relevant stakeholders in areas of government, non-government, academic, private, industry, community-based organizations and the general public (UNDP, 1998).

The UNFCCC project will strengthen the existing institutional framework and enhance internal capacity, thereby assisting the process towards submitting additional communication obligations in the future. Further development will be fostered allowing response measures to climate change and its adverse impacts to be identified and ultimately implemented (UNDP, 1998).

Since ratifying the UNFCCC in 1994, Dominica has been actively undertaking measures related to climate change. In order to address its national priorities and comply with its commitments, The Commonwealth of Dominica has undertaken the following steps:

- Representatives from the Commonwealth of Dominica are participating in the Conference of Parties meetings, as well as local and regional meetings, which address



Plate 7: Low-lying, unprotected Bayfront of Roseau, capital city of Dominica

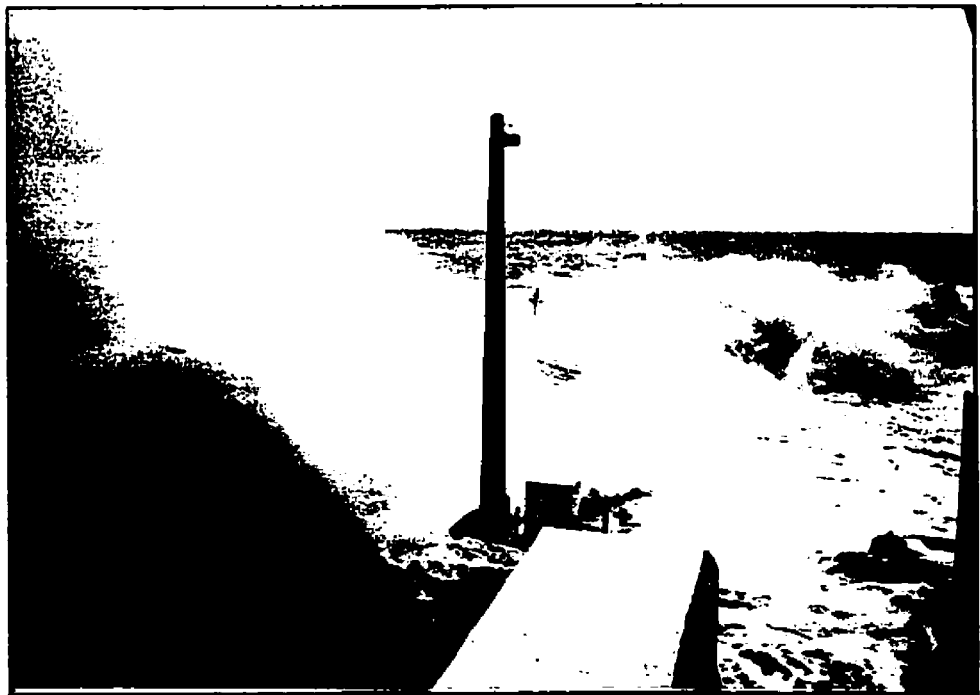


Plate 8: Hurricane Lenny sends waves crashing 30 feet over Roseau's Bayfront

the issue of climate change (Williams pers. comm., 1999).

- Dominica has prepared a National Environmental Action Plan (NEAP), Tropical Forest Action Plan (TFAP), and Environmental and Coastal Resources Management Project (ENCORE) to establish baseline data and planning in areas that are susceptible to the potential effects of climate change (Hill pers. comm., 1999).
- The Commonwealth of Dominica is one of the 12 countries in the Eastern Caribbean participating in the regional project entitled "*Caribbean: Planning for Adaptations to Global Climate Change (CPACC)*". This initiative is funded by the Global Environmental Facility (GEF) through the World Bank (WB). Early results for this work will be inserted in the Initial National Communication on Climate Change (GOCD, 1999).

The CPACC Project is an enabling activity of the larger UNFCCC Project, and the work and results generated from the CPACC Project will serve as the foundation material upon which the UNFCCC Project is built.

3.4 Caribbean: Planning for Adaptations to Global Climate Change

3.4.1 Project Background

The members of the Caribbean Community (CARICOM) are primarily small island states or low-lying coastal states with developing economies and fragile ecosystems. Traditionally, agriculture and tourism have served as the principal sources of employment and foreign-exchange earnings. The vast majority of the population and economic activity are situated along coastal areas. Coastal resources are vital to the prosperity of these countries. In addition, they are also the most productive areas, supporting a wealth of living marine resources and high biodiversity. Recently, the coastal areas have come under increasing amounts of stress (CPACC, 1999). These stresses include:

- Increased human activities;
- Tourism related infrastructure;
- Inadequate disposal of liquid and solid waste;

- Decaying drainage infrastructure;
- Uncontrolled development schemes;
- Natural disasters (primarily hurricanes) and severe weather events;
- Mismanagement of coastal ecosystems; and
- Increased sedimentation due to poor watershed management.

The anticipated global warming may compound the problems associated with coastal resources of small island states. A number of detrimental effects are currently being considered (Mullan pers. comm., 2000):

- Rise in sea level;
- Increase in sea surface temperature;
- Changes in wind and ocean currents;
- Permanent flooding and inundation;
- Increased coastal erosion;
- Salt-water intrusion and contamination of freshwater reserves; and
- Aggravation of natural disaster and tropical storm impacts.

All of these coastal resource hazards associated with global warming are a serious threat to the sustainable development of CARICOM and other small island states. The vulnerability to sea level rise of coastal resources, human settlements and related infrastructure underscores the urgency of establishing and integrating a framework to address this issue. A scarcity of reliable data, inadequate financial and human resources support, lack of suitable information systems or coordinated institutional structures to manage coastal resources serves to make the CPACC project a very difficult challenge (CPACC, 1999).

3.4.2 Project Purpose

The fundamental purpose of CPACC is to support Caribbean countries in preparing to cope with the adverse effects of global climate change (GCC). Of particular concern is sea level rise, which will be addressed through vulnerability assessment, adaptation planning and capacity building. This entails a regional approach being

executed through the cooperative efforts of all 12 CARICOM countries, the University of the West Indies Centre for Environment and the Development and several regional institutions. The project will involve a combination of national pilot / demonstration actions, regional training and technology transfer. This approach is intended to strengthen regional cooperation and institutions while also providing a cost-effective means for adaptation planning, data collection and the sharing of information, skills and project benefits (CERMES, 1999).

3.4.3 Origin and Legal Framework

The four-year project originated at the Global Conference on the Sustainable Development of Small Island Developing States (SIDS) that was held in Barbados in 1994, when the CARICOM countries approached the Organization of American States (OAS) for support from the potentially detrimental impacts of global climate change. The OAS and the Global Environmental Facility (GEF) supported the preparation of a project proposal.

Not until 1997 did the Board of Directors of the World Bank, and one of the GEF implementing agencies, approve the project and designate the OAS as the executing agency. A Regional Project Implementing Unit (RPIU) has been established at the Barbados campus of the University of West Indies (UWI). The project is funded with a US \$ 6.75 million grant. CPACC constitutes as an enabling activity of the United Nations Framework Convention on Climate Change (UNFCCC, 1992).

3.4.4 Project Organization

The Global Environmental Facility (GEF) is responsible for providing the monetary funding for the CPACC project. The project is then jointly administered by the World Bank (WB), United Nations Development Programme (UNDP) and the United Nations Environmental Programme (UNEP). The Organization for American States (OAS) is supported by the World Bank and is closely linked with CARICOM. CARICOM serves as the Chair of the Project Advisory Committee (PAC), which assists the OAS in administering the Regional Project Implementation Unit (RPIU). The RPIU, located at

the University of West Indies Centre for Environment and Development (UWICED), acts to coordinate each of the National Implementation Coordinating Units (NICUs). In Dominica, the Environmental Coordinating Unit (ECU) serves as the NICU (CPACC, 1999).

3.4.5 Specific Project Objectives

Essentially, there are five distinct CPACC project objectives as displayed on the below Table 2:

Table 2: CPACC Project Objectives

Objective	Description
One	To strengthen regional capability for monitoring and analyzing climate and sea-level data, dynamics and trends, in order to determine potential impacts of global climate change.
Two	To identify social, economic, environmental and geographic areas particularly vulnerable to the adverse effects of global climate change.
Three	To develop an integrated management and planning framework for the necessary cost-effective response and adaptations to the impacts of global climate change on coastal resources.
Four	To enhance the regional and national capabilities to prepare for the advent of global climate change through institutional strengthening and human resource development.
Five	To identify and assess policy options and instruments that may help initiate the implementation of a long-term program of adaptation to global climate change for vulnerable coastal areas.

Source: (CPACC, 1999)

3.4.6 Project Components

The CPACC Project components have been divided into two main categories, regional and pilots (i.e. smaller-scale, experimental projects that are being tested nationally before being implemented throughout the Caribbean):

Regional

Regional components are the core set of activities carried out within each of the 12 CARICOM islands. The first step is to design and establish a sea-level / climate monitoring system. Once installed, baseline information can be collected in all of the

relevant climate monitoring areas. It is then necessary to establish databases and information systems to handle all of this information. An inventory of coastal resources and use will then be created to help determine coastal vulnerability. Finally, a policy framework for integrated coastal and marine management will be formulated (CPACC, 1999).

Pilots

Regional components carried out throughout all of the twelve CARICOM countries will be accentuated by pilot projects occurring on specific islands. Pilot projects are smaller-scale, experimental projects that may have particular relevancy to certain islands, although they might be implemented throughout the Caribbean depending upon their relative success or failure in providing valuable information relative to areas of climate change.

Table 3: CPACC Pilot Projects throughout the Caribbean

Project	Title	Countries
1	Coral-reef monitoring of impacts of global climate change.	Bahamas, Belize and Jamaica
2	Coastal vulnerability and risk assessment.	Barbados, Grenada and Guyana
3	Economic valuation of coastal and marine resources.	Dominica, Saint Lucia, and Trinidad and Tobago
4	Formulation of economic / regulatory proposals.	Antigua and Barbuda, and Saint Kitts and Nevis
5	Greenhouse gases inventory / vulnerability of agriculture and water resources sectors.	Saint Vincent and the Grenadines

Source: (CPACC, 1999).

3.4.7 Status of CPACC Project in the Commonwealth of Dominica

The CPACC project entered its third component for the Commonwealth of Dominica in September 1999. This component, *"Inventory of Coastal Resources and*

Use (ICRU)”, involves gathering information on available data relevant to coastal and near-shore disaster and environmental degradation planning. The first phase of this component, determining the existence and availability of relevant data, took the form of a Gap Analysis, where data areas are selected and any gaps or holes are determined. In addition, an examination of interview results was also conducted.

The main activities of the ICRU component of the CPACC project include (CPACC, 1999):

1. Procurement and installation of equipment to create or upgrade existing Geographic Information System (GIS) capability;
2. Consolidate, evaluate and computerize (GIS) existing information in each participating country, and provide necessary GIS training;
3. Carry out a two-week regional training course on available techniques for resource inventory preparation;
4. Design coastal resource inventories for each participating nation to provide baseline data for project activities, such as vulnerability assessments, coral reef monitoring, economic valuation, etc.; and
5. Prepare coastal resource inventories.

The expected outputs of the Inventory of Coastal Resources and Use (ICRU) component of the CPACC project include the development and use of the institutional framework, technical capacity and equipment for the inventory and analysis of coastal zone resources, as well as their conditions and uses. Secondly, an inventory of physical and biological resources in Caribbean coastal areas, as well as their current uses and users will be created. Thirdly, country-specific mapped outputs for use in Integrated Coastal Zone Management (ICZM) and planning will be generated (CPACC, 1999).

By January 2000, the coastal resources use and user data from the CPACC project’s third component were being further analyzed by the Regional Project Implementing Unit (RPIU) of the Centre for Resource Management and Environmental Studies (CERMES) at the University of West Indies (UWI). However, preliminary

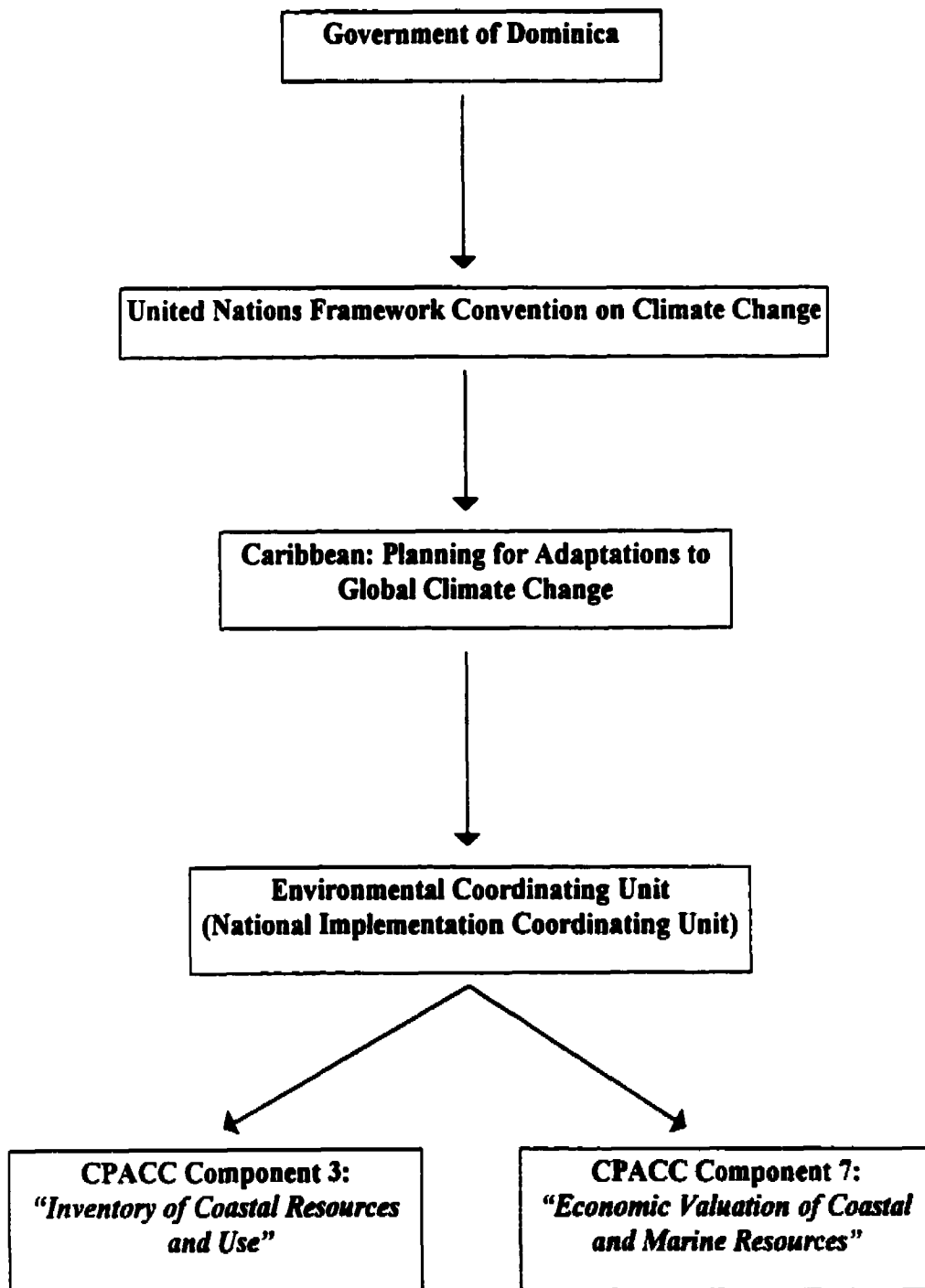


Figure 5: Climate Change Project Implementation in Dominica

work has also begun upon the CPACC Pilot Project #7 *"Economic Valuation of Coastal and Marine Resources"*. Component 7 is perceived as being a key contributor to the development of Component 4, *"Formulation of a Policy Framework for Integrated Coastal and Marine Management"*. Additionally, it should inform the developments emanating from Component 8, *"Formulation of Economic / Regulatory Proposals"*. Component 7 is one of five pilot projects being administered amongst the 12 participating countries. This particular component is being administered in three pilot countries with varying foci: St. Lucia (tourism); Trinidad and Tobago (industry); and Dominica (potential eco-tourism). The Environmental Coordinating Unit will continue to serve as the administrative body for the CPACC Project.

The overall objective of the component is *"to assist participating countries to apply the tools of resource valuation, environmental accounting and environmental decision-making for use in the development of policy frameworks and economic and regulatory approaches within the context of the coastal and marine resources and CPACC objectives"* (RPIU, 1999).

3.5 Methodology of Implementation of the UNFCCC in Dominica

The Caribbean: Planning for Adaptations to Global Climate Change (CPACC) project is a regional enabling activity of the United Nations Framework Convention on Climate Change (UNFCCC). The CPACC project was devised by the leaders of the twelve member states of the Caribbean Community (CARICOM) in order to assist with meeting the mandates as stipulated in the UNFCCC. The CPACC project attempts to provide background information that will assist with preparations being made for the potential effects of global climate change, and the associated sea level rise.

Therefore, the Commonwealth of Dominica has already performed preliminary work upon the United Nations Framework Convention on Climate Change (UNFCCC) with the advent of the CPACC project and the collection of baseline data. The first phase

involved an Inventory of Coastal Resources and Use (ICRU), Component Three of the CPACC project, and was conducted in Dominica in August 1999.

The objective of the ICRU component of the CPACC project is to further develop the national inventory of coastal resources to provide the necessary baseline data for the execution of other project activities.

In Dominica, the first phase of the ICRU was completed through the Environmental Coordinating Unit (ECU) of the Ministry of Agriculture and the Environment. Mr. Mullan and I collected information on available coastal resources and use by conducting interviews with senior- and mid-level Government officials responsible for coastal and near-shore information relevant to the CPACC project. This information covers fifteen sub-categories of data: Agriculture, Beach Morphology, Coastal Sea Defense, Fishing, Housing, Industry, Infrastructure, Marine Communities, Oceanographic, Parks / Reserves, Rare Species, Recreation, Tourism, Waste Disposal and Water Quality.

The objective of Component 3 is to further develop each participating country's inventory of coastal resources and use. This particular component is regional in scope, and is being implemented in the following twelve CARICOM states: Antigua and Barbuda, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, The Bahamas, and Trinidad and Tobago.

Component 3 will be implemented in seven modules, as follows: Data Assessment; Data Cataloguing; Development of Metadata; Database Design; Data Collection; Data Automation / Conversion; and Database Implementation and Training. Each of the seven modules will be implemented in three broad phases, namely:

1. Information assessment, cataloguing and data base design;
2. Training in cataloguing and digitization of coastal resource information; and
3. Preparation of spatially referenced coastal resource inventories.

The results generated from this component, within each country, will be useful for:

- A. Assessment of coastal zone vulnerability to sea level rise;
- B. Provision of critical data for pilot project activities; and

C. Assisting countries with the design, development and implementation of programs in integrated coastal zone management (Alleyne Planning Associates Inc., 2000).

In the Caribbean, this project is administered by the Regional Project Implementing Unit (RPIU) of the Centre for Resource Management and Environmental Studies (CERMES) at the University of the West Indies (UWI), Barbados. Completed Questionnaires and the resulting data were provided to the RPIU. Myself and Mr. Mullan, on behalf of Dominica, were formally recognized by the RPIU as having provided the most complete and comprehensive set of questionnaires of all of the islands in the Caribbean (CERMES, 2000).

Coastal resource data required for the proposed project includes coastal physical characteristics, natural environments and information on the use of coastal areas and resources. The inventory takes into consideration the widely varying coastal zone resources, existing inventories and analysis capabilities located in the Eastern Caribbean region.

The objective of the ICRU is to further develop each participating nation's inventory of coastal resources to provide the necessary data for the execution of further project activities. The main activities of the ICRU component of the CPACC project include:

- the collation and computerization of all existing relevant data;
- the development of an inventory of coastal resources and use data; and
- the development of a Geographic Information System (GIS) capable of performing an inventory and analysis of ICRU-relevant data (CPACC, 1999).

A regional training course will be provided through the CPACC program to facilitate improved data management.

The objective of this phase of the ICRU component is to identify the availability of coastal and near shore data relevant to planning for and adapting to global climate change. Findings from this phase of the ICRU component were based upon interviews conducted with Government officials in the Commonwealth of Dominica.

Mr. Mullan and I conducted the work involved in this phase of the ICRU component, the identification of existing coastal and near shore data, for the Dominica's Environmental Coordinating Unit (ECU). Funding for our work was provided by the Canadian International Development Agency (CIDA) and was administered by the Organization for the Cooperation in Overseas Development (OCOD).

Preliminary analysis of the data indicates that the Commonwealth of Dominica has the most comprehensive data set amongst all 12 islands involved in the CPACC Project. A follow-up visit was conducted by Ms. Shaiba Ali, a member of the CPACC RPIU staff, we met in order to verify the data, discuss the methodology employed and meet with some of the Government officials that provided information. Further analysis of the data continues at the Centre for Resource Management and Environmental Studies (CERMES), University of West Indies, which acts as the CPACC Regional Implementing Unit (RPIU).

In addition, Dominica has embarked upon the CPACC Pilot Component 7: *"Economic Valuation of Coastal and Marine Resources"*. Mr. Gerard Hill, the interim director of the Environmental Coordinating Unit, continued to serve as the National Focal Point (NFP) for the CPACC Project. A number of responsibilities are expected of the NFP:

- Selection and organization of Component Team and Team Leaders;
- Selection of study areas and organization of final site selection;
- Dissemination of relevant materials;
- Assist and facilitate the consultants in establishing contact with the relevant stakeholders and Government agencies;
- Facilitation of regular reporting to CPACC / RPIU on the progress of the Pilot Project; and
- Identification of capacity gaps and make recommendations on persons to be trained as part of CPACC component implementation (RPIU, 1999).

Work began in Dominica upon CPACC Pilot Component 7 in November 1999. The Environmental Coordinating Unit, in conjunction with the Ministry of Agriculture and the Environment, selected a Component Team to lead the project. Representatives were carefully selected from the Ministry of Agriculture and the Environment, Fisheries Division, Agriculture Division and the Ministry of Finance, Industry and Planning. At which time a representative from CPACC, Ms. Leisa Perch, and several accompanying consultants visited the island on December 8-10, 1999 to discuss the logistics of implementing the Pilot Project.

I was involved in a workshop conducted on December 9th for the Component Team and CPACC representatives to discuss possible study site areas. Two possible sites were identified: Scotts Head – Soufriere Marine Reserve in the south and Cabrits National Park on the north of the island. I was then responsible for escorting the Component Team on site visits to each of these areas in order to determine which might prove to be most suitable. Amongst the criteria used to decide were: existing coastal resource use data, community interest in participating with the study, quantity and diversity of coastal resource uses, susceptibility to sea-level rise and geographical size of the study site.

Following our deliberations from a second meeting, the unanimous decision was to use the Scotts Head – Soufriere study site for the CPACC pilot project. There is a multitude of coastal resource usages in this area, including small-scale fishing industry, marine biology research, snorkelling, scuba diving, sea bathing, guest houses, restaurants and local community inhabitants. An additional deciding factor favouring the selection of this site is the existence of a local community-interest group, called the Local Area Management Authority (LAMA), which is a valuable resource for data collection, community involvement and local knowledge support.

Proceeding the determination of site selection, members from the CPACC Component 7 Team attended a Metadata Training Workshop from December 13th to 17th at the Geographic Information System (GIS) Laboratory of the Department of Lands and Surveys, University of West Indies, St. Augustine, Trinidad and Tobago. Training

provided during this Workshop was intended to help each country's National Implementing Unit (NIU) to be better equipped to proceed with the project methodology.

In March 2000, a Data Assessment Survey Report and an accompanying Appendix 3: Summary of Questionnaire Responses was released by the University of West Indies for review by the National Focal Point, National Implementation Coordinating Unit and the respondent agencies. My contribution involved circulating the data assessment, attempting to clarify any identified areas of concern (i.e. data gaps) and creating a report for the RPIU on any new developments since the release of the data assessment.

The data assessment is a critical module of Component 3 - Inventory of Coastal Resources and Use. The survey has assessed the status of coastal resources management data in Dominica, and identifies gaps in the existing data. This assessment will enable CPACC to assist in the identification and procurement of new data to support the implementation of Component 7 – Economic Valuation of Coastal and Marine Resources.

3.6 Results of the UNFCCC Project in Dominica

3.6.1 Component 3 Data Assessment

In Dominica, CPACC Component 3 Inventory of Coastal Resources and Use (ICRU) has not proceeded beyond the Module 1, Data Assessment. Upon completing the ICRU survey in Dominica, the data we generated were sent to CERMES for analysis. The Component 3 Data Assessment was generated and sent back to Dominica. The principal objectives of the assessment are (Alleyne Planning Associates, 2000):

- i. To undertake an evaluation of the integrity and usability of available data sources, while indicating their strengths and weaknesses;
- ii. To identify critical data gaps and possible options for filling those gaps, with consideration to factors such as financial costs, time constraints and likely uses for which the data would be required;
- iii. To assist with the identification of additional existing data sources, which may have been omitted by individual countries;

- iv To review present data collection methodologies and identify weaknesses and training opportunities, where necessary; and
- v To assist with the identification and clarification of critical coastal management issues based on each country's priorities.

A data assessment report produced for the University of the West Indies serves as the first phase of the data assessment process. A summary evaluation of the status of perceived data availability and quality is provided for each country. The focus is to identify critical issues which can impact the timely completion of the data collection process, and possibly compromise the integrity of the available data. Once data are retrieved, the information will be used in the Initial National Communication on Climate Change for the UNFCCC Project.

3.6.2 Inventory of Coastal Resources and Use Data for Dominica

The principal instrument employed to accomplish the data collection objectives was a simple, yet detailed standard questionnaire divided into fifteen sections, including: Oceanographic Data; Water Quality; Beach Morphology; Marine Communities and Habitats; Rare / Threatened / Endangered Species; Fishing; Agriculture; Housing; Tourism; Recreation; Industry; Infrastructure; Coastal / Sea Defense; Waste Disposal; and Coastal and Marine Parks and Reserves. The data generated by the administration of the questionnaire by the Environmental Coordinating Unit, acting as the CPACC National Implementation Coordinating Unit, was sent to the University of West Indies for analysis.

3.6.3 Data Assessment for the CPACC Component 3 Questionnaire

The data from the CPACC Component 3 were analyzed by members of the CPACC Regional Project Implementing Unit (RPIU), and a Data Assessment Report was generated. The Report outlined the areas of data sufficiency, need for further analysis and data gaps. Table 4, on the following page, graphically displays the findings of this report:

Table 4: CPACC Inventory of Coastal Resources and Use Data Assessment

Section	Data Consistency	Electronic Format	Data Gaps	Data Sufficiency
Oceanography	Low	Not Complete	Wave period, data collection frequency	Need for further analysis
Water Quality	High	No	Temp., DO, chlorophyll a, faecal streptococcus	Adequate
Beach Morphology	Low	No	Nearshore bathymetry	Need for further analysis
Marine Communities	High	No	None	Adequate
Endangered Species	Medium	No	Estimated stock, location	Adequate (subject to verification)
Fishing	High	Yes	None	Adequate
Agriculture	High	Yes	Non-livestock stock size and numerous incomplete data sets	Need for further analysis
Housing	Low	No	Lot sizes, property values	Need for further analysis
Tourism	Low	Yes	None	Need for further analysis
Recreation	Low	No	No data available	Need for further analysis
Industry	Low	No	All except manufacturing	Need for further analysis
Infrastructure	Medium	Yes	Number and location of wharves, jetties and ports	Need for further analysis
Coastal Defense	Low	No	No data available	Need for further analysis
Water Disposal	Low	No	None	Need for further analysis
Marine Parks	Low	No	None	Need for further analysis

3.7 Discussion & Analysis

Given the present circumstance in the Commonwealth of Dominica, as a representative small island developing state, provisions have to be made for the advent of global climate change. Throughout the analysis of the 15 categories of the CPACC questionnaire, as depicted in Table 4, a number of recurrent themes appeared, including:

- Need for data conversion from hard to electronic format;
- Inconsistencies amongst respondents for identical questions from the survey;
- Absence of primary and secondary information sources to serve as data verification measures; and
- Lack of data for critical data subsets or even entire categories (e.g. Recreation, Coastal/ Sea Defense).

Over the past five years, many of the Government ministries have been gradually converting their filing systems to an electronic format. This process, however, will take time as the required resources are very scarce. There is a lack of computers available, as well as people trained in computer usage. Consequently, CPACC will have to provide technical, financial and human resource support if the required data are to be provided electronically and in a timely fashion.

Many of the inconsistencies provided by the various respondents are directly attributable to the lack of communication and coordination amongst the various Government ministries. In areas where jurisdiction often overlaps, little effort is being made to work together and jointly manage activities. The consequences of these actions are clearly depicted amongst the numerous contradictions provided by the respondents from various Government departments. Often is the case when one department is entirely unaware of the activities of another department, even in cases where they may be working upon the same material. Thus, confusion and inconsistencies are inevitable when each department is working in isolation from one another.

Such a lack of coordination within Government has other implications as well. Not only would contradictions in data be resolved if increased communication and

cooperation were fostered, but there would also be a built in data verification method. By retaining a degree of autonomy, while still cooperating, each Government department could help to verify the accuracy of each others data in areas where there is jurisdictional overlap.

As witnessed by particular categories of the questionnaire, there are some sizable gaps in Dominica's data collection agencies. Consideration of global climate change and its many far-reaching implications are a new phenomenon for the Commonwealth of Dominica. Thus, the CPACC questionnaire provides a valuable service by highlighting the areas that Dominica is deficient with regard to data collection. Such a broad encompassing regional survey will allow Dominica to remain up to date with modern climate change data requirements, as well as establishing a universal standard for the region.

3.8 Conclusion

The Commonwealth of Dominica, and other less developed countries, are embroiled in a debate over the responsibilities, conditions and mandates of multilateral environmental agreements (World Resources Institute, 1990). Fundamentally, the issue stems from the question of "*Who owes who?*" with respect to North-South relations. In 1999, the Christian Aid organization posed this query relating to areas of climate, debt, equity and survival. It suggested, "*its (the North) exploitation of the climate means that it has a greater debt to poor countries and the global community than poor countries do in reverse*". The premise being rich countries owe a vast environmental debt to poor countries.

This issue of environmental debt versus foreign debt amongst nations of the North and South has dire repercussions upon the negotiation of global environmental treaties. The massive foreign debt of less developed countries provides great leverage for creditors of more developed countries when negotiating international treaties. Thus, it has been suggested that progress on debt cancellation would also remove one of the obstacles to

fuller participation by poor countries in international environmental negotiations (Christian Aid, 1999).

Although the debate over human induced climate change continues, already precautionary efforts are being made. The development of the United Nations Framework Convention on Climate Change was the first step. Many regional agreements have also been made to support and assist with the goals, mandates and responsibilities under the UNFCCC. This has been especially evident in the areas determined to be most at risk to the detrimental effects of global climate change. These include the small island states (Maldives, Caribbean, Marshal Islands), the low-lying delta states (Bangladesh, Egypt, Vietnam, China) and the drought-prone states (Middle Eastern countries, Saharan and Sub Saharan Africa) (Christian Aid, 1999). Dominica and the other eleven members of CARICOM have adopted a precautionary approach in order to determine preventative measures for sea-level rise, natural disasters and other destructive attributes of global climate change.

The CPACC project originated at the Global Conference on the Sustainable Development of Small Island Developing States (SIDS), held in Barbados in 1994. The CPACC project is of immense importance as the low lying islands of the Caribbean have been determined to be one of the more vulnerable areas to climate change and sea level rise. Despite the financial, technical and administrative support that CPACC receives as an enabling activity of the UNFCCC (UNFCCC, 1992), debate still continues over whether climate change is human induced. Many of the policy makers and political authorities in Dominica support the theory that correlates climate change with increased severe weather activity (Williams pers. comm., 1999; Hill pers. comm., 2000; Magloire pers. comm., 1999). Traditionally, Dominica had hurricane activity on a decadal scale, with recorded hurricanes dating back to 1813 (Honeychurch, 1992). However, over the last 20 to 30 years Dominica has been ravaged by an increasing number of extremely strong hurricanes according to personal communication with Mr. Nathaniel Isaac (1999), National Head of Dominica's Department of Meteorology. In 1979, Hurricane David

left three quarters of Dominica's population homeless (Menhinik, 1989; Honeychurch, 1992). Hurricane Allen followed only one year later in 1980, and there have been 4 more hurricanes leading up to the most recent event, Hurricane Lenny, in 1999 (Isaac pers. comm., 1999). Each of these severe weather events is responsible for loss of lives, as well as damaging or completely destroying much of the island's coastal roads, resorts, communities, other infrastructure and coastal resources. Hurricanes serve to further demonstrate the vulnerability and susceptibility of Dominica to the detrimental effects of global climate change, and the associated sea level rise. Although, it is very difficult to establish a cause-effect relationship between climate change, human activity and increased hurricane activity, many authorities are acting on the side of caution and beginning to take preventative measures.

As a small island developing state with less than 80,000 inhabitants, Dominica is deficient in most all respects to address such a monumental problem. With the recent collapse of the banana industry, which was the foundation and backbone of the local economy, financial and other resources are especially scarce.

A colossal problem then presents itself as Dominica awaits the potentially disastrous consequences of global climate change, yet has little in the way of resources to make any of the necessary and critical preparations. Clearly foreign intervention and support is of absolute importance. Measures are already being taken in this respect, some of which have been covered in the preceding material, including the CPACC project, UNFCCC and contributions from various other areas. In an age of rapidly decreasing foreign aid (Christian Aid, 1999), Dominica cannot afford, expect or rely upon this support into the indefinite future.

Ultimately, the impending and imperative question to be asked is: *"Is the Commonwealth of Dominica any longer feasible as a sovereign state under the current state of the world economy, environment and society?"* With the advent of globalization, trade liberalization and trading blocks, Dominica has already started to show signs of a

weakening / failing economy as it struggles to remain competitive as an independent small island developing state in the fiercely competitive global market.

With regard to environmental concerns, the prospects are no less bleak. As a small volcanic island with a mountainous interior that is virtually impossible to develop, most all of the development and ensuing population concentration occurs along the coast; more specifically, along the West Coast as the east side of the island is swept with strong winds and harsh waves from the Atlantic Ocean. Much of this development along the West Coast is unprotected against the punishing effects of sea-level rise. Perhaps most disturbing is the realization that no efforts are yet to be successful to combat these natural disasters. No sea wall, jetty or wave break has proved sufficient in deterring damage to development along this exposed coastline. As a volcanic island, with very little continental shelf, the strength and fury of wave action is not disrupted until it crashes along the island's coastline.

Admittedly, it is important that projects such as CPACC determine the coastal resources, uses and vulnerability. Conversely, there must also come the realization that certain concessions will have to be made in light of global climate change and sea-level rise. As a nation, Dominica can ill afford to make further developments along the coast only to have to rebuild after each natural disaster episode. A difficult and distressing determination will have to be made of what industries, infrastructures, communities, development and activities can be sustainably developed and supported along the coast in light of the worst and most realistic scenarios for global climate change. Undoubtedly, this is a difficult decision to be made, yet it will only become more difficult with the coming of each severe weather event.

In conclusion, Dominica, as part of the larger international MEA community, is faced with additional global environmental problems that require attention and effort in an attempt to combat. The second case study to be discussed is that of the utilization and management of ozone depleting substances. The problem, actions being taken and

discussion of ozone depletion are further explained in the following chapter, which outlines the second of three case studies to be covered.

Chapter Four

Ozone Depletion

4.1 Chapter Overview

Chapter 4 involves the process of implementation of the Vienna Convention for the Protection of the Ozone Layer in the Commonwealth of Dominica. Once the Vienna Convention was ratified by the Government of Dominica, the Environmental Coordinating Unit (ECU) was assigned responsibility for implementation and to serve as the National Ozone Office (NOO). While assisting the ECU, a great deal of my time was spent: 1) conducting the 1998 National Ozone Depleting Substances (ODS) Survey; 2) creating the National ODS Phase-out Draft Policy Document for Dominica; and 3) serving as the national representative at the United Nations Environment Programme Meeting of ODS Caribbean Officers Network in Kingston, Jamaica (December 14-15, 1999).

4.2 Depletion of the Ozone Layer

As with climate change, ozone depletion is a global environmental management issue that affects and needs to be addressed by all nations of the world. Although the production of ozone depleting substances is concentrated in the North, atmospheric flows result in the depletion of the ozone layer in other parts of the world. In order to combat this global environmental problem, consensus and solutions must be sought at an international level.

The Ozone Layer is found in the stratosphere between 10 – 50 km above the ground. Ozone molecules have three atoms of oxygen instead of the normal two. The Ozone Layer protects us from the harmful effects of certain wavelengths of ultra-violet (UV) light from the sun, specifically UV-B. Any significant decrease in ozone in the stratosphere would result in an increase of UV-B radiation reaching the earth surface.

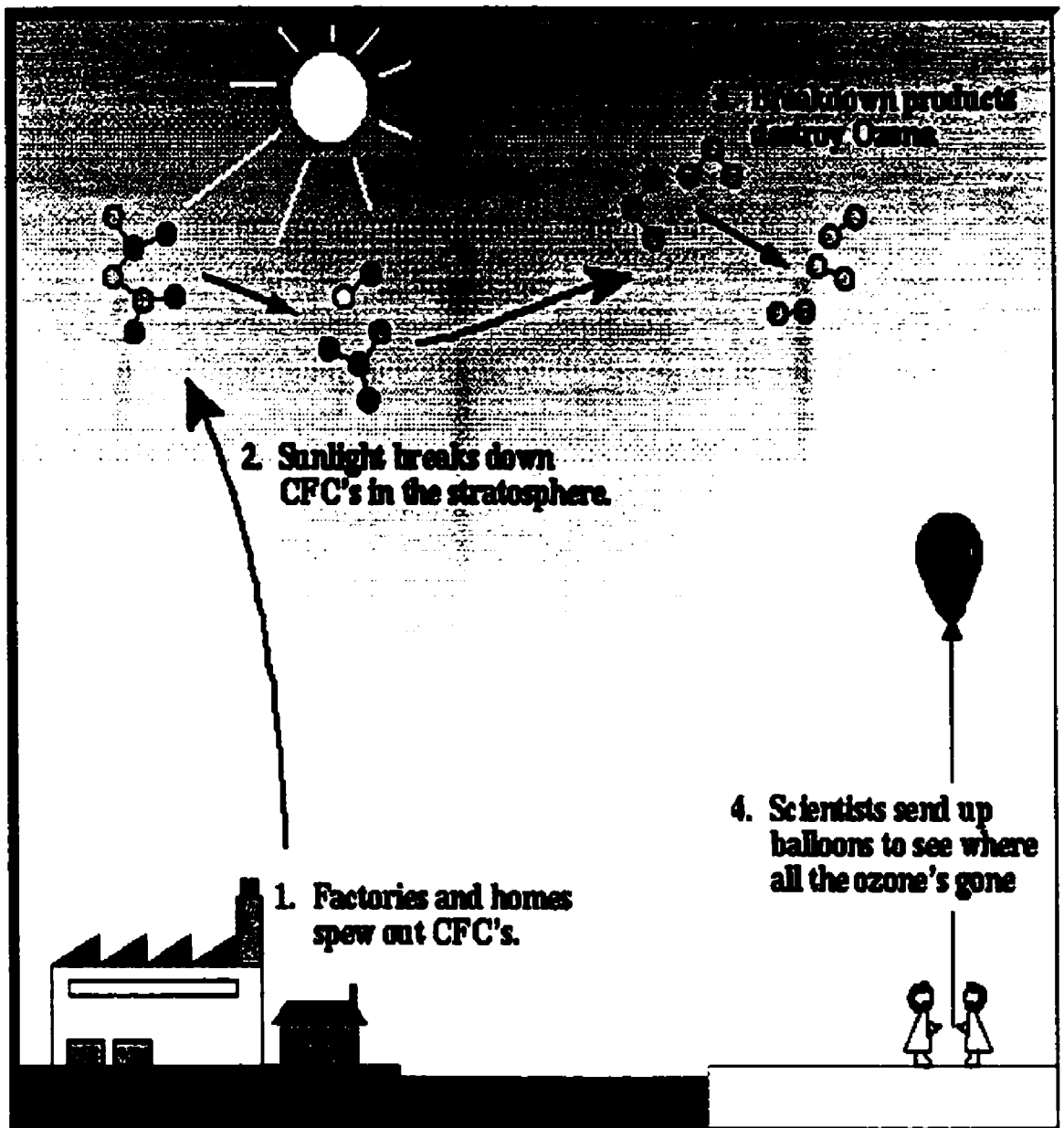


Figure 6: Process of Ozone Depletion Schematic

The above figure is a schematic illustrating the life cycle of the CFCs: how they are transported up into the upper stratosphere / lower mesosphere, how sunlight breaks down the compounds and then how their breakdown products descend into the polar vortex.

Source: (Atmospheric Change Organization, 2000)

Increases in levels of UV-B radiation causes increases in skin cancers, suppress the immune system, exacerbate eye disorders including cataracts, as well as detrimentally affect plastic materials, plants and animals (WMO, 1998).

Among these ozone depleting substances are chlorofluorocarbons (CFCs), invented in 1928, and found in aerosols, foams, refrigeration, air conditioners, solvents, fire extinguishers and many other products. These CFCs are long lived once released from containment, and eventually rise into the stratosphere and cause ozone depletion (Figure 6). This ozone depletion has been dramatically confirmed through the Antarctic "Ozone Hole" discovered in 1985 and observations, since then, of ozone depletion have occurred in the middle and higher latitudes (WMO, 1998).

This global environmental problem has continued to grow as a National Aeronautics and Space Administration (NASA) spectrometer detected on September 3, 2000 an Antarctic "Ozone Hole", or ozone depletion area, that is three times larger than the entire land mass of the United States (Figure 7). Dr. Michael J. Kurylo, manager of the Upper Atmosphere Research Program, NASA Headquarters, Washington, DC states that: *"These observations reinforce concerns about the frailty of Earth's ozone layer. Although production of ozone-destroying gases has been curtailed under international agreements, concentrations of the gases in the stratosphere are only now reaching their peak. Due to their long persistence in the atmosphere, it will be many decades before the ozone hole is no longer an annual occurrence,"* (NASA, 2000).

The United Nations Environment Programme (UNEP) has been addressing this issue since 1977. Under the auspices of UNEP, the governments of the world arrived at the Vienna Convention on the Protection of the Ozone Layer in 1985. Through this Convention, governments committed themselves to protect the ozone layer and to cooperate with each other in scientific research to improve the understanding of atmospheric processes (Ozone Secretariat, 1999).

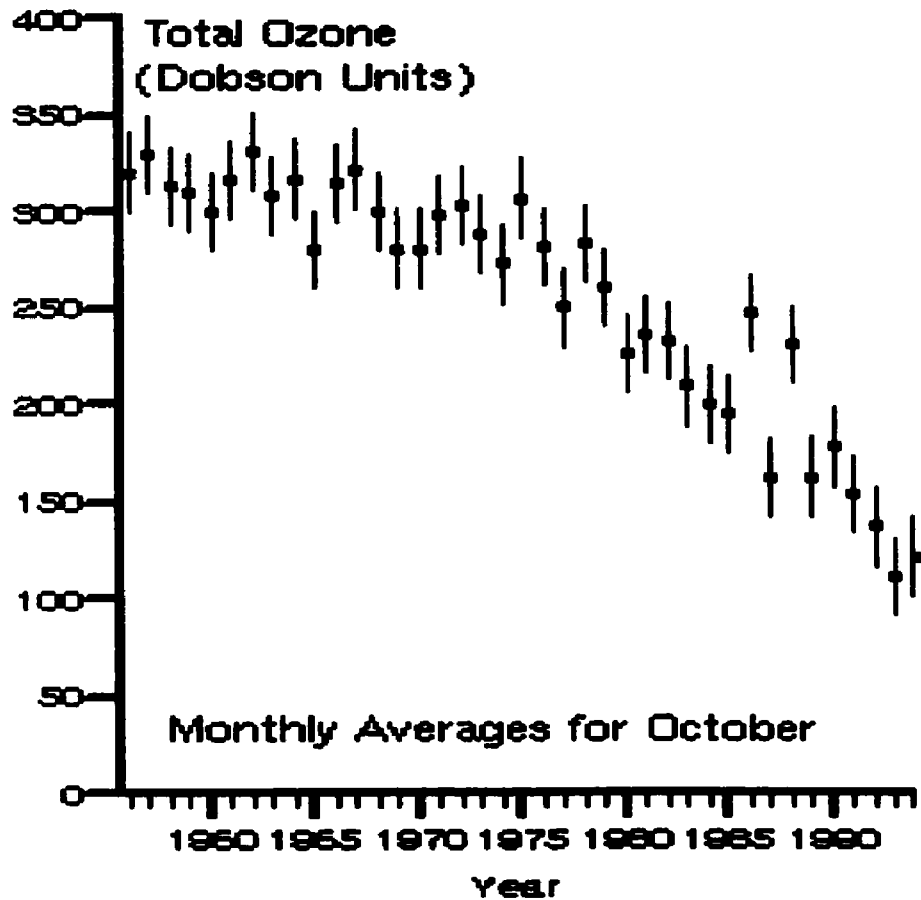


Figure 7: Graphical Representation of Ozone Depletion 1950-1990

Source: (EPA, 2000)

4.3 Vienna Convention for the Protection of the Ozone Layer

4.3.1 Introduction

The 1985 Vienna Convention for the Protection of the Ozone Layer is another of the global MEAs currently being addressed by the Commonwealth of Dominica. In 1987, the Montreal Protocol on Substances that Deplete the Ozone Layer was formulated, and 168 countries have ratified the Protocol as of March 25th 1999 (UNEP 1999). The Government of the Commonwealth of Dominica signed the Vienna Convention the

Montreal Protocol on Substances that Deplete the Ozone Layer and the London Amendment on March 31 1993, and qualifies as an Article 5 (less developed) country. Additional amendments have been made to the Montreal Protocol, including; The London Amendment (1990), The Copenhagen Amendment (1992) and The Montreal Amendment (1997) (UNEP, 1999). All of which Dominica is yet to ratify (Laronde pers. comm., 1999).

The Montreal Protocol establishes a timetable for the phasing-out of a number of Ozone Depleting Substances (ODS). Furthermore, the Montreal Protocol contains a "*Financial Mechanism*" with a Multilateral Fund (MF) governed by an Executive Committee consisting of seven members from developed countries and seven members from developing countries. Developing countries, such as the Commonwealth of Dominica, that are parties to the Protocol are eligible for financial and technical support through the Multilateral Fund, that assists them to fulfill their obligations under the Protocol (UNEP, 1999).

As a country operating under Paragraph One of Article 5 of the Protocol (Bojkov, 1995), Dominica has agreed to:

- freeze its consumption of controlled substances under the Protocol by July 1 1999 to 1995-1997 average levels;
- reduce consumption of controlled substances under the Protocol to 50% by 2005;
- reduce consumption to 15% of 1999 levels by 2007; and
- phase-out controlled substances completely (0% consumption) by 2010.

In order to meet these mandates, the Government of Dominica has taken initiative by declaring a National Ozone Office in order to coordinate the phase-out of all controlled substances.

4.3.2 National Ozone Office

The Government of Dominica has designated a National Ozone Office (NOO) under the Ministry of Agriculture and the Environment, and it operates out of the

Environmental Coordinating Unit (ECU). The NOO will be constituted within the ECU, to act as the focal point that coordinates and monitors activities towards a complete phase-out of ODS. Acting as the NOO, the ECU will have the following responsibilities (Hill pers. comm., 1999):

- To formulate and implement the Country Programme under the Montreal Protocol;
- To establish relationships with the Montreal Protocol Secretariat;
- To report periodically to the Montreal Protocol Secretariat;
- To initiate and coordinate activities under the Montreal Protocol; and
- To address the social, economic and environmental implications of the Montreal Protocol.

Accordingly, Dominica conducted its first *"Survey of Ozone Depleting Substances in Dominica"* during the period of May 4th 1998 to June 30th 1998. The survey helped to establish the levels of imports and consumption of controlled substances. One hundred and fourteen persons were surveyed as either individuals or serving as representatives of businesses that consume Ozone Depleting Substances (ODS). There are no known manufacturers of ODS in Dominica, also no exporters of ODS were identified. All of the ODS consumed in Dominica is utilized in the refrigeration and air-conditioning sectors (both private and commercial). The total 1997 ODS consumption amounted to 1.40 Ozone Depleting Potential (ODP) Tonnes, resulting in a consumption of 0.018 kg/capita (Bellot, 1998). Information gathered from this Survey was used to create the Country Programme.

The preparation of a *"Country Programme for the Phase-Out of Ozone Depleting Substances"* is generally the first step towards obtaining assistance from the Multilateral Fund. The objective is to express the Government's commitment to take appropriate actions to ensure compliance with the Protocol. The Country Programme contains an analysis of the current situation with regard to the production and consumption of ODS, together with a strategy statement and plan of actions to be adopted by the Government (MoAE, 1998). The approval of a Country Programme is a pre-condition for financial

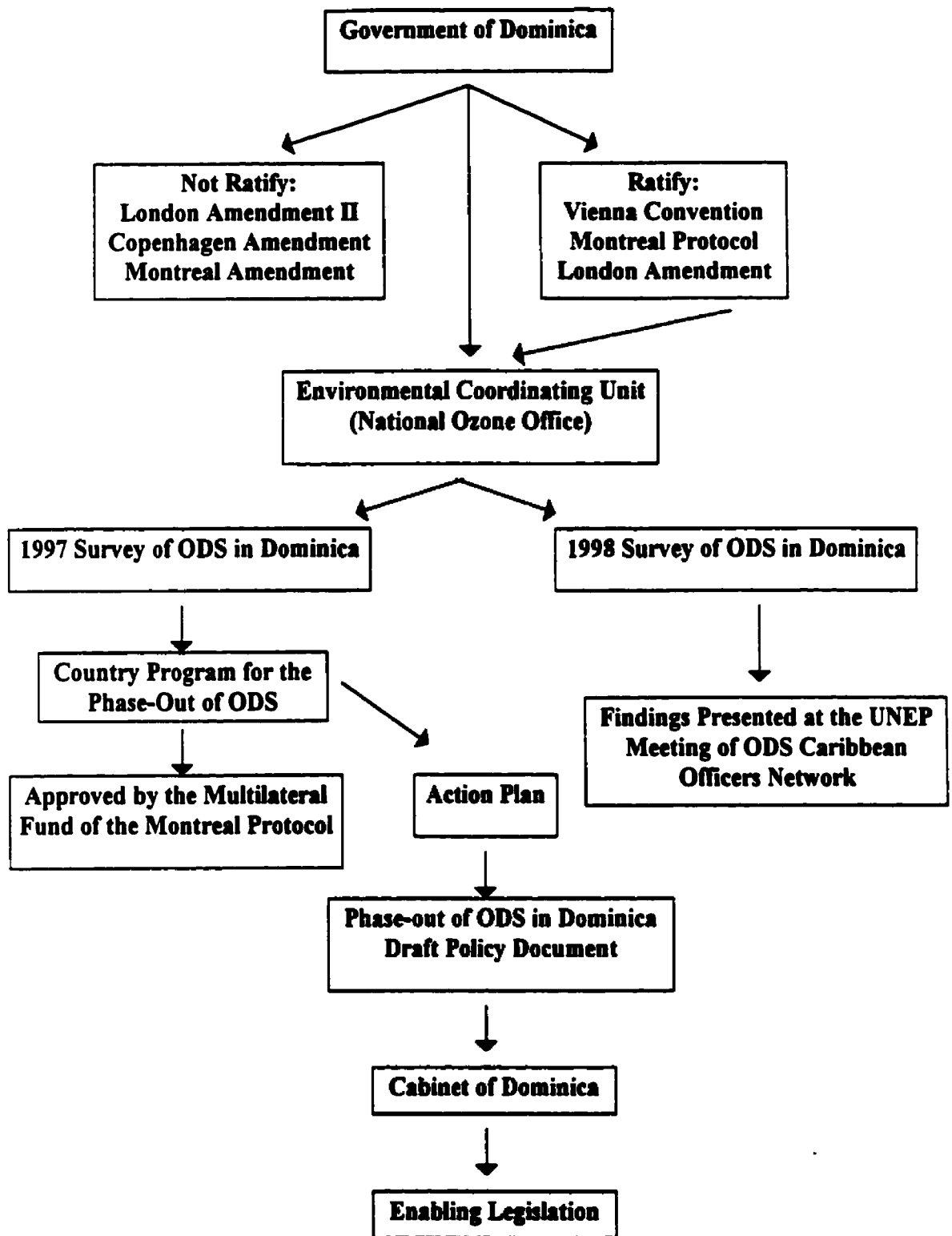


Figure 8: Ozone Depletion Project Implementation

assistance from the MF for investment and institutional strengthening projects.

At its 26th Meeting (November 1998), the Executive Committee of the Multilateral Fund, under the Montreal Protocol, approved the Country Programme for the Commonwealth of Dominica. The amount of funding for institutional strengthening is determined individually for each developing country, based upon the request made by each Article 5 Party. This is in accordance with the volume of consumption of controlled substances in the Article 5 countries, as well as the relative levels of socio-economic development and the institutional capacities for meeting their obligations under the Montreal Protocol (UNEP, 1996).

Funding is made available for a three-year period, which is subject to review and possible renewal for further two year periods. However, continued funding is contingent upon the performance in achieving the objectives established in the Country Programme, and fulfilling the obligations under the Montreal Protocol. Dominica was granted US \$65 000, from the Multilateral Fund, to commence in June 1999 and to be completed in May 2002. In addition, the Government of Dominica agreed to contribute US \$13 600, which brings the project's funding total to US \$78 600 (MoAE, 1998). Technical assistance has also been provided by the United Nations Environmental Programme, in part to assist with the First National ODS Survey and the creation of the Country Programme.

Within the Country Programme, an Action Plan has been devised with steps to be taken by the Government for an early phase-out of ODS consumption. The Action Plan hopes to ensure a *"smooth phase-out without causing undue economic hardship to the industrial, commercial and, in particular, the domestic consumers"* (GOCD, 1998).

The Government is committed to phasing out the consumption of ODS in a controlled and cost effective manner. The necessary steps, as outlined in the Action Plan, will be utilized to meet the freeze and earlier phase-out schedule (2005) than that provided by the Protocol (2010). Concern has been expressed by the Government regarding the availability of an ODS supply to meet the service requirements of existing

ODS-based equipment, in order to enable the equipment to operate up to the end of its economically viable life span. Therefore, it is expected that most equipment will have been retrofitted or replaced with ODS-free technology by 2005. The exception being some limited amounts of CFC-12 based refrigeration equipment remaining beyond the target date of 2005. In this case, recovery and recycling will be strongly encouraged to meet this requirement. Market forces such as increasing prices, non-availability of ODS and ODS-using equipment, in conjunction with easier availability of non-ODS using equipment and reduced prices of "ozone friendly" ODS alternatives will play a vital role in the shift by consumers to ODS-free technology, particularly in the commercial and industrial sector.

4.3.3 Ozone Depleting Substances Phase-Out Action Plan

In order to meet its early phase-out schedule for ozone depleting substances (ODS), the Government of Dominica has prepared an Action Plan. Covered by this Plan are all the activities deemed necessary for the early phase-out of all ODS in Dominica by 2005:

- Establish the National Ozone Office, within the Environmental Coordinating Unit, as the focal point for all activities related to the Montreal Protocol.
- Develop and implement control measures, such as (MoAE, 1998):
 - Restrict imports of ODS-using equipment;
 - Prohibit new enterprises from using ODS;
 - Certify all refrigeration technicians;
 - Train and certify all customs officials;
 - Establish Consumption or "Environmental" Tax on ODS;
 - Establish import quotas and licenses;
 - Prohibit investment in building new plants using ODS;
 - Prohibit expansion of existing industry requiring use of ODS technology;
 - Reduce import tariffs on equipment for implementation of ODS phase-out projects; and

- Reduce import tariffs on equipment using ODS-free technology.
- Establish a monitoring system for ODS imports and consumption.
- Embark upon a public awareness program.

Once created, it was then necessary to determine how best to implement each of the items identified in the Action Plan. Consequently, I, along with Mr. Martin Mullan (1999) created the "*Draft Policy Document for the Phase-Out of Ozone Depleting Substances in the Commonwealth of Dominica*". This Policy Document outlined specific measures, while also providing a methodology and timeline for implementing the Action Plan. Upon completion in December 1999, the Policy Document was forwarded from the ECU to the Permanent Secretary of the Ministry of Agriculture and the Environment, Mr. Eliud T. Williams, for his ratification and subsequent approval. The revised Policy Document will then be submitted to the Cabinet of Dominica for it to be passed into official Government policy.

While the above Policy Document was being formulated, the "*Second National Survey of Ozone Depleting Substances in Dominica*" was being conducted. The Survey was conducted by the ECU, acting as the NOO, from October 1999 until January 2000. Findings from this survey were important in determining the trend in ODS consumption for Dominica. This was necessary, as reporting national consumption rates is a condition under the Montreal Protocol. Also, all of the activities of each of the regional NOOs are regularly reported at the UNEP Meetings of ODS English-speaking Caribbean Officers Network. The last meeting was held in Kingston, Jamaica on December 14-15 1999.

4.4 Methodology of Implementation of Vienna Convention in Dominica

The Environmental Coordinating Unit has served as the National Ozone Office (NOO) since the commencement of the Ozone Depleting Substances Project in the Commonwealth of Dominica. Work began on May 4th 1998 when the first annual "*Survey of Ozone Depleting Substances in Dominica*" was conducted. By June 30th 1998, the survey was complete as 114 persons representing businesses across Dominica

had been surveyed. In conjunction with data gathered from the Customs Department, levels were established for the imports and consumption of ozone depleting substances in Dominica (Bellot, 1998).

The information gathered from the Survey was then used to create a "*Country Programme for the Phase-Out of Ozone Depleting Substances*". The Country Programme was developed to reflect the Government's commitment to its obligations as a party to the Montreal Protocol. In addition to the findings from the Survey, there are also a number of actions plans and forecasts for the phase-out of ODS in Dominica.

In compliance with the efforts being made for a phase-out of all ODS, a second national ODS Survey was conducted for import and consumption data from 1998. Data collection began on October 19th 1999 and continued until December 7th 1999, and was conducted by Mr. Kyle Fargey and Mr. Martin Mullan. A slightly different methodology was adopted for the second annual Survey as we discovered inconsistencies amongst the findings of the first National ODS Survey. Many of the same business enterprises were visited, thus allowing a comparison in consumption trends to be made. However, clearly not all premises which utilize ODS could be visited, especially considering much of the consumption occurs in private homes. Therefore, the most comprehensive and reliable data are those from the Customs Department as all ODS imports are carefully logged. However, to my great dismay I was informed that the data from 1998 cannot currently be retrieved. Since this time, the computer system at Customs has been upgraded and the new system is not compatible with the old system, and thus all of the old data cannot be accessed. Efforts are being made to bring in a foreign technician who might be able to retrieve the 1998 ODS data. Consequently, we were not able to report the findings from the second annual Survey and will not be able to do so until the Customs data is made available.

Despite not being able to complete the 1998 ODS Survey in entirety, reporting obligations still existed under the conditions of an Article 5 country of the Montreal Protocol. Therefore, I was selected by the Permanent Secretary of the Ministry of

Agriculture and the Environment, Mr. Williams, to represent the Commonwealth of Dominica at the UNEP Meeting of ODS English-speaking Caribbean Officers Network, held in Kingston, Jamaica (December 14-15, 1999). I was responsible for reporting the amount of ODS consumption in Dominica, whether there had been a reduction in consumption as well as outlining the activities being pursued to phase-out all ODS in Dominica. Many ideas, suggestions and concerns were exchanged at this meeting, and it became clear to me that the impediments encountered in Dominica exist throughout other parts of the Caribbean. For a multitude of reasons, including lack of financial, technical or human resources, many of the countries were not able to meet the full ODS reporting obligations established under the Montreal Protocol.

Mr. Mullan and I then began to work upon the creation of a *"Draft Policy for the National Phase-Out of Ozone Depleting Substances in the Commonwealth of Dominica"*. The fifteen draft policies contained within this document were based on the *"Action Plan and Projects – Government Action"* section of the Country Programme for the Phase-Out of Ozone Depleting Substances (ODS).

We developed the Draft Policy document in collaboration with Government agents and other representatives from various organizations who provided their ideas, advice and insights into relevant areas of the ODS Phase-Out Program. A Table of the contributing individuals and their respective roles can be found in Appendix III. In addition, we utilized a number of ODS specific literature sources in the preparation of this Policy Draft, as listed in the Literature Cited. Much of this material was supplied by the United Nations Environment Programme to assist Dominica with its efforts to phase-out ODS.

Feedback from all of the involved stakeholders, as well as pertinent literary sources, was collected, analyzed and processed in order for us to create the Policy Draft Document for the Phase-Out of Ozone Depleting Substances in The Commonwealth of Dominica.

Upon our completion of the Draft Policy, we submitted it to the Permanent Secretary of the Ministry of Agriculture and the Environment, Mr. Eliud T. Williams, on

December 29th 1999. Once reviewed, revisions and amendments will be made before the Policy Document is formally submitted to the Cabinet of the Commonwealth of Dominica. Once passed by Dominica's Cabinet, the policy provisions will serve as the enabling legislation necessary for the implementation of ODS phase-out programs in order to meet the mandates of the Montreal protocol.

4.5 Results of ODS Phase-out Project in Dominica

4.5.1 Phase-out of Ozone Depleting Substances Policy Document

All of the results generated from the National Ozone Depleting Substances Project sought to meet the goal of establishing national enabling legislation that would assist in the country's phase-out of ozone depleting substances. Thus, material we gathered from the ODS surveys, ODS Country Programme, interviews with business and government officials and literature searches resulted in the creation of the policy draft document for the Phase-Out of Ozone Depleting Substances (Fargey, Mullan, 1999). Appendix IV contains a list of the 15 specific policy items covered in this Draft.

This comprehensive set of action items for the phase-out of ODS, covers all aspects of reducing ODS import, usage and disposal into the atmosphere. Each of the action items is explained in much greater depth within the draft policy document. Areas of objective, methodology, implementing agencies, funding and timeline are each duly addressed.

4.6 Discussion & Analysis

Much time has passed since March 31 1993 when Dominica signed the Vienna Convention. As of July 2000, the Cabinet of Dominica has yet to review the policy document for the Phase-Out of ODS. Almost seven years after becoming a member party of the Vienna Convention and without passing any enabling legislation, in the form of a ODS Phase-Out Policy, Dominica is unable to officially introduce policy measures to reduce ODS consumption in Dominica. Such examples serve to clearly display the huge

discrepancy between signing and becoming a member party of an international multilateral environmental agreement, and actually implementing national enabling legislation that will serve to meet the mandates of the MEA.

Furthermore, Dominica's present circumstances will not allow most of the action items to be carried out once the policy document has been approved by Cabinet. Many of the Government departments identified as critical implementing agencies are severely under-staffed, lack training, deficient of resources and do not recognize ozone depletion as a serious threat to Dominica.

4.7 Conclusion

The Commonwealth of Dominica and a number of other less developed countries are signatories to the 1987 Montreal Protocol. This, however, is misleading as it is not the less developed countries of the South that are largely responsible for most of the ODS production and consumption (Worldwatch Institute, 1999). The reason behind the success and widespread international support of the Montreal Protocol lies in its unique nature. The Montreal Protocol has been deemed the strongest of the international environmental treaties by the Worldwatch Institute Report on Progress Toward a Sustainable Society (1999). The success of the treaty has been accredited to the unique provisions, which grant sovereignty to the signatories. For instance, international trade of CFCs is restricted with non-parties in order to eliminate CFC havens. Industrialized nations have helped establish a Multilateral Fund of US \$750 million to aid less developed countries in their transition. Finally, the Protocol requires consent of two-thirds of the signatories for ratification to the Protocol (Worldwatch Institute, 1999).

Unlike other MEAs, the Montreal Protocol recognizes that richer nations have caused more of the problem and need to take the lead in providing a solution (Roodman, 1999). Accordingly, industrialized nations have an accelerated ODS phase-out schedule, granted developing nations a ten year grace period, established the Multilateral Fund, funded most of the research on CFC substitutes and agreed to reimburse developing

nations for all incremental costs for complying with the Protocol (Roodman, 1999). All of these provisions provided in the Montreal Protocol are of great value in forging a North - South partnership. Despite all of the concessions by the North, they are still small relative to the future potential costs of ozone depletion in terms of skin cancer, crop losses and other damages. Of all the MEAs, the Montreal Protocol goes the furthest of achieving *"a treaty that serves each nation's interest, and at a price that each can afford"*(Roodman, 1999).

Despite the merits of the Montreal Protocol, given the present state of affairs in the Commonwealth of Dominica, social and economic considerations still often take precedence over the environment. Thus, environmental considerations must be prioritized and the scarce resources available must be allocated accordingly. With this in mind, one wonders if ozone depletion should be deemed as one of the more important environmental problems on the island.

With a population of less than 80 000, there has only been minimal amounts of usage of ODS in the air conditioning and refrigeration sectors and never been any production on the island. From a more global perspective of ozone depletion, Dominica is a very minor player. By no means is ozone depletion an insignificant global environmental problem, although Dominica was neither the cause, nor does it have the resources to be the solution. The cause and subsequent solution must therefore lie in the hands of the more industrialized nations.

As stipulated in the provisions of the Vienna Convention, as an Article 5 Country, Dominica has more lax regulations than those of the industrialized world. Consequently, if the industrialized nations are to fulfill their responsibilities and obligations under the Vienna Convention, then small island developing nations such as Dominica will require little effort to phase-out remaining ODS stocks. Once ODS is no longer produced and exported by foreign nations, then Dominica and other countries with similar circumstances will have no choice but to retrofit or replace equipment that once required ODS. Already this trend has become evident in Dominica as imports of alternative *"Ozone*

Friendly” gases, such as R 401 and 404A, are increasing while ODS imports have started to decline (Bellot, 1998).

Ozone depletion is a very serious problem, although the Commonwealth of Dominica is extremely limited in its ability to combat this global environmental problem. At a time when socio-economic hardship takes precedence, Dominica must carefully choose which environmental problems are of greatest national significance and weigh this against the internal ability to address the problem. Under this approach ozone depletion would most probably not be dedicated a tremendous amount of resources. By comparison, areas such as biological diversity conservation would be of far greater national significance. As eco-tourism flourishes in Dominica and serves as one of the few bright lights in the national economic outlook, biodiversity conservation becomes of extreme importance. The subsequent chapter will concentrate upon the third and final case study, which deals with Dominica’s efforts under the Convention on Biological Diversity (CBD).

Chapter Five

Biodiversity Conservation

5.1 Chapter Overview

Chapter 5 covers the implementation of the Convention on Biological Diversity (CBD) for the Commonwealth of Dominica. As the "Nature Island of the Caribbean", Dominica has a rich history of biodiversity conservation. The Environmental Coordinating Unit (ECU), serving as the National Implementing Unit (NIU), is responsible for the creation of a National Biodiversity Strategy, Action Plan (NBSAP) and First Report to the CBD. While assisting the ECU, I was active in gathering and formulating preliminary material for the National Biodiversity Strategy and Action Plan and First Report to the CBD, as well as serving as the national focal point for the creation of the United Nations Convention to Combat Desertification (UNCCD).

5.2 Background on Dominica's Biodiversity

The island of Dominica (Figure 2), with an area of 751 square km is the largest, and most northerly of the Windward Islands in the Eastern Caribbean (Figure 1). Its humid tropical marine climate is amongst the wettest in the Caribbean, with precipitation ranges from 4 000 mm to 10 000 mm per annum in the interior. Consequently, lush tropical vegetation and abundant freshwater resources, with over 350 rivers, are found throughout all parts of the island. Dominica is characterized by very rugged and steep terrain with high volcanic peaks rising in the south to 1424 m (Morne Trios Pitons), and in the north to 1730 m (Morne Diablotin). Such mountainous topography has an important orographic influence on climate, land use and the general physical development of the island. Flatter areas are restricted primarily to river valleys, the coastal areas of the Northeast, and an area in the centre of the island known as Belles Wet Area (CCA, 1991).

The terrain and climate has been largely responsible for creating a wide diversity of vegetation types that vary with the elevation and exposure to strong and steady trade winds, that blow in a westward direction between the Atlantic-Azores Subtropical High Pressure and the Inter-Tropical Convergence Zone. These winds contact the island from the north-east, throughout most of the year, but a south-easterly pattern develops during the summer. As a result, there are nine predominant vegetation types on the island:

Table 5: Types of Vegetation in Dominica

Vegetation Type	Dominant / Characteristic Species	Location in Dominica
<i>Swamps forest</i>	<i>Pterocarpus officinalis</i> and various mangrove genera	North-west areas
<i>Littoral woodland</i>	<i>Coccoloba uvifera</i> , <i>Erithalis fruticosa</i> and <i>Chrysobalamus icaco</i>	Windward coast
<i>Dry scrubland</i>	Endemic <i>Sabinea carinalis</i> (national flower)	Slightly higher ground on the Leeward coast
<i>Deciduous forest</i>	<i>Coccoloba venosa</i> and <i>Ryhticocus</i> as well as <i>Sloanea</i> , <i>Talauma</i> , <i>Ormosia</i> and <i>Drussia</i>	High rainfall interior and large areas of rain forest (highlands below 330m)
<i>Montane rainforest</i>	<i>Podocarpus coriaceus</i>	South end of island
<i>Elfin woodland</i>	<i>Prestolea montana</i> , and <i>Geonoma dussiana</i> .	Elevations higher than 1000m
<i>Fumarole vegetation</i>	<i>Tibouchina omata</i> and <i>Pitcairnia micotrinensis</i> (endemic species)	Geothermal areas (ex. Valley of Desolation)
<i>Secondary rainforest</i>	<i>Miconia mirabilis</i> and <i>Cecropia schreberiana</i>	Areas where mature rainforest was disturbed
<i>Mature rainforest</i>	<i>Dacryodes excelsa</i> and <i>Amanoa caribaea</i>	Towards interior and not below 330m

Source: (CCA, 1991)

The variety of vegetation types supports an extraordinarily high species biodiversity, relative to other islands in the Caribbean (James, 1996), for an island encompassing such a small area (751 km squared). Much of the island, 60-75%, is still covered with undisturbed forest, representing the most extensive areas of remaining forest in the Lesser Antilles (ICBP, 1990; Evans, 1989). Over 1600 flowering plant species have been recorded on the island, with an average of 60 woody plants and tree species per hectare.

Dominica is home to the most diverse assemblage of wildlife remaining in the islands of the Eastern Caribbean. Numerous biological surveys have been conducted upon the wildlife of the island, beginning in the 1960s with Chace and Hobbs (1969) and Jones and Schwartz (1967). More recently work has been performed by Evans (1986, 1988, 1989), Faaborg and Arendt (1985), and Swank and Julien (1975). The term "wildlife" will be used to include vertebrates, as well as terrestrial and aquatic decapods and crustaceans. There are 166 bird species, including 50 resident species and two endemic parrots, the Red-Necked (Jacquot), *Amazona arauica*, and Imperial (Sisserou - national bird represented on the flag), *Amazona imperialis*. Other species of limited distribution, include the endangered black-capped petrel (*Pterodroma hasitata*), the blue-headed hummingbird (*Cyanophaea bicolor*), the plumbious warbler (*Dendrocia plumbea*), the scaly-breasted thrasher (*Margarops fuscus*), the trembler (*Cinlocerthia ruficauda*) and the forest thrush (*Cichlherminia herminieri*). Twenty species of freshwater and land crabs, twelve native species of terrestrial mammals and four species of marine turtles also have been identified on the island (James, 1999).

In addition to this rich terrestrial biodiversity, Dominica also has outstanding marine biodiversity. Much of the marine biodiversity is associated with the extensive coral reef system that extends along much of the West Coast of the island. Consequently, Dominica has been placed amongst the top five scuba diving destinations in the world. Popular attractions include pods of humpback, sperm and pilot whales as well as striped and bottle-nosed dolphins. Migrating sea turtles can also be found laying



Plate 9: Roa constrictor hit by car, as biodiversity is threatened by development



This bird is the Sisserou (*Amazona imperialis*) Parrot. It is the national symbol for Dominica and adorns the country's coat of arms and flag. It may be the oldest species of amazon parrot in the world and is indigenous only to Dominica. After thousands of years on this island, the Sisserou finds itself on the brink of extinction, due to the ever-increasing human population, deforestation and poaching of this beautiful bird.

In 1976 the Commonwealth of Dominica passed the Forestry and Wildlife Act to give maximum protection to the Sisserou, making it illegal to hunt or own. Conservation efforts, including a breed and release program, are underway. While visiting Dominica you may see the birds in the Botanical Gardens in the capital city of Roseau (Banc Caribe, 2000).

Plate 10: Sisserou parrot, endemic to Dominica, their endangered national bird

eggs on the beaches during the appropriate season. Members of the Fisheries Department closely monitor populations of each of these species (Magloire pers. comm., 2000).

The rich and diverse natural resource base and largely unspoiled landscape has led Dominica to becoming known as the “*Nature Island of the Caribbean*”. However, terrestrial and marine biodiversity is coming under increasing pressures from the island’s economic development, based primarily on agriculture (bananas) and agro-processing. Recently, expansions in the manufacturing and especially the tourism sector have further threatened biodiversity conservation. Additionally, practices for sewage, solid waste and industrial wastewater disposal for the 71 183 population present potentially serious pollution problems, which jeopardize the health of the marine and fresh water resources. The increased activities in the tourism sector pose problems related to over-visitation, exerting stress on many of the island’s natural resources sites including the Boiling Lake, numerous popular waterfalls and forest hiking trails (NDC, 1997).

5.3 Biodiversity Conservation in the Caribbean

Biodiversity conservation in the Caribbean islands is an especially imperative case given the small area of some local habitats, the high incidence of endemism and the high regional vulnerability to natural and human-induced disasters. In addition, the region’s flora and fauna are economically, ecologically and socially important as they constitute one of the primary resources for development (Djoghlaif, 1999). To address this issue the United Nations Environment Program (UNEP), in conjunction with the Global Environmental Facility (GEF), created a project to help provide solutions: “*Conserving Biodiversity and Preventing Land Degradation in Small Island Ecosystems in the Caribbean*”. Amongst the countries for this Project to be initiated are: Antigua and Barbuda, Barbados, Dominica, Grenada, Jamaica, St. Kitts and Nevis, St. Lucia and St. Vincent and the Grenadines (UNEP / GEF, 1999).

The particular environmental conditions found in the Caribbean support the islands' flora and fauna, which are in a delicate equilibrium with their natural habitats. Habitat destruction has been identified as one of the major causes of biodiversity loss. On a regional level, 76% of all species that are endangered are being threatened by habitat loss or habitat alteration. Habitat destruction throughout the Caribbean islands is the result of a combination of factors including (Mullan pers. comm., 1999):

- Deforestation;
- Unsustainable farming practices;
- Overgrazing; and
- Unsustainable land use patterns (e.g. growth and expansion of the tourism industry).

Annual deforestation rates in almost all of the Caribbean vary between 0.8% and 7.2% (FAO, 1997). Dominica has been very proactive in protecting its forests and has one of the lowest deforestation rates in the Caribbean (CCA, 1991). Over the years, land degradation has extended into marginal areas, as land has been severely over-used. With an extremely limited amount of arable land (only 7% of the island's area), farmers have been clearing marginal land, often on steep slopes, to plant more crops. This has led to increased pressure upon forests and other natural resource areas (Djoghlaif, 1999).

According to the Global Environmental Outlook (1998), the biological resources of the Caribbean and their related ecosystems are under great pressure. Although this situation is not unique to the Caribbean, and is similar to other regions throughout the world, there are a number of additional factors that increase the sensitivity and vulnerability to the ecosystems of the Caribbean, namely (FAO, 1998):

- Steep slopes and rapid changes in topography create small, scattered ecosystems.
- Relatively small size of the ecosystems. (For example, the Windward Island dry forests represent an extremely small eco-region estimated at 431 sq. km., and especially, when this area is actually divided among six or eight islands.)
- The concentration of population and activities over small areas (relative to spatial orientations on continental landmasses) intensifies stress conditions.

- There is a high frequency and variety of natural disasters.
- Close association of terrestrial, coastal and marine systems results in collective impacts among these systems. (For example, clearing upland areas for farming will create sedimentation in the rivers and then results in reef degradation upon reaching the coast).

Current land use practices are resulting in the loss of habitat and biodiversity. Amongst the most serious activities influencing land use patterns, which result in habitat loss, is the inadequate appreciation of the value of biological resources and the ecological services (i.e. watershed protection, medicines, etc.) provided by habitats. There is also a lack of land use planning. For example, in Dominica, there are no land-use zoning regulations. Also, the capacity by the stakeholders to effectively integrate biodiversity conservation into development activities is limited. Finally, very few alternative livelihoods exist, in addition to there being inadequate enforcement of existing planning guidelines (Djoghlaif, 1999).

One of the major impacts of current land use practices is increasing land degradation. Consequently, there are increases in soil erosion and sedimentation, particularly during periods of heavy rainfall (rainy season). These impacts are also manifested in the coastal and marine habitats; especially susceptible are coastal wetlands, seagrass beds and coral reefs. Consequently, the main problem affecting sea grass beds in the Caribbean is increased rates of sedimentation. These same seagrass beds are responsible for stabilizing bottom sediments that could otherwise damage coral reefs, contributing to the retardation of coastal erosion and providing grazing for sea turtles, manatees, fish and invertebrates (Djoghlaif, 1999).

The impact of land degradation and the subsequent threat to the regions biodiversity resources (terrestrial, coastal and marine) must no longer be underestimated. Integrated resource management is imperative to prevent habitat destruction and land degradation in island ecosystems. Due to limited land resources and the ecosystem complexity, the effects of actions become readily apparent. A chain reaction occurs

where the degree of environmental degradation becomes successively worse with each passing stage. Intensified farming in the uplands creates watershed destruction and loss of soil fertility that results in higher levels of soil erosion. A loss of floral and faunal habitat occurs, leading to sedimentation of water bodies and attendant decline of fresh water and marine habitats. This destructive process of land degradation profoundly affects the biodiversity of Caribbean nations (Djoghla, 1999).

For small island developing states (SIDS) with a primary dependence on agriculture and tourism, the decline of productive lands, natural vegetative zones and coastal habitats has detrimental biological, economic and social impacts. Governments in such areas must devise new methods of environmental management aimed at reducing land degradation through the conservation and preservation of biodiversity. Visible and tangible benefits will first need to be achieved before such methods are fully adopted and implemented throughout the Caribbean region (Djoghla, 1999).

5.4 Biodiversity Conservation in Dominica

5.4.1 Background

Initial steps to deal with the preservation and management of biodiversity resources in Dominica began as early as the 1950s, when the first Forest Ordinance was enacted. The Forest Ordinance authorized the establishment of forest reserves on Crown Lands and protected forests on private land for purposes of soil and water conservation. Since this time, a series of acts have been enacted to regulate the use of different resources. These include (UNDP / GEF, 1999):

- Forest Reserve Rules;
- Forestry and Wildlife Act;
- National Parks and Protected Areas Acts (over 20% of the island's area is under federal protection);
- Fisheries Act;
- Beach Control Act;

- Water and Sewage Act; and
- Pesticide Control Act.

While addressing some aspects of biodiversity, these laws are fragmented, largely out of date and contain large gaps. Revisions and strengthening are greatly needed, especially in light of the tremendous pressures currently being placed upon biological diversity. Furthermore, the lack of sufficient financial resources, and in some cases lack of political will, have made the enforcement of existing legislation very tenuous. Also, pressures exerted on protected areas have risen dramatically as a result of over-depletion of the resources in surrounding areas. Moreover, efforts have focused on protection through restricted-use (mainly research, education and public awareness), rather than employing biodiversity management and sustainable-use as part of national development agenda (UNDP / GEF, 1999).

5.5 Convention on Biological Diversity

5.5.1 National Biodiversity Strategy, Action Plan and First Report to the CBD

The Convention on Biological Diversity (CBD), created in 1992, is a global multilateral environmental agreement that was ratified by the Commonwealth of Dominica on April 6th 1994 (UNEP, 1999). The general objective of the CBD is to: *“conserve biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and technologies, and by appropriate funding”* (CBD Secretariat, 1999). The Government of Dominica, as with many other parts of the world, recognizes the conservation of biological diversity as an important national objective.

This project will therefore develop approaches, strategies and mechanisms for the protection of Dominica’s biodiversity. Utilizing sustainable land use management will assist to prevent the loss of unique and critical biodiversity resources. The most effective

mechanism for conserving biological diversity is to prevent the degradation of habitats (UNEP / GEF, 1999).

Government of Dominica (GOCD) and non-governmental organizations (NGOs), recognize the need to prevent further deterioration in the island's rich biodiversity, through the development of a National Biodiversity Strategy and Action Plan (NBSAP). The NBSAP is intended to put the country on a course towards the sustainable development of its biodiversity resource. There is an understanding that this can only be achieved through an innovative, decentralised and participatory approach in which communities neighbouring protected areas, and conservation area committees, take part in biodiversity management decision-making, and in the economic benefits that are subsequently generated (Hill pers. comm., 1999).

While Government's commitment to this innovative approach to biodiversity management is strong, the country still lacks sufficient information and evaluations of the present state of biodiversity related issues (James, 1999). This is necessary for the incorporation of specific local strategies into national biodiversity and sustainable development strategies. Practical mechanisms for the decentralised and participatory decision-making processes need to be strengthened by providing access to information and data-banks that cover national biodiversity information. The systematic incorporation of a broad range of opinions from local stakeholders into the strategy formulation process would also be necessary (Williams pers. comm., 2000).

In addition to the NBSAP, there are other environmental projects, which will assist Dominica in its effort to protect and conserve its valuable biodiversity resource. Most notably, the United Nations Convention to Combat Desertification (UNCCD) is founded on the premise that all forms of land degradation will result in decreased land productivity, and subsequent losses in biodiversity. Many of the strategies to be outlined within the National Action Plan to combat land degradation will have far reaching and beneficial effects upon the island's remaining biodiversity. In addition, the Caribbean: Planning for Adaptations to Global Climate Change (CPACC) project will also be of use in identifying

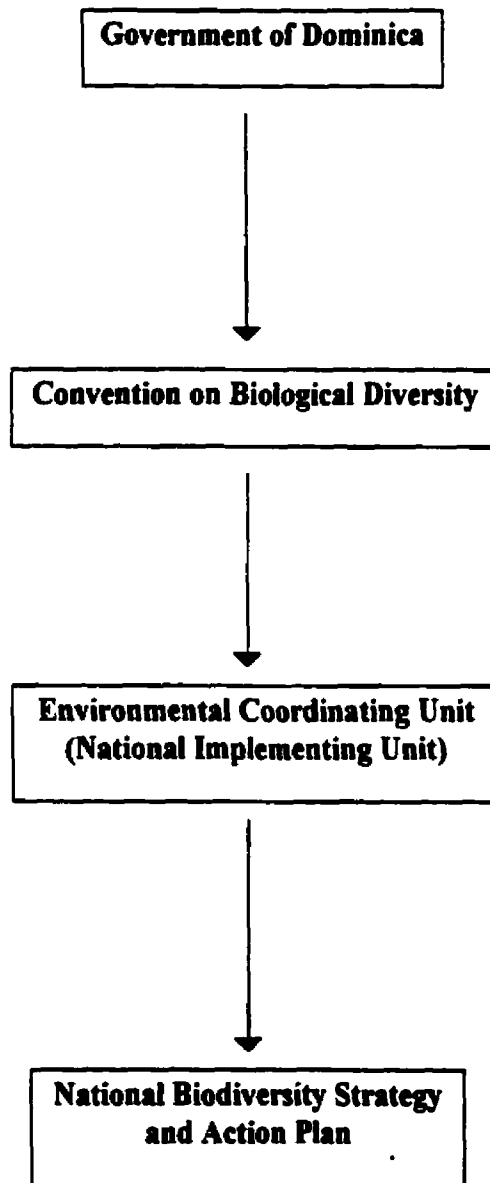


Figure 6: Biodiversity Conservation Project Implementation

rare, threatened or endangered biologically diverse species which may be at risk to the wide array of effects from global climate change.

5.6 Methodology of Implementation of CBD in Dominica

The Commonwealth of Dominica has a long and proud history of conserving the island's vast array of biological diversity resources. Initial steps to deal with the preservation and management of biodiversity resources in Dominica began as early as the 1950s, when the first Forest Ordinance was enacted. Since this time, much progress has been made as acts have been passed to protect the island's wildlife, forests, coasts and beaches, water and general environmental health (GOCD, 1998).

Despite all the efforts being made, serious environmental degradation has occurred throughout much of the island. In order to reverse this destructive trend, Dominica has adopted a new approach to environmental management matters. No longer is emphasis being placed upon protection through restricted use measures, but rather the concepts of biodiversity management and sustainable use have taken the environmental forefront. The Government of Dominica (GOCD) and non-governmental organizations (NGOs), recognize the need to prevent further deterioration in the island's rich biodiversity, through the development of a National Biodiversity Strategy and Action Plan (NBSAP). The NBSAP is intended to put the country on a course towards the sustainable development of its biodiversity resource (Hill pers. comm., 1999).

The NBSAP project document was created for the Commonwealth of Dominica on November 21st 1997 by a representative from the United Nations Development Programme (UNDP) with funding provided by the Global Environmental Facility (GEF). The Project Document was signed by the Chairman of the Sustainable Development Council, Mr. Sheridan G. Gregoire, and the Minister for Agriculture and the Environment, Honourable Peter Carbon, on April 20th 1998. The estimated starting date for the NBSAP was May 1998.

A general methodology has been provided by UNEP to guide the host countries in

implementing the NBSAP (UNDP, 1997):

- Formation of Project Team;
- Definition of Methodology and Planning Instruction;
- Public Awareness Campaign;
- Stocktaking and Assessment;
- Identification of Options;
- Prepare First Draft of NBSAP;
- National Meeting to review Draft;
- Prepare final version of NBSAP; and
- Prepare First National Report to the Biodiversity Convention of Parties.

A detailed schedule, or Standard Activity Matrix, was also provided by the UNDP in order to carefully structure the NBSAP Project for each host country. A copy of this UNDP Matrix can be found in Appendix V.

Work has yet to formally begin on the NBSAP Project in Dominica. However, some baseline data does exist for the biological diversity resource in Dominica. My work on this project involved determining where areas of biodiversity data existed, as well as data deficiencies. I found the Forestry Division, and in particular Mr. Arlington James and Mr. Michel Zamore, has been very active in this area, and will serve as an excellent source of information (James, 1999; Zamore, 1999). In addition, the CPACC Inventory Data of Coastal Resources and Use (Component Three) will prove to be of use. Gaps do exist, however, as there has never been a formal review of the island's biological diversity (James, 1999).

I was also responsible for creating and submitting a project proposal to the UNEP for the United Nations Convention to Combat Desertification (UNCCD). The UNCCD deals more broadly than simply with issues of desertification, and includes all areas of land degradation. I was, thus, responsible for gathering all information pertaining to land degradation practices in Dominica. I conducted extensive literature reviews, met with local experts and presented at a national conference on land degradation in order to gather

as much information as possible. Once the project proposal is approved by the UNEP, much overlap will occur between the UNCCD project and the NBSAP project. This is due to land degradation being one of the primary causes of biodiversity loss in Dominica (James, 1999).

In order to get the Biodiversity Conservation Project started, the Government of Dominica is searching for a NBSAP Project Coordinator (Williams pers. comm., 2000). In addition, plans are being made to host a regional biodiversity conference and discuss the interest and feasibility of establishing a regional biodiversity centre in Dominica (GOCD, 1999).

5.7 Discussion & Analysis

As the "*Nature Island of the Caribbean*", Dominica has very much at stake when it comes to conservation of the island's precious biodiversity resource. This vast, relative to the island's limited area, biological diversity collection is by far the nation's most valuable natural resource, and yet it is currently being threatened by a multitude of development pressures. Ultimately, for Dominica to succeed socially, economically and environmentally, all sustainable development efforts must revolve around the core principle of conserving the island's natural biological diversity resource.

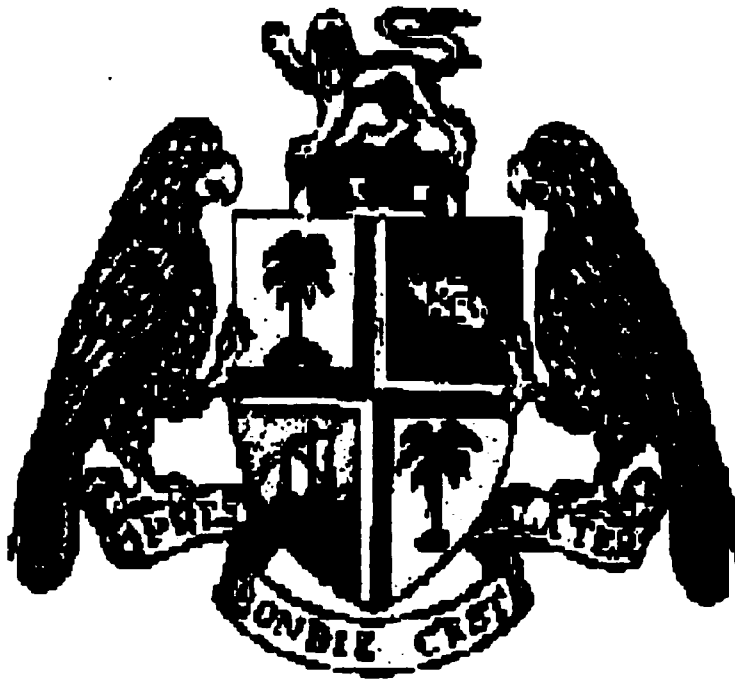
Contrary to the two previous environmental management case studies, those relating to climate change and ozone depletion, biodiversity conservation is a fundamentally different issue. Both climate change and ozone depletion are very complex and technical concepts that do not very easily lend to general understanding, acceptance and participation. Their repercussions are not clearly evident, measurable or nor directly attributable. Such complex global environmental issues are difficult to assess in terms of cause-effect relationships, determination of responsibility, matters of time frame and forecasting. Consequently, many residents of Dominica, and others nations of similar circumstance, do not acknowledge these problems or the respective role that Dominica may play in the global response. Climate change and ozone depletion are

widely perceived as ramifications of industrialization in more developed nations, and thus responsibility lies with these same global environmental offenders.

In contrast, the issue of biodiversity conservation is a much more localized, directly attributable, easily understood and widely accepted environmental management problem. Unlike other global environmental problems, biodiversity depletion can not be externalized and deemed a problem originating in and, accordingly, best addressed by more developed nations. Loss of biodiversity is very much a grass roots problems that can be as easily detected as a gradual reduction in fish harvests in response to mounting demands and fishing pressure or the extirpation of an indigenous species from the island.

Given the present state of affairs and efforts towards sustainable development, Dominica's environmental management resources are best utilized and made most effective if concentrated upon the theme of biodiversity conservation. Loss of biodiversity is an irreversible process and the repercussions are so great, far reaching and complicated that it is not humanly possible to predict or forecast. Both climate change and ozone depletion can conceivably be reversed and the damage repaired. Greenhouse gases and ozone depleting substances emissions can be reduced, and reverse the trend of accumulating these harmful substances in the atmosphere. Tragically, once a species has been made extinct on this earth, there is no way of bringing it back.

Of particular local relevance is the case of the endangered Sisserou (*Amazonia imperialis*), which is an endemic parrot species found in Dominica. The Sisserou is the source of much national pride as it is the national bird and also occurs prominently on the state flag (Figure 10) and national coat of arms (Figures 11). However, with continued habitat loss and hunting pressure, the dwindling numbers of this magnificent species are becoming dangerously low. With the potentially imminent loss of the Sisserou, the national flag for the Commonwealth of Dominica will serve as an eternal reminder of the grave consequences of biodiversity loss. The disheartening irony may be that only from the flag will the once proud Sisserou be able to majestically reign over its former



The Coat of Arms of the Commonwealth of Dominica is divided into four sections. Displayed are a coconut tree (top left), a crapaud or mountain chicken (top right), a Carib canoe with sail (bottom left) and a banana tree (bottom right). On either side of the shield is a Sisserou, Dominica's national bird. The motto beneath states: "Apres Bondie C'est La Ter", which means After God it is the Earth. The importance of the natural environment is clearly depicted by Dominica's Coat of Arms (Delphis, 2000).

Figure 10: Commonwealth of Dominica's Coat of Arms

Source: (GOCD 1999)

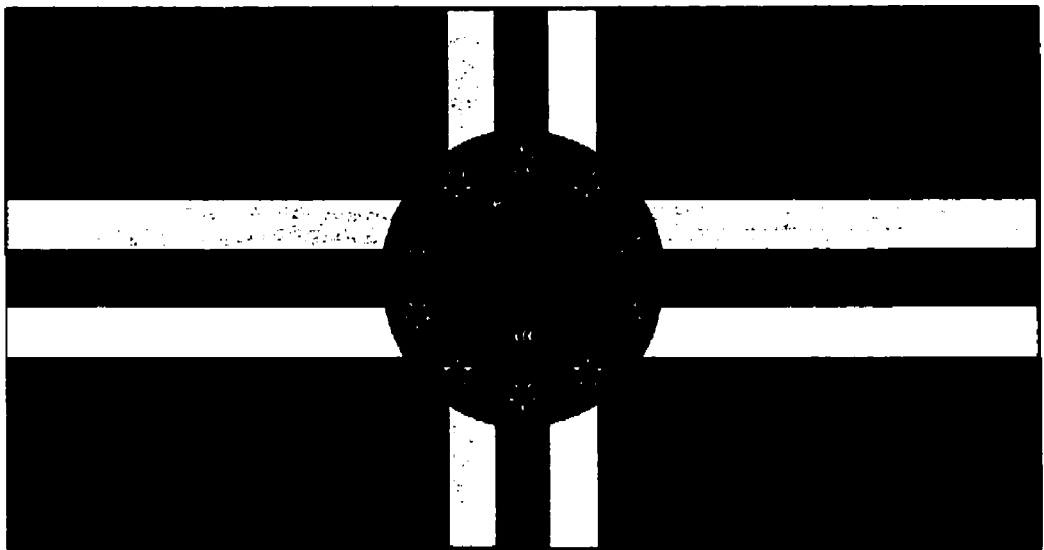


Figure 11: National flag of the Commonwealth of Dominica

Source: (Delphis 2000)

"Nature Island of the Caribbean" kingdom.

Accordingly, reduction of biological diversity should be recognized as the greatest global environmental problem facing the small island developing nation of Dominica, and the rest of the planet. The respective state of biodiversity, both nationally and globally, is a clear reflection of the ecosystem's relative health. With the loss of biodiversity, the general ecosystem integrity has been jeopardized and lost. Environmental problems such as climate change, ozone depletion and waste disposal are each reflected in the general health of the ecosystem, which can be measured by the state of the biodiversity resource. Thus, biodiversity conservation serves as an all encompassing term, which by extension includes all areas of environmental management that assist in maintaining ecosystem integrity.

5.8 Conclusion

Despite being in its preliminary stages, Dominica's biodiversity conservation project will be an integral component in the island's quest towards sustainable development. If the island is to develop sustainably and retain its illustrious claim as the *"Nature Island of the Caribbean"*, biodiversity conservation will have to be put at the forefront of the national agenda. The success of the biodiversity project, as well as that of the climate change, ozone depleting substances and all other environmental management projects will be contingent upon refining and improving the current process of MEA implementation.

The next and final chapter, Chapter Six, examines the implementation of multilateral environmental agreements in the Caribbean. The Chapter concludes by providing a number of specific recommendations for improving the method of implementation and overall success of multilateral environmental agreements.

Chapter Six

Summary, Recommendations and Conclusions

6.1 Summary of MEAs and Sustainable Development in Dominica

Great opportunity and potential exist for Dominica, and other small island developing states, to further their sustainable development strategies in conjunction with the implementation of national projects resulting from becoming party to multilateral environmental agreements (MEAs). Much potential funding support exists for the environmental areas covered within the mandates of the MEAs. Dominica has become a party to a number of such conventions, including areas of biodiversity, biosafety, climate change, land degradation (desertification) and depletion of the ozone layer. The scope of these projects serves to address virtually all of the most pressing environmental problems throughout the island. Within the national project frameworks for each of these MEAs, latitude is allowed for each implementing country to cater the project to their national environmental objectives. Thus, support for each of these projects has the potential to cover the plethora of environmental concerns in Dominica.

Dominica, however, lacks a national sustainable development strategy. Therefore, it is not possible to integrate the implementation of MEAs within this framework. Consequently, there is a lack of coordination in these areas. Many of the benefits and advantages presented by the support provided for implementing national MEA projects are not fully realized. Such critical areas as environmental education, institutional strengthening, increased legislative capacity and environmental policy development are often ignored.

Numerous impediments exist for the effective and efficient implementation of MEAs in Dominica. The principal obstacle is the lack of clear and concise guidelines for the implementation of MEAs. A standard procedure must be developed and adopted

that will allow optimal results and benefits to be garnered from all MEAs to which the Commonwealth of Dominica is a signatory.

6.2 Recommendations for MEA Implementation

6.2.1 Introduction

The most effective MEA implementing strategies are those supported by legal, administrative, institutional, technical and funding arrangements that directly address the carrying out of the obligations under the various conventions (Anderson, 1999). Such provisions serve as a catalyst for ongoing environmental management objectives, allow for internal capacity building and respond to the requirement of facilitating the long-term sustainability of environmental management activity.

There are no formal guidelines regulating the implementation of MEAs in any of the Commonwealth Caribbean countries. However, various procedures have evolved over time and some approaches have been discovered to be more successful than others. A critical review of these Guidelines for MEA Implementation have been devised from the experiences of Caribbean countries by Anderson (1999), a law professor at the University of West Indies (Appendix II). A careful examination should be made of this document in order to determine the best set of guidelines to adopt.

Once a set of guidelines for MEA implementation has been established, efforts will be required to strengthen the institutional capacity of Dominica's lead environmental agency, the Environmental Coordinating Unit. The guideline will be of little use if the ECU does not have the authority, resources and mandate to carry out its objectives.

6.2.2 Improved MEA Implementation in Dominica

There are several core issues that continually recurred during my work in Dominica that I deem to be detrimental to the process of MEA implementation. A number of these matters will first have to be addressed before Dominica is able to make substantial improvements in the field of MEA implementation. I will focus my recommendations upon the Environmental Coordinating Unit, as it is the lead

environmental agency, and is given the mandate of creating national programs to fulfill the mandates of international environmental treaties. My primary recommendations are as follows:

- Increased autonomy for the Environmental Coordinating Unit.
- Greater coordination and cooperation both internally and externally.
- Better allocation of resources to reflect the state of environmental concerns.
- Better understanding of the commitments, opportunities and impacts of each MEA.

Each of these recommendations could serve to substantially enhance Dominica's efforts to implement MEAs for a more sustainable future.

In order for the ECU to meet the mandate that it was established to fill, the Unit will have to be afforded greater autonomy. Although only established in 1998, the ECU is extremely limited in its capacities as it has very little functional independence. Since it has not been granted the status of a Government Division, such as the Forestry, Fisheries and Agricultural Divisions, the ECU exists simply as a Unit under the Ministry of Agriculture and the Environment. As such, the ECU has very little control over internal operations. Such common daily activities as sending out letters, buying more supplies (even pens), hiring staff or planning events cannot be performed without written consent from the Permanent Secretary of the Ministry of Agriculture and the Environment, Mr. Eliud T. Williams.

Needless to say, this highly bureaucratic system can become immensely frustrating and infuriating. Obviously, Mr. Williams is a very busy man who is also often out of the country. Thus, many of our activities at the ECU would be put on hold as we awaited approval from the Permanent Secretary. Frequently we would be unable to perform our work as we had not yet been granted approval, provided funding or supplied with the necessary resources.

By designating the ECU as a Government Division, it would be much better able to perform its duties. The funding allocated under the various MEA conventions to assist developing countries with implementation should be set aside in a special ECU

account. In addition, daily operating decisions should be made internally without requiring approval from the Ministry. Clearly, decisions that have a bearing upon other areas of Government should be consulted upon by the Permanent Secretary. Finally, as a Government Division the ECU would be provided with greater recognition and allowed to function on an equal basis with all other Government Divisions. With a Unit status, the ECU is often not very highly regarded, provided a very low profile and is generally not well respected. The Government must show its support for the ECU by providing the necessary autonomy to enable it to function more efficiently and effectively.

Increased autonomy and institutional strengthening has great potential for the ECU. With autonomy, comes greater independence and responsibility. In many respects, this notion could be extended to make the ECU a strong, independent, national lead environmental agency. St. Kitts and Nevis could serve as an excellent role model to emulate as their lead environmental agency has been given the statutory powers to participate in the negotiation and conclusion of environmental treaties (Anderson, 1999). Efforts to lessen the gap, between political and technical focal points for MEAs, are of tremendous importance to the creation of national enabling legislation that allows the mandates of the MEA to be met.

With greater autonomy, the ECU will be able to foster enhanced cooperation and coordination both internally, within Government, and externally with other nations. As a coordinating body, much of the Unit's work involves meeting, conferring, discussing and consulting numerous bodies throughout the Dominican Government. However, no procedure is in place, which supports the ECU in its effort to work in conjunction with a number of different agencies. A program must be developed that includes working groups, regular meetings, increased communication and joint efforts. The key to the success of the ECU lies in its ability to work as a coordinating mechanism for all areas of Government.

This need for greater cooperation extends externally as well, beyond the confines of the island and the Dominican Government. Each of the islands in the Caribbean has an

environmental management organization, in one form or another that is responsible for implementing MEAs. Due to the obvious similarities in geography, circumstance and obligations under these treaties, there is much opportunity for coordinating efforts. The current practice is to work independently of one another, although there is a tremendous amount of work overlap amongst the islands. By sharing information, foreign consultants, technical resources and ideas, the islands of the Caribbean could be much more efficient and effective in their MEA implementation efforts. A proposal of this sort has been suggested by the CARICOM Secretariat (1999), a regional organization representing 12 islands in the Caribbean Community. Work is being performed to determine the logistics of how such an arrangement might ultimately work.

Once the ECU has gained more autonomy and is cooperating both internally and externally, the focus must then shift to the determination of priority environmental management issues. By performing an exhaustive examination of environmental problems, concerns, issues and trends, the Government of Dominica will be better able to dedicate their scarce resources into areas of greatest national importance.

While assisting the ECU with its work mandates, it was certainly my impression and that of other ECU staff (Hill pers. comm., 1999; Mullan pers. comm., 1999) that a great deal of valuable time, effort and resources were being misdirected. Clearly Dominica has obligations under each of the treaties that it has signed, yet by prioritizing these environmental issues then resources can be allocated to reflect their relative ranking of importance to the Commonwealth of Dominica. For instance, biodiversity conservation has much greater significance to the *"Nature Island of the Caribbean"*, than ozone depletion to a country that consumes very little ozone depleting substances.

Preliminary work has already been conducted in this area as the Caribbean Conservation Association (1991) compiled Environmental Profiles for all of the islands throughout the Caribbean, including Dominica. Although no such profile has been conducted since 1991, a general framework has been established. Additional information could be gathered internally from a number of the ECU's files as well as consulting with

the numerous agencies throughout the island that area concerned with the state of the environment. The Dominica Conservation Association, Forestry Division, Fisheries Division, Environmental Health Division, Agriculture Division and National Development Council would all serve as excellent sources of information.

Once the ECU has determined the areas of greatest environmental concern for Dominica, it will then be necessary to closely examine all of the MEAs to which it is a party. It was clear through my experiences with the ECU that a better understanding of the commitments, opportunities and impacts of each MEA is necessary. Upon our arrival at the ECU, much of our work dealt with searching through the files to determine the relative priority of obligations under each of the MEAs. Thus, much of our work entailed attempting to meet commitments whose deadlines had already passed or were in the immediate future. In light of this haphazard approach, the limited resources available and the frequent bureaucratic delays, meeting commitments was always a difficult task. To assist with this task, Mr. Mullan and I created the ECU Work Program 2000-2001, which outlines all of the ongoing projects, implementing agencies, objectives and timelines.

Due to all the obstacles and restrictions regarding our work, little chance was allowed to further examine the MEAs in greater detail to determine all of the opportunities contained within. Funding provisions, technical supplies, consultant services and other opportunities were frequently overlooked and never realized. Coordination amongst the islands would be of immense service in this regard as each island would not then have to dedicate all of the resources necessary to carefully examining these often lengthy and complicated MEA documents.

Once the MEA documents are better understood and all of the opportunities being afforded are realized, then Dominica will have a more defined idea of the full impact of such an agreement. The potential for significant positive impacts are definitely contained within each of the MEAs, yet they are not being realized under the current system of struggling to meet the minimum reporting obligations to each MEA secretariat.

6.3 Discussion & Analysis

Upon entering the New Millennium, Dominica is poised at an extremely critical juncture of its development. Since attaining its Independence in 1978, development has not occurred in a particularly structured manner, and planning has typically not extended beyond the five-year term of government office. The creation of a National Sustainable Development Plan, with a core component being a standard procedure for MEA implementation, has the potential to lead Dominica sustainably into the future.

A tremendous opportunity presents itself for Dominica to set an international precedent in environmental management and sustainable development. Very few places in the world have been able to retain a natural environment as pristine as that found in Dominica. Only in the Dominica is much of the water found in the 365 rivers clean enough to drink, the air quality amongst the finest in the world, largest remaining tropical rain forest in the Caribbean, a wide variety of biodiversity, numerous magnificent waterfalls framed by a tropical jungle setting and some of the top dive sites in the world. For all of those that have had the pleasure of visiting Dominica, all could attest that it is most deserving of its illustrious claim of being the "*Nature Island of the Caribbean*". All of the above attributes have come naturally to Dominica, and historically little has threatened this island's environmental integrity. However, with the passing of time and increasing developmental pressures, Dominica must now take a stand to protect all that it has taken for granted for so long. Conservation measures must now be enacted to counter the advent of mounting pressures placed upon the environment. It is at this important juncture that Dominica must decide upon a path that will lead it towards a more sustainable future.

The groundwork has been laid as Dominica has had the foresight and initiative to protect large tracts of land as National Parks and Forest Reserves. The time has now come to make a further commitment to maintain the integrity of the island's ecosystem. Long-term goals must be sought in times of harsh socio-economic circumstances. Immediate measures of additional clearing of marginal lands for agriculture, development

of fragile ecosystems and exploitation of a finite natural resources base will inevitably only lead to further hardship in the future.

Great amounts of dedication, careful planning and perseverance are critical to seeing beyond short-term economic gains, and striving towards the lofty heights of sustainable development. Now is the time that such a decision must be made. Is the Commonwealth of Dominica simply satisfied with ratifying each of the these international environmental conventions and scrambling to meet the minimum obligations under each, all in an effort to retain good international relations and create a facade of environmental wariness? Or is Dominica ready and willing to commit to a long-term sustainable development plan that incorporates standard guidelines for effective and efficient MEA implementation in an effort to protect their environment for future generations?

Incorporation of the recommendations listed earlier in this Chapter would be the first step towards a more sustainable future. Dominica has become renowned as the "*Nature Island of the Caribbean*", and proudly flies the national flag with the magnificent Sisserou throughout the land. Historically, a lack of population and limited development pressure presented little threat to the island's natural environment. However, under more harsh socio-economic times, growing population, more competitive international markets and efforts for more development, Dominica must now take proactive and progressive measures if it hopes to not be regarded as what once was the "*Nature Island of the Caribbean*". With the endangered Sisserou as a high profile indicator, Dominica must now start upon a road less traveled to avert further environmental degradation, and move toward a sustainably developed future.

6.4 Conclusion

This chapter concentrated upon providing a summary and recommendations for improved MEA implementation. The current process being employed in Dominica is far from optimal, and thus many of the potential benefits are not being realized. With the advent of increased numbers of MEAs and the subsequent responsibilities and obligations

under each, Dominica must devise a standard implementation procedure, which will optimize efficiency and effectiveness to lead the way to a more sustainably developed future.

In closing, it is important to realize that most international treaties and agreements have been inadequate in addressing their intended environmental problem, either in design, implementation or enforcement (Roodman, 1999). The institutions have ambitious mandates in principle, yet often lack the necessary authority or funding (Hill pers. comm., 1999). However, international negotiating conferences have opened a global dialogue and created a means to address the current international environmental problems and those of the future.

With its diminutive size and limited natural resources base, Dominica must make a concerted effort to protect its environment. The splendor of Dominica's rugged natural environment presents a tremendous opportunity, during a time when socio-economic standards are low. Dominicans should take pride in the great amounts of very dedicated work that has been invested to allow Dominica to remain the "*Nature Island of the Caribbean*". As they enter the New Millenium, multilateral environmental agreements have the potential to assist Dominicans in their struggle, and transform Dominica into a more sustainably managed nation.

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Appendix I

Timeline of Thesis Development and Completion

Date	Event
September 1998	Begin course requirements for degree completion
February 1999	Awarded a University of Manitoba graduate Student Fellowship (declined)
May 1999	Awarded a National Sciences & Engineering Research Council Scholarship
June 1999	Accepted as an OCOD / CIDA International Youth Intern for Dominica
June - July 14 th	Completed the first 3 chapters, and appointed Committee members
July 14 th	First Committee Meeting
July 31 st	Departure for OCOD Orientation in St. Lucia, West Indies
August 7 th	Departure from St. Lucia to The Commonwealth of Dominica, West Indies
Aug.-Nov.	Work on Climate Change Project at the ECU in Dominica
September 14 th	Awarded an AUCC Latin America – Caribbean Research Exchange Grant
Nov.-Jan.	Work on Ozone Depleting Substances project at the ECU in Dominica
December 20 th	Represented Dominica at Regional ODS Meeting in Kingston, Jamaica
Jan.-April 15 th	Work on Biodiversity Conservation Project at ECU in Dominica
February 7 th	Departure from Dominica to the OCOD Debriefing Session in St. Lucia
February 12 th	Departure from St. Lucia to Dominica for a two - month extension assisting the Dominican Government with MEA implementation efforts
March 22-28 th	Attended the Inter-American Development Bank's Convention in New Orleans, Louisiana as a Canadian National Youth Delegate
April 24 th	Depart from Dominica to Canada
May 19 th	Second Committee Meeting
October 5 th	Committee First Thesis Draft Meeting
November 1 st	Complete Final Thesis Draft for Defense
November 15 th	Thesis Defense
December 20 th	Submit Thesis to University of Manitoba Graduate Studies
February 2001	Graduate with Master's of Natural Resources Management

Appendix II

Country Profile of National Implementing Agencies and Focal Points

1. Anguilla National Trust (ANT)

To best perform its duty of coordinating and implementing MEAs, the ANT developed a program to increase: a) public awareness, (b) participation by stakeholders at the community level, (c) institutional support, and (d) public and private sector sensitivity to related environmental issues.

2. Bahamas Environmental Science and Technology (BEST) Commission

MEA implementation in The Bahamas is largely unsatisfactory. A primary contributing factor is the lack of formal legal status of the BEST Commission. Thus, there is no legal basis for the involvement of BEST in MEA implementation. This brings into question the validity of the environmental measures taken by the Commission.

3. Barbados: Ministry of Environment / Ministry of International Transport

In Barbados, very little institutional arrangements exist for MEA implementation outside of the public service. Therefore, the vast majority of MEAs are administered by the Ministry of Environment, Energy and Natural Resources. Additional problems facing MEA implementation include: lack of resources and lack of appropriate legislation.

4. Guyana: Environmental Protection Agency (EPA)

The EPA has been granted the institutional and administrative capacity to manage Guyana's MEA implementation efforts. A problem in Guyana, as in much of the Caribbean, is much of the supporting environmental legislation is outdated, incomplete, not enforceable and difficult to monitor.

5. Jamaica: Natural Resources Conservation Authority (NRCA)

The NRCA is the central agency for the implementation of MEAs in Jamaica, and has had a relatively successful history. However, for instances where limited resources serve to threaten the implementation of a MEA, the NRCA has developed an innovative technique of delegating management functions to non-governmental organizations.

6. Trinidad and Tobago: Environmental Management Authority (EMA)

The EMA is the natural focus for implementing activities of MEAs. Although, institutional, administrative and legal work is being performed to provide the EMA with the necessary resources for the effective implementation of MEAs.

7. St. Kitts and Nevis: Department of the Environment (DOE)

Throughout the Caribbean, the National Conservation and Protection Act 1987 (revised in 1996) of St. Kitts and Nevis makes the most explicit provisions for the articulation of the central environmental agency (DOE) into MEA implementation. The DOE has been empowered to negotiate environmental treaties, as well implement activities under these projects.

Source: (Anderson, 1999)

Appendix III

Contributors to the ODS Phase-Out Program

Contributor	Position	Organization
Mr. Michael Astaphan	Director	Dominica Association of Industry & Commerce
Mr. Alvin Bernard	Economist	Ministry of Finance, Industry & Planning
Mrs. Burton	Chief Statistician	Statistical Division
Dr. Colmore Christian	Perm. Secretary	Ministry of Tourism, Ports & Employment
Ms. Annie Edwards	Planner	Physical Planning Division
Mr. Michael Faedelle	Oper'ns Manager	National Development Corporation
Mr. Raphael Francis	Director	Physical Planning Division
Ms. Joan Henry	Health Officer	Ministry of Health & Social Security
Mrs. Jacob	Perm. Secretary	Ministry of Health & Social Security
Mr. Lebad	Customs Official	Customs Division
Mr. Laronde	Attorney General	Ministry of Legal Affairs
Mr. Peter Letang	Comptroller	Customs Division
Mr. Atherton Martin	President Director	Dominica Hotel & Tourism Association Dominica Conservation Association
Mr. Earl Williams	Instructor	Clifton Dupigny Technical College
Mr. Desmond Willis	Comptroller	Inland Revenue Division
Mr. Boniface Xavier	Env. Health Officer	Environmental Health
Mr. Felix Gregoire	Perm. Secretary	Ministry of Education, Sports & Youth Affairs

Appendix IV

Policy Items within the Phase-Out of ODS Policy Draft Document

Policy #	Policy Recommendation
1	Establish a National Focal Point to Coordinate all Ozone Depleting Substances Phase-Out Activities related to the Montreal Protocol
2	Restrict Imports of ODS-using Equipment
3	Establish a Taxation System that Encourages the Phase-Out of ODS
4	Reduce Import Tariffs on Equipment and Materials for Implementation of ODS Phase-Out Projects
5	Reduce Import Tariffs on Equipment using ODS-free Technology
6	Establish an Import License and Permit System for ODS and ODS-equipment
7	Establish a Monitoring System for ODS Imports and Consumption
8	Prohibit New Enterprises from Utilizing ODS
9	Prohibit Investments in Building New Plants using ODS
10	Prohibit Expansion of Existing Industry Requiring Use of ODS Technology
11	Certify Refrigeration Technicians
12	Implement the National Refrigeration Technician Training Program, as per the "Training of Trainers in Good Refrigeration Management Practices" Workshop
13	Train Customs Division, Statistical Division and other Parties involved in the Collection, Monitoring and Management of ODS Data
14	Implement a National ODS Recovery and Recycling Project
15	Embark upon a Public Awareness Campaign

Appendix V

Convention on Biological Diversity Standard Activity Matrix

ENABLING ACTIVITY	OUTPUT	CAPACITY BUILDING		PUBLIC PARTICIPATION
		Institutional Strengthening	Training	
Commitment	Execution			
1. Stocktaking and Assessment (Based on Existing Information)				
1.1 Biodiversity and biological resources	NEP / X			
1.2 Cross-sectoral issues	SDC / X			
1.3 Policy and Regulatory framework	X			
1.4 Institutional and Human Capacity	X			
1.5 Analysis of root cause of BD loss	X			
1.6 Technologies for Conservation and SU	X			
1.7 Activities with adverse impact	X			
1.8 Existing Measures and Programmes	X			
1.9 Preliminary Statement of Objectives	NEAP/ X			
1.10 Identification of Gaps	X			
1.11 Assessment of existing Needs	X			
2. Identification and Analysis of Options to Meet the Objectives of the CBD				
2.1 Strategies for Conservation	X	X	X	X
2.2 Strategies for Sustainable Use	X	X	X	X
2.3 Strategies for Benefit Sharing	X	X	X	X
3. Planning and Preparation of a Strategy and Plan				
3.1 National Strategy	X			
3.2 National Action Plan	X			
4. Preparation of the First National Report to the CBD				
4.1 First National Report	X			

Source: (UNDP, 1997)

X = Activity Undertaken Within Enabling Activities Proposal

NEP = National Environmental Profile undertaken in 1991 funded by the USAID, CCA and the Island Resource Foundation

NEAP = National Environmental Action Plan; (1994) funded by the World Bank

SDC = Sustainable Development Council (1995-1997) funded under the UNDP / Capacity 21 Programme (UNDP, 1997)