

**VULNERABLE COASTAL COMMUNITIES AND PARTICIPATORY  
CLIMATE ADAPTATION STRATEGIES:**

**A CASE STUDY OF  
THE ARTESANAL FISHERIES AND TOURISM SECTORS,  
SCOTT'S HEAD/SOUFRIERE, COMMONWEALTH OF DOMINICA**

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## **ABSTRACT**

### **VULNERABLE COASTAL COMMUNITIES AND PARTICIPATORY CLIMATE ADAPTATION IN DEVELOPMENT:**

#### **A CASE STUDY OF SCOTT'S HEAD/SOUFRIERE, COMMONWEALTH OF DOMINICA**

Virtually all development efforts are at stake in this climate-changing world. Marginalized communities in the developing world are at greatest risk. Yet, despite impressive advancements in climate change adaptation, there is a poverty of thought or "critical ontology" (Foucault 1989) within the development and climate adaptation disciplines regarding community (micro-level) development. Growth theory, an affinity for meso-macro level programs, and a preponderance of scientific climate change research are substituting for community risk reduction and development discourse, and impeding vulnerable communities' participatory involvement.

The result is an imperfect coordination of analysis and praxis between mainstream and grassroots adaptation efforts, and a propensity to develop centralized, stagiest, and externally driven macro-remedial adaptation models prone to socially fragment and falter. We need a profound paradigm shift to navigate through the immense swamp of stale, normative ideas, and grapple with participatory, transformative concepts grounded in community that are floating amongst the micro, meso and macro development realms.

This research draws on the rich traditional adaptive knowledge of Dominica's artisanal fisher folk to engender greater understanding of participatory approaches to climate adaptation. Like the Andean stargazers who predict El Niño weather for tuber planting, and the Honduran Quezungal farmers whose terraced farming practices protect crops from flash floods, these coastal villagers continue to collaboratively practice their unique forms of collective adaptation to climate variability.

We must rekindle the notion of genuine community development through grassroots social agency. Self-determined social agency, with its endogenous decision-making and local resource management, is arguably much better able than externally designed projects to engage and sustain community resources over time, and obtain the desired adaptation goals. This is especially so where there are opportunities for synergies between social concerns (such as coastal erosion and fish stock depletion, threatened livelihoods and food security).

The pioneering of micro-adaptation risk-consciousness raising (ARC) and grassroots adaptation in development (GrAD) practices by and for marginalized coastal communities, and the blending of traditional adaptive knowledge and contemporary expertise and requisite resources within broader adaptation and development strategies will support sustainable livelihoods and biodiversity more effectively.

**Peter J. Hayes**  
**July 2004**

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In Barbados, Permanent Secretary in the Ministry of the Environment, Dr. Leonard Nurse provided valuable insight into local climate change adaptation priorities, and was most instructive in suggesting adaptation approaches and potential partnerships. University of the West Indies (UWI) National Librarian Kenneth Chase, and his Senior Librarian Carlisle Best, were most helpful in providing access to Caribbean-based literature on development theory, and contextual material on Dominican history and culture. In addition, at UWI, Dr. Robin Mahon, an eminent fisheries expert in the region, provided vital information on the Caribbean fishery, climate change morphology and sectoral data, and Small Island Developing States (SIDS) fisheries adaptation approaches.

In the host country of the Commonwealth of Dominica, the Hon. Deputy Minister of Tourism was most sensitive and insightful regarding the impact of climate change on the industry. Lloyd Pascal, Director of the Environmental Coordinating Unit (ECU) and Operational and Technical Global Environment Facility (GEF) Focal Point, took the time, amidst a profoundly hectic schedule, to provide guidance and staff support, and give greater formality to this research effort. Chief Fisheries Officer Andrew Magloire from the Fisheries Development Division, facilitated many of my field contacts and access to fisheries documentation. His intense commitment to his fishery colleagues in the field is truly inspiring. Aaron (Izzy) Madesetti graciously offered me a drive-around orientation of the Scott's Head/Soufriere Marine Reserve (SSMR) target communities. This is an ecologically committed man with a commendable mission.



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To the Dominican people, who in the spirit of labour and love for their traditional ways of life genuinely live up to their environmentally conscious national motto: *Après bondie, c'est la terre* (original Patois or 'Kweyol' for "After God, the earth").

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## ACRONYMS AND ABBREVIATIONS

ACCC	Adaptation to Climate Change in the Caribbean (CIDA)
AOSIS	The Alliance of Small Island States
ARC <sup>1</sup>	Adaptation Risk Consciousness-Raising
CARICOM	Caribbean Community and Common Market
CAS	Country Assistance Strategies (World Bank)
CBO	Community-Based Organization
CCA	Climate Change Adaptation
CC AID	Climate Change Adaptation In Development
CCCDF	Canadian Climate Change Development Fund (CIDA)
CDB	Caribbean development Bank
CED	Community Economic Development
CDERA	Caribbean Disaster Emergency Response Agency
CFCs	Chloroflourocarbons
CRFM	Caribbean Regional Fisheries Mechanism
CFRAMP	Caribbean Fisheries Resource Assessment and Management Program
CIDA	Canadian International Development Agency
COP8	(Eighth) Conference of Parties
CPACC	Caribbean Planning and Adaptation to Climate Change (World Bank)
CRFM	Caribbean Regional Fisheries Mechanism
CSO	Community Service Organization
DANIDA	Danish International Development Agency
DPC	Disaster Preparedness Committee
C'N-ASC <sup>2</sup>	Community to National Adaptation Sub-Committee
DFID	Department For International Development
DOWASCO	Dominica Water and Sanitation Corporation
DWA	Dominica Water Sports Association
ECHO	European Community Humanitarian Organization
EC\$	Eastern Caribbean dollar
EEC	European Economic Community
ECHO	European Community Humanitarian Organization
ECU	Environmental Coordinating Unit (Dominica MOAE, Dominica)
EDF	European Development Fund
EIA	Environmental Impact Assessment
ENSO	El Niño Southern Oscillation
EDF	European Development Fund
GCM	Global Circulation Models
GEF	Global Environment Facility (World Bank-UNDP-OAS)
GHG	Green House Gases
GrAD	Grassroots Adaptation Development
GSO	Grassroots Support Organizations
FAO	Food and Agriculture Organization (UN)
FAD	Fish Aggregating Device
FDD	Fishery Development Division (Dominica)
FINNIDA	Finnish International Development Agency
GDP	Gross Domestic Product

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<sup>1</sup> My nomenclature

<sup>2</sup> My nomenclature

GoCD	Government of Dominica
GrAD <sup>3</sup>	Grassroots Adaptation Development
GSO	Grassroots Social/Support Organizations
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit or German Technical Development Cooperation
IAF	Inter-American Foundation
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICSU	International Council of Scientific Unions
ICOD	International Centre for Ocean Development
IFIs	international Financial Institutions
IPCC	Inter-governmental Panel on Climate Change
JICA	Japanese International Cooperation Assistance
LAMA	Local Area Management Authority
LDCs	Less Developed Countries (CARICOM term)
LUP	Land-Use Planning
MACC	Mainstreaming Adaptation to Climate Change
MCWH	Ministry of Communications, Works and Housing
MDCs	Middle Developed Country
NAP	North American Oscillation
NAPAs	National Adaptation Programs of Action
NGOs	Non-Governmental Organizations
NGDOs	Non-Governmental Development Organizations
NICU	National Implementation Coordinating Unit
OAS	Organization of American States
OcCC	Organe Consultative sur les Changements Climatiques
ODA	Overseas Development Assistance
ODM	Office of Disaster Management
OECS	Organization of Eastern Caribbean States
PEO	Public Education and Outreach
RAP	Retreat, Accommodate, Protect
RPIU	Regional Project Implementation Unit
SIDA	Swiss International development Agency
SIDS	Small Island Developing States
SPAT	Small Projects Assistance Team
SPREP	South Pacific Regional Environment Program (Asian Dev. Bank/CIDA)
SRES	Special Report on Emissions Scenarios
SRES	Special Report on Emissions Scenarios
SSMR	Scott's Head/Soufriere Marine Reserve
TEL/LEK	Traditional Environmental Knowledge/Local Environmental Knowledge
UK	United Kingdom
UNDESA	UN Department of Economic & Social Affairs
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
UWI	University Of The West Indies
UWICED	University of The West Indies Centre for Environment & Development
WMO	World Meteorological Organization
WWF	World Wildlife Fund

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<sup>3</sup> My nomenclature

## GLOSSARY OF TERMS

### **Adaptation Development<sup>4</sup>**

The marriage of humanitarian aid, disaster management and poverty-alleviation, in other words, development practices, and adaptation practices as an integral cross-sectoral component of the development process, creating a complementary 'Adaptation in Development' discipline in the development process.

### **Adaptation Risk Consciousness-Raising (ARC)<sup>5</sup>**

Bottom-up and self-generated community effort(s) to awaken or motivate members of a defined or defining community to understand their climate vulnerability and impact, and act upon this awareness through adaptive action.

### **Civil Society**

A term coined in the early 1900s by Antonio Gramsci, a Russian Revolutionary. It is roughly defined as non-governmental social groups expressing their self-determined and collective interests. Today, civil society encompasses NGOs, trade unions, women's groups, peasants and farmers, academics, human rights groups, community-based and grassroots organizations. Private sector was also added in the 1980s as international donor affiliations with NGOs (especially community/grassroots) were being minimized. According to the UNRISD definition of civil society in the context of poverty reduction, "civil society can be understood as the realm of citizen's informal and formal private associations to pursue non-economic interests and goals" (Fowler 2000, p.3). This second definition is the operation definition used throughout the thesis.

### **Coping**

The immediate actions in the face of an event or changes, and ability to maintain welfare (in contrast to adaptation, which refers to long-term adjustments to the framework within which coping takes place)<sup>6</sup>

### **Climate Change**

The gradual warming of the earth's atmosphere caused by emissions of heat absorbing "greenhouse gases," such as carbon dioxide and methane. The term is generally used to reflect longer-term changes, such as higher air and sea temperatures and a rising sea level. The IPCC definition states: Any change in climate over time, whether due to natural variability or as a result of human activities. The United Nations Framework Convention on Climate Change (UNFCCC) definition reads: A change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods.

### **Climate Change Adaptation (CCA)**

Refers to efforts to protect against climate change impacts via vulnerability reduction and risk management policies and activities. The Dominican Government refers to 'adaptation' as: 'measures which countries should undertake to respond to the adverse

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<sup>4</sup> 'Adaptation Development' is my conceptual and programmatic nomenclature, defined based on my literature and field research.

<sup>5</sup> 'Adaptation Risk Consciousness-Raising' is my nomenclature

<sup>6</sup> CICERO definition, CICERO 2003: (2) 56

impacts of global climate change and sea level rise.' The Inter-governmental Panel on Climate Change (IPCC) defines adaptation as: "Adjustments in ecological, social or economic systems in response to actual or expected climatic stimuli and their effects and impacts ... (and) to changes in processes, practices and structures to moderate potential damages or to benefit from opportunities associated with climate change," (Climate Change 2001). The World Bank simply defines adaptation as: "efforts to protect against climate change impacts" (Cities, Seas, and Storms 2000: 1).

### **Climate Variability**

Reflects shorter-term extreme weather events, such as tropical hurricanes and the El Niño Southern Oscillation (ENSO), and North Atlantic Oscillation (NAO).

### **Disaster**

A serious disruption of the functioning of a society, causing widespread human, material, or environmental losses. These may exceed the ability of the affected society to cope, using its own resources.

### **ECS**

The EC exchange rate is set by the eastern Caribbean Central Bank (ECCB) and has been pegged to the US dollar at a rate of US\$1.00 to EC\$2.70 since 1983.

### **Enviro-Cultural Tourism<sup>7</sup> (Eco-Tourism)**

This more appropriate term, versus the more commercially oriented 'eco-tourism,' reinforces the idea that tourism activities should be grounded in the local community's culture and the sustainability of their inter-dependent environment, and should therefore be environmentally and culturally sensitive.

### **Extreme Event**

Event departing markedly from the average values or trends, and that is exceptional. Mostly, the return period substantially exceeds 10 years.<sup>8</sup>

### **Fisher folk**

Other than the occasional use of 'fishermen' in a quote or reference, I have chosen to use the gender-neutral term fisher folk, instead of 'fishermen' or 'fishers.' Fishing is mistakenly considered a men's traditional practice. There are indeed barriers to women's involvement in many aspects of the fishery. However, when one actually observes community subsistence fishing or even commercial harvesting in praxis, the 'catch' or collection of fish with gill nets, long-lines, or fish pots<sup>9</sup> (fish traps), and the gutting, processing, and hawking, etc, are generally not restricted to one gender. In fact, women play a primary role in the overall fisheries process. Women's pivotal activities include: beach seining, fish sorting, gutting, product preparation and packaging, and hawking. Gender stereotypes, rife throughout most modern societies, contribute to the systematic exclusion of women, and impede their integration into this primary economic activity. The term 'fisher folk' thus reinforces the real traditions of fishing practice: where divisions of labour, although existent, may be blurred especially where collective effort is

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<sup>7</sup> Enviro-cultural tourism is my nomenclature. The definition is based on my program development and research in Mesoamerica and the Caribbean.

<sup>8</sup> OcCC definition (OcCC 2002: 15)

<sup>9</sup> Fish pots were originally hand-made with bamboo strips, as were kali landing nets. Nowadays, wire mesh is used (Honychurch in Our Island Culture: 19).



involved. The term 'fisher folk' also helps promote the idea of a collective effort as subsistence and commercial fishing is a socio-economic activity connected to community, and is rarely experienced by isolated males.

### **Grassroots Adaptation Development (GrAD)**<sup>10</sup>

Climate change adaptation efforts, combined with other developmental priorities, conducted at the community level or grassroots.

### **Mainstreaming**

The Webster Dictionary, 1996 defines mainstream as: 'the principal or dominant course, tendency, or trend.' There are two distinct but potentially complementary definitions of mainstreaming. The first 'instrumentalist' definition of mainstreaming is used primarily by larger international financial institutions (IFIs) and donor agencies, referring "principally to making more routine those practices by us, as donor institutions and development implementing organizations, whose effect is the fuller engagement of people in their society's decision-making processes (USAID definition, La Voy and Charles, in 1988 in Long 2001, p17). Similarly, the World Bank Working Group defines mainstreaming as: "(T)he full and systematic incorporation of a particular issue into the work of an organization so that it becomes an accepted and regular part of the organization's policies and practices" (Long 2001, p18).

The second 'transformational' definition of mainstreaming is used largely by grassroots organizations, and refers to: 'The popularizing of specific social issues and/or practices through local decision-making, by and for target communities via their primary partners, stakeholders' and the broader community membership (author's definition). This thesis endorses the second definition.

### **Micro-Adaptation**<sup>11</sup>

"Micro-Adaptation is the gradual acquiring of both contemporary and traditional environmental knowledge (TEK) regarding climate change impact, and vulnerability and risk reduction, through adaptation risk consciousness-raising (ARC) and Grassroots Adaptation Development (GrAD) activities, to reduce risk."

### **Mitigation**

Refers to efforts to reduce greenhouse gas emissions into the environment/atmosphere.

### **Natural Catastrophe**

Natural event whose consequences cannot be dealt with by the local population without help from outside.<sup>12</sup>

### **Natural Hazard**

A rare or extreme event in the natural environment that adversely affects human life, physical or human capital or activity to the extent of causing disaster.<sup>13</sup>

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<sup>10</sup> 'Grassroots Adaptation Development (GrAD)' is my conceptual and programmatic nomenclature, defined based on my literature and field research.

<sup>11</sup> 'Micro-Adaptation' is my conceptual and programmatic nomenclature, defined based on my literature and field research.

<sup>12</sup> OcCC definition (OcCC 2002: 15)

<sup>13</sup> OcCC definition (OcCC 2002: 15)

**No-Regrets Option**

The UKCIP Technical Report (Climate Adaptation 2003) explains a 'no-regrets' option as follows: "A decision option that is assessed to be worthwhile now (in that it would yield immediate economic and environmental benefits which exceed its cost), and continue to be worthwhile irrespective of the nature of future climate, is an example of a **no-regret option**" (Climate Adaptation 2003: 66).

**Non-Annex I Countries**

Developing country parties to the UNFCCC under no obligation to reduce greenhouse gas emission, but are vulnerable to adverse impacts of global climate change.

**Precautionary Rule**

As per Article 15 of the Rio Declaration (1992), "...where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation" (Green Alliance 2002; Climate Adaptation 2003: 60).

**Risks**

The expected number of lives lost, persons injured, damage to capital stock and disruption of economic activity due to a particular natural hazard, and these expected losses are consequently the product of a specific risk and the elements (lives, etc.).

**Sustainable Development**

Development that meets the needs of the present without compromising the capacity of future generations to meet their own needs (Poverty and Climate Change 2002: 38). Daly defined sustainability as: a level of resource use that is both sufficient for a good life for its population and within the carrying capacity of the environment if generalized to the whole world" (Daly 1996: 3).

**The Intergovernmental Panel on Climate Change (IPCC)**

The international mechanism established by the United Nations Environmental Program (UNEP) and the World Meteorological organization (WMO) to assess available information on the science, impacts and the economics of climate change, and of the mitigation options to address it.

**Uncertainty**

Where there is insufficient data to estimate 'risk' regarding mathematical probability.

**United Nations Framework Convention on Climate Change (UNFCCC)**

The international response to climate change, whose objective is to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. This would be accomplished within a timeframe 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.

**Vulnerability**

Defined by the IPCC as "the extent to which climate change may damage or harm a system. It depends not only on a system's sensitivity but also on its ability to adapt to new climate conditions," (Initial National Communication 2001: 25).

## Chapter I

### Introduction

#### 1 Normative and Professional Motivation

*Genuine development means the construction by a human society of its own history, its own destiny, its own universe of meanings. (Goulet, D. 1987)<sup>14</sup>*

*"Let's save pessimism for other times" (Galeano); "Be realistic, demand the impossible!" (Grafitti, Paris 1968)<sup>15</sup>*

Over the past 25 years, I have cultivated a interest in community development and popular education through my work as a development professional in the Americas and Caribbean. My work has encompassed: directing biodiversity and enviro-cultural<sup>16</sup> tourism initiatives with Mayan groups in Mesoamerica through International Financial Institutions (IFIs) and Grassroots Social Organizations or 'GSOs;' managing community economic development (CED) initiatives in partnership with non-governmental development organizations (NGDOs); working with First Nation<sup>17</sup> populations such as the Macushi and Wapishiana in Guyana and Brazil, in partnership with bilateral agencies;

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<sup>14</sup> Taken from Culture and Traditional Values in Development

<sup>15</sup> Taken from Another World Is Possible, McNally: 2002

<sup>16</sup> This more appropriate term, versus the more commercially oriented 'eco-tourism,' reinforces the idea that tourism activities should be grounded in the local community's culture and the sustainability of their inter-dependent environment, and tourism activities should therefore be culturally and environmentally sensitive.

<sup>17</sup> The more historically accurate term 'First Nations' or 'First Peoples' highlights the existence of pre-colonial indigenous settlements or nations, with their independent and self-determined cultural, socio-political, and economic status. Note that the term 'indigenous,' or local is sometimes confused with referral to First People's. I refrain from using the term 'Amerindian,' as it is a Columbian term defined by the colonial world.

and promoting community literacy with the Mopan and K'Kechi Maya, and Garifuna peoples of Belize.

Time and again, I have been inspired by how much beneficiary communities have to offer through their intimate understanding of their local needs, their desire to contribute, and their steadfast commitment to collectively sustain their livelihoods.

My work conducting post-disaster community water and sanitation projects in Honduras (post-hurricane Mitch) and El Salvador (post-earthquake), and infrastructure development and social forestation in Peru (post El Niño floods) has made me ever more aware of the impacts of climate change on human settlements. I have a greater appreciation for the relationship between our changing environment and the complex sustainability challenges facing marginalized communities, grassroots community groups, donor agencies and host governments. My brief work with Paulo Freire (Pedagogy of The Oppressed & Brazilian literacy activist) and Rigoberta Menchu (Mayan human rights activist and Nobel Peace Laureate), my inspiring acquaintance with Gustavo Gutierrez (Peruvian founder of Liberation Theology), my work with *ClimAdapt* ([climadapt.com](http://climadapt.com)), and my current professional commitment to participatory climate change adaptation provide the noetic and conceptual motivation for this research on “Micro-Adaptation.” I will endeavour to adequately define the meaning and practical value of micro-adaptation in this thesis.

## 2 Posing the Problem

### 1 A Climate Changing World Threatens Sustainable Development

*"Climate has changed little for 10,000 years since the retreat of the last ice age; it is changing fast now," (Something New 2000).*

The Inter-governmental Panel on Climate Change (IPCC)<sup>18</sup> defines climate change as: Any change in climate over time, whether due to natural variability or because of human activities. The United Nations Framework Convention on Climate Change (UNFCCC)<sup>19</sup> definition reads: "A change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods." The term climate change is generally used to reflect longer-term changes, such as higher air and sea temperatures and a rising sea level.

The genesis of mass pollution and anthropogenic, or human induced, climate change was the first industrial wave, from 1400-1800. Emissions of heat-absorbing "greenhouse

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<sup>18</sup> The IPCC is the largest collaborative scientific peer review of climate change on the planet, made up of 2500 climate change experts from over 70 nations. It is the international mechanism established by the United Nations Environmental Program (UNEP) and the World Meteorological organization (WMO) to assess available information on the science, impacts and the economics of climate change, and of the mitigation options to address it.

<sup>19</sup> The UNFCCC is the UN's international response to climate change, whose objective is to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. This would be accomplished within a timeframe 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.

gases” (GHG)<sup>20</sup> from fossil fuel combustion, combined with effects of deforestation, gave rise to the gradual warming of the earth’s atmosphere and ozone depletion.

The “Greenhouse Effect” was first studied in 1827 by Baron Jean-Baptiste Joseph Fourier (Earthscan 1999: 67). In the 1890s, Scientist Svante Arrhenius predicted “a doubling of the CO<sub>2</sub> concentration would increase temperatures by 4.5 degrees – almost exactly the same as current estimates” (Environment In Crisis: 1990). As early as 1974, the link between chlorofluorocarbons (CFCs) and ozone depletion was established.

As the IPCC points out, the present level of CO<sub>2</sub> ‘has not been exceeded during the past 420,000 years and likely not during the past 20 million years’ (Ecologist Report 2001: 5). The Organe Consultative sur les Changements Climatiques (OcCC) maintains that CO<sub>2</sub> levels have increased by 30% since 1750, with present concentration levels being the highest in more than 400,000 years [OcCC 2003 (2): 3].

According to calculations on the impact of ozone depletion and global warming, “the net effect, since 1800 or so, was about 2 more watts per square meter of solar energy delivered to the earth’s surface” (Something New 2000). Thus, 200 years ago, industrial capital’s emissions into the atmosphere were already causing discernible global warming. “That such a process of change in the chemical composition poses some risk of significant climate change is not in doubt” (Burton, I. and van Aulst, Maarten 1999: 8).

“Global warming” really became a household term when NASA Scientist James Hansen announced at a Senate hearing, during the intense 1988 heat wave, that, “global warming

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<sup>20</sup> In addition to CO<sub>2</sub>, the WMO has formally listed over 43 additional GHGs that directly contribute to global warming (Earthscan Reader 1999: 71). Other key GHGs include methane (CH<sub>3</sub>), Nitrous Oxide (NOx), and numerous Chloroflouorocarbons (CFCs);

has begun” (State of The World 1988: 8). Then in 1995, UN scientists made the authoritative statement, “(I)t is now accepted that natural causes alone are not sufficient to explain the rate and pattern of long-term change during the past century, but that the evidence points towards ‘a discernible human influence on global climate’” (Climate Impact 1998: 5).

The scientific authors of this remarkable statement were referring to the UN IPCC Working Group I report, acknowledging a considerable accumulation of greenhouse gas (GHG) emissions, particularly from fossil fuel combustion of coal, oil and gas, and land use changes coinciding with industrialization. Thus, in response to the claim that natural climate variability may be contributing to the global warming of the past few decades, the IPCC concludes that ‘most of the observed warming over the past 50 years is likely to have been due to the increase in greenhouse gas concentrations,’ which is ‘attributable to human activities’ (Ecologist Report 2001: 6).

Globally, the 1990s appear to have been the warmest decade, and 1998 the warmest year, since instrumental records began in the 1860s. Furthermore, tidal gauge records for the period since the late 1950s show that global average sea level rose between 0.1 and 0.2 meters during the twentieth century (Dominica Initial National Communication 2001: 25).

The IPCC reports that the planet has lost about 10 per cent of its snow cover since the 1960s. It also states that “Glaciers in non-polar regions are retreating (and) Arctic sea ice has ... thinned by some 40 per cent since the 1950s” (Ecologist Report 2001: 5).

The IPCC Report concludes, *inter alia*, “that the globally averaged surface temperatures have increased by  $0.6 \pm 0.2^{\circ}\text{C}$  over the 20<sup>th</sup> century, and that, for the range of scenarios developed in the *IPCC Special Report on Emissions Scenarios* (SRES), the globally averaged surface air temperature is projected by global circulation models (GCMs) to warm 1.4 to  $5.8^{\circ}\text{C}$  by 2100 relative to 1990, and globally averaged sea level is projected by models to rise 0.09 to 0.88 m by 2100,” (Climate Change 2001).

Even considering the lowest emissions scenario, in 2100 levels will be 35% above 1990 levels, with mean temperatures increasing between  $0.8$  and  $4.5^{\circ}\text{C}$  by 2100, and sea-levels rising an average of 0.49 meters by 2100 (Climate Impact: 1998). According to the UK’s Hadley Centre, if worldwide emissions are allowed to double about every 30 years, the average temperature across the planet would be more than  $8^{\circ}\text{C}$  compared with 1990 (Ecologist Report 2001: 15).

The repercussions of human-induced or anthropogenic climate change variability (and consequent political economy disasters) on sustainable development, in all its dimensions, are profound. Inter-decadal and anthropogenic global warming have caused significant changes in precipitation and evaporation levels, and dramatic fluctuations in the hydrological cycle with consequent floods and drought intervals around the world.

The Worldwatch Institute 1998 State of The World Report bluntly stated that: “The warming of the earth’s climate is an environmental catastrophe on a new scale, with the potential to violently disrupt virtually every natural ecosystem and many of the structures and institutions that humanity has grown to depend on (State of The World 1989: 8).” Climate change could also cause “more intense cyclones and droughts, the failure of subsistence crops and coastal fisheries, losses in coral reefs, and the spread of malaria and



dengue fever” (Cities, Seas, and Storms 2000: X). In fact, global warming has even altered the geomorphic dynamic of seismic events as rising sea level, and the increase in overall sea mass, inevitably alters tectonic behaviour.

Even a modest sea-level rise “would threaten the coastal settlements in which half of humanity lives” (Earthscan Reader 1999: 75). “A one-metre rise in sea-level would affect 94% of the population of Bangladesh” (Huq, Saleemul et al, 2003). With predicted sea-level rise, “(l)arge areas of wetlands that nourish the world’s fisheries would also be destroyed.” Global warming will hurt rich and poor, North and South alike.<sup>21</sup> But those most at risk are the 4 billion people who live in the Third World (State of The World 1989: p.11). “Climate change would have the greatest impact on the poorest and most vulnerable segments of the population” and those most dependent on subsistence fisheries and crops destroyed by cyclones and droughts (Cities, Seas, and Storms 2000: 3).

Vulnerability to climate change is defined by the IPCC as “the extent to which climate change may damage or harm a system. It depends not only on a system’s sensitivity but also on its ability to adapt to new climate conditions,” (Initial National Communication 2001: 25). Because of the tenuous nature of their surrounding environment, precarious living conditions and restricted coping skills, the impoverished communities of the ‘developing world’<sup>22</sup> are at greatest risk from climate extremes. In fact, “vulnerability is highest for least developed countries (LDCs)” (Poverty and Climate Change: 2002, p.5). According to one estimate (Funaro and Curtis, 1982), “average costs (attributed to

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<sup>21</sup> The IPCC states that the Caribbean Region, which produces less than 1% of GHG emissions, is three times more vulnerable than developed countries to the effects of climate change (IPCC 2001b, in Sheppard, A. & Osterwoldt, R. 2002: 19)

<sup>22</sup> For many third world countries whose economies and social conditions have declined in relative terms, this term is incongruous with the record of the last 50 years or more. See Section 2.1, A Critical Ontology of Climate Change Adaptation in development.

extreme weather) as a proportion of GDP are 20 percent higher in developing countries than in developed countries, suggesting that lagging development and poverty tend to greatly amplify the impacts of natural hazards”<sup>23</sup> (World Bank, Oct. 2000).

Most studies consider the Pacific and Caribbean islands to be at high risk from climate change and sea level rise (Cities, Seas, and Storms: 2000). In the Caribbean, more frequent and intense extreme weather events (e.g., El Niño Southern Oscillation, hurricanes, storm surges) and resultant flooding, droughts, and damage to marine ecosystems threaten the socio-economic stability of Small Island Developing States (SIDS), and their coastal communities. Even minor climate increases in water temperature can “damage coral reefs, exacerbating other stresses such as pollution and over-fishing and thereby cause a reduction in fish stocks, jeopardizing fish- and tourism-dependent livelihoods” (Poverty and Climate Change: 2002, p.7). The IPCC posits: “Declines in coastal ecosystems (from climate change) would negatively impact reef fish and threaten reef fisheries, (threaten) those who earn their livelihoods from reef fisheries, and those who rely on the fisheries as a significant food source (IPCC, 2001, p.17).

“Beaches, wetlands and other coastal lands could be lost to rising sea levels and higher storm surges. Coral reefs may be lost due to higher water temperatures, leading to changes in fish stocks. Some agricultural crops may become less productive ... availability of fresh water supplies may be affected by long-term change in rainfall patterns and evaporation ... There is a risk of damage to buildings, roads, sewer and water systems, port facilities and other infrastructure due to rising sea levels, higher storm

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<sup>23</sup> A rare or extreme event in the natural environment that adversely affects human life, physical or human capital or activity to the extent of causing disaster.

surges, and more intense tropical storms. Flood damage from heavy rains may also occur...” (World Bank 2003: 4).

Already, island dwellers speak of having to move their houses and boats further inland because of rising tides and coastal erosion; of changes in wind, precipitation and marine currents; of drops in volume of fish catches, and species sizes; and of more storms.

Thus, climate change poses a direct challenge to the socio-economic stability of human settlements, as well as the integrity of the world’s biodiversity. Yet, “current development strategies tend to overlook climate change risks” (Poverty and Climate Change 2002: 1).

## **2 The Costs of Climate Change to Development**

In essence, virtually all former and future development efforts are at stake in this climate-changed world. As the inter-agency report *Poverty and Climate Change: Reducing the Vulnerability of The Poor Through Adaptation* states: “Climate change challenges the achievements of the Millenium Development Goals (MDGs) and related national poverty eradication and sustainable development objectives” (Poverty and Climate Change 2002: 11-13).<sup>24</sup>

At the level of development projects, “inadequate anticipation of the potential impacts of climate change can result in failure or premature obsolescence.” “Vulnerability also exists

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<sup>24</sup> In September 2000, at the UN Millennium Summit, world leaders of 189 nations agreed on the Millennium Declaration that outlined eight development goals which set clear targets for reducing hunger disease, illiteracy, environmental degradation, and discrimination against women, to be accomplished by 2015 (Poverty and Climate Change 2002: 9-10; Millenium Project website, March 2003). The Inter-Agency Report: *Poverty and Climate Change: Reducing the Vulnerability of The Poor Through Adaptation*, details the potential impacts of climate change on all eight MDGs (Poverty and Climate Change 2002: 12)

at the country level, where development strategies frequently do not pay attention to climate change and vulnerability” (Burton, I. and van Aulst, Maarten, 1999, p.11). Thus, poverty reduction goals and long-term socio-economic and ecosystem sustainability may be achieved only through the incorporation of climate change considerations into environmental and development thinking and programming.

The World Bank reports, “(C)ompared to the 1960s, the frequency of hazardous events that have had a disastrous impact ... more than doubled during the 1980s and increased more than threefold in the 1990s. (S)uch losses increased from an average of US\$71.1 billion in the 1960s to US\$608.5 billion in the 1990s (a nine-fold increase),” (World Bank Reducing Vulnerability: 2000). The World Bank’s Project Appraisal Document for the Mainstreaming Adaptation to Climate Change (MACC) program points out that Caribbean SIDS over the last three decades “have suffered direct and indirect losses due to natural disasters<sup>25</sup> estimated between US\$700 million to US\$3.3 billion” (World Bank 2003: 4).

In 1998, total losses resulting from natural disasters in developing countries amounted to an estimated 70% of net Official Development Assistance or US\$40 billion (Swiss Re 1999) of US\$57 billion (World Bank 2000b).<sup>26</sup> Development groups’ best guess is that climate change ‘could cost developing countries up to 6.5 trillion over the next 20 years, many times anticipated aid flows’ (Ecologist Report 2001: 23).

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<sup>25</sup> Event departing markedly from the average values or trends, and that is exceptional. Mostly, the return period substantially exceeds 10 years

<sup>26</sup> Swiss Re 1999, Natural Catastrophes and Man-Made Disasters 1998: Storms, Hail and Ice Caused Billion-Dollar Losses, Sigma No. 1/1999; World Bank 2000b. World Development Indicators. Washington, D.C., World Bank.

During a November 2002 presentation to delegates at the 8th Conference of the Parties (COP8) to the United Nations Framework Convention on Climate Change (UNFCCC), insurance giant Munich Re reported that the number of environmental victims from major floods, droughts and earthquakes had increased from 500,000 to 55 million over a six-year period. Furthermore, the International Red Cross reported that there were 526 'natural'<sup>27</sup> disasters in the first nine months of 2002. These included 99 disasters in Europe amounting to \$33 billion in estimated losses, 195 disasters in Asia with \$14.8 billion in losses, 149 disasters in the Americas and Caribbean, and 38 natural disasters in Africa (Canadian Institute for Business and the Environment 2003).

A report written on behalf of the UN Environment Programme's (UNEP) finance initiative found that more frequent and more devastating storms caused by climate change could cost US\$150 billion in insurance pay outs a year within the next ten years. A more compelling statistic is Mimura and Harasawa's (2000) report, which estimates "11.5-20 trillion Yen as the cost of maintaining the functions of Japanese infrastructure against a 1-meter rise in sea level," (Climate Change 2001: 892).

The economic cost of inaction far exceeds the investment necessary to respond proactively to climate variability, particularly in vulnerable coastal zones (Canadian Institute for Business and the Environment, 2003). Failure to address natural hazards is 'a potentially serious threat to sustainable development' (World Bank Dominica, 2001, p.1).

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<sup>27</sup> With the dramatic rise in climate-induced 'natural' disasters, with some certainty from the IPCC that there is 'a discernible human influence on global climate,' the anthropogenic source of climate change and its influence on these disasters places in great question the accuracy of the term 'natural.'

An excellent example, the Small Island Developing State (SIDS) of Dominica, is considered one of the more developmentally disadvantaged countries within the Organization of Eastern Caribbean States (OECS). International Cooperation (UNDP, OAS, CIDA, USAID, ECHO, DANIDA, FINIDA, DFID<sup>28</sup>) has provided millions of dollars in multi-sectoral development assistance to this island state largely through the Caribbean Community and Common Market (CARICOM) and Organization for Economic Cooperation and Development (OECD) regional initiatives. However, the long-term sustainability of development investments is now at risk from increasing extreme weather events associated with longer term climate variability, as witnessed during hurricane Luis, which destroyed the CIDA-funded Mero seawall project, and hurricanes David (1979) and Lenny (1999), which smashed Dominica's aid-supported fishing boat fleet and damaged the Mero sea wall again.

Hurricane Lenny alone caused US \$3.9 million in agricultural damages in Dominica and virtually all other economic sectors were hard-hit (Initial National Communication 2001: xxv). According to vulnerability indices developed by Briguglio (1995), Dominica "was the second most disaster-prone of the 114 countries analyzed; and the 18<sup>th</sup> most vulnerable country overall (World Bank Dominica 2001: 13). A Commonwealth Secretariat study ranked Dominica 5<sup>th</sup> most disaster vulnerable country over the period 1970-1996 and relative to total land area (others being Saint Vincent, Saint Kitts and Nevis, and Saint Lucia) (ibid).

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<sup>28</sup> United Nations Development Programme (UNDP); organization for American States (OAS); Canadian International Development Agency (CIDA); United States Agency for International development (USAID); European Community Humanitarian Organization (ECHO); Department for International development (DFID)

### **3 The Limits of GHG Mitigation**

Fortunately, international awareness of climate change is on the rise. However, it was not until 1985 that the problem of anthropogenic climate change was moved onto the political agenda by the World Meteorological Organization (WMO), the United Nations Environment Programme (UNEP), and the International Council of Scientific Unions (ICSU). In 1987, the Brundtland Report called for popular participation in local-level environmental development, and noted the relationship between development and environmental concerns. The Report states, "We have in the past been concerned about the impacts of economic growth on the environment." We are now forced "to concern ourselves with the impacts of ecological stress ... upon our economic prospects" (Sachs 1992: 28).

The eventual policy recognition of climate change by world leaders was motivated by widespread public pressure regarding environmental degradation, an international outcry from civil society, and recognition by industry of the link between industrial 'revenue inefficiencies,' increased resource management costs, and infrastructure deterioration associated with changes in the environment.

Under the terms of the UNFCCC, a protocol has been established to reduce GHG emissions from fossil fuel consumption. The purpose is to "achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system," (Seitz 1997: 15).

With the signing of the Kyoto Protocol, member states would commit to mitigate global warming from GHGs through emissions reductions. Generally, emissions targets are set at 5.2% below 1990 levels by the year 2012<sup>29</sup> (Ecologist Report 2001). This is far less than the immediate cut of over 60 per cent that climatologists say would be necessary to keep greenhouse gases at safe levels. However, even these modest objectives under the Kyoto protocol may be abandoned with Russia threatening to remove itself as a signatory member.

Even if Kyoto mitigation (emissions reduction and carbon sinks) targets, were set at 100% of total GHG emissions and attained today, the IPCC estimates that anthropogenic climate variability and extreme weather events will continue to beset the globe for centuries to come (Climate Change 2001). In fact, the Hadley Centre for Climate Prediction and Research stated that: “The damage already done to the climate by man's greenhouse gas emissions will affect us for the next 1,000 years. Thus, we are living in a climate-changing world that demands our adapting to the consequent vulnerabilities engendered by it.” Therefore, “while the UNFCCC continues to emphasize efforts to mitigate the anthropogenic causes of climate change, it also recognizes the need to ‘adapt’ to the anticipated changes” (World Bank 2003: 59).

#### **4 Adaptation In Development Imperative**

Traditionally, development practices have emphasized project impact on the environment. In a climate-changing world, if sustainability is a key objective, consideration must now also be given to the impact of climate change on development projects and human security.

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<sup>29</sup> GHG reduction targets vary depending on the UNFCCC Annex I signatory country



## 1 Adaptation Defined

Given the magnitude of anticipated climate change impacts on the human community over the short-to-medium term, and the profound impact climate-related disasters will have on development priorities, 'adaptation' or *climate change vulnerability assessment and risk management* must be prioritized within the national and regional policies and development plans of host governments, donor agencies and International Finance Institutions (IFI).

The IPCC defines adaptation as: "Adjustments in ecological, social or economic systems in response to actual or expected climatic stimuli and their effects and impacts ... (and) to changes in processes, practices and structures to moderate potential damages or to benefit from opportunities associated with climate change," (Climate Change 2001). The World Bank simplistically defines adaptation as: "efforts to protect against climate change impacts" (Cities, Seas, and Storms 2000: 1).

The UNFCCC has systematically classified adaptation measures. These measures were ratified by the Conference of the Parties (COP 1) in Berlin in 1995 (Burton, I. and van Aulst, Maarten 1999: 23). The Conference of Parties (COP 7 and 8), a UNFCCC negotiating body for emissions mitigation, discussed and negotiated strategies to address climate change adaptation mechanisms in New Delhi, India in November 2002. Article 4.1(b), 4.1(e), and 4.1 (f) of the UNFCCC reference adaptation as a priority. At the Rio Summit in 1992, climate change was placed on the agenda as a pivotal consideration to ensure socio-economic and environmental sustainability. Similarly, the 2002 World Summit on Sustainable Development in Johannesburg articulated concerns about climate risk. Thus, climate change was now on the world agenda.

## 2 Marriage of Adaptation and Development

As per Article 15 of the Rio Declaration (1992), ‘...where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation’ (Green Alliance 2002; Climate Adaptation 2003: 60). This is called the “Precautionary Principle.”

“A recent estimate of the potential economic consequences of the impacts of climate change on the economies of Caribbean countries (Haïtes 2002), in a “no-adaptation” scenario, ranges from 5% to over 30% of GDP on average” (World Bank 2003: 4). In contrast, ‘spending 1% of a structure’s value on vulnerability reduction measures can reduce probable maximum loss from hurricanes by, on average, a third’ (World Bank 2000b in World Bank Dominica 2001: 85).

A ‘no-regrets’<sup>30</sup> adaptation strategy need not involve large investments of public resources. It will however require strong political will, as adaptation measures may face stiff competition from other development activities for scarce funds. Yet it is important to understand that the short-term gains of a ‘do-nothing’ strategy could be easily dissipated by the impact of future climate events (Cities, Seas, and Storms 2000: 30). Thus, “it is generally accepted that there is sufficient evidence to merit urgent action that is guided by

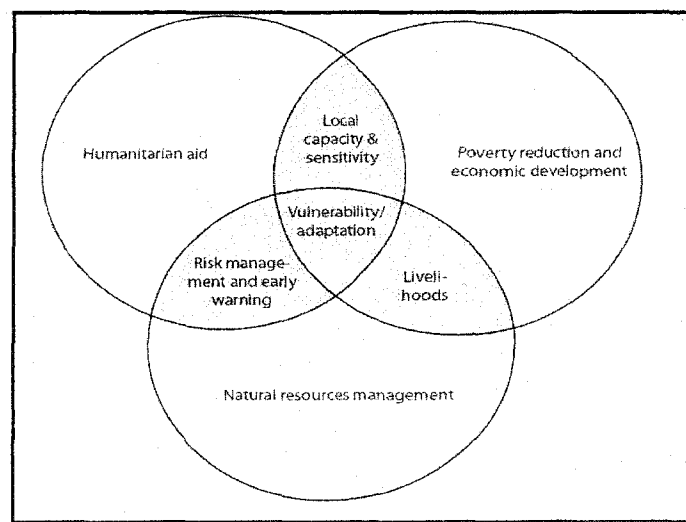
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<sup>30</sup> The UKCIP Technical Report (Climate Adaptation 2003) explains a ‘no-regrets’ option as follows: “A decision option that is assessed to be worthwhile now (in that it would yield immediate economic and environmental benefits which exceed its cost), and continue to be worthwhile irrespective of the nature of future climate, is an example of a no-regret option” (Climate Adaptation 2003: 66).

the tenets of the precautionary principle” (Policy Framework 2002: 8). Adaptation measures should be considered complementary to other development goals such as poverty reduction and sustainable biodiversity.

By integrating climate adaptation into their respective humanitarian aid, natural resource management, poverty reduction and economic development plans and strategies, UN dependencies, development banks, the Organization of American States (OAS), multi-lateral aid agencies, SIDS within the CARICOM and South Pacific, and international and indigenous NGOs and community groups can identify adaptation and development synergies while responding to the challenges of global climate change.

“These three strategic areas provide entry points for adaptation through development cooperation activities,” as pictured in the following diagram by CICERO:<sup>31</sup>



**Figure 1**

<sup>31</sup> Permission of author: CICERO Report 2003: (2) 13, Nov 2003. Erikson, Siri & Otto Naess, Otto. Pro-Poor Climate Adaptation, Norwegian Development Cooperation and Climate Change Adaptation: An Assessment of Issues, Strategies and Potential Entry Points. ISSN: 0804-4562;

The International Strategy for Disaster Reduction or ISDR [successor to the International Decade for Disaster Reduction (1990-1999)] stresses the need for 'forging links between climate change adaptation and disaster reduction' [CICERO 2003 (2): 20].

The European Commission's (EC) March 18, 2003 action plan is aimed at integrating climate change concerns into EU development cooperation activities. The plan highlights that "climate change is as much a development priority as an environmental one, and underlines that developing countries are most vulnerable to climate change and therefore deserve full support in addressing their vulnerability" [Cicero 2003 (2) 21].

The UK Parliamentary review (House of Commons 2002) highlights the need to consider climate change as a separate development problem, concluding, "Integration of climate change in DFID's work would not require radical changes, but that developing indicators and a system of climate impact assessments is necessary." They suggest key entry points for adaptation at the country level such as the Millennium Development Goals (MDGs), Poverty Reduction Strategy Papers (PRSP), and National Strategies for Sustainable Development (NSSD). However, the Report refers to inter-agency dialogue and inter-departmental awareness-raising, while failing to look at actual community-based interventions [Cicero 2003 (2) 21].

Another example of adaptation and development synergies is the inter-agency partnership between the The World Conservation Union (IUCN), International Institute for Sustainable Development (IISD), the Stockholm Environmental Institute (SEI), and the Worldwatch Institute. This joint project brings together adaptation, disaster reduction and environmental management strategies to reduce communities' vulnerability to climate change (ibid 22). As well, CIDA's Canada Climate Change Development Fund (CCCCDF)

“promotes activities to combat the causes and effects of climate change in developing countries, while helping to reduce poverty and promote sustainable development” (CIDA 2000).

The International Institute for Environment and Development (IIED) Climate Change Programme (partly NORAD funded) focuses on associations between sustainable development and climate change, and in particular, themes of adaptation capacity in developing countries, sustainable livelihood linkages, capacity strengthening and equity (ibid 23). The Danish International Development Agency (Danida) has yet to develop a strategy linking development aid and climate change. The Swedish International Development Agency (SIDA) is in the process of developing a climate change strategy (ibid 24).

One of the most comprehensive efforts articulating the need for a symbiosis between development and adaptation is an inter-agency collaboration comprised of: Netherlands Development Cooperation, DFID, UNDP, the Asian Development Bank, the OECD, the African Development Bank, the European Commission (EuropeAid Cooperation), UNEP, German Economic Cooperation and Development, and the World Bank. This coalition stated that, “the development and environment community must ensure that adaptation is not treated as a standalone issue, but in the context of poverty reduction and the Millennium Development Goals (MDGs) ... that the best way to address climate change impacts on the poor is by integrating adaptation measured into sustainable development and poverty reduction strategies” (Poverty and Climate Change 2002: x-xi).

It is imperative that the global community embrace integrated approaches to ‘adapt’ to climate change and reduce risk and vulnerability to human settlements, public

infrastructure, and the environmental commons. This “climate change adaptation” approach within the climate change research and development community, is deemed complementary to, not a substitute for, or detracting from, the quintessential need to dramatically reduce or mitigate GHG emissions on a global scale.

The essential marriage of humanitarian aid, disaster management, environmental management, and poverty-alleviation (in other words, development practices), and impact, vulnerability and risk minimization (adaptation) practices makes for the emergence of a new “Climate Change Adaptation in Development (CC AID)”<sup>32</sup> discipline.

### **3 The Analytical Framework**

#### **1 Participatory Climate Change Adaptation for Sustainable Development**

*“It is clear that managing resources sustainably on the local level is essential for achieving the global goal of sustainable development; although more macro-level activities are also important, it is the combined impact of the small-scale activities – undertaken by vast numbers of individuals which will determine the fate of many resources and ecosystems, especially in the Third World” (Dharam Ghai and Jessica M. Vivian)*

Developing world coastal communities are subject to increasing risk and vulnerability from anthropogenic climate change. More frequent and intense extreme weather events are causing wholesale damage to marine ecosystems, human settlements

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<sup>32</sup> Climate Change Adaptation in Development (CC AID) is my nomenclature

and infrastructure, threatening the socio-economic stability of entire Caribbean and South island marine-based communities.

To meet this challenge, there have been some impressive advancements in climate change research, and the emergence of invaluable CC-AID methodologies, program planning, and regional and national implementation initiatives. I would contend, however, that the integration of grassroots or participatory adaptation efforts by indigenous community stakeholders, which is, in my view, essential to the adaptation and development process, is being systematically neglected, or appended as an afterthought to adaptation and development strategies. This contention is thoroughly substantiated in Chapters II through IV.

## **2 Institutionally Centralized Adaptation Impedes More Sustainable Grassroots Adaptation**

*“The idea of Development stands today like a ruin in the intellectual landscape. Its shadow obscures our vision.”* Wolfgang Sachs

Several socio-economic, institutional and cultural obstacles impede the genuine pioneering of grassroots adaptation, and the micro-integration of coastal communities into broader municipal/national (meso-macro) and sub-regional (macro) adaptation development strategies to respond to extreme climate variability. In this thesis I propose that these impediments are generated by an epistemological propensity within the development community and adaptation industry toward institutionally centralizing development, and consequently adaptation, research and programming.

I contend that, within most adaptation thinking and programming, international donor institutions, governments and omnibus NGOs identify more with centralized climate change adaptation institutions and macro-programming, and less with more sustainable decentralized community-based adaptation approaches, through indigenous community-based organizations (CBOs), grassroots organizations (GROs), community stakeholders, and collective effort.

I also contend that this centralism leads climate change aid agencies, environmental consulting firms, UN climate change dependencies, and adaptation-oriented environmental NGOs to design remedial adaptation models that fail to identify with more participatory and dynamic, activist-oriented coastal populations and community groups. This argument is empirically supported in Chapters II through IV.

Thus, opportunities for micro-integration of coastal communities into broader meso-to-macro adaptation development strategies may be compromised or ignored altogether. More centralized programs are encouraged to the detriment of self-determined participatory adaptation approaches.

Within civil society, higher learning institutions, and the (environmental sustainability and climate change) development community, there seems to be a surprising absence of community-based adaptation analysis to replace the centralizing policies and programs of adaptation development. It may be that a sort of *Marcusian-style* one-dimensional determinism has eclipsed adaptation development thinking (Marcuse 1964), as within other development disciplines.



Little currency appears to be placed on evaluating traditional community adaptation approaches to repeat what works well (so as not to reinvent the wheel) and identifying purposeful participatory alternatives to best meet the needs and objectives of target coastal communities seeking respite from the ravages of weather extremes arising from present day climate variability<sup>33</sup> in defence of their livelihoods and the ecological commons. Considering their relative isolation from broader adaptation strategies, and with such limited resources, marginalized coastal communities can rarely self-initiate vulnerability and risk reduction initiatives.

### **3 Void in Community Development Thinking, Void in Community Adaptation**

This analytical and consultative research is designed to address the current void in community development thinking related to climate change adaptation (CCA) in the artisanal fisheries and eco-tourism sectors. Within this innovative area of climate change adaptation in development (CC-AID), a systematic analysis of 'macro-adaptation centralism' and 'grassroots micro-adaptation' may advance our understanding.

More importantly, it is hoped this research endeavour will help: formulate meaningful CC-AID programming models/methodologies; and foster the micro-integration of these participatory micro-adaptation approaches, by vulnerable coastal communities in Dominica and the Antilles, into broader municipal, national and regional poverty alleviation and adaptation strategies. If successful, this community adaptation research

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<sup>33</sup> Some reputable organizations such as the the Ecologist or the International Federation of the Red Cross/Res Crescent (IFRC) have suggested that the global environment is already experiencing extreme climate change

will contribute to reducing overall risk and vulnerability to further sustain the target communities' livelihoods and supporting environment.

Research on micro-integration of vulnerable coastal communities into broader poverty alleviation and adaptation development strategies is discouragingly lacking, and corresponding funding mechanisms are only just emerging. Considering that climate adaptation is an emerging programmatic priority for vulnerable communities and many IFIs and UN dependencies, and recognizing that community integration should form an essential part of any adaptation strategy, community adaptation research is essential to further genuine development goals. This is even more so, considering the current void in community adaptation approaches, and the widespread empirical evidence (albeit unapplied) indicating that micro-approaches must be researched and operationalized to effectively reduce coastal community climate vulnerability in the artisanal fisheries and tourism sectors.

With micro-adaptation methodologies developed, these approaches can readily be incorporated into broader adaptation in development strategies and spearheaded via local stakeholders and donors in Dominica and other neighbouring SIDS and vulnerable mainland communities. This is essential because the attainment of Millennium Development Goals, such as eradicating extreme hunger, ensuring environmental sustainability, or achieving universal primary education, 'is directly or indirectly jeopardized by the impacts of climate change' (GTZ Adaptation 2003, p.4, and CICERO 2003:2, p.vi).

It is hoped that this thesis research will allow me to make a lasting contribution to development thinking and praxis in the emerging development discipline of climate change adaptation, in a climate-changing world.

#### **4 Research Methodology**

*With all research methods, conceptualization and operationalization involve an interaction between theoretical concerns and empirical observations.*

(Berg, Bruce L. 2001)

##### **1 Overall Purpose of Commonwealth of Dominica Scott's Head/Soufriere Case Study**

As with most SIDS and OECS member states, the bulk of Dominica's resident population (90%) is dispersed amongst coastal villages, cities and towns. Dominica and all other OECS and OAS member states are located within a hurricane belt.

Scotts Head/Soufriere is a typical Caribbean peri-rural coastal community that relies heavily on coastal fisheries and coastal tourism revenue for its livelihood. The fishery is a primary source of protein and employment especially for low-income coastal communities. In addition, the eco-tourism sector is quickly becoming a primary revenue generator for the island, especially in the target community where this research is being conducted.

However, Dominica's coastal infrastructure, and specialized ecosystems, such as mangroves, coral reefs, sea grass beds, volcanic beaches, and fish species biodiversity, are subject to the impacts of increasing climate variability and consequent risk from

extreme weather events. This has a direct impact on the community's overall socio-economic and environmental sustainability. There is a worrying tendency, by design and default, of international development and macro-adaptation agencies and programs in the region to discount or minimize community-based adaptive knowledge and local expertise. This contention is well substantiated further on in Chapters II through IV. This tendency is occurring in spite of the wealth of traditional and contemporary community-level impact and adaptation knowledge and practices.

Considering the pattern of extreme weather events and vulnerability, and the community's traditional CCA experience, this target region serves as a valuable research case study.<sup>34</sup> It may also serve as a potential program pilot area for the integration of Grassroots Adaptation in Development or GrAD into broader adaptation development strategies in support of sustainable livelihoods and sustainable biodiversity.

## **2 Research Methods**

Currently, Dominica and other Caribbean SIDS do not have sufficient measurable data for a quantitative assessment of climate impacts on the fishery matrix: fishery habitat, fishery resources, fishery economics and fishery sustainability (Mahon 2002: 3). This would require a substantial long-term research investment. One can however, observe patterns by reviewing documented damage reports on infrastructure and economic sectors caused by specific extreme weather events such as hurricanes, landslides and flash floods (see section 3.2.10: *Some Hurricane and Other 'Natural' Disaster History*).

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<sup>34</sup> Please refer to Annex A: *Project Genesis and Target Country Selection* for a detailed review of the genesis of this research project, and the reason for selecting the fishery sector and the Commonwealth of Dominica as the target country

More importantly, there is little in the way of a qualitative analysis of community perceptions on climate change on climate impact information. For this case study, field impact information has been gathered in the form of anecdotal evidence through interviews with representatives of key host national agencies and target communities.

As climate scientists are unlikely to ever make definitive statements about climate impacts, and quantitative climatological, biological, and socio-cultural climate data may or may not become available, SIDS such as Dominica should continue to take a precautionary approach<sup>35</sup> to managing the fishery and tourism sectors.

During the spring and summer of 2003, I conducted a methodical review of contemporary climate change literature, examined program activities and collected and analysed field data related to macro and micro-level climate change adaptation approaches while in the OECS and Commonwealth of Dominica. This triangulated empirical data supports my analysis of 'macro-adaptation centralism' and 'grassroots micro-adaptation.' It has allowed me to formulate conclusions about the relative value, impact and applicability of mainstream macro and grassroots micro-level adaptation approaches, and develop appropriate micro-adaptive recommendations for further consideration.

Preceding my field research, I was required to obtain an ethics review from Saint Mary's University. The proposed field research involved no more than minimum risk or stress as consultations and enquiries conducted over the course of this research were encountered in

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<sup>35</sup> As per Article 15 of the Rio Declaration (1992), '...where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation' (Green Alliance 2002; Climate Adaptation 2003: 60).

the normal routine of the target participants. During community focus group interviews, I assured informants complete anonymity and utmost confidentiality to protect their safety and privacy. Some participants were content to have their comments attributed to them.

### **3 Research Premises**

Within the spectrum of macro-to-micro emergent properties, there are innumerable impediments to coastal community integration into broader climate change adaptation in development strategies. My broad research assumptions include the following:

- Civil society underestimates the immense economic costs resulting from inaction to climate variability versus cost-saving integration of community adaptation methods into broader development strategies;
- There is a lack of institutional mandate or political will to incorporate micro-models within broader development and adaptation strategies.
- Aid programs will tend to deliver adaptation programs from above and outside without adequate input and decision-making from below and inside;
- There are no existing mechanisms to integrate traditional/local environmental knowledge (TEK/LEK) and community impact responses to climate variability into broader national or regional Climate Change Adaptation (CCA) strategies;
- There are socio-cultural variables not factored into adaptation strategies;
- There is a virtual absence of adaptation capacity-building (toolkits/training) at the community and municipal level;

- There is a paucity of adaptation-based resource management and monitoring practices at the community/village/township/parish/municipal level after many years of climate change discourse, and several years of adaptation discussions.

#### **4 Focus Group Research Questionnaire**

Following from these premises, I developed a questionnaire comprised of four research categories: (1) Resources (Perceived) at Risk; (2) Organization and Stakeholders; (3) Traditional and Contemporary Responses; and (4) Impediments and Opportunities. Please refer to Appendix B for details.

#### **5 Field Research Work Plan**

To conduct time-effective field research, I developed a detailed Research Workplan as follows:

**RESEARCH-TO-PILOT WORKPLAN AND TIMELINES**  
**VULNERABLE COASTAL COMMUNITIES AND CLIMATE ADAPTATION IN DEVELOPMENT: A CASE STUDY OF SCOTT'S**  
**HEAD/SOUFRIERE, COMMONWEALTH OF DOMINICA**

**Start** Mid July, 2003 **End** Mid August, 2003 **Timeline** 2-3 weeks (originally 8-10)

<b>DATES</b>	<b>LOCATION</b>	<b>ACTIVITIES</b>	<b>PARTICIPANTS</b>	<b>ANTICIPATED RESULTS</b>
TBD as per funding	Halifax, N.S.	A. Completion of library literature review Completion of sectoral (CCA) literature review Consultations re structure/epistemological approach (analytical, epistemological, relational focus)	Researcher	Epistemological analysis; confirmation of core research issues/ assumptions related to hypothesis/problematique; institutional and socio-economic context
	Ottawa/ Washington	Dominica pre-departure briefing (Centre for Inter-Cultural Learning, Ottawa) Trip preparation (confirmation of dates with host and stakeholders, procurement of trip supplies, travel docs); Briefing with UNDP, OAS, World Bank CCA stakeholders	Researcher	Acquisition of target country briefing information Scheduled visits/interviews
Over research life cycle	Canada/Dominica	Directed field and telecom/remote consultations with Field Reps.	Researcher and field contacts	Cogent research structure and research strategy
TBD as per funding	Barbados/Belize	B. Scheduled interviews with Project Advisor/Project Manager for CARICOM/CIDA's RPIU (ACCC/CPACC), & WB GEF Field Representative in Dominica	Researcher and Reps;	Collection of essential reference documents related to area of research (Caribbean); Sectoral orientation.
TBD as per funding	Roseau, Dominica	Fisheries Division orientation and document collection; In-country introductions via Fisheries Division (MoA &E), etc; Tourism Division orientation and document collection.	Researcher and Hon. Min. of Agric. Vince Henderson & Exec Assistant Ms. Dori Sabien; Permanent Secretary Raymond Austrie & Exec. Assistant Ms. Carol Chambers;	Formal contacts established with stakeholders and support base created for research activities



DATES	LOCATION	ACTIVITIES	PARTICIPANTS	ANTICIPATED RESULTS
			Andrew Magloire, Chief Fisheries Officer; Mr. Aaron Madesetti, Manager, SSMR; Tourism reps; National CCA focal point Colin Guiste	
TBD as per funding	Roseau; Scott's Head/Soufriere	C. Tours of climate impacted community sites/informal institutional visits	Researcher, Fisheries Division, Tourism Reps and community stakeholders	Insight into socio-economic conditions; identification of risk areas/issues and barriers to community adaptation integration
TBD as per funding	Roseau; Scott's Head/Soufriere	D. Numerous reconnaissance, and in-depth institutional visits and interviews	Researcher and various municipal, national, funding and community stakeholders re fisheries/enviro-tourism protection (see org list)	Field insight, collection of core research data; establishment of structural/ procedural info for research; identification of prospective interview participants
TBD as per funding	Scott's Head/Soufriere; possibly other communities	E. Conduct series of 3-4 scheduled collective (community) interviews	Researcher and community reps/ residents	Identification of local knowledge base re climate vulnerability and traditional adaptive approaches; identification of barriers to community adaptation integration
TBD as per funding	Roseau/ Barbados-Washington/ Halifax, Canada	Pre-departure analysis of triangulated data collected; formulate tentative conclusions and recommendations; prepare for repatriation; De-briefing with GEF Reps	Researcher	Report/recommendations at advanced stage of development
TBD as per funding	Halifax, Canada	Completion of final draft; publication and dissemination; develop national and inter-island pilot draft;	Researcher	Incorporation of recommendations into adaptation/development strategies & pilot funding

## **6 Case Study Of Scott's Head/Soufriere,<sup>36</sup> Commonwealth of Dominica (Primary Data)**

This case study was conducted in the Commonwealth of Dominica, with approval from the host agency - the Fisheries Development Division within the Ministry of Agriculture and the Environment. The main purpose of this field research was to collect primary data in Barbados (some key adaptation stakeholders) and Dominica to supplement secondary empirical evidence obtained from my literature review. Local data has helped determine the principal institutional, socio-economic, and cultural impediments to integrating grassroots adaptation development (GrAD) into broader adaptation in development strategies.

Through adaptation program review, and consultative agency and community focus group interviews, this field project has provided the researcher, host agencies, and other SIDSs and prospective funding entities with a clearer understanding of traditional and contemporary adaptive knowledge. This research has allowed me to formulate recommendations that may:

- Support the development of operationally pragmatic and enviro-culturally sensitive climate change adaptation approaches by and for marginalized vulnerable coastal communities; and,
- Foster the methodological integration of coastal communities into broader municipal, national and sub-regional adaptation and development plans.

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<sup>36</sup> Target area also includes neighbouring villages of Pointe Michel (North of Soufriere, Gallion and Bagatelle above and between Soufriere and Scott's Head)

## **7 Institutional Consultations (Barbados)**

En route to Dominica, I conducted a scheduled office interview in Barbados with my Thesis Reader, Dr. Neville Trotz. He was the Project Director for CARICOM's CIDA-funded Caribbean Planning for Adaptation to Climate Change (CPACC) Program. This program was administered within the Regional Project Implementation Unit (RPIU) of the University of The West Indies, Center for Environment and Development (UWICED), in Barbados. This office served as a clearinghouse for all adaptation-related material generated through the GEF-financed, and OAS-administered CPACC and MACC programs within the CARICOM.

Dr. Trotz is currently Program Manager for the World Bank GEF-funded Mainstreaming Adaptation to Climate Change (MACC) program for CARICOM, managed out of Belize. Descriptions and analysis of the CPACC and MACC adaptation initiatives are contained in section 3.2.2: *Review of Macro-Adaptation Programs and Funds*.

While in Barbados, I also had the privilege of meeting Dr. Leonard Nurse, Permanent Secretary of the Ministry for the Environment, senior UNDP GEF Small Grants Program representatives and the senior FAO representatives. In addition, I interviewed the Caribbean Disaster Emergency Response Agency (CDERA) Program Manager regarding the UNDP/USAID funded Caribbean CARICOM disaster management program.

These consultations provided a wealth of current program and institutional information on climate change adaptation and community disaster preparedness for critical analysis. Due to financial and time constraints, I was unable to meet with the World Bank GEF

climate focal point in Washington. I did however consult with Dominica's GEF National Climate Change Focal Point on several occasions.

## **5 Thesis Statement**

Despite impressive advancements in climate change adaptation (CCA) programming, the paucity of community (micro-level) development theory has led to an imperfect coordination of analysis and praxis between mainstream and grassroots climate change adaptation efforts, and a propensity to develop less sustainable macro-remedial adaptation models. Thus, there are significant institutional, economic and socio-cultural impediments to community integration into broader adaptation in development strategies.

Championing participatory micro-adaptation models by and for marginalized coastal communities, and integrating these methodologies into broader adaptation development strategies, will support sustainable livelihoods and ecological biodiversity more effectively.

This is a particularly exigent research task considering the complexity of climate change as a relatively new area of research, the magnitude of climate change variability, the prevailing centralism influencing mainstream development thinking, and the challenge for marginalized or disadvantaged coastal communities and their partners to identify and devise genuine participatory adaptation approaches.

## 6      **Structure of Thesis Argument**

Chapter II represents a comprehensive literature review of pivotal development theories influencing climate change adaptation and participatory development. This review will enable me to construct a theoretical framework of working ideas upon which to examine the mainstream development community's imperfect coordination of analysis and praxis between macro and micro adaptation efforts, and the essential value of mainstream (macro) and grassroots (micro) adaptation.

To better understand the intellectual topography in relation to my problematique, my research is focussed on the following development theories: development and climate change adaptation theory; growth theory in relation to development and climate change adaptation thinking; community-centred participatory development and adaptation; macro-autogenous and micro-endogenous climate change adaptation theories; southern traditional environmental knowledge and western science; the dialectic of objective and subjective social agency and adaptation; and centralism and decentralization related to adaptation practices.

Chapter III provides the field context for my thesis argument. It is comprised of primary empirical evidence collected through a case study in Dominica, and offers critical reflections on the overall socio-economic, cultural and climatic context of marginalized coastal communities in relation to their knowledge of climate vulnerability and risk. This chapter examines communities' traditional adaptive approaches to climate variability, and perceived impediments to their integration into broader municipal, national and regional

adaptation strategies. As well, current meso and macro-level adaptation initiatives in Dominica are analyzed with community adaptation in mind.

Chapter IV is essentially a dialogue between the theoretical framework of working ideas upon which to examine mainstream and grassroots adaptation (literature review), and empirical evidence collected in the field. I provide a comparative critique of existing adaptation funds and programs from macro to micro. These include macro-meso remedial efforts such as: the World Bank GEF and CIDA funded Caribbean Program for Adaptation to Climate Change (CPACC) and Mainstreaming Adaptation to Climate Change (MACC) programs in the Caribbean; UN and donor agency adaptation policies and funds including COP7, GTZ, VARG, DFID, the Netherlands, AusAID, JICA, UNFAO, and the UNDP; and development banks like the World Bank and Inter-American Development Bank (IADB). Meso-level and grassroots climate adaptation programs are also evaluated and compared.

This chapter seeks to justify the three premises of my thesis argument. First, despite impressive advancements in climate change adaptation (CCA) programming, the paucity of community (micro-level) development theory has led to an imperfect coordination of analysis and praxis between mainstream and grassroots adaptation efforts, and a propensity to develop less sustainable centralized and externally driven macro-remedial adaptation models. Second, there are significant institutional, economic and socio-cultural impediments to community integration into broader adaptation in development strategies. Third, that the championing and integration of participatory micro-adaptation models by marginalized coastal communities into broader adaptation development strategies supports sustainable livelihoods and the commons more effectively.

Chapter V concludes that this research confirms the aforementioned thesis statement. In this chapter, I have also formulated conclusions and recommendations (see Chapter V) for use by host governments, donor agencies, and implementing agencies/vulnerable communities, in support of participatory micro-integration of vulnerable coastal communities into broader adaptation and development strategies.

## **7 Research Results and General Conclusions**

This thesis research reveals that in spite of the impressive array of international adaptation in development efforts, there is an overwhelming lack of analysis and recognition that sustainable results would be best achieved by integrating transformative, decentralized, and community participatory adaptation in development.

This thesis also attempts to demonstrate that by marrying traditional adaptive practices with contemporary methodologies, and incorporating endogenous grassroots adaptation approaches into broader township, municipal, national (NAPAs), and even sub-regional adaptation strategies, marginalized coastal communities become less vulnerable to variable climate impacts. Adaptation development, and its community corollary -- grassroots adaptation development (GrAD)<sup>37</sup> -- when supported by adaptation risk consciousness-raising (ARC) have the potential to galvanize local resources and channel traditional environmental knowledge (TEK) and contemporary adaptive practices for effective risk management.

With the development and integration of participatory micro-adaptation policies and strategies, human settlements will be safer, fisheries-dependent eco-systems better

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<sup>37</sup> GrAd, ARC & TEK to be defined and explained further below

managed, and the artisanal fishery more sustainable. It is also hoped that the integration of grassroots micro-adaptation in poverty alleviation, humanitarian assistance, and disaster preparedness policies, strategies, and programming may facilitate improved coordination between international cooperation, and local and national authorities in vulnerable coastal communities in the Commonwealth of Dominica and other neighbouring island states.



## Chapter II

### Climate Change Adaptation and Development: A Review of The Literature

#### 1 A Critical Ontology of Climate Change Adaptation (CCA)

I would contend that the mainstream development community's and climate change industry's instrumentalist and centralist approach to adaptation, and almost isolationist attitude toward grassroots participatory adaptation, is explained by a profound paucity of development theory analysis, or what Foucault would call a "critical ontology" (History and Totality 1989: 183). This, I will substantiate in Chapters III and IV.

There may be some disagreement about whether an 'adaptation industry' actually exists, and in turn, whether one can actually critique the shortcomings of a fledgling industry or movement for adaptation awareness. I would posit that the adaptation industry is well beyond fledgling considering it has sustained policy discussions at the highest levels in governments, overseas development agencies, and UN institutions, and it has allocated substantial resources for numerous adaptation programmes over a prolonged period (about a decade, when vulnerability and adaptation assessments were first undertaken within the GEF-funded National Communications in the mid 1990s).

Ideally, development theory and praxis should be multi-dimensional, support a political economy analysis, and drive transformative goals that are universal in spirit and theory, but diverse in praxis. However, this ideological paucity within the adaptation and

development community severely limits the possibilities for micro-level community adaptation, and transformative sustainable development.

Inspired by Noam Chomsky (author of *Manufacturing Consent*), and in the context of current development theory and praxis, I would suggest that, at no point in recorded human history has there simultaneously existed the means to communicate such great concentrations of development knowledge, and such immense manufactured ignorance about societal development and collective community involvement.

Current development and climate adaptation (risk management) policies and programs seem to be quite removed from community development principles. As Wolfgang Sachs bluntly states: "The idea of development stands like a ruin in the intellectual landscape." (Sachs 1993: Intro) World development priorities have now shifted from the economically deterministic growth for progress theory of the post-war era, and have been replaced by an almost messianic emphasis on "the redistribution of (economic) risk rather than the redistribution of wealth" (Sachs 1992: 3).

This issue of 'distributive justice is "finessed" by the claim that aggregate growth will do more for the poor than redistributive measures' (Daly 1996: 51). Yet, despite almost 60 years of post-war growth and 'development' effort, "the number of people subject to extreme poverty has and continues to increase dramatically. Many are now faced with accelerating environmental degradation, coupled with a growing immediate need to utilize natural resources to survive" (Nelson and Wright 2000: 157).

Arturo Escobar asserts that the very 'system' of development discourse that has emerged in the past fifty years has remained largely invariant (Escobar Winter 1984-85). David

Moore retorts, "The silences in this (development) discourse are deafening" (Moore 1995: 195, P.18). Veltmeyer posits that "(a)t worst, the development project was not designed to benefit its stated beneficiaries. One reason ... is that the underlying problem is often misconstrued and its major structural conditions no matter how well defined are inadequately explained" (Veltmeyer 2003: 4).

Baker explains the impotence of the development scheme, and the divorce between society and environment on the basis of Hobbesian classical sociological theory, "science was invoked as the preferred intellectual perspective, and the Newtonian linear, reductionist logic that followed was applied to an understanding of society as a "thing." The problem of (social) order came to be rephrased in terms of the problem of integration, and the intellectual perspective that generated it was dubbed functionalism. The functionalist approach ignored the relationship between society and its environment, and that between society and its history" (Baker 1994: 6).

The need to combat poverty by IFIs and bilateral donors can be historically traced back to the World Bank's Development Report (1973) published under the Presidency of Robert McNamara (Veltmeyer 2003: 3). The World Bank first paid attention to the question of poverty alleviation<sup>38</sup> under the tenure of Robert MacNamara between 1968 and 1981. However, the Bank's institutional concern for poverty reduction was largely abandoned between 1981 and 1986 under President Alden Clausen (Long 2001: 21). In fact, according to the *World Bank Task Force Wapenhans Report on Portfolio Management*, 'more than a third of all Bank projects were considered failures by its own criteria' (Gray,

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<sup>38</sup> It is interesting to note as part of the development philosophy that the vast majority of development banks and aid agencies refer to poverty alleviation or poverty reduction as their primary mandate, as opposed to poverty eradication.

1998 in Long 2001: 33), with 11% unsatisfactory project completion in 1981 to 37.5% by 1991 (ibid).

## 2 Growth Theory and Climate Change Adaptation Approaches

*The growth of the economic subsystem is limited by the fixed size of the host ecosystem.* (Herman Daly, Growth 1996)

Adaptation policies and programs are a difficult priority for tiny debt-laden developing nations attempting to compete in regional and international trade zones, while struggling to manage crippling debt loads. In this context, “(w)ithout a just and lasting solution to the foreign debt problem, the countries of Latin America and the Caribbean will be unable to achieve sustainable economic and environmental development” (Countries of Latin America and The Caribbean 1990).

Former World Bank expert Herman Daly explained this international debt impasse as “a clear symptom of the basic disease of growthmania” (Daly 1996: 38). As one scholar poignantly stated in reference to North-South equity and development, “The greatest distance between the developed and developing world is economic.”<sup>39</sup>

The absurdity of infinite growth has been the most carefully ignored anomaly in the paradigm of modern economics (Daly 1996: 33,187). John Stuart Mill, in his *Principles of Political Economy* (1873), stated that we must protect nature from unfettered growth if we are to preserve human welfare before diminishing returns begin to set in.

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<sup>39</sup> Dr. Anthony O'Malley, Professor Adjunct at Saint Mary's University, Halifax, Nova Scotia, Canada

In 1955, Arthur Lewis described his developmental growth theory in terms of pure economics, not equity, when he said: “First it should be noted that our subject matter is growth, not distribution,” (Sachs 1992: 12).<sup>40</sup> According to Daly, the term rose to the prominence of a mantra – or a shibboleth – following the 1987 publication of the UN-sponsored Brundtland Commission Report, *Our Common Future* (Daly 1996: 1).

With the post-war creation of the World Bank in 1944 until the 1980s, its purpose was to make loans, with a broad goal to promote economic growth. By 1990, it announced that its major objective would be ‘poverty reduction’ (Long 2001: 100). However, as recently as 2002, the World Bank notes in its *Annual Development Report*, ‘without growth there is nothing to trickle down or redistribute to the poor’ (Veltmeyer 2003: 14). It is this deterministic logic that blocks the Bank from acknowledging limits to growth, precisely because growth is viewed as the primary target for poverty alleviation.

Hence, it can be disputed that, “development practice has long been dominated by the positivist (especially economic) paradigm, in which we seek to discover the true nature of reality to predict and control natural phenomena” (Nelson and Wright 2000: 157). Consequently, throughout the first *UN Development Decade* (1960-1970), centralized economic growth seemed to be the primary developmental focus.

Today, the buzzword “sustainability,” which emerged during the post war phase, is used to reinforce Growth Theory. As David Moore writes in his book *Debating Development Discourse*, “(T)he term was almost synonymous with ‘order:’ the hope was for ‘sustained growth,’ meaning economic growth that would not be destroyed in the entrails of the social chaos it engendered.” He goes on to say, “(t)hat the meaning has remained, but it

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<sup>40</sup> Lewis: *The Theory of Economic Growth*, Homewood, Ill: Richard D. Irwin, 1955

has been added to by the environmentalism which emerged in the 1960s and 1970s: ... as one reads of attempts to keep the environment in a good enough condition to maintain economic growth well into the future..." (Moore 1995: 4). Using a political economy approach, Redclift explains that the emphasis of sustainable development is placed on "the structural determinants of local-level decision-making, at the local, national and international levels." ... "Most policies designed to tackle development problems, including those which fall within the 'sustainable development' idiom, are essentially production-oriented" (Ghai and Vivian 1992L: 23,25).

Furthermore, in most countries, particularly in developing ones, there is an overwhelming propensity to collect quantitative macro-economic data. Surprisingly few qualitative social indicators are used, except for standardized demographic information such as education and vital statistics. As Herman Daly posited: 'a shift in emphasis from the economic norm of quantitative expansion (growth) with that of qualitative improvement (development) as the path of future progress' would be "resisted by most economic and political institutions, which are founded on traditional quantitative growth and legitimately fear its replacement by something as subtle and challenging as qualitative development" (Daly 1996: 1).

Thus, there is a tendency for development planners to interpret development conditions in economic terms, and make status quo normative assumptions about social factors, as though these assumptions factually represent the reality of the target population. In contrast to this status quo assumption, in 1995 several renowned economists and ecologists signed a statement entitled *Economic Growth, Carrying Capacity, and The Environment*, published in the journal *Science*. Their consensus was that (1) "the [environmental] resource base is finite," (2) "there are limits to the carrying capacity of

the planet,” and (3) “economic growth is not a panacea for [diminishing] environmental quality” (Daly 1996: 10). From a purely economic standpoint, growth in this physical sense can be anti-economic – that, at the margin, throughput growth may cause environmental costs to increase faster than production benefits, thereby making us poorer, not richer (Daly 1996: 11).

Thus deterministic growth development (versus development growth) appears to be the overriding ‘normative’ concept permeating the field of development, and by reasonable extension to the field of climate impact and adaptation.

### **3 Community-Centred Participatory Adaptation**

*“It is indoubtable that every (person) wishes to better (their) condition.”<sup>41</sup>*

(Adam Smith or Kenneth Lux)

#### **1 Terms Defined: Their Development History and Meaning**

Before addressing the question of micro-community adaptation, we must first understand the quintessential value of the following concepts: ‘community,’ ‘culture,’ ‘sustainability,’ ‘participatory development,’ ‘impediments,’ ‘integration,’ and ‘mainstreaming,’ and how these concepts relate to the field of adaptation.

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<sup>41</sup> My parenthesis

## *Community and Adaptation*

*'Community Development' is: "the process by which the efforts of the people themselves are united with those of governmental authorities to improve the economic, social and cultural conditions of communities, to integrate these communities into the life of a Nation and to enable them to contribute fully to national progress"* (UN Definition: Nelson and Wright 2000: 117).

A primary focus of this research is the analysis and relevance of 'participatory community adaptation' as an essential contribution to sustainable development. I have already defined adaptation above (see Section 1.2). Next, I will define 'community,' being that this research acknowledges *community as the primary agent for social adaptation*.

Historically, the community development movement, like its French counterpart, 'Animation Rurale,' had its origins in the late colonial period in Africa, with its cultural condescension by urban-schooled western elites pronouncing on the need to help a rural unschooled mass" (ibid, 116). Today, as with 'culture', the term "community is a concept often used by state and other organizations, rather than the people themselves, and it carries connotations of consensus and 'needs' determined within parameters set by outsiders" (ibid, 15).

Eyben and Ladbury describe 'community' as "a word that generates a good feeling in an observer" (UN 1975: 31). "Community" has been defined as "the lowest level of aggregation at which people organize for common effort." Another definition of community put forward by the same source states: a "community" implies a locally run polity whose leaders and problems are known to its members" (ibid, 61).



### *Culture and Adaptation*

An understanding of the concept of culture, and a profound appreciation for and awareness of the complexities of a given culture is integral to the successful implementation of any development activity, including micro-adaptation efforts.

For instance, identification with cultural and spiritual animators enables disadvantaged communities to galvanize their resources through community action and self-discovery. As Majhid Rahnema eloquently states: The spiritual dimension 'has produced a staggering contagion of intelligence and creativity, much more conducive to people's collective 'efficiency' than any other conventional form of mass mobilization (Sachs 1992: 127). Laura Macdonald insists that "...any authentic approach to participation must respect the traditions and desires of the 'target population,' and must involve substantial transfer of power to that population. Robert Chambers talks about 'handing over the stick' or a visible transfer of power to legitimize knowledge of the marginalized (Nelson and Wright 2000: 12).

### *Sustainability and Adaptation*

*"Like 'motherhood' and 'God,' (the concept of) sustainable development is invoked by different groups of people in support of various projects and goals" (Redclift in Grassroots Environmental Action 1992)*

If the 1980s were considered by many to be 'the lost decade for development,' with a doubling of least developed countries (LDCs) resulting from the 'adjustment

process,' the 1990s became the decade of 'sustainable development,' for 'our common future,' as prescribed by the Brundtland Commission in 1987 (Sachs 1992: 16). It should be noted that unlike the pure economic growth theory mentioned previously, *Our Common Future* places emphasis of the discussion of sustainable development on human needs, rather than on the trade-offs between economic and biological systems" (Ghai and Vivian 1992: 29). Although this emphasis on human need was encouraging, Brundtland had 'little to say about popular participation in environmental management at the local level' (ibid: 38).

According to the 1987 World Commission on Environment & Development (par.2.1), the definition of "Sustainable Development" is: "Development that meet the needs of present generations without compromising the needs of future generations." In the 'North's' relationship to the 'South,' Daly suggests that the North needs 'to attain sustainability in the sense of a level of resource use that is both sufficient for a good life for its population, and within the carrying capacity of the environment if generalized to the whole world" (Daly 1996: 3).

John Stewart Mill recognized that " a stationary condition of capital and population implies no stationary state of human improvement." Mill was actually arguing for sustainable development – development without growth – that is qualitative improvement without quantitative increase (Daly 1996: 3). Thus, Daly would probably agree that "sustainable growth" (within an economy as a subsystem, Daly 1996: 7) is an oxymoron.

Questions remain regarding what exactly constitutes genuine sustainability, and what methodologies may be best suited to foster sustainable development practices within the realm of adaptation. According to Sachs, in the mainstream the "sustainable

development” paradigm has been explicitly conceived as a strategy for sustaining ‘development,’ not for supporting the flourishing and enduring of an infinitely diverse natural and social life (Sachs 1992: 6). Notably, “the green-house effect and the depletion of the ozone layer, are not the product of scarcity but of reckless and unsustainable production systems” (Ghai and Vivian 1992, p.32).

Daly is equally concerned when he suggests “the greenhouse effect, ozone layer depletion, and acid rain all constitute evidence that we have already gone beyond a prudent Plimsoll line for the scale of the macro-economy” (Daly 1996: 57). Reclift warns “unless the political and economic relations that bind the developing countries to the developed are redefined, sustainable development will prove a chimera” (Ghai and Vivian 1992: 30).

#### *Participatory Development and Adaptation*

*‘Participation’ “has become the dominating ideology in contemporary thinking in both non-governmental organizations and governmental/inter-governmental agencies.”<sup>42</sup>*

Over the years, the United Nations Research Institute for Social Development (UNRISD) ‘has been instrumental in propagating a community-based, socially inclusive and participatory form of sustainable development’ (Veltmeyer 2002: 24). The Oxford Dictionary defines “participation” as: ‘the action or fact of partaking, having or forming a part of.’ As Majhid Rahnema explains, “participation can be either transitive or intransitive ... immoral or amoral, either forced or free’ (Sachs 1992).

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<sup>42</sup> Development practitioners and authors Chambers 1994, Hussein 1993, Cernea 1985; Poulton and Harris 1988; Oakley et al 1991

Perhaps the best expression of “popular participation” was articulated in the African Charter on Popular Participation, defined during the International Conference at Arusha, Tanzania, that was released simultaneously with the liberation of South Africa’s Nelson Mandela. They defined it as: “(T)he empowerment of the people to effectively involve themselves in creating the structures and in designing policies and programmes that serve the interests of all as well as to effectively contribute to the development process and share equitably in its benefits” (African Charter 1990, in Long 2001: 1, 25).

It has been said by many development practitioners and authors (Chambers 1994, Hussein 1993, Cernea 1985; Poulton and Harris 1988; Oakley et al 1991) that ‘Participation’ “has become the dominating ideology in contemporary thinking in both non-governmental organizations and governmental/inter-governmental agencies.” But, “(t)oo often, homogeneity of interests is assumed...” (Nelson and Wright 2000: p15). This idealized notion of community homogeneity “is a real barrier to understanding the dynamics of participation” (Nelson and Wright 2000: 170). “Participation’ is a multi-dimensional concept meaning different things to different people” (ibid: 170).<sup>43</sup> Nici Nelson and Susan Wright explain that, “Just as writers of projects and documents may use unexamined concepts of ‘community,’ so they may use vague definitions of ‘participation’” (Nelson and Wright 2000: 15).

Chambers elucidates the various meanings of ‘participation’ as follows: “There are three main ways in which ‘participation’ is used. First, it is used as a cosmetic label, to make whatever is proposed appear good. Second, it describes a co-opting practice to mobilize

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<sup>43</sup> Hussein in Participatory Ideology and Practical Development: Agency Control in a Fisheries Project, Kariba Lake, Power and Participatory Development 2000

local labour and reduce costs. 'They' (local people) participate in 'our' project. Third, it is used to describe an empowering process that enables local people to do their own analysis, to take command, to gain confidence, and to make their own decisions (ibid: 30).

Considering the various meaning of 'participation,' Pretty and Scoones recommend that the term "should always be qualified by reference to the type of participation, as most types threaten rather than support the goals of sustainable development" (ibid: 159). Hussein reiterates this concern with the statement that "both 'NGO' and 'participation' are dangerously close to becoming buzzwords, rhetorical terms without theoretical clarity or practical content" (ibid: 190).<sup>44</sup>

The emergence of 'participatory development' came in the late 1950s when social activists recognized that development projects were failing because they removed populations from the design and implementation stages. As Chambers put it, there was "recognition that many development failures originate in attempts to impose standard top-down programmes and projects on diverse local realities where they do not fit or meet needs." "The big shift of the past two decades has been from a professional paradigm centred on things (infrastructure) to one centred on people (community) (ibid: 32).

Even McNamara, then President of the World Bank admitted that 'growth (was) not equitably reaching the poor' (Sachs 1991/2: 117). As such, World Bank analysts

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<sup>44</sup> Hussein makes a historical and conceptual distinction between: 'relief and welfare NGOs' (whose immediate goal is the immediate alleviation of suffering); 'development NGOs' (promoting long-term change and increased capacity to satisfy target populations needs), and 'community development NGOs' (committed to developing the capacities of people to better meet their needs through self-reliant local action. Hussein in *Participatory Ideology and Practical Development: Agency Control in a Fisheries Project, Kariba Lake, Power and Participatory Development* 2000: 184/85);

concluded that '(t)he long-term sustainability of projects is closely linked to active, informed participation by the poor' (Annis 1987: 25). Thus, the World Bank's *Working Group on Participation* 'stresses the importance of empowerment which entails sharing power and raising the level of political awareness and strength for disadvantaged people.' However, aid agencies including the World Bank continue to have difficulties with this as an explicit project objective. (Nelson and Wright 2000: 195).

As Carolyn Long of the Institute for Development Research pointed out, '(World Bank) staff simply do not see participation as a strategic issue' (Long 2001: 99). Fowler suggests that the aid community sees participation 'as a symbolic act required for bolstering (competitive) proposals, not a core feature of a process of engagement' (Fowler 2000: 24). He goes on to suggest that foreign aid can: focus NGDO attention on financiers at the cost of local constituents, favour imported models over local knowledge, generate self-censorship of Non-Governmental Development Organizations (NGDOs) concerned about risking financial exclusion, and promote patron-client behaviors, and encourage donor dominance (Fowler 2000: 26-27). Furthermore, donor sectoralization channelled through NGDOs corresponds to donor priorities, and not necessarily field needs.

The World Bank has established a number of participatory development resources over the years. These include reports on the 19 'presidential flagship' projects in 1995 focussing on participation of the poor, discontinued a year later; the US\$4 million Fund For Innovative Approaches in Human and Social Development (FIAHS) in July 1994, discontinued in 1997; and the creation of the Inter-Agency Group on Participation (IGP) to encourage in-country learning that would rely on collaboration among national governments, civil society and international organizations.

IGP initiatives such as PAL (Participatory Action Learning Program), and LAMP (Learning and Action to Mainstream Participation) were designed to 'enable poor and marginalized groups to have a voice in the design and implementation processes of development assistance programmes.' However, all IGP initiatives were quickly abandoned and not assessed (Long 2001: 36-38). Of the Bank 'participation of the poor' projects initiated under Wolfensohn's presidency, none survived more than one or two years (ibid).

With the World Bank being a primary proponent of what critics call 'exclusionary neoliberal policies,' its support of the fundamentals of participatory development is seriously undermined and questioned by grassroots development activists and community development critics. According to Veltmeyer, there is virtual consensus in the academic literature that 'the neoliberal model (of IFIs such as the World Bank) is profoundly exclusionary' (Veltmeyer 2003: 4).

The post-war use of the concept of 'participation' continues to view 'people as objects of a national programme of development, and their participation in projects often meant contributions in the form of labour, cash or kind.' "Yet, these material incentives distort perceptions, create dependencies, and give the misleading impression that local people are supportive of externally driven initiatives." (Nelson and Wright 2000: 2, 159). As Curtis argues, "this 'assisted self-help' has become the essential formula around which the rhetoric of community development is aired" (ibid: 117). Thus, the "blueprint approach to development planning remains the conventional (development) wisdom" (ibid: 158).

There is a wide body of empirical evidence that suggests that participation fosters attitudes that promote legitimacy for government, thus providing the basis for institutionalization and national integration (ibid: 14). Resolution 1747 (LIV) of 16 May 1973, recommended that the Government of Member States of the UN should “encourage wide popular participation and co-operation in the development process – in setting the goals, implementing the plans and enjoying the benefits of development.”

The discursive practice of participation and sustainability was a key part of the social movement which culminated in Paris’s May 1968 (Moore 1995: 26). Consequently, during the Second UN Development Decade (1970-1980), this groundswell of bottom-up political movements worldwide caused a leftward shift in mainstream development thinking toward participatory self-sufficiency, “rather than depend on top-down state provision of services (Nelson and Wright 2000: 3).

Thus, the concept of participation was highlighted in a UN Report entitled ‘Popular Participation As A Strategy For Promoting Community-Level Action and National Development.’ Paragraph 6 of UN Economic and Social Council Resolution 1929 (May 1975) directed the Secretary General to: give priority to “(r)esearch and study that will lead to the development of a viable concept of, and policy measures for popular participation that will enhance its effectiveness in the implementation of the International Development Strategy for the Second United Nations Development Decade, and future global strategies” (UN 1978: 1).

Many developmentalists trace donor interest in participatory action to the *World Conference on Agricultural and Rural Development* in 1979, led by the UNFAO (Long 2001: 1). Here, the UN finally made the link between development and popular



participation. This position was crystallized in the report's introductory statement: "The socio-economic and political structure of a nation has a direct bearing on the level and quality of popular participation as practised by its people. Popular participation, it is now recognized, makes an important contribution to development, as well as being directly influenced by it" (ibid: 2).

Although the mainstream development community continued to support the primacy of economic growth or "increased production of material goods and services," the notion of social development quickly emerged with its emphasis on "change in the distribution of material goods and in the nature of social relations." Thus, in 1975 the UN definition of "popular participation" resulted: "(A)ctive and meaningful involvement of the masses of people at different levels (a) in the decision-making process for the determination of societal goals and the allocation of resources to achieve them, and (b) in the voluntary execution of resulting programs and projects" (ibid: 4).

The resulting dual notion of market growth and social determinism in the 1970s and onwards was reflected in a statement by Prof. Gerald Helleiner: "Poverty reduction, as perceived by the disadvantaged themselves, ... requires not only improvement in material income but also increased security and empowerment of voice" (Thirty First Annual Meeting, Caribbean Development Bank News 2001).

In the 1980s "discussion began on why thirty years of conventional technocratic, top-down forms of development were not working" (Nelson and Wright 2000: 3). Pressures towards reform gave way to a widespread search for an "alternative form of development that was participatory and sustainable, as well as more socially inclusive and equitable (Rahman, 1991, Veltmeyer 2003: 11). In the 1970s through early 1980s, bilateral and

multilateral development agencies “incorporated these third sector ‘civil society’<sup>45</sup> NGO organizations into the development process as partners” (Veltmeyer 2003: 28).

Conversely, in the mid 1980s through 1990s Overseas Development Assistance (ODA) organizations reduced their reliance on civil society and community NGOs/CSOs “to incorporate the ‘private sector’ of civil society into the development process: (to tap) the considerable resources, technology, competencies, creativity and global reach of the business community and employing these for development ... goals” (Utting 2000: 1; Veltmeyer 2003: 29).

The UNDP was one of several ODAs that assumed this responsibility of incorporating private sector interests (see 1989 Policy Framework Paper on *The UN Business Partnership*). ODAs for the most part advocated a form of tripartism – a ‘collaborative triangle’ between ‘the public sector, private business and civil society’ (Atal and Yen 1995; Bessis 1995; Reilley 1989, Veltmeyer 2003: 58).

After over two decades of diminished focus on civil society and community, and increased emphasis on commercial involvement in development, the majority of disaster preparedness and vulnerability and risk reduction efforts today focus much of their attention on host national and business stakeholders, minimizing community interests and participation.

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<sup>45</sup> A term coined in the early 1900s by Antonio Gramsci, a Russian Revolutionary. It is roughly defined as non-governmental social groups who are expressing their self-determined and collective interests. Today, civil society encompasses NGOs, trade unions, women’s groups, peasants and farmers, academics, human rights groups, community-based organizations. Private sector was also added in the 1980s as international donor affiliations with NGOs were being minimized. According to the UNRISD definition of civil society in the context of poverty reduction, “civil society can be understood as the realm of citizen’s informal and formal private associations to pursue non-economic interests and goals” (Fowler 2000: 3). This second definition of civil society is the operation definition used throughout the thesis.

### *Impediments to Micro-Adaptation*

At the macro-level, the centralizing tendencies of hierarchical management structures within mainstream donor agencies, development banks and host governments heavily influence policy on civil society access to the development process, and project ownership, and generally restrict community involvement.

For the World Bank, 'participation (of target populations<sup>46</sup>) in project formulation and in project evaluation remains very low ... with achievements heavily dependent on the personal interests of staff and management involved, rather than the result of organizational incentives and systems' (Long 2001: 53).

Poverty, lack of skills, and undeveloped social institutions inhibit the capacity to adapt to climate variability and extreme weather events (Burton and van Aulst 1999: 5). GNP is another powerful impediment or facilitator of impact and vulnerability reduction "since it substantially determines a country's capacity to adapt" (ibid: 16).

At the micro-level, poor people are by definition asset-poor, and are therefore highly dependent on public or common resources. This resulting dependency on unreliable government resources creates a certain impediment to the community instigating its own participatory adaptation efforts. Furthermore, regulatory laws may actually restrict what a community can do independently of government, to respond to the ravages of climate extremes, and local development needs.

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<sup>46</sup> My addition

### *Integration and Adaptation*

UNESCO first defined 'integrated development' as: 'a total, multi-relational process that includes all aspects of the life of a collectivity, of its relations with the outside world and of its own consciousness' [UNESCO, Plan a Moyen Terms (1977-1982), Document 19c'4, 1977]. During the second UN Development Decade (1980s), cross-sectoral 'integration' appeared to be the key linking the social with the economic, along with participative development (Sachs 1992: 14). According to Norwegian development cooperation, development integration 'can take place through addressing, more explicitly, such factors aimed at strengthening local livelihoods and capacity, through the framework of existing strategies, programmes and tools' (CICERO 2003: vi).

At a macro-meso regional level, particularly with island states, there is a constant tension around the question of regional integration. In the sixties and seventies, a plethora of economically inclined integration movements emerged. In Latin America, it was the Latin American Free Trade Association (LAFTA). Within this regional movement came an LDC sub-group known as the Andean Pact. Another Latin American regional movement was the Central American Common Market (CACM). In the Caribbean, the West Indies Federation was created. "The West Indies Federation was established in large part to overcome the obstacles to development which were seen to be the result of small size."

Although other priorities such as foreign policy, social services, and culture were considerations, a neoclassical economic perspective, or 'collective approach to import substitution' was the underlying motive for the regional formation of CARIFTA (Caribbean Free Trade Association Agreement) in 1968, and for CARICOM (Caribbean

Common Market) in 1973 (Boxill 1997: 44). There are fourteen member countries in CARICOM. They are as follows: (LDCs) Antigua and Barbuda, Belize, Dominica, Grenada, St. Lucia, St. Vincent, St. Christopher (Kitts) and Nevis, Montserrat; (MDCs) Barbados, Guyana, Jamaica, Tobago, and Suriname; and the Bahamas.<sup>47</sup>

In spite of 'regional integration efforts,' there have been and continue to exist varying levels of international cooperation, trade, and political and social links between largely western states (particularly extra-regional colonial mother countries), and their dependent island states (Boxill 1977). Thus, the states of Guadeloupe and Martinique rely on and are heavily influenced by trade ties with France, as well as some immigration ties with Canada due to the French language.<sup>48</sup> Jamaica's economy and foreign policy are strongly 'attached' to the US, UK and Canada. Saint Lucia's import/export markets are strongly accountable to UK, US, Canadian, and French Protectorate (Martinique and Guadeloupe) markets. Dominica's economy is trade-dependent on the US, UK and Canada. Considering the aforementioned, regional integration may be as important to the success of CARICOM's adaptation efforts, as it is to the region's trade dynamic.

In the case of Dominica, it has been argued that this nation's economic and social status were undermined by foreign intervention or forced integration (Honychurch 1995), from the 'outside' and 'above'. "Like virtually all Caribbean islands, Dominica found few opportunities in the past to pursue an indigenous program of development, while external

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<sup>47</sup> The categorization of LDCs or Less Developed Countries, and MDCs or Middle Developed Countries are CARICOM defined designations. The World Bank defines Dominica as a 'lower middle-income SIDS,' 'Middle-Income Country' or 'poor country' depending on its statistical model (see World Bank Dominica 2001). Haiti is the only internationally (UN, IFI, ODA) recognized least developed country (LDC) within the Caribbean.

<sup>48</sup> Most Dominican emigrants have gone to Martinique and Guadeloupe, Canada, the UK and US.

influences still heavily dominate growth and development patterns” (Country Environmental Profile 1991: 1).

As Trouillot<sup>49</sup> explained, Dominica is underdeveloped “not because of its feeble ties with capital but because of its forced integration within the world economy” (Baker 1994: 5). Baker reinforces this point of ‘forced integration’ “as centripetal and centrifugal forces from the metropole continuously play havoc with their (Dominica’s) efforts” (ibid: 15). Dominica, to use Brazilian President Cardoso’s distinction, moved from a situation of overt political dependence to one of “structural dependence where there is no direct determination of any policies by metropolitan states or companies, but nevertheless an indirect determination through a particular trade structure, through capital movements (and) communication flows” (ibid: 186).

As well, pan-regional antagonism between competing island states in the Caribbean basin has caused undue strain on the integration movement. For instance, “(a)s a result of perceived intransigence by the MDCs, the LDCs opposed suggestions by the MDCs for deepening the (integration) movement. As far as they were concerned, deepening the integration process would only worsen the already polarized situation and work to the benefit of the MDCs” (Boxill 1997: 46).

Resulting from this intra-regional antagonism and ‘skewed level of economic development’ came the creation of a regional sub-group of island states comprising the LDCs from the Eastern Caribbean. This association called itself the Organization of Eastern Caribbean States or OECS (ibid: 48). Within the risk management realm, the

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<sup>49</sup> A prolific writer on Caribbean history and political economy

OECS has developed its own unique impact and adaptation programming to respond to OECS sub-regional needs and expectations.

### *Mainstreaming Adaptation*

*The ration of words to action is weighted too heavily towards the former.*  
(UNEP Ten-Year Report, 1984).

The Webster Dictionary, 1996 defines mainstream as: ‘the principal or dominant course, tendency, or trend.’ There are two distinct but potentially complementary definitions of mainstreaming development and climate adaptation. The first ‘instrumentalist’ definition of mainstreaming is used primarily by larger IFIs and donor agencies, referring “principally to making more routine those practices by us, as donor institutions and development implementing organizations, whose effect is the fuller engagement of people in their society’s decision-making processes (USAID definition, La Voy and Charles 1988, in Long 2001: 17).

The World Bank Working Group defines mainstreaming as: “(T)he full and systematic incorporation of a particular issue into the work of an organization so that it becomes an accepted and regular part of the organization’s policies and practices” (Long 2001: 18). The World Bank Learning Group on Popular Participation (launched in December 1990), combined its understanding of ‘mainstreaming’ and ‘participation’ in its 1994 Final Report and Action Plan entitled: *The World Bank and Participation, and Immediate Actions to Mainstream Current Bank Work on Participation*” (Long 2001: 28). This Report and Action Plan clearly focuses on mainstreaming the Bank’s priorities, not the field’s.

The second 'transformational' definition of mainstreaming adaptation, the approach embraced in this thesis research, that would likely be used by grassroots organizations is as follows: The popularizing of specific social-political and economic issues and/or practices through local decision-making, by and for target communities via their primary partners, stakeholders,' and the broader community membership.

#### **4 Macro-Exogenous and Micro-Endogenous Models of Adaptation**

The term: 'third world,' which seems to engender paternalistic views of the South and legitimize exogenous or foreign intervention to aid the South, was invented by the French in the early 1950's to designate embattled territory between the two superpowers (Sachs 1992: 3). Sachs explains that the perception of the advantaged ('developed') and disadvantaged ('underdeveloped') state entered the public psyche following an inaugural speech by Harry S. Truman who declared the Southern hemisphere as "under-developed areas." It was this centrist view of development, Sachs argues, that fuelled western interventionism and exogenous development 'to' the South.

During the UN's Second Development Decade (1970-1980), the quest for a unifying development principle was motivated by the failure to fulfill basic human needs during the UN's first Development Decade. Human-centred development (eg. Dag Hammarskjold Foundation), diversity, and self-reliance became core considerations within the international development community. In the mid-seventies, Experts at UNESCO decided to promote the concept of 'endogenous development' which rigorously critiqued Rostow's hypothesis of industrial determinism and development 'in stages,' replacing these ideas with a full account of nation-state's particularities.



In the seventies and eighties, the World Bank claimed to embrace this 'endogenous' approach as a logical follow-on from its target group experiments with the rural poor and small farmers. In practice however, the World Bank continues to largely rely on its technological determinism in the field of disaster risk management and adaptation, as emphasized in its Environmental Policy paper, World Bank, 2000c, that rallies for "greater expenditure on scientific research and monitoring ..." (World Bank Dominica 2001: 11).

As John Kurien posits: "Sustainable development is premised on a basic notion of intergenerational equity, and people's participation postulate a degree of effective collective control in achieving this" (Ghai and Vivian 1992: 222). To be sure, the state should be expected to play a meaningful role in protecting and coordinating common property resources, formally supporting collective adaptation action through popular participation, and endorsing sustainable adaptation development practices. However, when communities are tagged for adaptation programming, climate change adaptation oriented aid agencies and national governments frequently design and execute adaptation programs 'to' communities ("from above") without adequate input and decision-making ("from the outside"). Instead, adaptation programs should be directed 'by' the communities ("from below") through their self-determination ("from the inside") (Veltmeyer 1997).

Macdonald explains that 'Mainstream NGOs' are often characterized by: beneficiary participation valued primarily for project implementation; participants lacking real control over project design or evaluation; project conformity to donor interests rather than the perceived needs of recipients; and limited local linkages. She characterizes

‘Progressive NGOs’ by: Projects with an explicitly political strategy for empowerment of excluded groups; relative agency autonomy from external funders; and challenges to the existing distribution of power and resources (Debating Development Discourse 1995: 202).

Recognizing these two divergent groups of NGDOs may help us distinguish between exogenous and endogenous development approaches, and help us determine which of the two ‘NGDO camps’ may possess a greater ability to foster traditional adaptive knowledge and local capacity in vulnerable target communities.

## **5 Traditional Adaptive Knowledge Impeded by Western Paradigmatic Science**

### *Traditional Adaptive Knowledge*

Local inhabitants and communities who rely immediately on the natural environment to sustain their livelihood, such as coastal fisher folk, have typically created elaborate social, technical and economic methods to ensure the conservation of their surrounding environment. This constantly evolving, locally derived practice is known as ‘traditional knowledge,’ ‘First People’s knowledge,’ or ‘indigenous knowledge.’ “Indigenous knowledge has in fact been distilled over centuries and is often the best guide to sustainable resource management” (Ghai and Vivian 1992: 58).

At the community level, effective (sustainable) adaptation practices should ideally represent both traditional adaptive approaches as well as modern ones, to benefit from the best of both worlds. “As know how increased, societies adapted their social organization

to maximize the effectiveness of their improving technology, thus increasing their capacity to appropriate resources from the environment” (Baker 1994: 7). Baker goes on to suggest that there are two patterns within social systems whereby they form ‘dissipative structures,’ systems capable of maintaining their own identity only by remaining continually open to the flux and flow of their environment. But societies may also be thought of as ‘autopoietic structures,’ which are self-renewing and autonomous” (ibid: 10).

Furthermore, various local customs and social controls have evolved in communities to regulate resource use and ensure sustainable use of their community resource. For instance, in many Pacific island communities, ‘marine resources are seemingly harvested under open-access conditions: there are few stated general rules limiting access, and if local residents are questioned about any such regulation they may say that all are free to fish as they like. However, in a study of a Solomon Islands community, Hviding (1990) points out that ‘where resource extraction exceeds certain limits (commonly associated with the commercialization of fishing) marine tenure traditions (or what I would deem adaptive resource management) begin to exert their force, and social sanctions limit the overexploitation by local residents of any particular area or species.’ “The existence of these invisible (to outsiders) or latent traditional management systems means that caution must be taken before judging any particular resource to be unregulated” (Ghai and Vivian 1992: 58).

An example of a traditional practice that effectively responded to overexploitation of common fishing resources comes from the fishworkers of the Kerala coast in India. With years of competition with commercial fleets, many traditional fisher folk were pressured to turn to modern outboard motors and destructive mini-ring seines to increase their

catch. However, “in the course of collective action against the commercial boats, “... organizers have gained a more precise understanding of the limits of marine resources, and they are now beginning to act to stop the newly formed destructive habits of their own community” (Ghai and Jessica 1992: 69).

With climate variability impacting their marine resource-dependent livelihoods as fisher folk, these adaptive conservation practices will reduce species exploitation, and help mitigate climate stresses on the local resource. Compelling examples of traditional climate adaptive practices are detailed in Section 4.5.1 in Chapter IV.

*Traditional Adaptive Knowledge Impeded by Western Paradigmatic Science*

*Regarding climate change “science is confirmed through anecdotal evidence.” (Dominica’s Lennox Honychurch, during August 1993 Interview)*

In the few remaining social communities not yet despoiled by the dominance of Western/Northern arrogance, the traditional management of the environment, productive livelihood and culture are inextricably linked. However, the ‘modernization growth oriented’ model of development demands the ‘superimposition of a modern ... specialized technology over the existing traditional base which was largely labour-intensive and of great technical diversity’ (Ghai and Vivian 1992: 224). Globally, the artisanal fishery is continually under threat from this ubiquitous economic determinism.

In its Ten Year Report, *State of The Environment 1972-82*, UNEP found that actual fish catches “lie far below the potential catches possible under competent resource management” (Simonis 1990: 31). Twenty years later, this deterministic growth theory

persists largely intact. Yet, with wholesale competition from large-scale industrial fishing industries around the world, catches by artisanal fisher folk are dwindling. Considering the well-documented research<sup>50</sup> on offshore over fishing in the Caribbean basin largely by commercial fleets, and increasing examples of near-shore over fishing by competing coastal communities<sup>51</sup>, climatological impacts on fish species will exacerbate an already existing crisis.

Using Daly's premise, "the world is moving away from an era in which man-made capital was the limiting factor into an era in which remaining natural capital is the limiting factor. The production of caught fish is currently limited by remaining fish populations, not by the number of fishing boats ... barrels of pumped crude oil is limited by petroleum deposits (or perhaps more stringently by the capacity of the atmosphere to absorb CO<sub>2</sub> ...) (Daly 1996: 78).

According to Professor Gwin Prince of the London School of Economics, 'contemporary fisheries management is predominantly based on the marketing and consumption of fish stock, and not on sustainability practices or notions of conservation.' "All 5 oceans in the world are rising, and climate change poses a serious problem to the world's fisheries, especially considering that one-third of the globe relies on fish for protein." 'Extreme weather and the collapse of the fisheries could seriously threaten governance structures in an already burdened national economy' (CBC Radio interview, Aug 22, 2003).

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<sup>50</sup> Fisheries Development 1994: 9; Goodwin, Country Environment Profile 1991: 108; The Fishery 1996: 13; Mahon 2002: Esp. the International Commission for the Conservation of Atlantic Tunas (ICCAT) data; CARICOM CFRAMP data collection system.

<sup>51</sup> Our Island Culture 1982: 25; Country Case Study 1997: 6; Espeut 1994; O'Marde 1994; Royer 1995.

'The ubiquitousness of Western Science, however, has led to traditional knowledge becoming 'fragmented' in the South, increasingly divorced from that of the dominant scientific paradigm' (Ghai and Vivian 1994: 34). In *Farewell to Reason*, the philosopher Feyerabend distinguishes between two entirely different traditions of thought: the first tradition, which corresponds closely to scientific epistemology, is the *abstract tradition*, whereby '(i)t is possible to make scientific statements without having met a single one of the objects described' (Feyerabend 1987: 294). Par contre, knowledge possessed by small-scale societies Feyerabend would label as *historical traditions*. Over time, much of this traditional knowledge outside mainstream society, especially in the South, 'becomes encoded in rituals, in religious observations and in the cultural practices of everyday life' (Ghai and Vivian 1994: 35).

This extraordinary wealth of historical traditions has been dominated and eclipsed by scientific determinism and its defence of neoliberal consumer growth. Consequently, traditional environmental knowledge and adaptive practices grounded in the community's life experiences have been seriously eroded, or have vanished forever.

## **6 The Dialectic of Objective and Subjective Social Agency and Adaptation**

During the post-war modernization period, poverty alleviation was premised on relief, and local participation was not encouraged. "NGO assistance was thus initially provided as a charity, and recipients were treated as objects rather than subjects of the process" (Debating Development Discourse 1995: 202). The complete failure of charity to put even a slight dent in underdevelopment eventually necessitated participation of the poor in development activities. However, according to Macdonald, '(t)here was

substantial resistance to the implementation of a 'basic needs' approach on the part of both international organizations like the World Bank and Third World states" (ibid: 206).

Because of this institutionalized negligence, and the emergence of popular movements across the globe in the 60s (student revolts in Paris and North America, anti-colonial independence movements, the Women's, Black Power, and Gay Liberation Movement, etc), 'development NGOs' became the main agents of basic needs development (ibid: 206). Thus, international NGO Cooperation was born.<sup>52</sup>

With social immiseration on the rise, dependency theory (rejecting modernization, and rationalizing the exploitation of the 'periphery' by the 'core') spread like wild fire through the Americas and Caribbean. Its most famous proponent was Raul Prebisch of ECLAC. Out of dependency theory there emerged new popular development principles such as Dr. Paulo Freire's '*conscientização*,' and '*educación popular*' (Debating Development Discourse 1995: 208).

Through a process of acting on socio-economic and environmental conditions, marginalized people can become transformed from an objective state of "distortion, limitation, or denial of their nature" to a subjectively conscious mode "by themselves and as themselves" (Marcuse 1964: 125). Marx referred to this social dynamic as the political transformation or radicalization of a group or movement, hence, "a class in itself versus a class for itself." The Brazilian literacy theorist, Paulo Freire, referred to this dynamic as 'dialogical action,' (Freire, 1989), or the need for 'critical and liberating dialogue' (Spitting 2000: 183).

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<sup>52</sup> The number of registered development NGOs in industrialized countries had grown from 1600 in 1980 to 22,970 in 1993, with an estimated 50,000 in developing countries by 1993 (Long 2001, p.9)

'Freire (1972) saw conscientization of the masses by outsiders as essential to awaken beneficiaries out of the 'culture of silence' brought about by their circumstances of underdevelopment" (Nelson and Wright 2000: 173). However, according to Rahnema, although Freire underlines the inability of the oppressed to fully understand their plight, this acknowledgement of the need for dialogical action in community projects failed to "recognize that the perceptions of the 'conscientizers' were distorted" (Debating Development Discourse 1995: 208).

Hence, participation may occur "in forms that are directed from above, rather than in organizations which spring from the grassroots" (ibid: 209). So, 'consciousness-raising,' like institutional development, "can be a means to ensure that participation occurs only on the non-governmental organization's terms." "While we may accept the paradox that 'promoting bottom-up development often requires some top-down efforts,' the problem is knowing when the latter begins to undermine the former goal" (Nelson and Wright 2000: 176/178). Or as Dr. Trotz stated, "for effective participation we need to empower the community with knowledge -- the challenge really is -- knowing when our intervention does not dull the instincts and creativity of the recipient (Trotz notes 2004).

## **7 Centralism-Decentralization and Adaptation**

With market globalization, multi-nationals are making strident efforts to simultaneously concentrate and centralize surplus capital and surplus resources by elite groups, while decentralizing or downloading resource management responsibilities to civil society. 'Civil participation' plays a pivotal role in facilitating this decentralization or resource devolution process. As Nelson and Wright explain, "(t)he rhetoric of



participation may ... mask continued centralization in the name of decentralization” (Nelson and Wright 2000: 16). After all, “despite talk of decentralization, governments (no matter how good intentioned) tend to retain bureaucratic power at the centre” (ibid:164).

Amidst its analysis on the decentralization process for SIDS, in 2000 the UN Department of Economic and Social Affairs added canon-fodder to this scepticism around decentralization when it pointed out that “(i)n several countries, these efforts are, at best, highly rhetorical and do not provide the local level with either the authority for decisions and action or the resources necessary to support such efforts” (ibid).

Other development authors have commented “on the paradox of aid agencies which exert top-down influence while at the same time desiring to create local capacity for participation and decision-making” (Nelson and Wright 2000: 16). In 1992, the Tokyo Declaration of the World Conference on Metropolitan Governance was clear that “decentralization should strengthen local government and administration” (UN 2000: 11).

The UN Department of Economic and Social Affairs clearly articulated the challenges of this propensity toward centralism. It affirmed: “(b)y and large, the operations of national planning agencies are not decentralized and resist efforts to bring about such a devolution in management and functions” (UN 1981: 15). It is a question of institutional control. The effect of this is to restrict the influence of community-level groups on the planning process, which is often not adapted to respond to citizen feedback in formulating and implementing plans.

Under these circumstances, centralization has stifled popular participation in planning. It has increased the vertical distance between planners and the broad mass of the population. Under the impact of these centripetal forces, micro-level planning has little scope or application, or simply serves as an instrument to extract labour and other resources from the poor” (UN 1981: 15). A centralization framework is not designed to bolster local capacity in adaptive development practices.

Moore refers to the state’s role in decentralization as a precarious balancing act “of encouraging the growth of civil society while fearing that such development will lead to popular ideologies seeing the state/capital link and seeking to replace it with one building new bonds between the state and a ‘popular’ civil society” (Moore 1995: 18).

#### *Advantages of Decentralized Adaptation and Development*

Structural decentralization is generally seen as a reduction in advantages by central government administrators. Nonetheless, the decentralizing of government decision-making can increase the ability of these same leaders to direct and influence societal interests by creating more decentralized communication links within. “What is certain is that the (adaptation<sup>53</sup>) strategies favouring a relatively small group of people at the expense of the masses of people are largely precluded by increasing popular participation” (UN 1975: 28).

The daunting task of adapting to climate variability is frankly too vast and complex to be assumed solely by governments. Admittedly, government overhead functions (budget supervision, personnel policies, procurement) cannot be effectively decentralized in

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<sup>53</sup> My addition

adaptation programming without compromising certain 'national standards and program adherence'. However, local project design, use of local resources, and community buy-in are likely enhanced by decentralized decision-making (UN 1975: 23). Thus, Laura Macdonald points out that '(a)gainst the centralized models of bureaucracy, NGOs (can) decentralize responsibility to local groups and community associations (Debating Development Discourse 1995: 202).

Publicly, although far from practice it seems, the World Bank supports this decentralized position. It makes clear that "(m)uch of the costs and success of adaptation will depend on the extent to which communities, individuals, and the private sector own and implement the strategies. This requires government support for community-based (adaptation) efforts, and may require working through traditional decision-making processes to ensure 'buy-in' at the local level" (Cities, Seas, and Storms 2000: 36).

#### *Disadvantages of Decentralized Adaptation In Development*

There are of course disadvantages to decentralized micro-level participation. The most apparent is the inability of governments to equitably distribute scarce (or inequitably distributed) national resources amongst competing localities and sub-national regions. Furthermore, a lack of resource uniformity and program absorption capacity amongst collaborating communities poses various logistical problems. In addition, traditional forms of communal self-help tend to be episodic and sustaining attendance, resource commitments, a program focus, and energy levels is a challenge. As the adage goes, 'it's easier to train an enthused participant than it is to enthuse a trained one.' As well, popular participation may require educational effort and longer-term decision-making compared with a one-off results-oriented activity by government. Then again,

governments with limited political terms may have far less incentive than vulnerable communities who have a vested interest in defending their local interests.

Lane suggests that, “Northern non-governmental organizations (and IFIs) should concentrate on raising money, consciousness raising and education while leaving the actual ‘doing of development’ to other counterparts in the South” (Nelson and Wright 2000: 16).

It should be noted that, “participation revolving around a community’s economic activities has a high potential for maintaining levels of participation.” Decentralized participation will also remain high where the focus is placed on “economic and social problems closely related to everyday life” (UN 1975: 37). However, economic institutions and revenue projects may be more difficult to manage than cultural or social organizations because they involve greater demands and more complex relationships within society.

## **8 Theoretical Position vis-à-vis Adaptation Development**

There are several international UN adaptation funds, including the UNFCCC LDC (NAPA) Fund and Adaptation Fund, and a handful of international donor agency funds dedicated to supporting climate change adaptation efforts at the regional and host-national level (World Bank GEF, Asian Development Bank SPREP, CIDA/World Bank CPACC, GTZ CaPP).

In spite of considerable global effort to institutionalize impact and adaptation policies and practices within the global development framework to ward off the immense social and

material losses attributed to climate variability and extremes, according to the literature and existing program and funding priorities, the existence of participatory programs targeting vulnerable communities is disturbingly absent.<sup>54</sup> Meaningful grassroots adaptation approaches have yet to be developed and integrated into wider national and regional development frameworks. This is the case even after fully ten years of IPCC activity, the creation of the COP in 1995, and extensive global donor agency dialogue, large-scale research efforts and inter-agency workshops.

One can extrapolate from a cross-section of the development, climate change, and disaster management literature that there is a profound paucity of development theory and analysis surrounding participatory development, and community adaptation in development by extension. Consequently, an enormous structural and epistemological rift seems to have been created between mainstream economistic instrumentalism, and grassroots participatory or transformative development, between poverty alleviation and distributive justice, between a deterministic macro growth paradigm and qualitative micro-community sustainability.

Although the development industry derives the notion of 'community development' from our recognition of community as the micro-agent of social change, there do not appear to be any paradigmatic movements in sight supporting micro- (community) participatory action. Instead, there seems to be a preponderance of macro-level thinking in international development discourse, and by extension in climate impact and risk management practices.

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<sup>54</sup> Some relative exceptions do exist such as Component 4 of the CARICOM MACC program in the Caribbean, and community work through the South Pacific Regional Environment Programme (SPREP) in the South Pacific

On the sustainability front, it seemed that significant progress was made when Brundtland in 1987 replaced deterministic growth theory for sustainable development in support of human need. However, little was said regarding popular participation's role in environmental management and human development. It seems that mainstream sustainable development is chiefly premised on sustaining productive market development as the end goal, not for supporting biodiversity and social security. But what exactly constitutes genuine sustainable development, especially within the realm of climate impact and adaptation priorities for vulnerable communities?

The concept of popular participation emerged in the 1950s, exploded in the 70s and 80s, but became the idealized centrepiece of contemporary development thinking in the 1990s. Participation seems to be largely viewed as an instrumentalist approach to mobilize local labour and resources for buy-in in support of externally driven objectives. It is infrequently viewed as an enabling process to engage and empower marginalized community stakeholders to own and control their own decision-making for the determination of societal goals and allocation of resources.

Historically, participatory development and the incorporation of civil society has been repeatedly institutionalized programmatically and abandoned by the World Bank and the international aid community. In the 80s and 90s, there was a forced retreat of grassroots CBOs and NGOs because of ODA's redirection of development resources to private sector groups. Thus, resources supporting transformative development activities grounded in community were reidirected towards more deterministic top-down development (and more recently to climate change adaptation) based on productive capacity and economy-building. Nonetheless, participatory development seems to be

gaining some limited currency within the growing climate change movement, especially because of its functional benefits in support of public education and outreach projects.

As for impediments to micro-adaptation, a top-down approach to adaptation programming generally favours national or regional institutional structures (i.e., National Implementation Coordinating Units, and NAPAs for climate change), with all of the impediments inherent in a large bureaucracy. It might be argued that programmatic and policy arrangements for community incorporation have not yet been established. Conversely, the structure, mandates and manner of functioning of these institutions have yet to consider micro-approaches. Nonetheless, this top-down approach systematically leaves out community as an essential agent of change. At the same time, the socio-economic impediments of an asset-poor and public resource dependent community make it more vulnerable and less able to adapt to extreme weather events. In spite of these institutionalized impediments, grassroots community organizations (CBOS, NGOs, cultural associations) seem better equipped to adequately represent the needs of vulnerable communities in their quest to mitigate their climate change risks. They may also offer a logical bridge between uninstitutionalized beneficiaries and government and donor bureaucracies.

With the second UN Development Decade (1980s) declaring cross-sectoral 'integration' as the key linking the social with the economic and participative development, the concept of micro-level community agency seemed to loom big on development agency radars. Yet, according to Boxill, most integration initiatives (albeit fragmented) in the Caribbean and Americas have been operating on the economic trade spectrum, such as CARIFTA, CARICOM and LAFTA, as opposed to resource redistribution. This ideology

of economic regional integration is also apparent within the ever expanding disaster management, climate change, and climate impact and adaptation disciplines.

These macro-integration movements have eclipsed (or have at the very least systematically ignored) indigenous efforts for community integration at the village, township and parish level. Some authors have proposed that the weakness of the Caribbean integration movement is the absence of an ideology of regionalism, while others contend that multiple identities prevent wholesale integration. If we downscale this ideology of regionalism to the community-level, it might be argued that a genuine ideology of communalism does not exist, which may explain in part why community development and micro-adaptation integration are not prioritized.

Participatory adaptation planning at the intermediate level seems to offer a practical link between the nation (macro) and community (micro) or vertical connection, and resource integration or horizontal function. This approach would then allow for a more effective and inclusive assessment of adaptive capacity locally, regionally and sectorally. Industry wide, the development community has historically acknowledged the principle of participatory development. Virtually all mainstream ODAs and alternative development groups have embraced and institutionalized the concept and practice of participatory development, as witnessed in their respective program and policy literature. However, there are two competing variations on the concept of participatory development: 'instrumental,' to secure buy-in from civil society for donor-led projects (the World Bank is a proponent of this form); versus 'transformative,' empowering marginalized and vulnerable communities to self-determine their future (grassroots NGOs and CBOs identify with this approach). As Doctor Trotz has pointed out, the latter variation is not the paramount practice in ODA program delivery (Trotz notes 2004).



International adaptation stakeholders, such as the World Bank, maintain that popular participation is central to the success of adaptation projects, and there are more examples in the literature of aid effectiveness through popular approaches, than there are failures. Yet, there are innumerable examples of ODAs, including the Bank, whose organizational 'needs' have placed and continue to place very severe constraints on any participatory development, as it does not fit into their funding criteria and program cycles. These institutionalized constraints, and the 'instrumental' perception of participatory development may spell the demise (or limited success) of existing and planned adaptation efforts in the Caribbean and other target regions.

If we focus on the relationship between emergent properties and the developmental process, there appears to be an imperfect coordination of analysis between mega-macro and meso-micro adaptation initiatives, resulting in the operationalization of more 'autogenous' or externally driven macro-adaptation policies and projects over 'endogenous' or internally driven micro-adaptation initiatives. I have already pointed to structural and conceptual tendencies supporting autogenous practices in section 2.4 Macro-Autogenous/Exogenous and Micro-Endogenous Models of Adaptation. In sections 4.4 and 4.8 of Chapter IV, I site specific examples of adaptation programs that are externally driven.

The interventionist or macro-exogenous approach to development, fuelled by the North/West, is in sharp contrast to the grassroots or micro-endogenous strategy, embraced by community activist groups especially in the South. Retallack suggests that climate change discourse is technocratic, not popular. Veltmeyer and Petras, and Macdonald refer to development tendencies as 'from above and outside' versus 'bottom-

up.' But even so-called 'grassroots' agencies are not necessarily representative of traditional knowledge and popular needs, as many of these agencies rely heavily on externally driven priorities.

Traditional adaptive knowledge plays a vital role in socially regulating resource extraction and managing climate variability. Whether it is the 'fe pay' practice of Dominican fisher folk, or the star-gazing meteorologists of the Andes preparing for their tuber harvest, traditional adaptation plays a pivotal role in responding to climate variability. "This (traditional adaptive expertise) forms an excellent platform to plan adaptation to climate change" and sustain livelihoods and the environment (Trotz notes 2004). However, the western notion of equitable growth and consumption (which drives global warming) is seriously disrupting and systematically discounting the effectiveness of traditional adaptation practices.

In theory, the World Bank is a strong proponent of bottom-up development that effectively embraces decentralized traditional adaptation practices. Yet, marginalized community leaders and their representative CBOs are rarely consulted or intimately involved in IFI and national government administered adaptation programs.

As several authors above have suggested, micro-autogenous risk management efforts derived from local community stakeholders are likely to bring about greater adaptation development synergies than externally-driven macro-autogenous projects from above. Furthermore, with the wholesale dismissal of a basic needs approach by large development institutions throughout the 50s, 60s, and 70s, the grassroots periphery began to subjectively address its own development needs through collective action. Meanwhile, market globalization has precipitated the decentralizing or devolution of certain

responsibilities to the meso and micro-levels, without the requisite resources to sustain these newly required responsibilities.

To be sure, there are many advantages and disadvantages to decentralizing development and adaptation activities. However, as various authors suggest, current economic and political centralization practices, when combined with a decentralized pseudo administration and the burden of limited resources at the meso-to-micro levels, actually stifles local capacity and popular participation in coping<sup>55</sup> with their day-to-day development priorities, let alone the challenges of extreme climate variability.

Drawing from my literature review of the various development paradigms and their relationship to the climate change field, and specifically the impact and adaptation discipline, my preliminary conclusions suggest that there is an immense paucity of community development theory within the field of climate adaptation. Being mindful of the fact that adaptation as a development and disaster management issue has evolved on the global landscape over the past ten to 20 years (depending on where you identify the historical beginnings of the adaptation discipline of industry)<sup>56</sup> years – at least since the IPCC was formed in 1995.

‘Equitable’ growth theory seems to have subjugated more sustainable community-centred participatory practices, external development priorities continue to supersede grassroots

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<sup>55</sup> The immediate actions in the face of an event or changes, and ability to maintain welfare (in contrast to adaptation, which refers to long-term adjustments to the framework within which coping takes place)

<sup>56</sup> Climate change was placed on the political agenda in 1985 by the WMO and UNEP; The 1992 Rio Summit discussed in detail climate change impact on poverty; the UNFCCC established adaptation measures during COP 1 in 1995; climate risk was thoroughly discussed in Johannesburg in 2002; and adaptation was again systematically prioritized during COP 9 in Milan in 2003.

social agency, and traditional environmental practices are systematically discounted in the name of western centralized adaptation approaches.

The likely result is a tendency by development institutions to impede local input, and design and implement macro-remedial adaptation programs that fail to integrate invaluable community players and local needs and expertise into the risk management process. In the absence of participatory micro-adaptation efforts in the development process and adaptation strategies, livelihoods and biodiversity may be dramatically compromised.

## **Chapter III**

### **Climate Change Adaptation and Development in Dominica:**

#### **The Context**

*“As with all research methods, conceptualization and operationalization necessarily involve an interaction between theoretical concerns and empirical observations” (Berg, Bruce L: 2001)*

#### **1 Caribbean Regional Overview**

Most studies consider the Pacific and Caribbean islands to be at high risk from climate change and sea level rise (Cities, Seas, and Storms 2000: X). Small Island Developing States (SIDS), and their coastal communities are subject to growing risk and vulnerability from anthropogenic and inter-glacial climate change. According to the World Bank, coastal populations comprise about 60% or more of the 5.2 million inhabitants in Caribbean SIDS (World Bank 2003: 13).

Most scientific projections at the regional level suggest that “permanent climate shocks to the Caribbean countries are expected” (World Bank 2003: 3). More frequent and intense extreme weather events (e.g., El Niño Southern Oscillation, hurricanes, storm surges) and resultant flooding and landslides, droughts, and damage to marine ecosystems threaten the socio-economic stability of all Caribbean island communities.

Other exposure risks include earthquakes and volcanic eruptions. Island dwellers speak of having to move their houses and boats further inland because of rising tides and coastal erosion; of changes in wind, precipitation and marine currents; of drops in volume of fish catches, and species sizes; and of more severe tropical storms.



Moreover, because of their smaller size, less diversified economies, and dependence on foreign revenues earned from agriculture and tourism, the Eastern Caribbean islands of Dominica, Guadeloupe, Martinique, St. Lucia, St. Vincent, Antigua and Barbuda,

Barbados, Grenadines, Grenada, Trinidad & Tobago, Turks and Caicos, and St. Kitts and Nevis are particularly vulnerable to natural hazards and climate variability.

### *Caribbean Climatic Change and Eco-System Impact*

With global warming, some of the most pronounced temperature increases have occurred in the lower latitudes, including the wider Caribbean region.<sup>57</sup> The IPCC (1999) indicates that during the twentieth century, Caribbean islands have on average experienced an increase in temperature exceeding 0.5 degrees centigrade. Relative sea-levels have risen at an estimated rate of 2.5 mm/year within the wider Caribbean (Country Environmental Profile 1991: 18-19). Moreover, there has been a significant increase in rainfall variability with mean annual rainfall declining by approximately 250mm, with warming and drying tendencies in the Caribbean (Initial National Communication 2002: 25). Hendry (1993) indicates that relative sea level rise in the Caribbean is increasing at an average of 3mm/yr, but with considerable regional variation (including tectonic processes).

Other anticipated or occurring climate change phenomena include: an intensification of the seasonal cycle with increased flooding during the wet season, and increased drought in the dry season; an association of increased sea surface temperature with increased hurricane activity, suggesting that hurricane frequency could increase, and a doubling of CO<sub>2</sub> could lead to intensification of hurricanes by 10-20%; and, global sea level rise of about 5 mm per year projected for the next 100 years but varying considerably from region to region (Nurse et al. 2001).

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<sup>57</sup> With global warming, there has been a polarization of perceptible temperature increases in higher and lower latitudes.

Rising sea levels, in conjunction with other meteorological changes such as severe storms, hurricanes, and heavy rains generate potential for increased coastal erosion and the loss of mangroves and other wetlands, as well as other habitats such as coral reefs (Country Environmental Profile 1991: 18-19). With increasing coastal erosion, especially considering Dominica's volcanic topography, "(l)andslides scar the mountains after heavy rains and raging floods tear away river banks and pulverize rocks" (Honychurch 1995: 4). Furthermore, significant increases in intense precipitation, and more incidents of flash floods will reduce coastal water salinity. This will continue to threaten coral reefs coastal ecology, and the local and regional fishery and eco-tourism sectors.

#### *Climatic Change and Fishery Impact*

Near shore nursery grounds may be unable to sustain their normal biodiversity, and fish stocks with delicate salinity-siltation tolerance may move further off shore. Furthermore, increased sea/ocean temperatures would affect breeding cycles, parent fecundity, offspring survival and species resistance to environmental stresses attributed to climate change (Initial National Communication 2002: 39,40).

According to Mahon (Mahon 2002), storms and hurricanes appear to affect the availability of demersal fish stock on coralline shelves. As a Soufriere fisher confirmed "hurricanes seem to disrupt and reduce the fish stock, especially the snapper and reef fish like the jacks and coil fish." Reef fish reportedly show a drop in availability just before a storm, though there can be short periods following the storm in which catches are actually higher (Mahon 2002: 13,14). Stormy weather has also caused a decrease in availability of conch, which bury themselves in the sand when sea conditions are rough.



For fisher folk in the eastern Caribbean, climate change may further intensify seasonal wind cycles during the wind season between January and March. This would reduce fishing time at sea. Similarly, an increase in frequency of storms during the hurricane season from July to October would restrict vessels fishing days, and a reduction in overall catch. This may be a blessing in disguise, as reduced fishing efforts may help replenish stocks and improve catch yields. However, potential benefits in stock recovery would easily be offset by a short-term increase in fishery workers (from the hard hit tourism sector) eager to exploit an already over exploited nearshore fishery [(see Antigua and Barbuda experience with hurricane Luis (Mahon 2002: 15))].

Fishing normally provides a post-disaster quick-fix, as fish stocks are usually not heavily impacted by hurricanes. Catches, are almost immediate and provide the necessary protein intake to sustain inhabitants until regular food stocks are stabilized. Lenny seemed to be the exception, as it had a short-term detrimental impact on Dominica's fishery. It should be noted that the Government of Dominica is currently unable to adequately collect extreme weather impact data.

## **2 Dominica Country Overview**

### **1 Economic Overview and Adaptation Priorities**

The aggregate regional contribution of the Caribbean to the global emission of GHGs is estimated at 0.15% of the world's total (World Bank 2003, P. 20). Dominica (and neighbouring SIDS), does not have a strong manufacturing or industrial sector. The

Food and Beverage industry, and road paving with asphalt are the main emitters of non-CO<sub>2</sub> (NMVOCs) gases (Initial National Communication 2001: 17).

Thus, the island is a net sink for carbon dioxide with net removals of 294.14 Gg. of carbon dioxide in 1994. This record is worlds apart when compared with the industrialized emitting North/West (The US emits 25% of the world's GHGs with only 5% of the world's population, and Canada emits even more per capita). Because SIDS are at considerably greater risk from climate change (sea-level rise being the most obvious), they perceive industrialized countries as having a moral and economic obligation to foot the bulk of the climate change adaptation bill.

As nation states and partnering community stakeholders search for answers to their developmental and vulnerability reduction and risk management challenges, competing priorities vie for resource allocation, and frequently pose explicit dilemmas and tradeoffs. Dominica is under considerable pressure to develop national strategies to protect its natural resources, while attempting to achieve economic development in a depressed world economy, and with a burgeoning debt load. In fact, from the point of national independence, the island suffered from a shortfall in revenues against its expenditure. Elite thinking was that the island's economic position at independence obliged it "to depend heavily on external aid funds to finance its economic development for the foreseeable future" (Honychurch 1995: 258). By 1992, the combined external public debt and IMF debt amounted to US\$83.9 million compared with US\$63 million the previous year. In 1994, public debt reached \$115.19, and continued to increase with US \$175.9 million owed by 2000 (Initial National Communication 2001: xvii).

Honychurch alerts Dominicans to the need to break from this pattern of economic dependency. 'If one subtracts the unprecedented amounts of foreign aid, and cuts the \$1.6 million which came into the country every week in 1988 from banana exports, then one is left with virtually nothing with which to run the country.' "Not even the much vaunted tourism industry would have much impact." "(This) new colonialism is based on market forces controlled by the trade agreements of powerful metropolitan states ..." (Honychurch 1995: 289). In an effort to diversify the economy, eco-tourism and crop diversification are relative national priorities.

## 2 Historical Overview of Dominica

*"Après bondie, c'est la Ter" (original Patois or French "Kweyol"<sup>58</sup> for "After God, The Earth")*

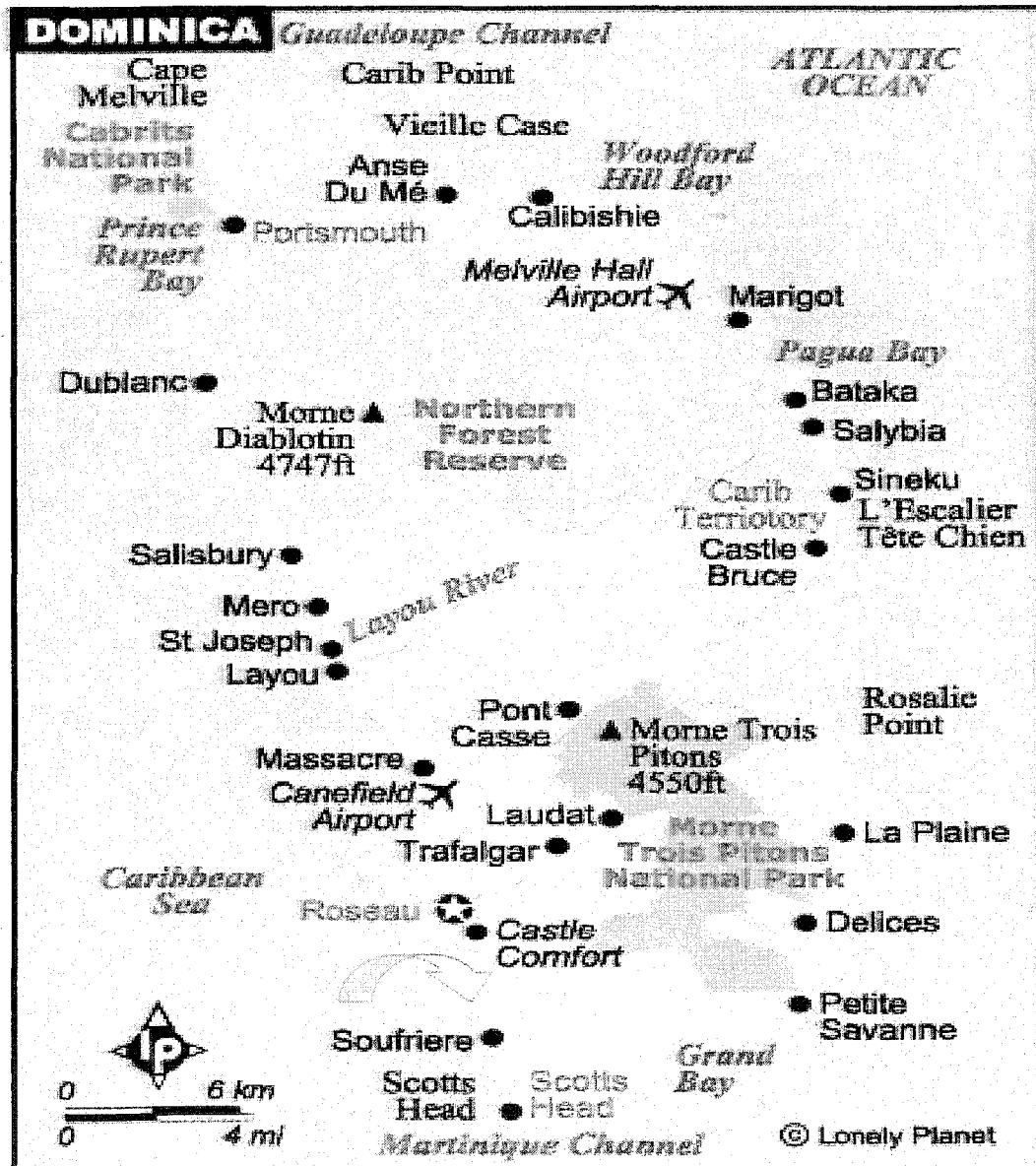
This unembellished motto of the Commonwealth of Dominica, "conveys with simplicity the intrinsic, underlying spirit of the country" (Country Environmental Profile 1991: 19).

The first settlers (Ortoiroid) to set foot on Dominica's shores came from the Orinoco River delta of the coast of South America, about 5,000 years ago. In about AD 400 the Igneri settled. Like other Taino speaking ('Arawakan' and 'Carib,' like 'Eskimo' are actually derogatory labels) people of the region, the Igneri worshipped the spirits of nature or Zemi, the powers of the sky, sun, moon, wind and earth.

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<sup>58</sup> "Kweyol" is also commonly referred to the anglicized form as "Creole."

The Kalinago or 'Carib'<sup>59</sup> people worshipped various forces of nature such as the 'iwaiyu hurru' or hurricane (Honychurch in Our Island Culture: 1982). They were superb fisher folk, using the canoe (a Kalinago term) and rafts made of Bois Canon (*Cecropia peltata*) called 'pwi pwi' (still popular today) (Honychurch 1995: 25).



<sup>59</sup> The term "Carib" was referred to by Columbus in his journal. He heard of the islander's fear of those of the place 'caniba' or 'canima,' or 'Carib' as referred to by Hispaniolans. This term was later modified by the ever-paranoid and bellicose Spaniard Conquistadoras to 'canibal' and 'caribi' or 'caribe,' meaning man-eater. From this came the geographical reference of 'Caribbees' islands, and eventually 'Caribbean' for the entire 'West Indies' region.

For over 500 years, although the 'Carib' Amerindians fought bravely against the ravages of colonial raider's military greed, slavery, violent occupations, and imposed disease, their numbers greatly diminished. French and English conquerors even attempted "the total annihilation of the Kalinagos" (Honychurch 1995: 46-47).

Many valiant attempts were also made by slaves, Maroons (run away slaves), and revolutionaries inspired by events in France, to rebel against French and English slave drivers. Because of these anti-colonial struggles, Dominica "shows the effects not so much of a plantation society as of a Maroon society." A delayed and frail plantation society, i.e., a less colonized society, was thus "less developed" (Honychurch 1982:in Our Island Culture: 3). Dominica's terrain, hurricanes, and the Maroon threat effectively impeded colonization. This, in part, would explain Dominica's economic history.

French settlements were strategically placed in flat coastal areas such as Colihuat, Pointe Michel, Soufriere<sup>60</sup>, and Grande Bay. Although English has dominated the country for 200 years, historian Lennox Honychurch explains that 'Dominicans felt more comfortable with the French words which described natural features (e.g., La Grand Baye and Petit Savanne) in contrast to English place names which favoured personalities, or military names and victories (such as Scott's Head, named after British Lieutenant-Governor Captain George Scott)' (Country Environmental Profile 1991: 19). Furthermore, when the British sold off their ruined estates, free-coloured Creole-speaking mulattos from French colonized Martinique and Guadeloupe bought them (Honychurch 1982:in Our Island Culture: 4). This added to the French Creole character of the island, and economic ties with the aforementioned neighbouring islands. Today, consider the

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<sup>60</sup> Not to be confused with Petit Soufriere on Dominica's south east coast, St. Lucia's Soufriere, or Montserrat's Soufriere Hills.

residual divisions between 'mulatto gros bourg' (still retaining some relative power in Roseau and social and political influence in government and business decision-making), offshore Caribbean and western interests, and the majority black population.

Dominica has predominantly been an exporter, of coffee and sugar for European households, later limes for the British Navy, and more recently bananas (70% of total exports in 1988). Citrus and exotic fruits<sup>61</sup> (such as passionfruit, soursop, mangoes, breadfruit, coconut, sugar apples and avocados), and vegetables (such as manioc varieties, yam varieties, dasheen, sweet potato varieties, and pepper) are being exported in regional markets. Dominica's economy is still considered quite vulnerable to natural disasters, because it is considered a "pre-modern" economy in the eastern Caribbean context, heavily reliant on its natural environment for the production of agricultural staples (bananas). That is, 'the process of diversifying the economy away from a mono crop base and of rapid urbanization and suburbanization has only just begun' (Country Environmental Profile 1991: 30).

On March 1, 1967, Dominica's Constitutional Order was initiated, and celebrations for Associated Statehood (with Britain) took place on November 3, 1967. Defence and foreign affairs remained the purview of the U.K. Full Independence was gained in 1978.

This island state has retained its British form of government, with a Parliamentary System and President as Head of State. An elected Prime Minister and House of Assembly run government. Local government is made up of Town Councils, Urban Councils, a Carib Council, City Council and 37 Village Councils with 41 local authorities. National elections are expected in 2005! Village Councils change every three

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<sup>61</sup> Mango, breadfruit and coconut are not indigenous to the Caribbean.

years at different times. In Soufriere, the most recent Village Council was inaugurated May 2003 for a 3-year term.

### **3 Demographics, Public Services (Water, Sanitation/Health, Education), Women, and Land Tenure**

#### *Demographics*

Of Dominica's total population of 71,242 (provisional results of 2001 National Census), 62.5% are below the age of 30 (similar to the region) (Initial National Communication 2001: xv). The urban population was estimated at 34% of the total in 1994.

The infant mortality rate in Dominica was 18.5 deaths per thousand in 1987. Life expectancy at birth was 64 years for men and 71 for women (in 1994). Revised figures were 71 and 74 respectively (in 2000).

The level of absolute poverty<sup>62</sup> was estimated by the British Development Division (BDD) in 1994 to be over one quarter of the entire population at 27.6%. The World Bank estimated it at 28% below the poverty line for 1995 (World Bank Dominica, 2001, p.vi, 79). Women represent a large proportion of this statistic (Women's Bureau 2000, p.2). GDP per capita in 1991 equalled about US\$2,000, US \$2000.67 in 1994, and rose by 48.5% to US \$2,967.72 by 2000 (IFAD 1995: 3, and Initial National Communication 2001: xvi).<sup>63</sup> However, this increase does not discount Dominica's poverty excesses. Unemployment in 1994 was estimated at 20%, with an increase to 23% by 2000 (ibid).

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<sup>62</sup> Households spending 60% or more of their income on food.

<sup>63</sup> World Bank estimates GDP per capita at EC\$3,960 (US\$1,470) in 1998.

There are high levels of unemployment in the age group 15-24 with few opportunities for youth residing in rural areas (IFAD 1995: 5).

### *Public Services: Water, Sanitation and Health, Education*

#### *Water*

Dominica contains an extensive network of surface and groundwater interspersed with rivers, waterfalls and lakes, and is widely reported to have 365 rivers – one for each day of the year. Thus, about 83% of the population have access to publicly administered potable water. In the case of Soufriere, 60-80% of residents have domestic water. The rest rely on public stand-pipes. In Scott's Head, about 25% of inhabitants rely on public spigots for their drinking water.

In 1968, Roseau and the southwest benefited from Canadian funds for the damming of the Antrim River, and for pipes and purification tanks that were laid and built to replace the outdated system from Riviere Claire and Douce. Tanker and spring water is exported for foreign exchange (Honychurch 1995: 193).

When hurricane Lenny hit in 1999, the state-owned private Dominica Water and Sewerage Company (DOWASCO) estimated damages to its water works facilities at US\$125,852. Scott's Head, at \$41,561 in damage, and the Mero distribution line at \$42,042, were hardest hit. In 1988 DOWASCO was in the process of developing additional water works facilities through a CIDA-sponsored<sup>64</sup> water sector program.

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<sup>64</sup> CIDA also supported a Hydroelectric expansion Project in concert with the World Bank, CDB, CCCE (France), and the European Investment Bank (Country Environmental Profile 1991: 210)



However, indoor plumbing was reported as rare (70% of the populace rely on community standpipes and public wash houses). The Dominica Rural Enterprise Project reported that 35% of rural households have potable water provided to their homes (IFAD 1995)

DOWASCO has had plans to have 50% of households connected by the year 2000 (results unknown) (Country Environmental Profile 1991: 89). In a more recent year 2001 government document, DOWASCO is said to serve 16,000 customer water connections which represents about 50,000 users, or 63% of the island's population. That increased coverage, combined with the provision of standpipe facilities installed for all major communities with populations over 200 inhabitants, is said to cover over 90% of the populace. Some smaller communities may have benefited from systems built by NGOs such as SPAT (Small Projects Assistance Team), DomSave and CanSave (Initial National Communication 2001: 37).

### *Sanitation and Health*

The City of Roseau and the Jimmit Housing Scheme are the sole areas in Dominica with a municipal sewage system. The rest of the island uses septic systems, or raw sewage simply flows along the seashore. The number of households with pit latrines was 6,851 (35.4%), cesspit/septic tanks 4,637 (23.9%), linked to sewer treatment 2,499 (12.9%), other 449 (2.3%), and none 4,938 (25.5%) (Initial National Communication 2001: 19). Thus, over one quarter of the national population has no latrine facilities.<sup>65</sup>

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<sup>65</sup> In another section of the Initial National Communication 2001: 52, the figure is quoted at 20% without access to sanitary excreta disposal facilities.

In Scott's Head, 95% have domestic water, and all appear to have septic tanks. In Soufriere some residents have septic tanks, and there are noticeable effluents emanating from the village into the SSMR through the hot spring area adjacent to the local church. The Scotts Head/Soufriere region appears to have the highest incidence of water-borne disease, and the highest rate of helminthic (parasite) infestation in the country, with ascariasis (roundworm) at 77.8% and 72.7% in Soufriere and Scotts Head respectively, versus only 1% in Mahuat. Scabies and gastroenteritis are also common afflictions. The dengue household index has declined from 34% in 1991 to 17% in 1998 (Initial National Communication 2001; 53).

The Ministry of Health and Social Security is responsible for monitoring coastal water quality. It is interesting to note that the Public Health Act of 1968 does not establish criteria for water quality, or standards for industrial wastewater discharges, or for solid/hazardous waste management. (Initial National Communication 2001: 58,59).

### *Education*

In the seventies, larger schools were being built with help from the Canadian, British, French and US governments. In 1971, the University of the West Indies (UWI) opened a local University in Roseau.

Only 68% of 12-15 year-olds are enrolled in secondary institutions, in comparison with an OECS average of 80% (IFAD 1995: 4). Of women surveyed in 1995, 75% attained only primary level education (Women's Bureau 2000: 2). Most recent statistics show that adult literacy was 81.2% in 1994, and rose to 95% by 2000 (World Bank Dominica 2001: vi, 79).

### *Women In Dominican Society and Gender Equality Barriers*

*We are in fact seeking to mainstream gender issues in Dominica, but acceptance (in government) has been limited. “ The percentage of women in Parliament is about 6 women of a total of 55 candidates. Women comprise 2 of the 21 Parliamentary seats. Rosie Browne, Director, Dominica Women’s Bureau, Ministry of Community Development & Gender Affairs (Aug 12, 2003 interview)*

The widespread social problem of high illegitimacy and paternal negligence has undermined women’s ability to enter the workforce and maintain their economic independence within Dominican society. The absence of job opportunities has lead to a high incidence of teenage pregnancies. Births to teenagers comprised 20.8% of total births in 1991 (IFAD 1995: 5).

Nonetheless, women play a pivotal role in the huckster trade, an economic activity that has survived centuries of blight, collapse and destruction of Dominica’s mono-crops. These women traders “have bargained with the powerful, ... marketed throughout the villages and towns, and crossed stormy sea channels to ply their trade’ (Honychurch 1995: 213). Women also play an essential role in the artisanal fishery (see Section 4.3.5.4) with little social or economic recognition for their contributions.

### *Land Tenure*

“Dominica, a Small Island Developing State (SIDS), is characterized by limited land space, vulnerability to the effects of changes in marine conditions due to its

encircling coastline, limited human and economic resources to address adverse impacts, population centers and critical infrastructure located on low lying coastal lands and an extremely vulnerable location within the hurricane belt” (Policy Framework 2002: 7).

During a 1987 inventory, more than 980 landslides were mapped, the average landslide was about 4 hectares in size, and Dominica experiences roughly 1.2 landslides per square kilometre (DeGraff, 1987 referenced in Initial National Communication 2001: 39). It is interesting to note that about 50-55% of cultivated land has a moderate to steep slope. About 90% of the island’s population of 71,242 lives along the coast, with 70% residing on the leeward side, offering more protection from wind and other climactic extremes, and providing relatively calm seas suited to fishing, leisure boating and navigation.

Dominica’s volcanic make-up has created very rugged and steep terrain. Thus, flat land is restricted to coastal areas in the northeast, in river valleys and in certain areas in the centre of the island. Because of the rugged topography, existing settlements have nowhere to expand except via hillside residential expansion and density increases within current residential neighbourhoods. This poses serious risk to human settlements and infrastructure, and obvious development and adaptation challenges. The rugged and steep topographical coastal terrain, coupled with limited foreshore space, unsheltered bays, and abrupt shallow sea-bed uptilts present setbacks to developing fish launching and landing areas (Fisheries development 1994: 49). Furthermore, limited resources and land tenancy burdens “induce the (marginalized) to settle on unstable slopes, riverbanks and low-lying coastal areas” (World Bank 2003: 4).

In a 1961 Census, the wealthier 1.4% of farmers occupied 56.4% of the nation's arable land.<sup>66</sup> Following independence in 1978, through the Government of the Commonwealth of Dominica's (GOCD) Integrated Rural Development Program, and other land reform projects, several estates have been divided into small plots and distributed amongst local farmers (Country Environmental Profile 1991: 76). In 1995, the DAC (Dominica Agricultural Census) listed the following: ownership with 13,765 ha (65%), family land at 2,308 ha (10.9%), and rented farms and communal land at 1,174 ha (5.6%) (Initial National Communication 2001: 45). This seems to represent a noticeable change from elite ownership in 1961, though the ambiguous term 'ownership' is not clearly defined in government statistics along socio-economic lines. In the case of Soufriere Fishery Group for example, only 4 of the 15 members indicated that they own property.

#### **4 Dominica's Natural Features, Physiography and Climate Change**

##### *Natural Features*

The actual Kaninago Amerindian name for 'Dominica' is *Wai'toucoubouli*. "The most northerly and largest of the Eastern Caribbean Windward islands, the country of Dominica has, with justification, been heralded as the region's premier nature island, ... and the country's undisturbed vegetation is more extensive than on any other island in the Lesser Antilles" (Country Environmental Profile 1991: 1).

The island is among the wettest in the Caribbean region, a factor that contributes to its lush vegetation. The east coast receives an average annual rainfall of 2500mm-3800mm, distributed between the dry season from December to April and a wetter season from June to November. The west coast lies in the 'rain shadow' of the mountainous interior.

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<sup>66</sup> Over 86% of all arable land is on a slope of 30° or more.

Its forests are considered the most extensive in the Lesser Antilles, and its rain forest the finest in the entire Caribbean.

Vegetation comprises over one thousand species of flowering plants, and sixty woody plants and tree species per hectare, supporting over 50 bird species (Country Environmental Profile 1991: 13), of which 27 species are coastal (Initial National Communication 2001: 8). Vegetation consists of approximately 155 families, 672 genera and 1226 species of vascular plants (Initial National Communication 2001: xiv). Numerous species of coastal vegetation (shrubs, herbaceous plants and trees) all play a crucial role in protecting the coast from wind, surf and coastal erosion. There are many similarities in flora, fauna and fishery with neighbouring Leeward and Windward islands such as Guadeloupe, Antigua and Barbuda, the Grenadines, Martinique and St. Lucia, etc.

#### *Physiography and Climate Change: A Delicate Balancing Act*

“Dominica, a Small Island Developing State (SIDS), is characterized by limited land space, vulnerability to the effects of changes in marine conditions due to its encircling coastline, limited human and economic resources to address adverse impacts, population centers and critical infrastructure located on low lying coastal lands and an extremely vulnerable location within the hurricane belt” (Policy Framework 2002: 7). Thus, extreme climate variability precipitated by sea-level rise and warming sea temperatures will likely cause flooding and submergence of coral reefs and coastal lowlands, loss of forests and reduced agricultural production, increased coastal erosion and infrastructure damage from increased storm surges and hurricanes, and a loss of marine diversity, and depleted fish stocks.

The island's rugged mountainous terrain greatly contributes to its spectacular beauty, but this physiographic element has also impeded development efforts. As such, "the island's high relief has had, and will continue to have an important orographic influence on climate, on land use, and on the general physical development of the island" (Country Environmental Profile 1991: 1). For example, the soils are in general readily erodible since they tend to be unconsolidated and friable. Soil loss is worse on the Leeward side of the island on the montmorillonitic clay soils. In addition, on steep slopes denuded of their tree cover by clearing, the soil surface is directly exposed to the erosive forces of rain and soil erosion is greatly accelerated. This can cause alterations in peak flows and greater flood discharge downstream (Country Environmental Profile 1991: 11). Thus, frequent debris flows, rockslides, and slump and landslides have resulted. During a 1987 inventory, more than 980 landslides were mapped, the average landslide was about 4 hectares in size, and Dominica experiences roughly 1.2 landslides per square kilometre (DeGraff, 1987 referenced in Initial National Communication 2001: 39). Interesting to note that about 50-55% of cultivated land has a moderate to steep slope.

As well, volcanic beaches and coastal vegetation and reefs are extremely susceptible to the impacts of severe coastal erosion from flash floods and landslides caused by hurricanes and storms. Finally, sea-level rise and increased frequency of tropical weather systems will continue to cause reef over topping, and exacerbate shoreline erosion particularly during storm surges. Several sand beaches have been replaced by rocks and boulders such as Scott's Head Beach, Rock-Away Beach, Belle Hall Beach and Toucarie Beach (Initial National Communication 2001: 34).

## **5 Economic Growth in The Fishery and Tourism Sectors, and Ecological Vulnerability**

For Dominica, there are several lessons to be learned, both good and bad, from Antigua's and Barbuda's agricultural contraction in the late 1950s towards growth in tourism, and a corresponding increase in fisheries as a means of employment and source of protein (Country Case Study 1997: 2). Currently, Dominica is attempting economic diversification beyond its dependency on the agricultural sector towards eco-tourism, while at the same time trying to strengthen the artisanal fishery. A comparative assessment of this sectoral shift would be most useful for planning purposes. This is however beyond the scope of my research.

The dominant growth for development paradigm, ever-present in Dominican government circles, may pose serious challenges to Dominica's biodiversity dependent social economy. Of possible concern, is the government's 2000/01 Budget Address which indicates as its future development path the 'accelerated emergence of modernized, ... economic structures that will be supportive of genuine, profit-oriented private sector investment ... more compatible with the realities of the rapidly emerging liberalized global trading systems' (Initial National Communication 2001: 28).

This growth mentality is further reinforced by a marine consumption mentality articulated in UNCLOS III, 1982 (United Nations Convention of the Law of the Sea), which makes provisions for the 'conservation and *optimum utilization of the living resources* in the EEZ (Exclusive Economic Zone).' The Convention explicitly dictates in Article 61, 62 and 63 that: "a coastal state, based on the best scientific and biological evidence



available, has the right to determine the Total Available Catch (TAC) of the living resources within its EEZ and its capacity to harvest it. Where the coastal state does not have the capacity to harvest the entire TAC, it has the *duty to allocate the surplus* to other countries” (Fisheries Development 1994: 6, italics are my emphasis).

“The impacts of unrestricted and unsustainable coastal development have already initiated the process of degradation of the natural systems that provide habitats for the diversity of species that inhabit the coastal zone, provide protection from coastal erosion, and provide food for the island’s people” (Initial National Communication 2001: 33). Augmented effluents from domestic tourism and consequent by-products from agricultural practices will further damage watersheds and fragment coastal marine habitats already compromised by wastewater outflows.

The fishery, dive tourism and marine recreation may all become direct environmental casualties of this laissez-faire growth plan, especially when combined with anticipated climate variability and coastal deterioration. In fact, it is estimated that a 2° rise in temperature could lead to a 15-20% reduction in tourism (Lise and Tol, 2001 in Sheppard and Osterwoldt 2002: 25), which translates into a loss of US\$0.7-\$1.4 billion for the Caribbean economy (Haïtes, Pantin, Attzs).

## **6 Dominica’s Traditional and Contemporary Fishery and Tourism**

### *Traditional (Subsistence) Fishery and Adaptation*

The fishery sub-sector, although considered artisanal or cottage-based: provides needed protein especially in low-income areas, contributes to the nation’s GDP, adds to

the eco-tourism package, and employs people. However, these self-employed artisans are at the lowest socio-economic echelon in Dominican society (Fisheries Development 1994: 61), having average annual revenues of less than EC\$1,000 per capita (US\$370) in 1988 (Fisheries Development 1994: UNFAO/WFP Appendix 126).<sup>67</sup> Furthermore, the fisheries sector upon which their livelihoods depend 'is extremely vulnerable to hurricanes and storms.' There are no naturally secure harbours, and fisheries infrastructure is squeezed in between the coasts and the sea (World Bank Dominica 2001: 25).

In the SSMR area, I observed numerous examples of adaptive behaviour and informal practices that were built into the daily 'rituals' of local area residents. One Soufriere fisherman commented with certain candour that, '(w)e observe the swells, and if the winds are easterly, then we expect a storm. So we prepare.' "We move the boats upshore, and take whatever supplies we can between storm swells." (K.B.). "We have the Red Cross and disaster people telling us what to do to prepare. As a precaution, boats are placed on the town basketball court and next to the church. "After Hurricane Lenny, what we now do is we wait for a hurricane advisory and we prepare by storing our boats and preparing our houses, and then wait for the storm. There's nothing else we can do. We have no money for plywood (to board up windows, doors, roofs), or to anchor our roofs to protect our houses, though some do."

Other fisher folk described their traditional adaptive activities and needs as follows:

'We need a way to attract fish. Currently we are using FADs (Fish Aggregating Devices), and the SSMR is installing more. One exists already made of rope, a 300-meter anchor,

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<sup>67</sup> GDP was estimated at US \$2,967.72 by 2000 (IFAD 1995: 3, and Initial National Communication 2001: xvi); World Bank estimates GDP per capita at EC\$3,960 (US\$1,470) in 1998.

and a buoy (at EC \$2500). We tie old nets, tarpaulin, wood crates and clothing to attract fish, provide them with shelter and hiding places.'

"We also use stone casting around our houses, and for our home foundations." "These days people take extra care to ensure their houses are stronger. With hurricane David, I built my house with concrete instead of galvanized sheets (Scott's Head Improvement Committee member). New housing guidelines require that roofs have hurricane ties."

"We need a sea wall. We don't know how high the sea will come, so we just raise sea walls, the stone castings, and our boats." "We also construct 'gabion' steel-netted stone retention walls. We also need sea level predictions." We need a local petrol station for our boat fuel, especially if we are temporarily cut-off by storms or road damage as has happened several times in past years. Otherwise we have to travel all the way to Roseau."

During a focus group discussion, volunteer Scott's Head Improvement Committee members reflected on their risk and disaster preparedness practices: "There are five Disaster Preparedness Committees. Women are responsible for food preparation, first aid, alert and rescue, safety, and post disaster assessment." "If the sea is rough, I don't venture to town. Parents don't let their kids to school. People now stock candles, kerosene, matches, flashlights, dry & canned foods." Because of (Hurricane) David, people also save more (money)." If the wind blows in from the Atlantic, all is normal. However, if it comes from the direction of Guadeloupe, it is likely there is a storm coming."

### *Dominica's Demersal and Pelagic Fishery*

The fishery is divided into four areas: near shore, deep slope (generally at depths of 200-300m), coastal pelagic,<sup>68</sup> and migratory pelagic. Coastal waters off Dominica provide a rich habitat for numerous pelagic stock and demersal reef species or shelf stock (Fisheries Development 1994: 8). The migratory stock consists of small coastal pelagics such as: ballahoo/ballyhoo, small carangids (small jacks, mackerel and couliwou), gar, sprats, and robins; and regional/oceanic larger pelagics including: grouper, snapper, dolphin fish (mahi mahi), wahoo, king fish (wahoo), flying fish, tuna species (skip jacks, yellow fin), and sharks, etc. (Fisheries Development 1994: 8; The Fisheries 1996: 5). Coastal pelagic species represent about 90% of the SSMR's landings, both in weight and value (The Fisheries 1996: 6).

Demersal fishing occurs mostly on the east coast where the island shelf is more extensive. These shelf or reef species include: snapper, grouper, parrot fish, squirrel fish, and grunts. Bill fish such as the blue marlin and swordfish like the *Xiphias Gladius* are also target species. Other fished species include: black bar soldier fish, goat fish, several species of wrasse, trigger fish, sardines, scads, sprats and file fish. Other reef species include: octopus and eels, and crustaceans and molluscs such as lobster, crab and conch.

The southeastern area of Dominica is known to fisher folk from Soufriere around to Castle Bruce as the 'Macouba Bank.' This volcanic massif causes deep-sea currents sweeping in from the Atlantic to forcibly rise, bringing up swelling of marine nutrients

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<sup>68</sup> Less than a mile out, ocean depths are 4-9,000 meters. Pelagic fish are present here, yet this is 'technically' an inshore area, where most Dominican's fish.

attracting schools of fish. This water mixing from delocalised near shore currents comprised of water columns of different temperature and salinity, with submarine turbulence has its effect on coastal pelagics, particularly along the west coast in areas such as Soufriere/Scott's Head (Fisheries Development 1994: 14).

It is along the east coast (north-east of Martinique and south-west of the Macouba Bank) where the greater quantity of oceanic pelagics is found during the regular migratory pelagic season (January to June). Large schools of skip jack tunas and other coastal pelagics periodically visit the Scott's Head Bay, and large adult yellowfin tuna are targeted by the artisanal fleet (Fisheries Development 1994: 14,15). With long-lining of pelagics being encouraged in the second half ('off-season') of the year, a year-round harvest of pelagics may be in the offing.

During the months of January to June, trolling with long-lines is concentrated on the migratory pelagic species of dolphin fish, tuna, wahoo (king fish), flying fish and bill fishes. Flying fish surface gillnets are also used. Bottom gill nets and beach seines are used year-round to catch coastal small pelagics such as sprats, ballyhoo (half beaks), skipjack tuna, small mackerel, and caranx. Grunts, snappers and sharks are also sought. The average gillnet catch in the SSMR area in 1993 was 20.34 pounds/trip (The Fisheries 1996: 7). Trammel nets are prohibited. During the second half of the year, fish are caught almost exclusively by fish pots (traps) and hand-lines (Fisheries Development 1994: 21).

Fish pots are the second most common gear to beach seines, with an average 1993 catch per trip in the SSMR area of 11.36 pounds (The Fisheries 1996: 8). The most common pot used in the SSMR is the traditional Z-trap that is unbaited and hauled after a few days, catching most reef fish and crustaceans. Another fish pot is the tombé levé that is

smaller and baited (with fish or octopus to catch grouper and morays) (The Fisheries 1996: 5).

Seining is the most common activity on the west coast, targeting small, schooling pelagic fish such as gar, ballyhoo, and jacks. There is no distinct seasonality in the use of this gear (The Fisheries 1996: 60). Gear is worked from beaches, or most commonly, from small rowed canoes (Country Environmental Profile 1991: 102), and fish are literally herded by free-breathing divers into waiting nets. The average catch in the SSMR area by seining was 60.80 pounds/trip in 1993.

Beginning in 1987, the promotion of tuna surface long-lining has increased yellowfin tuna and bill fish landings during the August to December period. Also being promoted to protect the reef base and small nursing fish, and diversify species landings, is the use of 3.5 inch meshed gill nets, and bottom long-lines to target snapper on steep slopes not accessible by traps. The average catch in the SSMR area in 1993 was 5.07 pounds/trip. In total, beach seines contributed 87% of total 1993 landings with 4,340 pounds. Fish pots contributed 6% of total 1993 landings with 358 pounds (The Fisheries 1996: 5).

The SSMR Area 1992 catch history is as follows:

Technique	Average per fishing trip	Total Annual <sup>69</sup>
Reef (Demersal) Fish		
Fishpots (Traps)	11 lbs	1200 lbs
Bottom Line	0.7 lbs	700 lbs
Bottom Gillnets	12.3 lbs	600 lbs
Pwi Pwis (or 'Bwa bwa flo)	Unknown	Unknown
Onshore casting	Unknown	Unknown
Migratory (Pelagic) Fish		
Surface gillnets	16 lbs	8,158 lbs
Beach seines	112 lbs*	50,049 lbs*
<b>Total:</b>		60,707 lbs (approx 30 imperial Tons) **

With an alarming drop in pelagic yields in the Eastern Caribbean in 1986, the FAO/OECS initiated a Regional Fisheries Project (Fisheries development 1994: 23). Of course, the emphasis by the Dominican Government to relocate to offshore grounds does not begin to address either depleted demersal and pelagic stocks or over fishing within the region (The Fisheries 1966: 13), though it may deflect SSMR species depletion.

#### *Reef Dependent Fishery and Tourism*

There is a high correlation between the nearshore demersal fisheries and coral reef habitats. The limited extent of these coral habitats constrains the absolute size of such stocks, their direct economic value, and relative food availability. While true coral reefs are limited or non-existent, there are a number of coastal areas where extensive live coral exists. The most significant sites include: Scotts Head, Soufriere, Pounte Guignard,

<sup>69</sup> Partial Source: SSMR 1993: 18. \*1992/93 Total; \*\*The 1993 catch figure was 36,818 lbs., representing 1,023 trips (The Fisheries 1996: 5). The reason for this significant discrepancy is unknown. Incorporation of the 1992 and 1993 beach seines catch in the 1992 total catch history data may partly explain the difference.

Mero, Grand Savanne, pointe Round, Portsmouth, the Cabrits, Petite Baie, Toucari, Calibishie, and Pointe Baptiste (Initial National Communication 2001: 7).

These marine communities provide important habitat for fish species typical to shallow reef, as well as spiny lobster and queen conch. The vulnerability of complementary critical marine habitats, eg., mangroves and sea-grass beds to strengthen the fringing coral reefs, does not augur well for the demersal fish resource, especially with the increased threat of more intense and more frequent climate extremes.

Dominica's coastal zone "... includes extensive areas of complex and specialized ecosystems such as mangroves, coral reefs and sea grass beds, which are highly sensitive to human intervention" (Initial National Communication 2001: 32). For example, the Fisheries Division recorded 25-30% dead coral along the coast adjacent to the village of Scott's Head, with human impact rated at 50-70% (The Fisheries 1996: 3). These complex ecosystems support a wide variety of social and economic activities including fisheries, tourism, recreation and transportation. However, many coral species live near their limits of temperature tolerance, and elevated sea temperature may therefore result in serious damage to coral from bleaching<sup>70</sup>.

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<sup>70</sup> A massive coral bleaching event in 1998 killed one third of Palau's coral reefs, estimated to cost US\$91 million, and saw annual tourism revenues drop by 9% (Hay et al, 2003 in Climate Change in The Pacific, WWF. Reef-building corals live in symbiosis with tiny single-celled algae (zooxanthellae) that reside in the corals' tissues and provide them with most of their colour and much of their energy. Coral bleaching occurs when stressors in the environment (such as increased sea surface temperature from global warming, freshwater flash flooding and siltation) cause the degeneration and expulsion of zooxanthellae from the coral host, such that the white skeleton becomes visible through the transparent coral tissues.

Depending on intensity and duration, once the stress is removed corals often recover and regain their zooxanthellae. Prolonged exposure can result in partial or complete death of not only individual coral colonies, but also large tracts of reef. Bleached corals, whether they die totally or partially, are more vulnerable to algae overgrowth, disease and reef organisms that bore into the skeleton and weaken the reef structures. As reefs disintegrate, patterns of coral species diversity can alter dramatically and the reef community may be restructured, with consequent impacts on



After the 1995 tropical storms Iris and Luis, and hurricane Marilyn, reefs showed signs of damage, including broken barrel sponges, and damage to finger, pencil and brain coral colonies (Initial National Communication 2001: 35). Damage to the fishery from hurricane Lenny was valued at US\$2.8 million (EC\$7.58 million), and damage to tourism infrastructure was approximately US\$250,000 (Initial National Communication 2001: 50,51). Because these reef systems sustain the eco-tourism dive product, and the local subsistence fishery, any negative impact on reef resources will result in significant losses to both sectors of the economy. Furthermore, climatic damage to mangroves<sup>71</sup>, sea grass beds<sup>72</sup> in inter-tidal coastal environments, and river estuaries will negatively impact the near shore fishery and dive tourism sector.

Based on my field research, I have estimated annual economic losses to the subsistence fishery attributed to climate variability and consequent coral degradation at US \$245,000-\$1.24 million. As for local tourism revenue, I have calculated total losses at between US \$157,000 and \$525,000. Please refer to the following detailed analysis.

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the diversity of fish and other organisms within the reef ecosystem. Elevated sea-level temperatures (SSTs) during the 1997-98 El Niño Southern Oscillation (ENSO) triggered mass corals bleaching that resulted in extensive reef damage in many regions of the world. Some countries are now at serious risk of losing this valuable ecosystem and the associated economic (and biodiversity) benefits of fisheries and tourism. It should be noted that small-scale, localized bleaching events that are due to direct anthropogenic stressors can be addressed directly to minimize the threat at its origins. In contrast, coral reef managers can not readily address large-scale bleaching events linked to global warming and ENSO events (Climate Change and Human Health, p.254-255)

<sup>71</sup> Mangroves are expected to retreat shoreward from sea level rise (Snedaker 1993; Vicente et al. 1993)

<sup>72</sup> Seagrasses, which serve as a nursery for many marine species, are not expected to be impaired by a predicted rise in sea temperature (Vicente et al. 1993), but may experience rhizome erosion from storm surge.

## **7 Estimated Economic Losses to Dominica Fishery and Tourism Resulting From Climate Change**

### **A. Annual Losses in Subsistence Fishing from Climate Impact on Coral Reefs, Mangroves and Sea Grass Beds<sup>73</sup>**

Climate change is expected to have a deleterious impact on near shore coral reefs, mangroves and sea-grass beds through sea-level rise, increased frequency and intensity of hurricanes and storm surge, and expected increases in marine surface temperatures leading to coral bleaching. Human activities add to this damage through mechanical damage to reefs from dredging, anchor damage, coral reef destruction from fish trap dropping and dragging, depletion of grazers from over fishing, effluents from hotels and residential communities, and depletion of large fish by spear fishing. Furthermore, without proper ecological management policies in place, projects such as the possible construction of a 400-room hotel at Soufriere would exacerbate marine contamination (Country Environmental Profile 1991: 107).

Since 1979, there have been 15 tropical weather systems on Dominica. There is already evidence that flash flooding on the island, caused by more frequent tropical depressions and heavy rainfall, will accelerate coastal land erosion (already at 50%+ topsoil loss along most of the Leeward coast)<sup>74</sup> and near-shore sedimentation<sup>75</sup> off-flows from the numerous island rivers. Consequently, signs of coral bleaching have already been seen in Dominica's reefs. Studies done by the Fisheries Development Division in 1998 reported

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<sup>73</sup> The following information, data and an analysis in sections A and B are mine. Data template modelled from Cities, Seas, and Storms 2000, World Bank SPREP

<sup>74</sup> Country Environmental Profile: 1991, Dominica Soil Loss map: 12

<sup>75</sup> Banana cultivation is producing high sedimentation rates from accelerated soil erosion.

that approximately 15% of the coral shown some sign of bleaching ranging from minor to severe. High temperatures from climate change are likely to result in the bleaching of an already stressed ecosystem (Initial National Communication 2001: 35). Moreover, the FDD recorded 25-30% dead coral along the coast adjacent to the village of Scott's Head, with human impact rated at 50-70%. Adjacent to Soufriere, coral cover was 40%, though algal growth was high at 65% and human impact 90% (The Fisheries 1996: 3,4). Thus, there is high probability that further coral damage and marine species loss will occur.

We will first estimate financial losses resulting solely from coral reef damage (mangroves do not exist within the SSMR, sea-grass beds do). Let's first assume that the SSMR's share of Dominica's land area also applies to its coral reef, and that the width of coral reef surrounding the island is broadly proportioned to the length of the coastline. If Dominica's linear coastline is 153 kilometres (95 miles), which extends along a generally narrow continental shelf that measures less than one kilometre in width (except in Marigot where it increases to 5 km), then in rough terms there are 153 sq. kms of coral reef around the island. The SSMR has a linear coastline of approximately 2 kilometres. Hence, it contains 2 sq. kms of coral reef representing about 1.3% of the island's total coastal reef area, or 0.2 hectares. However, the SSMR has a considerably larger surface area of coral than most other coral reef deposits around the island, about twice the surface area, in part because of the influence of the local land-based and marine hot springs along the perimeter of the beach area. So, we will estimate the surface area of coral to be closer to 2.6% or 0.4 hectares.

## **B. Products/Functions Lost Resulting From Climate Change**

In the SSMR dependent communities of Scotts Head, Soufriere and Pointe Michel, climate change damage to coral reefs is likely to affect productivity of subsistence (and the limited commercial) fisheries, as well as eco-tourism (diving) activities, biodiversity, marine habitats.

At present, 15% of the reef is considered to be at high risk (Guiste, Country Environmental Profile), with perhaps an additional 50% at moderate risk over the next 50 years from storm surge and coastal erosion. Seismic activity in the area may of course increase magmatic activity and overheat the hot springs feeding into the SSMR, possibly causing undue damage to temperature sensitive coral biodiversity. As a low-bound estimate, although the coral reefs are protected by the SSMR (restricted landings and select use of fishing gear), habitat degradation from anticipated climate change (mentioned above) will likely eliminate all high-risk reefs<sup>76</sup>. As a high-end estimate, we will assume that all high risk reefs and half of the moderate risk coral might also die in the future. This analysis thus assumes a reef mortality of 15 to 50% of total coral reef area. This may be a reasonable assumption given the pace of noticeable reef damage and bleaching occurring off other Eastern Caribbean islands (see CPACC and GEF biodiversity documentation).

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<sup>76</sup> Hurricanes can cause extensive damage to coral reefs (Stoddart 1985, Harmelin-Vivien 1994; Also see Mahon 2002: 8).

### C. Annual Losses to Fisheries sub-sector (considered Artisanal and Subsistence)

Dead or bleached coral generally does not lose all of its habitat provision and fisheries value, as coral is quickly covered by algae and supports the proliferation of herbivorous fish species. However, dead reefs will eventually disintegrate and increased productivity losses can be expected. With the above assumption, 15-50% of reefs would die and would lose about 50% of their fisheries value.

Even though the SSMR has just 2.6% (0.4 hectares) of Dominica's reef system, the three villages rely heavily on artisanal and subsistence fishing where 3.5% of the population live (2500 of 71,242 as per provisional results of 2001 National Census). It is therefore reasonable to assume that subsistence fisheries in SSMR account for 2.6% to 3.5% of Dominica's total. Subsistence fishing is valued at 1.8% of GDP (\$US 167.13 million in 2000 as per Initial National Communication 2001). For those village fisher folk depending on the SSMR, the bulk of fishing techniques (pot fishing, pwi-pwis or 'bwa bwa flo coastal rafts, inshore/onshore casting nets, overnight gill nets, deep water hand-lining by outboard boat) are applied right off the beach, or in/near-shore, and hence rely to a large extent on reef dependent species, and near-shore pelagics. Coastal pelagic species represent about 90% of the SSMR's landings, both in weight and value (The Fisheries 1996: 6). With coastal reefs therefore accounting for between 75 and 85% of coastal fisheries production, the value of SSMR-based subsistence fishing is as follows:

Total Annual Value Subsistence Fishery	SSMR share of catch	Share of Subsistence Fisheries dependent on Reefs	Total Value Subsistence Fishery
US \$167.13 x	2.6-3.5% x	75-85% =	US \$3.26 to \$4.97 million

Assuming a reef loss of 15 to 50% due to anticipated climate change impacts, and a loss of 50% in reef fisheries productivity, the impact on SSMR-dependent subsistence fisheries will be:

<b>Value of SSMR-based Subsistence Fishery/Year</b>	<b>Est. CC Reef Mortality</b>	<b>Loss of Fishery from Dead reefs</b>	<b>Total Subsistence Fishery Loss per Annum</b>
US \$3.26 to \$4.97 mil. x	15-50% x	50% =	US \$245K to \$1.24 million <sup>77</sup>

#### **D. Annual Losses to SSMR Tourism**

The Commonwealth Dominica is regarded as The Nature Island of The Caribbean. Its tourism sector generated about 25% of Dominica's foreign exchange earnings, or US \$10 million in 1986. A significant number of tourists (largely enjoying Dominica's eco-dive opportunities as there is little in the way of beach and leisure activities here) are likely to cease their visitation to the Scott's Head Marine Reserve due to coral reef mortality. The number of tourist visitors in 1986 was 36,519 (Dominica Integrated Development Plan: 2003). Extensive coral reef mortality in the SSMR may well result in at least a 15% drop in tourism revenue (% rate of coral mortality). This is in line with estimates in Palau, South Pacific, where there was a 9% drop in scuba diver's willingness to pay following the 1997-98 bleaching events. A similar survey in East Africa indicated that 19% of tourists visiting Zanzibar would likely reroute their travel if they knew coral reefs were bleached (Cities, Seas, and Storms 2000: 22). However, there are a disproportionate number of eco-tourists who frequent the SSMR in particular

<sup>77</sup> World Bank study estimates that damages caused by sea-level rise and coral bleaching from climate change will cost Tarawa, Kirabati between US\$6.6-12.4 million annually.

because of its attraction as the “Top Ten Dive Location” in the world (Dive International 2002), and its proximity to the capital Roseau. The population/visitation ratio for the SSMR is estimated to be three times the national visitation average or 10.5% (3.5%x3).

The impact of climate variability on dive tourism linked to the health of coral reefs is estimated as follows:

<b>Annual Tourism Revenue*</b>	<b>% of tourist visitation to SSMR (as % of regional pop x3)</b>	<b>Proportion of Tourists Likely to Reroute (Based on Coral Reef Mortality)</b>	<b>Total Loss Tourism Revenue in SSMR From Climate Change (Based on Coral Mortality)</b>
US \$10 mil. (1986) x	10.5% x	15%-50 =	US \$157.5K-525K

\*As per Country Environmental profile 1991 (the Dominica Integrated Development Plan (IDP): 2003 does not contain GDP or GNP stats for Tourism.

Annual Losses in Habitat Value, and Coastal Protection Values have not been calculated as part of this research, but are equally considerable.

#### *Fisheries Demographics and Impediments to Micro-Adaptation*

Over 80% of fisher folk are over the age of 45. Low income and poor incentives fail to attract younger more ‘progressive’ players, and hence the workforce continues to remain older, conservative and tradition-oriented in the use of technology. This may explain the resistance to the introduction of new technologies, and may be an impediment to fisheries development and innovation prevalent in the sector. For example, there is little evidence of ‘the desire to move away from the primitive dug-out canoe and the keel

boat which measure in lengths ranging from 12 to 23 feet' (Fisheries Development 1994: 18).

### *The Traditional Fishery Limitations and Climate Vulnerability*

Traditional fishing methods, some dating from pre-Columbian times, are still widely used in Dominica's (and other Caribbean SIDS) coastal villages. Traditionally, pelagic (i.e., tuna, king fish, swordfish, dorado) fish landings have been seasonal, based primarily on trolling<sup>78</sup> from keelboats (single-outboard pirogues) and dugout canoes, and supplemented by drift fishing or surface gill nets. Demersal fish (bottom-dwelling species) are harvested by Antillean Z-traps, hand-lines, gill nets<sup>79</sup> (inshore/onshore casting nets), and occasionally trammel nets (although prohibited by law).

Pot fishing<sup>80</sup> (hand crafted fish traps or cages) are the most frequently used gear and are constructed of wire mesh on wood frames, although traditional woven bamboo traps are also used on the west coast. The bamboo design is used for drop and lift fishing on the reef. Wire meshed traps are used for deeper sea application. P' Pwi ('petit puits,' French for little well, hole, or cockpit) or 'bwa bwa flo (French 'bois' for wood and English 'flo' for flow or float) are more common in Soufriere. Coastal rafts made out of balsa-like Cecropia wood species, originating in pre-Columbian times, are also used.

The target region of Scott's Head Marine Reserve (SSMR) has the greatest concentration of fishing vessels and registered fisher folk on the island. Of 1546 registered fishers in

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<sup>78</sup> Long trolled lining is done with a single hook ('Lilon') by outboard boat; 'Palan' or long-lining is with several hooks.

<sup>79</sup> 'Filet,' using several kinds of nets cast to gill-net fish. This includes double or triple-meshed nets called 'twamay'.

<sup>80</sup> The 'Carib' are pot and spear fishers.



Dominica, there are 80 in Scott's Head, 25 in Soufriere, and 17 in Pointe Michel for a total of 122 licensed fishers. This represents 8% of the national total. Following the devastating impact of hurricanes David and Frederick in 1979, which almost wiped out the entire fisheries (90%) and the nation's fleet of 500 boats, there was a mass exodus of fisher folk away from the industry. Numbers involved in the national fishery dwindled from 2500 full and part-time fisher folk to about 1,200, or less than half the original (Fisheries Development 1994: 17). Furthermore, because of the part-time nature of subsistence fishing, 55% of fisher folk engage in other economic activities (The Fishery 1996: 11). In 1988, there were an estimated 765 vessels<sup>81</sup> operated by 1850 fisher folk (Country Environmental Profile 1991: 101/2), generating a total national annual catch in 1988 of about 858,000 pounds<sup>82</sup> (ICOD-funded Fisheries Development Plan 1994: vi). Projections for 1993 were 2,573,000 pounds valued at EC\$10,292,000 (US\$3.8 million) (Fisheries Development 1994: 63). In 1994, just over 1,950 persons were back fishing.

Full-timers amount to 375, while part-timers operating at subsistence levels largely fishing within the inshore grounds number 1,560 (80%). The fishing fleet in 1994 was estimated at 654 boats (243 keel or planked and 411 dug-out canoes) (Fisheries Development 1994: 18,62). All told, only about 500 boats are powered by engines. Most crafts, especially on the west coast, are engaged in fishing neritic pelagics by seine, and do not require engines. Dominica's small fishing boats traditionally fish near shore demersal species (Fisheries Development 1994: 19). In the SSMR target communities, the 1988 census revealed that there were 13 craft in Soufriere, and 106 in Scott's Head (no data for Pointe Michel) (The Fisheries 1996: 10). Another undated graph indicates

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<sup>81</sup> The drop in total craft from 765 in 1988 to 654 in 1994 may be a result of damage from hurricane Hugo.

<sup>82</sup> This same Plan reports 1,049,880 pounds for 1988 (Fisheries Development Plan 1994: 23)

Soufriere at 25 registered fishers, Scott's Head with 80, and Pointe Michel at 17 for a total of 122 licensed fishers or 8% of a national total of 1,546.

In 1994, there were an estimated 42 landing sites scattered around the island (see Figure xx, Country Environmental Profile 1991: 103, and Fisheries Development 1994: 18). There are 7 major fishing centres on the west coast (Scott's Head, Newtown, Pottersville, Salisbury, Colihuat, Bioche and Portsmouth), and 5 on the east coast (Veille Case, Calibishie, Marigot, San Sauveur and Fond St. Jean). Dominica recently set up 9 fish data collectors. There are 36 fish coops now collecting fish catch data for the Fisheries Department. Although adequate data sets are not yet available, this information will eventually help determine changes in fish stocks, species locations, and perhaps climate impact on species.

The Scott's Head isthmus or Cachacrou (Carib term meaning "that which is being eaten by the sea") acts as a physically barrier between the Atlantic Ocean and Caribbean Sea. For the SSMR villages, and their fishery and recreational activities, this vital natural barrier prevents the incursion of damaging surge and waves from the Atlantic, especially during the storm season. However, this isthmus is actually shrinking, it is believed, because of sea-level rise, successive storm surges, and coastal erosion.

#### *Government of Dominica's View of Traditional Knowledge and Fishery*

The Initial National Communication is guided by the principles of Article 4 of the UNFCCC Convention, and subsequent COP decisions. Dominica's National Adaptation Strategy states that 'the challenge for effective adaptation to a changing

climate will be the extent to which the country is able to integrate concerns for climate change into decision-making at all levels' (Initial National Communication 2001; 66).

Under the section Sectoral Adaptation Option, sub-section Coastal Ecosystems, of the Initial National Communication, emphasis is placed on the use of traditional knowledge and skills. "(E)fforts should be made to maximize the use of traditional knowledge and skills that the island people have used in the past to cope with the variety of environmental stresses they have faced, even if these measures have no scientific basis (IPCC 1998). Often, the use of traditional knowledge and skills results in the implementation of more cost-effective measures to address problems of coastal erosion" (Initial National Communication 2001: 68).

#### *Fishery Development Efforts With Macro-Agency Funding*

'Development' Aid Flows to Dominica have been significant, yet without significant improvements in living standards. From Independence in 1978 to 1993, British aid to Dominica amounted to an estimated £21.5 million pounds sterling or about US\$40 million (Honychurch 1995: 297). Canada's total aid to Dominica through CIDA from 1963 to 2000 was about Can \$89 million (est. US\$59 million).

Peaks in international aid commitments to the Government of the Commonwealth of Dominica (GoCD) in 1987 and 1992 were linked to structural adjustment agreements. Excepting hurricane David, there has been no clear correlation between aid flow support (in commitments and disbursements) and natural disasters (World Bank Dominica 2001: 74-75). Conversely, for the Fishery sector foreign aid has been noticeable, but has focussed largely on productive and consumption sustainability, little on fishery

environmental sustainability, and none directly on fishery climate impact and adaptation at the host national or community level.

In the late eighties, the International Fund for Agricultural Development (IFAD) helped improve landing sites for beaching and launching small vessels. The UNDP/FAO/WFP sponsored a EC\$2.5 million (US\$926K) grant project in the early nineties to improve ten landing sites to provide efficient community-based facilities to support the government's aforementioned strategic development efforts (Country Environmental Profile 1991: 101/2; Fisheries Development 1994: 22). In addition, in the early nineties, Canada's International Centre for Ocean Development or ICOD (now defunct) provided a fisheries development advisor, and CIDA funds in the form of small grants to some fishing cooperatives for icemakers and boats. Further support included a joint CIDA-CARICOM regional fishery programme (Caribbean Fisheries Association and Resource Management Program or CFRAMP) starting in 1990. However, there was no indication of the Dominica fishery being targeted (Fisheries Development 1994: 70).

In 1987, Dominica decided to entertain diplomatic relations with the Republic of China in Taiwan, instead of Mainland China. The Taiwanese government loaned EC\$2.6 million (US\$963K) to finance fisheries equipment purchase. However, the loan schemes were far beyond target beneficiaries' social and economic means (Fisheries Development 1994: 31). Financing would probably have been better utilized through a micro-enterprise soft-loan, peer lending, and business training approach.

In 1998, the World Bank approved the US \$423.79 million Emergency Recovery and Disaster Management Program for the OECS (including Dominica). This involves physical prevention and mitigation measures, strengthening emergency preparedness

through the National Office of Disaster Management, and institution strengthening. A separate program supports segments of the sea defense program in the target region of Soufriere and Scott's Head (World Bank Dominica 2001: 81).

Recently, a Japanese International Cooperation Assistance (JICA) fishery project worth EC\$34 million (US\$12.6 million) was initiated. This project assists with fishery infrastructure development and resource management training. It has also provided refrigerated storage facilities, fish loading and transport operations, and a boat protection and fisheries complex at Marigot and Roseau.

#### *Micro-Agency Fishery Development*

The National Development Foundation of Dominica (NDFD) was funded in 1981 to assist the recovery of poorer segments of society following hurricane David, focussing primarily on micro-enterprise support. A small proportion of its fund portfolio was provided to the national fishery, representing 3% of lending in 1998 (World Bank Dominica 2001, p. 54).

Dominica's policy is to encourage the development of District Fishermen's Co-operative Societies. In 1994, there were five registered Fishermen's Co-operative Societies, and a handful of Fisheries Co-operative Study Groups aspiring to attain Society status. The Fond St. Jean Co-operative on the south south-west of the island has been considered one of the most vibrant groups, successfully securing European Development Fund (EDF), CIDA, USAID and Inter-American Foundation (IAF) financial support. The Newtown Fisheries Co-operative, just north of Soufriere on the east coast, has successfully received

US, UK and Canadian aid for ice-making and storage facilities. Both Co-ops are near to the target area. The Coulibistrie Society, north of Roseau, also received CIDA assistance.

## **8 Dominica's Development, and The Socio-Economic Anatomy of Hurricanes**

Although climate variability (both inter-decadal and anthropogenic) is manifested in many different forms in the Caribbean, such as displacement of fish stocks, radically altered seasonal cycles, crop destruction due to flash floods, etc, it is the increasing intensity and frequency of cyclonic activity, and consequent storm surge, coastal erosion, and damage to physical and natural assets that are most noted.

Dominica is situated in the tropical Atlantic "hurricane belt." Since 1979, the island has been adversely impacted by 15 tropical weather systems, 11 of which were hurricanes. Thus, statistically Dominica averages a direct strike or close range hit (within 60 miles) by a cyclonic storm system every 3.82 years (Initial National Communication 2001: xv). This is in sharp contrast to mid-twentieth century hurricane statistics indicating an average direct hit every ten years or so.

The *first recorded hurricane was in 1753*. Friar La Vallette witnessed damage to buildings and estate crops. By this time the 'hurricane season' was already a strategic consideration for military manoeuvring in the region (Honychurch 1995: 57, 84). In 1779, 1780, and again in 1787 disastrous hurricanes hit the island, damaging buildings, crops and livestock (Honychurch 1995: 87).

In the next century, *1813 suffered two severe hurricanes* in July and August, destroying Government House, the Court House and many other buildings. One Attorney described the damage in a letter to a friend: “The hospital, horse stable, wood and timber house blown down as well as several of the Negro houses.” “At present the island is destitute of rice, flour, biscuits, corn meal or, in fact, any sort of eatables.” In desperation, planters and merchants unsuccessfully attempted to establish trade links with Canada (Honychurch 1995: 119). 1825 saw a devastating gale pummel the island, and in 1834, yet another hurricane wrecked the island, battering it ecologically and economically. ‘Dominica virtually resigned herself to poverty during the mid-nineteenth century’ (Honychurch 1995: 121). With the Sugar Duties Act passed in Britain in 1846 removing protected status of West Indian sugar, Dominica’s sugar industry rapidly declined, and land settlement and agricultural education took over the island economy.

In spite of the *1915, 1916 and 1917 storms* lashing the island, cocoa and lime production recuperated from these damaging events and agri-business revenues rose. Citrate of lime was being produced by L. Rose and Company (i.e., Soufriere estate), famous for their Lime Juice Cordial. Dominica’s international markets continued to improve, with the Royal Mail Steam Packet Company, the Canada Pacific Ocean Services, and the Quebec Steamship Company maintaining regular marine contact. In 1901, crown colony Governor Henry Hesketh Bell conducted a hurricane study, making it possible for property in the West Indies to be insured against hurricanes (Honychurch 1995: 150).

The *successive hurricanes of 1926, 1928 and 1930* wiped out the agriculture. In 1934, the United Fruit Company and Canadian Banana Company agreed to buy bananas of the Gros Michel variety (Honychurch 1995: 207). This ‘green gold’ helped transform Dominica’s economy. In spite of these agricultural riches, in 1938, a Royal Commission

under Lord Moyne declared: 'Of all the British West Indian islands, Dominica presents the most striking contrast between the great poverty of a large proportion of the population, ... and the beauty and fertility of the island' (Honychurch 1995: 185). As the national economy continued to develop, towards the middle of the century, banking became established on the island with the Colonial Bank, Barclays Bank (now Bank of Montreal), Royal Bank of Canada, and the Co-Operative ('Penny') Bank.

Jetties constructed between Roseau's river mouth and Fort Young have been wrecked several times by hurricanes (Honychurch 1995: 190). Thus, construction of a deepwater wharf (known as Deepwater Harbour) began in 1974 North of Roseau at Woodridge Bay. Assistance came from the Britain, Canada, the US, and the Caribbean Development Bank. The Canadians also helped with reinforcement of a jetty at Longhouse in the north, and another at Anse De Mai in 1984. During the hurricane season of 1977, a tragedy struck when torrential rains caused tons of soil and debris to topple over a section of Bagatelle village smashing houses and killing eight.

Without any disaster preparedness program in place, and just as an interim government was just being installed to contain a political and economic crisis on the island, hurricane David (1979), one of the three most destructive storms<sup>83</sup> ever known to hit Dominica "lashed its shores, stripped trees from its mountains and tore the fragile homes of its people apart" (Honychurch 1995: 270). Hurricane David was followed by Hurricane Frederic two days later, and Hurricane Allen in 1980.

Following Hurricane David, the Deepwater Harbour wharf, built just four years earlier, required serious repair. The banana crop, the largest revenue generator on the island was

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<sup>83</sup> The other two were 1806 and the "Great Hurricane" of 1834



blasted to shreds, as was coconut production. The island lost approximately 70 per cent of its normal annual crop to hurricane damage, at a revenue loss of EC\$435.8 million (US\$161 million)” (Baker 1994: 179).

“The hurricane named David shot across the southern section of Dominica on August 29, 1979. There was little local radio warning and no operational systems for disaster preparedness. With swirling 150 mile-an-hour winds, David pounded Dominica for approximately six hours. Thirty-seven people were killed (40 according to UNDRO) and an estimated 5,000 injured. Over three-quarters of the population was left homeless, with many temporarily sleeping under rough cover in the open or huddled into the homes of more fortunate friends for weeks and months after the storm. Surveys by the Shelter and Housing Task Force indicated that 8,760 of the 15,000 dwellings had lost their roofs” (UNDRO 1999: 4). Housing rehabilitation costs were estimated at US\$10 million.

“Most interesting is that hurricane David compelled hundreds of pregnant women to move to Guadeloupe, thus lowering the nation’s fertility rate (Country Environmental Profile 1991: 1725). In fact, roughly 20,000 Dominican’s (equivalent to one quarter of the pre-hurricane 1978 population) fled the island because of this devastating storm” (World Bank Dominica 2001: 76).

The Dominican economy was destroyed resulting in substantial social and economic dislocation. Roads and bridges were blocked and swept away. The hurricane destroyed most of the island’s electricity transmission system and severely damaged its communication network. Some 50% of the trees were damaged in forested areas. Sixty primary schools were destroyed or damaged. With the banana crop and food crops destroyed or heavily damaged, “food was scarce - there was only fresh fish to eat (Oxfam

1990: 46). In the southern half of the island where damage was heaviest, the 200 families in the fishing community of Scott's Head suffered extreme damage to their homes (UNDRO 1979: 4). Of the 637 fishing boats on the island, an estimated 472 were destroyed and 157 lost their engines (ibid: 5).

International cooperation alleviated some of hurricane David's devastation. Oxfam and the US government assisted with prefabricated houses. A Coconut Rehabilitation project financed by Canada for EC\$9 million (US\$3.33 million) in grants helped with cultivation, disease prevention, and feeder road improvements. Over US \$37 million in aid was promised by Canadian, American, and British aid, as well as the IMF, Red Cross, Non-Aligned Movement, the OAS, EEC and Caribbean Community States (Honychurch 1995: 272, 297).

While the country was struggling to recover from three natural calamities, an invasion plot to topple the Government was revealed in 1981. White racist mercenaries from Canada and the US were involved in a bizarre plot "Operation Red Dog" to invade the island, overthrow the ruling government with support from disgruntled members of the disbanded Dominica defence force, and restore Ex-Prime Minister Patrick John to power (Honychurch 1995: 262, 266, 265, 280).

Then came *Hurricanes Iris, Luis, and Marilyn*, back to back (all within about three weeks) on August 26<sup>th</sup>, September 4<sup>th</sup>, and 14<sup>th</sup> respectively<sup>84</sup>. Damage to the agricultural sector, the backbone of the national economy, was estimated at EC\$193 million or US \$71.5 million, and immediate cross-sectoral emergency aid requirements for agriculture alone amounted to EC\$88.58 million or US\$32.8 million (Post Hurricanes 1995: 4).

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<sup>84</sup> Dates according to Canefield meteorological records

Eighty-five to 100 percent of banana acreage, and 55 percent of tree crop production was destroyed. Forestry suffered EC\$8.85 million (US\$3.28 million) in ecological and facilities losses (Post Hurricanes 1995: Appendix II). Root and vegetable crops, for domestic consumption and regional export, were dramatically impacted with EC\$9.6 million (US\$3.6 +million) in damages (Post Hurricanes 1995: Appendix III). The fisheries were also heavily impacted with damage or elimination of fish landing sites, destruction of boathouses, engines, storerooms, fish markets and fish pots, amounting to EC\$3.45 million (US\$1.28 million) in emergency restoration and rehabilitation.

*Hurricane Lenny* (1999) was the most dramatic and devastating hurricane since Hurricane David (also a Category 4), with unusually high seas (15m-25m swells), flooding and wind. Houses (154), civil and fishery infrastructure, hotels, road network, waterworks and telecommunications were destroyed or severely damaged. Water supply was interrupted, especially on the West coast, with total national damages estimated at EC\$342 million (US\$127 million).

The South Western District (Pointe Michel, Scott's Head/Soufriere/Loubiere, Baytown, and Newtown/Citronier) was particularly hard hit (District West Team Report 1999). The Scott's Head-Soufriere road and gabion sea-defence walls were heavily damaged, with 90% of the double surface road dressing completely removed. Remedial roadwork was valued at EC\$550,000 or US\$203,703 and repairs to the 657 feet of damaged sea wall were estimated at EC\$781,000 or US\$289,260 (Ministry of Communications, Works and Housing: 4). Five boathouses were destroyed.

Scott's Head water infrastructure repair costs were estimated at EC\$13 million (US\$4.8 million), and Soufriere's and neighbouring areas' at EC\$50,000 (US\$18,500) (DoWasco 1999). In the Scott's Head and Soufriere area, two kilometers of underground telephone cables and telephone poles were destroyed (Cable & Wireless 1999). Nationally, many homes were destroyed. In Scott's Head/Soufriere, two houses were destroyed, with another two seriously damaged (Dominica Red Cross). As for electricity supply, damage was an estimated EC\$150,000 (US\$55,555) nationally. Total power disruptions occurred in Soufriere, Gallion, Scott's Head, and the Bay area of Colihuat, all on the south-west coast (Dominica Electricity Report).

The national fishery suffered extensive damage, with total losses estimated at EC\$7.6 million or US\$2.8 million. Coastal damage to coral reefs, beach landing sites, boats and equipment, jetties and slipways was extreme. Crop production losses (citrus, tubers, tropical fruits, legumes) amounted to an estimated EC\$18.5 million or US\$6.85 million (Agricultural Task Force, 1999).

## 8 A Chronological History of Hurricane and 'Natural' Disaster Impact<sup>85</sup>

Hurricane	Date	Impact
Hurricane	1753	1st. recorded hurricane: extensive damage to estate crops/buildings
Hurricane	1764	
Hurricane	Oct, 1766	
Hurricane	July 26, 1769	
Hurricane	August 30, 1772	
Hurricane	Sept 6, 1776	
Hurricane	Oct 9, 1780	
Hurricane	Aug 3, 23, 29, 1787	
Hurricane	1789	Disastrous hurricane damage: buildings, crops and livestock
Hurricane	1780	Disastrous hurricane damage: buildings, crops and livestock

<sup>85</sup> See Appendix C for meteorological data on recent hurricane phenomenon in Dominica.

Hurricane	1787	Disastrous hurricane damaging buildings, crops and livestock
Hurricane	1792	
Hurricane	1806	131 drowned because Roseau river backed-up, flooded capital
(2) Hurricanes	July 22/Aug, 1813	Two back to back hurricanes in July & August: Destroying Gov. House & Court House, & many buildings, island destitute of foodstuff
Hurricane	1815	
Hurricane	Oct 21, 1817	
Hurricane	1818	
Hurricane	1819	
Hurricane	Sept 26, 1820	
Tropical gale	1825	Devastating tropical gale
The "Great Hurricane"	Sept 20-21, 1834	Followed within 1 month of Emancipation. Widely acknowledged as the worst of all, with 200 lives lost and overwhelming ecological and socio-economic loss
Hurricane	1835	Battered island's ecology & economy, extreme deprivation
Hurricane	1876	
Hurricane	1883	
Hurricane	1889	
Hurricane	1891	
Hurricane	1893	
Hurricane	1915	Extreme tropical storm affecting monoculture production, such as sugar, cocoa and lime
Hurricane	Aug 28, 1916	Extreme tropical storm affecting monoculture production, such as sugar, cocoa and lime
Hurricane	1917	Three storms in 3 years severely weakened sugar, cocoa and lime monoculture production
Hurricane	1926	Severely damaged agri-industry
Hurricane	Aug 30, 1928	Severely damaged agri-industry
Hurricane	1930	3 hurricanes in 6 years wiped out agri-industry

<b>Hurricane Janet</b>	Sept 1955	Impact unknown
<b>Hurricane Edith</b>	1960	Scott's Head cricket field, located on the isthmus separating Atlantic from the Caribbean, disappeared
<b>Torrential flooding during hurricane season</b>	1977	A tragedy struck when torrential rains caused tons of soil and debris to topple over a section of Bagatelle village smashing houses and killing eight
<b>Hurricane David (Category 4)</b>	Aug 29, 1979 (est. 50 year event)	Most devastating hurricane in 150 years, within 1 month of National Independence. Immense destruction across entire island, including severe damage to infrastructure (95% buildings) & crops; 42 killed, 3-5000 injured, 3/4 of population (75,000) homeless. Roads & bridges damaged/destroyed; potable water systems & telecommunications obliterated; banana & coconut crop shredded; 75% of tropical forest damaged; damage to coastal embankments, reefs & fishery (75% or 472 boats destroyed/ 25% engines); Exodus 1/4 population (20,000); World Bank/IMF forced structural adjustment
<b>Hurricane Frederick</b>	Sept 1, 1979	Two days after Hurricane David. Close passage caused heavy precipitation and flooding, etc. exacerbated damage
<b>Volcanic eruption</b>	1980	Minor
<b>Hurricane Allen</b>	Aug 4, 1980	Impact on agriculture/coastal zone. Repeated utility disruption. St. Lucia impacted
<b>Hurricane Klaus</b>	1984	No data identified
<b>Hurricane Hugo (Category 4)</b>	Aug 17, 1989	Close passage damaged banana production/export (30%) & reduced tourism visitation by 27% for over a year. Negative GDP growth. Landslides. Also damaged Antigua, Barbuda, St. Kitts/Montserrat
<b>Hurricane/intense tropical depression Debbie</b>	Sept 9-10, 1994	Prolonged drought; negative agriculture/fisheries (EC\$5M)

<b>Hurricane Iris (Category 1)</b>	Aug 25/26 1995	Negative GDP growth
<b>Hurricane Luis (Category 1)</b>	Sept 4/5 1995	Damage to infrastructure and beaches; Negative GDP growth
<b>Hurricane Marilyn (Category 1)</b>	Sept 14/18 1995 (est. 10 year event)	Three hurricanes in 3 weeks causing socio-economic hardship, 98% loss to banana crop, and severely damaged agri-industry (85% vegetables, 71% citrus, 55% tree crops, 50% root crops, 33% coconut plantations). 10 fishing boats destroyed, with EC\$3.5 million damage to landing sites, boat houses, boats & engines. Also impacted Antigua, Barbuda, Montserrat, St. Kitts & Nevis
<b>Tropical storm and landslide/flooding</b>	1997/98 (Layou/Carholm)	Dramatic land loss, dam breaks and environmental damage
<b>Earthquake</b>	1998-99	South of island, causing some landslides

*Sources:* Honychurch 1995; Policy Framework 2002; Meteorological Office; World Bank Dominica 2001, p.98; etc;

### 3 **Field Review of Adaptation Literature and Programs/Funds**

*From the 1980s, Global Climate Change is a major international phenomenon with potentially devastating impacts for all nations of the world, particularly vulnerable Small Island Developing States, such as Dominica.<sup>86</sup>*

(Hon. Vince Henderson, Minister of Agriculture and The Environment)

#### 1 **Regional and National Literature Review**

My secondary literature review was followed by a targeted review of field literature at the University of West Indies library (Barbados) and Carnegie National Library (Dominica). Host stakeholders provided many reference documents about socio-economic and environmental programming. This review furthered my understanding of contemporary Caribbean and Dominican thought and praxis regarding macro- and micro-level development models and adaptation approaches for fishery and tourism. This context is integral to my understanding of key research issues and my interpretation of regional and local findings. Empirical data collected is interspersed through chapters III and IV.

#### 2 **Review of Macro-Meso Adaptation Programs and Funds**

I went on to review Caribbean program activities and adaptation funding mechanisms related to climate change adaptation at the macro-regional and micro-community level. This review illuminates how the above normative development theories are operationalized in relation to adaptation development, and provides contemporary

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<sup>86</sup> Introductory paragraph of the Policy on Planning For Adaptation to Climate Change, March 2002 (CPACC)



data to help explain impediments to participatory development approaches. This context is also integral to my understanding of key research issues and my interpretation of local and regional findings. The following is a review of Caribbean IFI adaptation funds and programs.

### *International Adaptation (Macro)*

*People have learned to enlarge the circles of their allegiance and their loyalty, as well as the institutions through which they are governed, from the family to the tribe to the village to the town to the city to the nation state. We are now called upon to make the next and final step, at least on this planet, to the global level.” (Maurice Strong, First Head of UNEP, Worldwatch Institute p20)*

In addition to agencies mentioned previously, numerous international initiatives have emerged to assist governments to adapt to climate variability and climate change. Adaptation programs focussing on Climate Change Adaptation In Development have become an international environmental priority through several UN dependencies following the 1994 Barbados Declaration and Program of Action (POA) at the UN Global Conference on Sustainable Development of Small Island Developing States. In fact, climate change adaptation is now a stated priority within the World Bank Global Environment Facility (GEF), created in 1991.

The GEF has been selected as the interim financial mechanism of two major environmental conventions: the Convention on Biological Diversity, and the United Nations Framework Convention on Climate Change. Designated climate change funds are being administered by the UNDP, UNEP and the GEF. During the 1990s,

vulnerability and adaptation assessments were undertaken within the GEF-funded National Communications.

At the UNFCCC's COP7 (seventh Conference of the Parties) in Marrakech in 2001, three international funds were established mainly to support adaptation activities. First, is the Least Developed Countries (LDC) Fund (currently the only operative fund) with US\$12 million until mid-2004. It is intended to assist LDCs to carry out their National Adaptation Programs of Action (NAPAs). NAPAs are meant to address the urgent and immediate national needs of LDCs in adapting to the adverse impacts of climate change.<sup>87</sup>

The second Special Climate Change (SCC) Fund allows for a wide-range of activities, including diversification of the economies of oil-exporting countries. The third Adaptation Fund will only become operational when the Kyoto Protocol enters into force [CICERO 2003 (2) 5], or during the first commitment period (2008-2012). Resources for the Adaptation Fund will be raised from a global carbon trade levy (2% suggested), and additional pledges by Annex II developed countries (CCCCC 2002: 16).

Most international development agencies have established, or are in the process of establishing 'climate change adaptation' as a noted developmental objective. Specific adaptation program examples include:

The *Canadian International Development Agency* (CIDA) with its five-year *Canadian Climate Change Development Fund* (CCCCDF). This recently completed Can \$100

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<sup>87</sup> Other than Haiti, this fund does not include the Caribbean as the IFI's definition of 'LDC' does not cover Caribbean SIDS

million Adaptation Fund supported seven adaptation projects, worth Can\$16 million, in India, El Salvador, the Sahel, Bangladesh, Vietnam, the Caribbean and South Pacific.<sup>88</sup> This fund is now complete as of the spring of FY2004. Another CCCDF CIDA effort was *Adaptation to Climate Change in the Caribbean (ACCC)*, a bridging fund for regional and host national adaptation projects in the Caribbean.

The German Technical Development Cooperation or *Deutsche Gesellschaft für Technische Zusammenarbeit* (GTZ) Climate Protection Programme (CaPP) launched in 1993 only recently included adaptation in its fourth phase (2001-2004) [CICERO 2003 (2): 21]. In addition, the joint working group 'VARG' or *Vulnerability and Adaptation Resource Group* was established to examine climate change adaptation from a poverty reduction perspective, and help 'develop strategies to integrate adaptation measures into national development programmes' (GTZ Adaptation 2003: 3).

The *UK Department for International Development* (DFID) recently established an impressive climate change adaptation section and supporting technical and administrative team. Encouragingly, this section views climate change as a part of the environmental context for poverty alleviation [DFID 2000; DFID et al. 2002, in CICERO 2003 (2): 21]. There appear to be no designated funds for community adaptation. As well, JICA (Japan) may consider untied adaptation program funding in the future, and the UN FAO is sure to follow through its *Inter-Departmental Working Group on Climate Change*. The *United States Agency for International Development* (USAID) established a Global Warming Initiative (GWI) in 1990, mostly supporting emission reduction and carbon sink efforts.

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<sup>88</sup> For example, the World Wildlife Fund has organized awareness and capacity building activities within Pacific Island communities (Fiji, Cook Islands, Samoa and Vanuatu) through the CCCDF funded "Capacity Building for the Development of Adaptation Measures In Pacific Island Countries" (South Pacific Programme 2003: 25)

Some USAID vulnerability and adaptation activities have occurred in the Americas (Honduras, Mexico, Central America, Panama) and Africa (Senegal, Guinea).

The *Netherlands Climate Change Studies Assistance Programme*, launched in 1996 enables developing countries to promote policy development and awareness building in support of the Climate Convention. Studies on vulnerability and adaptation focus on 13 developing nations, with special attention on livelihoods systems, coastal zones and disaster management [CICERO 2003 (2): 22]. The *Australian Agency for International Development* (AusAID) has dedicated Aus\$237 million through its climate change programme to implement projects “that reduce poverty whilst producing positive climate change outcomes” (ibid).

#### *Pan-Regional and National Adaptation (Macro-Meso)*

Regional development banks and international donor agencies have set up regional adaptation funds such as the GEF-funded and World Bank implemented *Mainstreaming*<sup>89</sup> *Adaptation to Climate Change (MACC)* in the Caribbean, and the Asian Development Bank's/CIDA's South Pacific Regional Environment Programme (SPREP).

During the Caribbean meeting of the Ministries of Finance and Environment in 2000, priority activities for sustainable development were identified, including planning for climate change (World Bank 2003: 7). In April 2001, the OECS countries signed the *St. George Declaration*, under which, Principle 4 posits: “member states shall implement obligations under the UNFCCC and establish appropriate legal, technical, and regulatory mechanisms for adaptation to the impacts of climate change” (ibid). By 2002, CARICOM

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<sup>89</sup> See Glossary for World Bank definition of ‘Mainstreaming’

member countries established the Caribbean Community Climate Change Center (CCCC).

#### *Development Bank Adaptation Program Activities and Funds*

##### *World Bank*

Broadly speaking, only a handful of sectoral and regionally based adaptation funds have been allocated to respond to the increasing needs of vulnerable SIDS subject to extreme climate variability. 'Global funds for investments in adaptation are still something of the future' (World Bank 2003: 7). To its credit, it should be noted that CPACC was the first GEF-funded project managed by the World Bank to address issues of adaptation (CCCCC 2002: 11). Again however, vulnerable communities are not a primary program focus (see below on this page and critique in Chapter IV).

##### *Inter-American Development Bank (IDB)*

The IDB has developed an Action Plan on Climate Change. Within the adaptation context, the Bank has committed to two climate change priorities: reducing vulnerability to catastrophic events and adopting responses to non-catastrophic changes. An Action Plan for Disaster Prevention and Mitigation (risk reduction) was launched in 2000. Regarding gradual non-catastrophic impacts, the Bank has initiated a program in partnership with the UNDP to assess likely impacts to Caribbean SIDS member countries at greatest risk (IDB website: 9-10). Also, in partnership with the UNDP, work will be done in the Caribbean re tourism for economic growth and climate impact (CICERO

2003:2, p.23). In the latter two programs with the UNDP, work is being directed at the host country level and for bank staff, not vulnerable communities.

*Caribbean Planning for Adaptation to Climate Change (CPACC)*

This four-year Stage I<sup>90</sup> CPACC Program (1997-December 2001), worth US\$6.5 million, provided support to CARICOM countries. It was the first major Caribbean initiative designed to enable countries to prepare to cope with the adverse effects of global climate change in coastal areas, through vulnerability assessment, adaptation planning, and capacity building, linked to adaptation planning. CPACC illustrates that a regional approach provides for economies of scale and efficiency gains in the Caribbean region comprised of small national economies.

The OAS served as the executing agency with a Regional Project Implementation Unit (RPIU) at the University of West Indies Centre for Environment and Development (UWICED) in Barbados. Programme focus was almost entirely at the host national and regional level, benefiting each of the 12 CARICOM participating member countries. Regional projects focussed on climate modelling, database systems (LAN, website, E-groups), coastal resources inventories (CRIS and GIS), and policy framework development (12 National Adaptation Issues Papers). Pilots focussed on coral-reef monitoring (18 stations established), coastal vulnerability and risk assessment (SIDS methodology developed), economic valuations (T&T oil, St. Lucia tourism, Dominica hurricane impact), regulatory proposals (beach resources in St. Kitts and Nevis, sand

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<sup>90</sup> UNFCCC defines stage I Adaptation activity as planning (including studies of possible impacts). Stage II activities include medium-term measures enabling vulnerable countries/regions to develop adaptation policy options and further capacity-building, that fall short of project implementation (World Bank 2002: 2)

conservation), and agriculture and water resource vulnerability assessments (St. Vincent & Grenadines 1<sup>st</sup> National Communication) (Sheppard & Osterwoldt 2002: 32-33, and World Bank 2002: 9-11).

Under CPACC Component 4 of the Project “Formulation of a Policy Framework for Integrated Adaptation Planning and Management,” participating Caribbean countries undertook to develop National Adaptation Plans for Action (NAPA’s) (Policy Framework 2002: iv). This was done through National Implementation Coordinating Units (NICUs), and coordinated through each National Focal Point (NFP). The establishment of regional and national climate change institutional capacity through NICUs and NFPs has been measured by the World Bank as “highly satisfactory” (World Bank 2002: 6). Impressive is the fact that most participating host governments have already prepared national papers on climate change issues. In 2002 Dominica prepared a *National Policy on Planning for Adaptation to Climate Change*.

This Policy Framework document clearly highlights ‘trends towards non-sustainable impacts on vital natural resources including forests and coral reefs. The Policy helps to assess climate change vulnerability, possible impact, and adaptive capacity in several key sectors including coastal and marine resources, human settlements, water and forest resources, tourism, agriculture and the fishery. The Framework identifies: ‘the role of Government as the major facilitator of implementation of the policy directive’ (Policy Framework 2002: vi).

Interestingly, in many cases, CPACC’s primary concern has been climate change impacts on Caribbean marine habitats, with the resulting impacts on fisheries and socio-economic

issues reflected as a secondary concern. According to Mahon, this is because of the co-dependence of tourism and the fishery on sustainable marine habitats (Mahon 2002: 5).

According to the CPACC program review, CPACC buy-in at the regional and national level “constitutes a solid platform on which to continue building the process of local (national)<sup>91</sup> ownership,” and the Caribbean region is probably one of the most advanced in terms of planning for adaptation (World Bank 2002: 12-13). “The project began the process of tackling a large (regional) problem in a dispersed region with limited (existing) capacity” (ibid: 26). Furthermore, there is now overwhelming support for adaptation from the region’s political directorate and donor agencies.

#### *Adapting to Climate Change in the Caribbean (ACCC)*

With CPACC complete, Canada contributed to the bridging program Adaptation to Climate Change in the Caribbean (ACCC). This recently completed programme was funded by CIDA’s Can \$100 million Canadian Climate Change Development Fund (CCCCDF). This initiative was ‘aimed at maintaining CPACC momentum’, and ‘extending selected experiences until the GEF funded portion of the MACC was expected to come on stream in early 2003’ (World Bank 2003, p.8). MACC inception was delayed until early 2004.

ACCC program components included: a business plan for the Regional Climate Change Centre; public education and outreach policy development; integration of climate change in planning processes using risk management; technical capacity-building of SIDS governments; integrating adaptation planning in Environmental Assessments at the host-

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<sup>91</sup> My emphasis



national level; implementing adaptation strategies in the water and human health sectors; and fostering collaboration with non-CARICOM SIDS.

*Mainstreaming Adaptation to Climate Change (MACC) Program*

This US\$5 million MACC programme [(co-financed by Canada through CIDA, the World Bank GEF, and the US through NOAA)] is designed to 'consolidate Stage I (CPACC) activities' and 'extend the coverage to move to Stage II Enabling Activities' (ibid). As with CPACC, CARICOM serves as the executing agency for the MACC with a Project Implementation Unit (PIU) located at the University of Belize campus in Belmopan, Belize.

It will support CARICOM SIDS and low-lying states as they develop methods to integrate vulnerability assessments and risk management into each member country's planning process. The MACC is designed to help host CARICOM countries of the UNFCCC complete their Second National Communications (ibid: 9). The MACC is not designed to develop or support actual adaptation projects. Implementation of adaptation projects will presumably be covered under the recently launched World Bank GEF enabling fund worth US \$50 million, entitled: *Piloting An Operational Approach to Adaptation*.

As per the World Bank Project Appraisal Document on the MACC (World Bank 2003: 10-12), *Component I* is intended to build capacity to assess vulnerability and risks at the regional level. A sub-component of this is to prepare vulnerability and risk assessment studies at the country level in key economic sectors, with national experts. *Component II* is designed to build in-country capacity to reduce vulnerability through the formulation

and analysis of adaptation policy options, and complete country-level sectoral adaptation strategies. *Component III* seeks to build regional capacity to effectively access and utilize resources to reduce vulnerability, through regional capacity-building for the UNFCCC, and development of a regional strategy to access financing and policy harmonization. *Component IV* will support the implementation of national and regional PEO strategies (crafted through consultations with multiple stakeholders) to improve decision-making and foster climate change public awareness. Finally, *Component V* will support project management.

It should be noted that as a precondition for MACC support, participating CARICOM countries are required to establish National Implementation Coordinating Units (NICUs), established under the CPACC program. NICUs are government-led, with possible representation by private sector, NGOs, and specialized agencies [Saleemul Huq, pers. comm. in CICERO: 2003 (2): 14].

MACC Beneficiary/Coordinating Lead Agencies include: the Caribbean Institute for Meteorology and Hydrology (CIMH); the Faculty of Engineering of the UWI (St. Augustine); the Marine Studies Center of the UWI, Mona, Jamaica; the Climate Studies Group at UWI, Mona; and the Caribbean Disaster Emergency Response Agency (CDERA) in Barbados.

#### *Caribbean Community Climate Change Center (CCCCC)*

As an output of the CPACC (above), the Caribbean Community Climate Change Center (CCCCC) was established in July 2002 as a “regional center of excellence,” and to support CARICOM countries in climate change mitigation and adaptation. To ensure its

long-term sustainability, a Resource Mobilization Group (RMG) has been created to identify potential financing, such as developing partnerships with key private sector stakeholders within the insurance and petroleum sectors (CCCCC 2002: 9).

#### *Caribbean Regional Fisheries Mechanism (CRFM)*

In February 2002, the CARICOM approved the establishment of the Caribbean Regional Fisheries Mechanism (CFRM) to address fisheries issues at the regional level. It is run out of the CARICOM Secretariat in Belize and St. Lucia.

As the primary mechanism for fisheries coordination, CARICOM countries will require close collaboration between the CCCCC and CRFM to successfully mainstream climate change issues within the regional fishery (Mahon 2002: 22). However, climate change did not emerge as a priority issue during CRFM program design, and therefore no provisions were made to address climate in general, or adaptation specifically. Nevertheless, the MACC is expected to further strengthen the CRFM process (in the preparatory stages of the MACC there was full consultation with CFRM regional stakeholders)<sup>92</sup> by assisting in the development of a strategy to help integrate climate change issues into CRFM planning (Mahon 2002: 26).

In relation to the CFRM, the Commonwealth of Dominica recognizes that medium to long range socio-economic sustainability, and the attainment of targets outlined in the Fisheries Development Plan, Corporate Plan, and Dominica Rural Enterprise Project (Fisheries and Tourism) can only be fully achieved through the incorporation of climate change adaptation initiatives into strategic development programming. This recognition

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<sup>92</sup> Trotz notes 2004

of adaptation is essential to sustain the fishery and dive tourism industries as vital revenue generators for this small island economy of 71,000 largely coastal inhabitants.

### *Caribbean Hazard Mitigation Capacity Building Program (CHAMP)*

CHAMP is a CIDA-funded program initiated in June 2002. It is implemented by the Caribbean Disaster Emergency Response Agency (CDERA), and executed by the Unit for Sustainable Development and Environment (USDE) of the OAS. CHAMP focusses on vulnerability reduction in the Caribbean by building capacity to improve: national hazard mitigation policies and implementation programs, use of hazard information, and safe building practices through training and certification.

### **3 Dominica's National to Community-Level Adaptation (Meso-Micro or Meso-Macro)**

As mentioned above, although there are several macro-level adaptation efforts, currently there are only a handful of international, regional and country-specific programs supporting community-level adaptation programming. Community-based adaptation applied research and field applications are just emerging, and grassroots adaptation approaches have yet to be meaningfully developed and integrated into a wider national and regional framework for poverty reduction, sustainable development and adaptation strategies to reduce climate and weather associated vulnerability and risk.

The OcCC suggests that the climate change research community over the past few years “has changed from a predominantly scenario-based, top-down and “single-stress” approach to climate change impacts and adaptations, towards a more bottom-up

approach, focusing on the resilience of societies in the face of multiple interacting climatic and social stresses” [CICERO 2003 (2): 2]. This assertion does not coincide with existing international adaptation program priorities. The fact that it is the scientific research community that is driving climate adaptation discourse, decision-making, and funding priorities immediately poses institutional limitations on the adaptation discipline especially at the operational level, in vulnerable communities.

*Dominica's Adaptation Literature and Climate Change Adaptation Approach*

*Self-reliance appears to be the most realistic option for a micro-state in a troubled world. (Lennox Honychurch 1995: 305)*

A recent 2001 Commonwealth of Dominica Government Report entitled: *Climate Change Vulnerability and Adaptation Assessment for Dominica* concluded that, “projections for global climate change would have profound, adverse impacts on Dominica, exacerbating many of the existing socio-economic and environmental difficulties that the country already faces.” Moreover, Dominica recognizes that coastal and marine resources are at greatest risk from climate change, and impacts are expected to include: inundation of coral reefs, sea grass beds and mangrove swamps as sea level rises; erosion of beaches and coastal islands due to sea level rise and changing coastal processes; and, loss of fishery production; and, fish kills and coral die-off from increased seawater temperatures (Policy Framework 2001: 5, 11).

Dominica's Initial National Communication (2000: 25) proposes the undertaking of a vulnerability assessment to provide baseline information on the island's vulnerability to climate change impacts to the year 2050. The analysis would utilize internationally accepted climate change scenarios and examine possible impacts on the coastal zone,

freshwater resources, human settlements, tourism, agriculture, fisheries, and human health. Furthermore, the vulnerability assessment would identify data gaps, capacity building needs, and implementation requirements to conduct more in depth vulnerability and adaptation activities.

Giving reference to the Commonwealth of Dominica's *Policy on Planning for Adaptation to Climate Change* Policy Framework (Policy Framework 2002: 10), a host of policy principles have been put forth. Corresponding government commitments include the following:

- Ensure that adaptive responses are consistent with national social, economic, and environmental development goals;
- Endeavour to obtain, to the greatest extent possible, the involvement and participation of all stakeholders at the national level in addressing issues related to climate change;
- Ensure that society, at all levels and in the all sectors is adequately informed on climate change issues and their implications for the nation; and,
- Endeavour, where possible and necessary, to develop national human and institutional capacity in all aspects of climate change research, response, and planning, etc.

Furthermore, the Policy Framework states that "there must be aggressive and effective involvement by all stakeholders at all levels of society' for Dominica's Climate Change Adaptation Policy to be effective (Policy Framework 2002: 11). This is reiterated in Dominica's Initial National Communication in the statement: "it must be emphasized that although the public sector will have a crucial role, adaptation to changing climate will

require actions and change behaviour by stakeholders at all levels” (Initial National Communication 2001: 67).

Consequently, Dominica (Initial National Communication 2001: 80-84) has identified six Priority Areas central to enabling meaningful adaptive response measures to climate change.<sup>93</sup> To address these coastal impacts Dominica (Policy Framework 2002: 12) has also proposed several priority responses including:

1. A national assessment of coastal areas and resources at risk;
2. Adopt short, medium, and long-term measures to protect coastal lands and to increase the resilience of coastal ecosystems and resources;
3. Develop measures to restore or “replace” damaged or destroyed coastal resources (i.e., artificial reefs and wetlands);
4. Identify and promote alternative fishery and resource use activities (e.g., Mariculture) where impacts on ecosystems and natural resources preclude the continuation of traditional activities;
5. Foster increased awareness and knowledge on the part of the public regarding climate change impacts on the coastal and marine environment.

#### *Dominica’s Fisheries Development Division and Climate Change Adaptation*

The Fisheries Act of 1987 requires the Chief Fisheries Officer to prepare a plan for the development and management of fisheries, providing licensing, and the designation of local Fisheries Management Areas and organizations, such as Local

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<sup>93</sup> See Initial National Communication 2001: 80-84 for details

Fisheries Management Authorities, to represent local fisher folk (Country Environmental Profile 1991: 105).

The Territorial Sea Act, Contiguous Zone Act, and Exclusive Economic and Fishery Zones Act of 1981 govern management of fishery resources in Dominica. Although Dominica has no comprehensive coastal zone management regulations, it continues to build its legislative and regulatory framework for environmental management. A UNEP-funded Biodiversity Action Plan, and National Environmental Action Plan (1994) provide guidance on sustainable development activities in the use of natural resources (Initial National Communication 2001: 57,58,59).

With the Town and Country Planning Act of 1975, all development activities are the responsibility of the Physical Planning Division (PPD). Dominica is also considering enacting into law a policy, under this Act, to ensure that Environmental Impact Assessments (EIAs) precede all major national development projects likely to negatively impact the environment (Initial National Communication 2001: 60). The Beach Control Act (1966, 1990), among others, helps to address issues of coastal zone environmental management.<sup>94</sup> To date, no Land Use Plan (LUP) or climate change-oriented LUP Guidelines exist.

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<sup>94</sup> For a good region-based introduction to coastal zone management, refer to "A Workbook of Practical Exercises in Coastal Zone Management for Tropical Islands," Commonwealth Science Council, Bacon et al, 1998.



*Target Area: Dominica's Scott's Head/Soufriere Marine Reserve (SSMR)*<sup>95</sup>

The combined population of the SSMR's neighbouring villages of Scott's Head, Soufriere, Gallion, Bagatelle, and Chamagne is estimated at 5,500 residents, or about 8% of the national total.

In 1987, the Fisheries Division of the Ministry of Agriculture and the Environment established a Marine Reserve in Scott's Head/Soufriere (see Figure 2 below).<sup>96</sup> The SSMR is the only fisheries-based marine reserve in the Caribbean. It runs 11 square miles from Chamagne, south of Point Michel, to Scotts Head point. The entire Scotts Head/Soufriere bay is actually a volcanic crater averaging a depth of about 100 meters.

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<sup>95</sup> Soufriere sign-post population: 1036; Scott's Head sign-post population: 721; Pointe Michel sign-post population: 1576. The populations of Gallion, Bagatelle, and Chamagne (all part of or bordering on the SSMR) are undetermined.

<sup>96</sup> Permission of author: Guiste, H.; Gobert, Bertrand. The Fisheries of the Scottshead/Soufriere Marine Reserve (SSMR, Dominica), 1996 [Document Scientifique, ORSTOM (now IRD), Brest (FRA), No 79. 14 p. multigr., bibl., graph.]

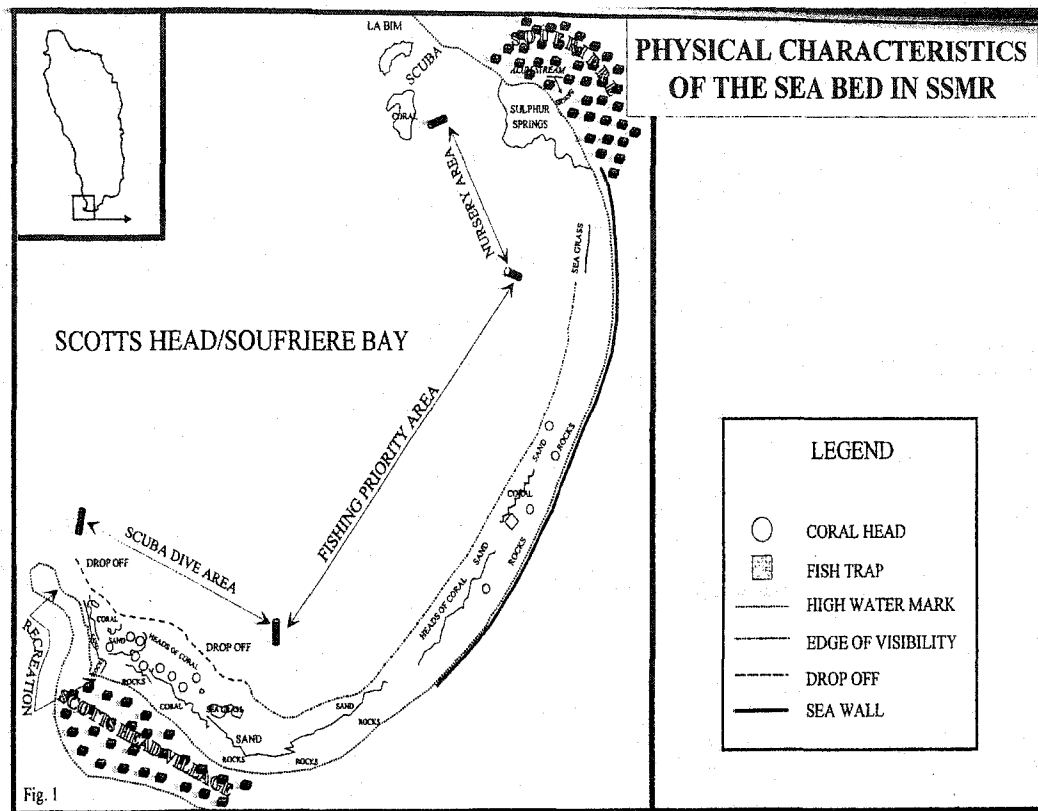


Figure 2

The Marine Reserve's fisheries management goal is to "develop and increase the potential of marine living resources to meet human nutritional needs, as well as social, economic and development goals while taking into account traditional knowledge and interests of the local communities, small-scale artisanal fisheries and sustainable management programmes. It is also designed to "establish measures to maintain the traditional activities, and cater for new interactions, and to avoid user conflict" (SSMR 1993<sup>97</sup>: 3).

Other key objectives of the SSMR include: effective utilization of fishery resources to provide food security for the three target communities of Scott's Head, Soufriere, and

<sup>97</sup> Estimated year as there is no date in the reference document.

Pointe Michel, and for the wider Dominican population; improve the target communities' socio-economic status; conserve and promote the recovery of over-exploited species, maintain biological diversity, and sustainably harvest non-endangered species for food and economic gain; manage land-based activities posing negative effects on marine resources; monitor reserve resources through data collection and analysis; encourage research to establish SSMR carrying capacity; regulate users such as fisher folk, divers and snorkellers to maintain resource integrity and avoid user conflict; and, provide appropriate land and marine-based infrastructure (SSMR 1993: 11).

SSMR marine attractions include: hot sulphur vents bubbling off the ocean floor, 'free-fall' marine cliffs, an array of coral colonies and other marine flora and fauna, all cast within a marine volcanic crater. The area is comprised of patchy sea-grass beds, volcanic sand, coral cover, and boulders and rocks.

To ensure an ecological balance in the marine environment, and allow for different activities with minimum user conflict, the marine reserve is formally titled in the Fishery Act, and demarcated on the water with marker buoys, into: a Fishing Priority Area; Fish Nursery Area; and Recreational Area.

In an effort to sustain a community-oriented management approach to the SSMR, major stakeholders have formed a Local Area Management Authority (LAMA)<sup>98</sup> under the provision of the Fisheries Act, No. 11 of 1987 (SSMR 1993: 5). Stakeholders include:

- Fishing Organizations from Soufriere, Scott's Head, and Pointe Michel;
- Village Councils of Soufriere, Scott's Head and Pointe Michel;

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<sup>98</sup> LAMA is a registered charity.

- Community Scout troop (Soufriere);
- Hospitality Industry entities from the three communities;
- Community groups (Scott's Head Improvement Committee);
- Dominica Water-Sports Association;
- The Fisheries Division;
- Dominica Police Force Marine Section (Coast Guard)

LAMA is empowered under Part III, Section 22 (1), and Part II, Section 18 and 19 of the same Act to provide overall management of the marine reserve. LAMA's Management Board is divided into 4 Sector Committees: Education, Operations and Development, Scientific Research, and Finance. LAMA personnel include Wardens, Guides, Life Guards, and Beach Hands. Wardens are empowered to enforce SSMR laws with the Coast Guard and Fisheries Division (including permit use of fish pot traps and fishing gear specifications). They are also in a position to provide guidance to users, collect user fees<sup>99</sup> from members of the Dominica Water-Sports Association (DWA) for snorkelling and diving, ensure appropriate maintenance of infrastructure (such as government-owned moorings and foreshore structures), and provide local community training in various areas (SSMR 1993: 8,10).

LAMA is also expected to erect an Interpretation Centre and Reserve Control Centres (RCC). LAMA's research data has been converted into promotional and educational material for schools and other institutions. Another community education initiative spearheaded by the LAMA is "SSMR Day," a nation-wide event that provides the island's school children with first-hand nature experience. LAMA is also in the process

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<sup>99</sup> User fees are actually referred to as 'ENDO' or Environmental Donation. These ENDO fees will be used for the hiring of LAMA Wardens and to assist local fisher folk.

of installing four Fish Aggregating Devices (FADs), to create community artificial reefs or 'green the marine commons.' FADS are designed to encourage more concentrated fish foraging and moderately improved catches, and to improve recreational opportunities for divers and snorkellers.

#### **4 Local Government, CBOs, and Community Fishery Micro-Adaptation**

*If you're able to work with people from the bottom up in building leadership in communities ... you're laying the foundations for people to make their own choices (Joey Pelletier, SPAT founding member)*

The village is the foundation of Dominican society. During much of Dominica's social development, villages were isolated peasant-based communities, self-reliant and independent with a strong community spirit (Honychurch 1982 in *Our Island Culture*: 8).

In 1940, Elma Napier became the first woman in Dominica and the West Indies to sit as a representative in the Legislature. She pioneered Village Boards and cooperative ventures as a means of community growth (Honychurch 1995: 171). Although resistance to Village Boards was fierce at first, eventually these Boards (now called Village Councils), who are 'charged with good government and improvement of the village,' began to make locally enforceable by-laws.

Village Councils have become a significant political offshoot of the central party system. Each community now has a Village Council. Councils, elected every three years by village voters, suggest improvements to relevant government departments, and undertake small decentralized projects. Council operational funds are provided by central government with local matching funds and taxes.

A self-help group to emerge in the aftermath of Hurricane David was the Dominica Hucksters Association, largely comprised of women, to represent the fair-trade interests of inter-island traders. Small Projects Assistance Team (SPAT), also created out of a hurricane, is widely acknowledged as a community-based local NGO with an excellent record in promoting participatory programs for rural communities (Country Environmental Profile 1991: 198). Prominent businesses that may be in a position to provide partnership assistance in the SSMR might include the Roseau Corporation Credit Union, the Church, and Astaphans Wholesale, etc.

#### *CBOs and Community Fishery Adaptation*

Several non-governmental and community-based entities are involved in or are related to the fishery. They include: various fisher folk's cooperatives; church and cultural groups; private sector tour operators involved in dive operations and whale watching; and the volunteer Scott's Head Improvement Committee. This dynamic committee has made substantial contributions to community development and informal adaptation initiatives, including the construction of the Caribanti community centre for village activities, and the coordination of pre/post-disaster community support efforts. These community-based groups are in a pivotal position to mobilize community resources for their own micro-adaptation initiatives.

A recently completed risk management effort in the SSMR has been the construction of government fishery lockers on Scott's Head beach to protect the fisheries boats and gear. This was accomplished through the efforts of the Fisheries Development Division, with

funding by Plenty Canada, and community self-help mobilization. El Rose donated the land. These lockers are to be used for storage of fishing gear, especially during storms.

*UNDP GEF-Small Grants Program (SGP) and CBOs/NGOs*

One of a few, or perhaps the sole funding mechanism available for community-level environmental development programming (allowing for climate change initiatives) is the UNDP's GEF Small Grants Program (SGP). The GEF-SGP provides grants up to US\$50,000 and other support to community-based organizations (CBOs) and non-governmental organizations (NGOs) 'for activities that address local problems related to the GEF areas of concern' (GEF SGP website 2002).

What is unique about this program is that it attempts to link global (macro), national (meso) and local (meso) development issues through a participatory and country-driven approach to project planning, design and implementation. Thus, grants are made directly to CBOs and NGOs, unlike virtually all other international donor funding mechanisms. As such, the SGP 'encourages maximum country and community-level ownership and initiative' (UNDP GEF). However, no official approval structure exists to promote or assess the value of community adaptation projects.

**4 Site Tours, Reconnaissance and Institutional Interviews, and Community Focus Groups: Scott's Head, Soufriere, Gallion, Bagatelle, Pointe Michel**

During my visit to Dominica, site tours provided a first-hand impression of general climate and socio-economic conditions in various communities, enabling me to identify risk areas and issues, and providing insight into additional socio-cultural,

economic and institutional factors impeding community integration into public adaptation efforts.

As part of my field research, I interviewed the SSMR Manager, Marine Management Program during a drive-around of the target region, engaged in several onshore observations and informal discussions with local fisher folk, and took a near-shore boat provided by local Soufriere fisher folk.

I was also able to conduct a number of reconnaissance and institutional interviews. They included:

- A meeting with the Director of the Ministry of Dominica's Communications, Works and Housing;
- Discussions with the Director of Dominica's Women's Bureau of the Ministry of Community Development and Gender Affairs;
- Consultations with the Director and Assistant Tourism Officer from the National Development Corporation (NDC);
- Two meetings with the Executive Director of the office of Disaster Management under the Ministry of Communications and Works;
- Consultations with the Acting Senior Meteorological Officer at Canefield Airport;
- A discussion with the Hon. Permanent Secretary of Tourism;
- An interview with the distinguished Historian of the University of The West Indies in Dominica, Dr. Honychurch;
- Two well attended community Focus Groups with the Soufriere Fisheries Group membership (15 in attendance), and with the Scott's Head Community Fisheries Study Group (12 participants);



- A meeting with the Soufriere-Scott's Head-Gllion-Bagatelle Village Council;
- An interview with the Scott's Head Improvement Committee;
- Because of time and financial constraints, I was unable to meet with representatives from the neighbouring villages of Pointe Michel, Gallion or Bagatelle.<sup>100</sup>

The results of the adaptation literature review, site observations and informal interviews, institutional consultations, and Focus Groups, are incorporated throughout this paper.

## 1 Site Tours

*Interview with SSMR Program Manager Aaron (Izzy) Madesetti and a National Parks representative during SSMR Drive-Around (Aug. 10, 13)*

The SSMR Program Manager oversees the Marine Management Program for the West Coast under the EU's two-year Dive Improvement Program.

During our marine reserve drive-around, it was pointed out that Dominica, and the SSMR in particular, is considered one of the top-10 dive destinations worldwide according to Dive Magazine. The local company Dive Dominica offers snorkelling, recreational diving and whale-watching outings. The Anchorage Hotel offers whale & dolphin-watching, and Nature Island Dive offers snorkelling, recreational diving, dive courses, kayaking, and mountain biking.

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<sup>100</sup> These communities would have provided secondary empirical data to reinforce data collected from the target communities of Scott's Head/Soufriere.

### *Soufriere Near-Shore Fishing Boat Tour (August 11)*

These seasoned fisher folk fish in groups of three or four to share the workload and entertain one another. For 'canal' or deep-sea channel fishing, they often depart at sunrise and return in the late afternoon. Frequently, several boats will compete for a large school of balaw or bonik.

During a sea-faring expedition with Soufriere fisher folk, I was surprised that within only a couple of minutes traversing Scott's Head bay, we had left the calm waters of the Caribbean Sea for the distinctly rougher swells of the Atlantic Ocean. The west coast is considerably calmer, and hence popular for seine net fishing.

## **2 Reconnaissance and Institutional Interviews**

I conducted numerous reconnaissance and institutional interviews on the Southwest portion of the island, with pertinent government (municipal and national), and community stakeholders involved in the fisheries, tourism and environmental protection sectors. These interviews provided field insight, confirmed and identified core research issues, helped establish data types and other structural and procedural information for my research, and helped identify prospective participants.

My country host was the Ministry of Agriculture and the Environment. This Ministry's Environmental Coordinating Unit (ECU) houses the National Implementation Coordinating Unit (NICU) that, in turn, manages adaptation and mitigation-related initiatives nationally and is the GEF's National Focal Point for climate change. NICU

facilitated my access to local adaptation-related information and my intelligence gathering, including the coordination of several inter-agency interviews.

*Ministry of Agriculture and the Environment, Environmental Coordinating Unit  
(Aug 11)*

The Ministry serves as a Secretariat to the National Climate Change Committee. The Environmental Coordinating Unit (ECU) is responsible for all environmental activities on the island, including implementation of the national climate change adaptation policy and MACC coordination. Under the ECU, the Fisheries Development Division is responsible for all fisheries, and potential SSMR related adaptation activities. This would likely be done in collaboration with the Local Area Management Authority (LAMA).

During a telephone interview with the ECU Director and GEF Focal Point, he stated that “Although Dominica is listed at over 30% poverty rate, we still do not classify for debt reduction,” ‘though, there may be a possibility of Caribbean Development Bank (CDB) debt forgiveness.’ ‘The IMF is taking the lead in directing Dominica’s economy ... and nothing will take place without the IMF Agreement ... which is signed by the IMF’ (July 3). This includes an austerity budget endorsed through the House of Assembly.

Currently an austerity program is being introduced in Dominica. In 2003, in line with the IMF’s fiscally conservative austerity guidelines, the Commonwealth of Dominica increased taxes and reduced government wages. This included a state tax levy of 3% on salaries above ECS900/month (US\$333.33) for all Dominican nationals. Public servants suffered a 5% salary reduction, along with a 5% staff reduction across the board and a 5%

pension coverage reduction. Furthermore, sales tax was raised from 5 to 7% and applies to utilities.

During successive visits to the Ministry of Agriculture, I reviewed Dominica's 5-Year Fisheries Development Plan and Corporate Plan to begin to understand how within that plan adaptation how local fishery adaptation issues may be addressed. I was also able to source sections of the Dominica Rural Enterprise Project (Fisheries component) document, and approached the head of the LAMA regarding the SSMR. In addition, I reviewed the National Poverty Reduction Strategy. Other references include the DOWASCO Utility Authority, Dominica National Council of Women, the National Climate Change Adaptation and Implementation Plan, UN Framework on Climate Change, and a couple of CARICOM OECS Initial (Climate Change) Communications.

During my discussions with Fisheries Development Division (FDD) representatives, it was suggested that some rivalry existed between the communities of Scott's Head and Soufriere because Soufriere has only three working net fishers versus Scott's Head's ten. That unevenness has caused some noticeable competition and uneasiness between the two sister communities. Yet, because of the similar challenges facing these neighbouring communities, particularly in times of disaster (or community project development), frequently there are efforts of solidarity (Aug 11 interview).

*Interview with Ministry of Communications, Works and Housing General Manager Petronelle Green (Aug 12, 8:15 a.m.)*

There is little in the way of post-disaster damage statistics for hurricane David (1979) within the Ministry. Departmental information management appears fragmented

and disorganized. Hurricane Lenny in 1999 caused significant road damage on the West coast, including Scott's Head and Soufriere. A good 90% of the main (only) thoroughfare was gone ... close to one mile destroyed. The embankment, running the length of the road, was severely eroded because it is comprised of loose volcanic material typical of much of the Dominican topography. The sea damaged 4-5 houses in Soufriere, as it is more exposed to the sea, and closer to the beach-head. With Hurricane Lenny, there was considerably more sea damage. Moreover, hurricane David had made the roads more vulnerable. Lenny wasn't a windstorm as much as a storm surge.'

*Interview with Ministry of Community Development & Gender Affairs Dominica  
Women's Bureau Director Rosie Browne (Aug 12, 9:30 a.m.)*

Following a brief meeting at the Department Of Local Development and Community Development, I was referred to the office of the Director of the Women's Bureau, a branch of the Ministry of Community Development & Gender Affairs. As with gender in development, women and adaptation is a key sustainability and equity consideration.

Currently, there are no Ministry gender programs in the target communities of Scott's Head or Soufriere. The Bureau operates more on a District level regarding questions of poverty, domestic violence advocacy, and skills training. "Climate change has not been a subject we have dealt with in any depth." We have only had brief contact with the Environmental Coordinating Unit (ECU) two or three years ago. "We cannot open ourselves to many issues when our resources are so limited." " Nevertheless, we are in fact seeking to mainstream gender issues in Dominica, but acceptance (in government) has been limited." Reflective of this is the percentage of women in Parliament, with 6

women of a total of 55 candidates, and women comprise only 2 of the 21 Parliamentary seats.

*Interview with National Development Corporation (NDC) Executive Director Vincent Philbert and Assistant Tourism Officer Marcella LaRocque (Aug 12, 10:45 a.m.)*

The NDC is the crown corporation responsible for national tourism promotion and development. Dominica is the Caribbean's nature island destination, and the NDC's national priority is biodiversity and ecological conservation. The Fisheries Division is the custodian of the marine environment, and Forestry and Parks is the custodian of land-based ecologies.

I was informed that dive and whale watching operations represent an estimated 4,000, or 6%, of the overall 65,000 annual tourism visitations. A total of 200,000 cruise passengers largely benefit the dive shops and local transportation services. Tourism contributes EC\$113 million (US\$41.85 million) to GNP. Agricultural receipts (including the fishery) are lower.<sup>101</sup>

During this interview, Philbert suggested I meet Atherton Martin, Ministry of Planning, and obtain a copy of the recently completed Integrated Development Plan, and Tourism Niche Market Consultancy Report (Draft Sept 03). He explained that the NDC is a parastatal entity with 100% administration from government, and grants from the European Union, CIDA, CIPEC, the OAS, and UNDP.

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<sup>101</sup> This contradicts central government statistics which indicate Dominica's agricultural output at 25% GDP or 70% of export earnings (Policy Framework 2002: 1).

In response to my queries about the NDC's understanding of climate change, Philbert responded, "The banana industry is the single most guilty in terms of land erosion and road slippage." "As far as risk goes, climate change is not a high priority for the NDC. However, the NDC has been cognisant of the need to identify a haven from volcano disasters."

"A logical pilot for Fisheries and Tourism are the Scott's Head/Soufriere communities." Marigot is also a fishery community, but has little in the way of tourism. Cabrits has a National Marine Park and some fishery activity.

*Interview with Ministry of Communications, Works and Housing (MCWH) Office of Disaster Management (ODM) Cecil Shillingford (Aug 12, noon)*

Immediately following the three hurricanes in 1995, Disaster Preparedness Committees were established, and community disaster management training was conducted by the Office of Disaster Management (ODM) and the Red Cross. In Scott's Head/Soufriere, training was conducted in 1998, largely motivated by concerns about seismic activity in the area. There is a 20% chance within the next two years of a sizeable volcanic eruption. The Seismic Research Unit in Trinidad and 12 local monitors have been recording seismic activities since the 1950s. During 1998 and 1999, 2,000 plus seismic events were recorded in the South (Roseau to Scott's Head/Soufriere). There were over 1,000 earth tremors recorded in Northern Dominica (Portsmouth to Calibishi) in April of 2003.

"Climate change is more of a priority for the ECU and meteorology office." Climate is not a central issue for the ODM largely because of staffing and resource limitations." "In fact, climate change at the community level is somewhat of a novelty." "I am not aware of

any available information on sea defence.’ “Furthermore, likely stakeholders of a climate change adaptation program would include: Fisheries; Tourism; the Meteorological Office; Village Councils and other community interest groups; the ECU; and schools.”

‘A likely NGO partner for a CCA community development initiative might be SPAT (Small Projects Assistance Team).’ They have an office and a couple of staff members. The IEM (Institute of Energy Management) Inc. is another. They are funded by the World Bank and Government of Dominica, but have no office. Mr. Shillingford is involved.

*Interview with Canefield Airport Acting Senior Meteorological Officer Fitzroy Pascal (Aug 12)*

The Canefield Airport Meteorological Office was completed and established in 1981. It serves as a second weather station and airport to Melville Hall (Airport), established in 1965. Both stations measure dates, wind speed, temperatures, precipitation, and gusts.<sup>102</sup>

The World Bank loaned money for the installation of seven automatic weather stations in Dominica, and CPACC funded the installation of an automatic weather station on the Coast Guard base.

*Interview with the Permanent Secretary of Tourism Dr. Colmore Christian (August 13)*

“We see tourism as an alternative to the fishery. This was the driving force for the development of the SSMR, and for alternative revenue generation.” “We need a

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<sup>102</sup> See Annex B for detailed Meteorological Hurricane Data in Dominica



public awareness program on the impact of climate change.” “Housing construction codes need to be reflected in climate change strategies.” “For example, the Evergreen & Anchorage hotels were severely damaged in Lenny.” The accommodation sector is aware of climate change impact as they have witnessed the damage to their facilities, but the dive tourism industry is essentially unaware.” Land variances and setbacks on coastal infrastructure are needed but very difficult.”

“Tourism could be a key partner in a CCA project, and the industry has some interest.” “From the perspective of Village Councils and community coops, the Ministry of Community Development would be very well placed to lead coordination of CCA PEO programs, with Village Councils. They could help mobilize the community, and Ministry of Communications, Works and Housing would assist with infrastructure development coordination (such as minimizing soil erosion, and agricultural and forestry adaptation).”

*Interview with Dr. Lennox Honychurch at University Centre (August 13)*

The Integrated Development Plan is an EC\$1.1 million (US \$407K) report “full of waffle or padding, and doesn’t adequately address the development issues.”

“In the mid-eighties, the village consciousness has gone from fishing for a livelihood, to a tourist environment.” As such, the fisheries and dive tourism are now parallel industries.

Because of a governance structures ‘from above’ by Dominica’s national government, the power of decision-making has been sapped from the community, and has created a relative environment of dependency and reliance on government coffers.

### **3 Community Focus Group Interviews**

I coordinated four focus groups in the target communities of Scott's Head and Soufriere with participants comprised of Fishery Group stakeholders, community organizers and residents. Two Fisheries Group Focus Groups were conducted with arms length assistance from the Fisheries Division of the Ministry of Agriculture and the Environment. The third focus group was conducted with the Scott's Head Improvement Committee, comprised largely of women volunteers. During my initial field investigations, this group was recommended to me on several occasions. The fourth focus group was with the Soufriere, Scott's Head, Gallion, Bagatelle (SSGB) Village Council local government. These focus groups helped to identify local traditional and contemporary adaptive approaches, such as coastal zone resource management, shore protection measures, informal hazard mapping and storm risk assessment, and random set-back strategies. As well, these community-level interviews helped identify perceived barriers to micro-integration into adaptive program opportunities.

This qualitative research approach generated dynamic discussion while enabling efficient gathering of first-hand information from a diversity of sources. Furthermore, in-depth, small group interviews provided community residents and organizers with a supportive forum, in community centres and in community members' homes, to freely discuss issues they may otherwise be unable to discuss individually or in the presence of government authorities. With participant agreement, data was hand-recorded, and focus groups lasted from one to two hours depending on energy levels, the number of participants, and their family and work commitments.

Guiding research questions, a data filing system, and category coding were developed for field use. See Section 1.4 *Research Methodology and Data Types/Sources*.

#### **Soufriere Fisheries Group Focus Group (evening August 11)**

I met with the Soufriere (St. Mark) Fisheries Group on Monday evening, August 11. To help build for this meeting, a popular, private-sector radio station aired a couple of public service announcements inviting local villagers. Word of mouth was also effective in attracting participants. Local organizers characterized the actual turn-out for this focus group, 15 members or about 70% of the membership, as impressive. Because this was a first contact with local Soufriere fisher folk, focus group questions were presented in a more casual manner. The community building had no lights, so the meeting was largely conducted in the dark, which made for a little lighthearted humour, and more difficult note taking.

I was first introduced to the President of the Soufriere (St. Mark) Fishers Group, currently comprised of about 20-25 members. "The (Fisheries) Group doesn't really function now, because the old Board (of President Secretary and Treasurer) doesn't want to hand over the books" (FT). In Soufriere, some people rely significantly on fishing, but they are more artisan than at Scott's Head. Others have jobs in Roseau and in agriculture. "We fish and then tend to our crops."

#### **Soufriere Fisheries Group Focus Group results are as follows:**

##### *Resources & Perceived Risk*

- 1.1 It's hotter in the summers and cooler around Christmas. There's no wind now and more low tides, and tuna stocks are decreasing.
- 1.2 Climate change doesn't affect us, except during hurricanes (!).
- 1.3 Only 4 of the 15 members own property.
- 1.4 There were more fish, and now there are less of most all fished species.
- 1.5 Five years ago we pulled in 100 pounds of jacks (night-fishing). Now we pull in about 10 pounds.
- 1.6 N/A

#### *Organizational/Stakeholders*

- 2.1 The Soufriere Fisheries Group would be a primary community stakeholder.
- 2.2 We work with Fisheries only. We're not interested in sponsorship.
- 2.3 The Soufriere Fisheries Group can organize its members. We take care of risks like storms.
- 2.4 N/A
- 2.5 We can provide resources like labour.
- 2.6 We would collaborate ... if Scott's Head and Pointe Michel are willing.
- 2.7 We sometimes do education or training as a group, sometimes with help from the Fisheries Department.
- 2.8 The (Central) Government doesn't include us in their plans. We can't get information from the Disaster Preparedness Agency.
- 2.9 The (Village) Council and SFG Board would be involved (in risk management).
- 2.10 Our houses are constantly at risk.
- 2.11 See 1.3.
- 2.12 Decisions in the SFG are by vote. We meet once per month.

- 2.13 Hurricanes are the biggest threat to us.
- 2.14 Women sell the fish (fish mongers). They don't actually fish, but they pull in the catch nets. We used to have many women members. They were also shareholders.
- 2.15 N/A
- 2.16 N/A
- 2.17 N/A
- 2.18 N/A
- 2.19 Our relationship with them is OK. We have a few solvable problems with Dive Tourism, such as fishing and boat compatibility.

*Traditional and Contemporary Responses*

- 3.1 We temporarily retreat from the water, and move our gear and boats upland. Then we rebuild because there is no remaining space elsewhere. We do need fish lockers (like at Scott's Head) to protect our livelihood.
- 3.2 We need advance organization. We depend on PSAs. We observe the swells, and if the winds are easterly, then we expect a storm. So we prepare.
- 3.3 N/A
- 3.4 Houses are secured by boarding-up windows, roping houses, storing drinking water. During Lenny, there was no water or telephone.
- 3.5/6 Depending on the storm direction, the bayside (beach) is worst of all. There are no official hazard maps, but based on community experience we have identified the beach as the most vulnerable. There is no soil erosion in Soufriere.
- 3.7 None.
- 3.8 N/A

- 3.9 For risk assessment, it's necessary that we receive advance storm warnings to prepare. We are all willing to participate in a workshop to assess our risks. Previously, we received a training workshop in general fishing skills.

#### *Impediments and Opportunities*

- 4.1 (similar to 2.15) We suffer from poor communication internally. (There is a distinct dependency on the Fisheries Division).
- 4.2 We recommend combining two or three community groups (Scott's Head, Soufriere, and Pointe Michel) to leverage assistance.
- 4.3 N/A
- 4.4 We would prefer if Fisheries provided the leadership.
- 4.5 See 4.2
- 4.6 N/A (Note no women present)
- 4.7 See 4.2
- 4.8 Ocean navigation, community communication, FADS, weather forecasting, organizational management, fish finding techniques.
- 4.9 N/A
- 4.10 Fisheries training/our labour.
- 4.12 We would go back to fishing no matter what! This is because of our traditionalism, yet those who see risks and opportunities (especially those with other sources of revenue) are willing to consider agricultural or tourism activities. The overall level of risk to our livelihoods is less in Soufriere because we depend on multiple sources of revenue. For several of us, fishing is not the primary source of income generation. 'We must have home gardens so that if there are no fish, we garden.' Dominica is the breadbasket for the Caribbean.

### **Scotts Head Bay or ‘Cachacrou’: (Sign Post Population 721)**

#### *Scott's Head Community Fisheries Study Group (evening August 12)*

On Tuesday evening of August 12, I had the privilege of meeting the vibrant and organized Scott's Head Community Fisheries Study Group. The Group is comprised of 18-20 active members, and 12 attended. We met in the Carabanti Community Building. To help publicize this meeting, community PSA's were aired through a popular private-sector radio station. Again, word of mouth through the membership was most effective.

The Scott's Head economy and lifestyle significantly evolve around, and are heavily dependent on the fishery, which is somewhat more commercial than Soufriere's more artisanal approach. This difference is clearly evident when reviewing Fisheries Division comparative statistics, and visiting both sites. The recent construction of government fishery lockers on Scott's Head beach, through efforts by the FDD, was funded by Plenty Canada and community self-help initiatives. Lockers are to be used for storage of fishing gear. El Rose donated the land.

Because of the size of the group, and time constraints to return to Roseau before nightfall, discussion was less formal, and many of the target research questions were either combined or already answered during other community or institutional interviews.

#### **Scotts Head Fisheries Group Focus Group results are as follows:**

1.1/1.2/1.4/1.5

“Today, there are less fish to catch. Twenty years ago, we used to catch more fish like bonito, tuna, jacks, mahi-mahi, and red fish.” “Lenny fooled everyone. There were no clear hurricane advisories.” “All 30 fishermen have home freezers.”

2.2/2.5/2.9

The community has an excellent building owned by the Scott’s Head Improvement Committee. The GoCD and the Village Council provided the construction funds, and the Caribbean Concrete Development Corporation provided the concrete and aggregates.

2.5/2.8/2.14/2.16/4.6

“After Lenny, local fishermen and women were cooperative in helping to rescue boats. There are no women members in the Group, other than the President who is Felita Paul-Thomas.

1.2 (During Lenny) “There was no electricity, telephone service or road access. We were stranded. Before the storm, we put our boats on the village road.”

2.4/2.8/4.1/4.4/4.5

The community boasts a Disaster Preparedness Committee (President George Bellot), comprised of teachers, carpenters, nurses, and fishers.

2.2/2.5/2.9/2.12/2.15/2.18/4.5

Although the Scott’s Head Fishers Group is not registered, it would certainly like to be, ‘though government bureaucracy is a barrier and there is some reticence on the part of the Fisheries Development Division to help register us.’ Group Membership costs \$10 EC



(US\$3.70) per month. It was suggested that 'if a project were considered, it should be conducted through the Village Council for both communities!'

#### 2.6/4.3

"In a crisis such as Lenny, both communities (Scott's Head & Soufriere) unite forces."

#### 4.11

Group members indicated that they would consider, and currently are considering alternative livelihoods to the fishery. Unlike Soufriere, Scott's Head has few gardens because of steep inclines and rocky volcanic terrain. Tourism may provide options.

#### 3.1/3.2/3.4/4.8/4.11

When asked about other adaptation ideas or solutions, the response was: "We need a sea wall. We also need a way to attract fish. Currently we are using FADs and the SSMR is installing more. One exists already made of rope, a 300-meter anchor, and a EC \$2500 (US\$926) buoy. We tie old nets, tarpoline, wood crates and clothing to attract fish, provide them with shelter and hiding places. We also use stone casting around our houses, and for our home foundations. "We don't know how high the sea will come, so we just raise sea walls, the stone castings, and our boats." "We also construct 'gabion' steel-netted stone retention walls. We also need sea level predictions." We need a local petrol station for our boat fuel, especially if we are temporarily cut-off by storms or road damage as has happened several times in past years. Otherwise we have to travel all the way to Roseau."

**Interview with Soufriere-Scott's Head-Gallion-Bagatelle Village Council**  
**(Soufriere, evening of Aug 13)**

Disaster PEO meetings occur just before the hurricane season, from June to November. There is a Scott's Head Disaster Preparedness Committee and a Disaster Preparedness Warden (Principal of the Scott's Head government school). Women play a pivotal role in organizing water supply, groceries, emergency supplies. Men's role includes nailing down roofs, barricading windows, and hauling fishing supplies off the beachhead.

The most recent Soufriere-Scott's Head-Gallion-Bagatelle Village Council was inaugurated May 2003 for a 3-year term. It has 8 volunteer Councillors. It is housed in a large stone heritage building, comprised of an office and general activity area, large meeting centre, with one computer and a printer, but no fax or internet. It has basic money management capability. The Council collects house rates, and conducts community fund-raising to sustain its work.

Currently, the Village Council has no concrete activities or connections with the LAMA, Dive Tourism or the Water Sports Association. "However, we could arrange a possible PEO in collaboration with the LAMA, local school, the Scott's Head Improvement Committee, and the Fishermen's Groups."

**Interview with the Scott's Head Improvement Committee (Scott's Head, evening Aug 14)**

Of the socially organized groups at the community level, the Scott's Head Improvement Committee is certainly one of the most instrumental in coordinating community actions. The Scott's Head Improvement Committee represents at least two Committees: The Scott's Head Improvement Committee (since 1989/90), including beach clean-up and Carnival, and the Scott's Head Disaster Preparedness Committee.

Because the handful of mothers present needed to attend to their infants while answering questions, it was a more structured format was inappropriate. Furthermore, free-flowing discussion seemed to be working well in obtaining general responses to several key research questions. Thus, in some cases data sets are combined.

**Scott's Head Improvement Committee Focus Group results are as follows:**

**1.1/1.2/1.5**

"Generally, climate change is not really construed as a threat or point of discussion within the community." (A.D.) Yet, hurricanes, storm surge, and unpredictable extreme weather are popular and worrying themes.

**2.1/2.9**

ENCORE (Environmental & Coastal Resources Project) was established five years ago by the Ministry of Agriculture to promote environmental (marine) sustainability, climate & disaster issues. LAMA filled their vacuum.

A logical project partner would be the Scott's Head Disaster Preparedness Committee (DPC). Public education is performed by a Sub-Committee of the DPC. 'During a severe storm, the Scott's Head DPC is frequently isolated from Soufriere because the access road is frequently flooded or damaged. Thus, we are unable to assist with or collaborate with the Soufriere community in times of crisis.' 'Scott's Head has one large assigned shelter at the schoolhouse. But is it not considered safe because it requires reinforced windows and lacks a washroom facility.'

2.5 The Caribanti building was built in 1998 by the Scott's Head Improvement Committee counting on 100% support from local community and business stakeholders and volunteers. User fees are collected when the community building is utilized for fundraising events.

Groups of influence and community decision-making include: Central Government, Village Council, Sign Committee, Jewels of The South (Women's Sports), Cricket team, church groups (Social League, St. Vincent de Paul).

2.8/2.12/4.1

"A serious lack of political continuity by central government causes them to retract their many promises for disaster preparedness resources." (A.D.) "If we don't take action, we will lose our credibility and our conscience. Our livelihoods and security (houses, work, and roads) will be at risk. If we do take action, we will get enormous satisfaction. We'll save lives." (A.D.)

2.8/2.15

Two more years of Labour Party. Likely the United Worker's Party will replace them. There's also the Freedom Party.

### 3.1/3.4/3.8

"These days people take extra care to ensure their houses are stronger. With hurricane David, I built my house with concrete instead of galvanized sheets" (A.D.). New housing guidelines require that roofs have hurricane ties.

There are five Disaster Preparedness Committees: Women are responsible for food preparation, first aid, alert & rescue, safety, and post disaster assessment. "If the sea is rough, I don't venture to town. Parents don't let their kids to school. People now stock candles, kerosene, matches, flashlights, dry & canned foods. Because of (Hurricane) David, people also save more (money)." (Marie Lewis) If the wind blows in from the Atlantic, all is normal. However, if it comes from the direction of Guadeloupe, it is likely there is a storm coming.

### 3.2

We need general training.

### 1.1/3.5

Defending the Scott's Head isthmus defence against sea-level rise and successive storm surges is a priority, as it physically separates the Atlantic Ocean and Caribbean Sea. This provides the SSMR villages, and their fishery and recreational activities, with a vital natural barrier preventing damaging surge and waves from the Atlantic, especially during the storm season.

When the SSMR road is impassable, there is a mountain path between Gallion and Scott's Head school. The original path was developed between 1997 and 2000, but needs upgrading to improve emergency access. Also, road landslides are a continuous problem.

Hurricane Edith was in 1960. During this storm, the Scott's Head cricket field, located on the isthmus separating the Atlantic from the Caribbean Sea, disappeared. "Lenny wrecked the West coast road. Iris and Luis also damaged the road. Everything was flattened down on the island from David" (C.O.).

#### 4.3

Prominent businesses: Roseau Corporation Credit Union, the Church, Astaphans Wholesale.

#### 4.4/4.5

Our experience with community action was that "we got community members to help build the Caribanti Building. This included volunteer skilled and manual labour. Women helped by cooking food and carrying masonry stones and water supplies." (A.D.)

#### 4.5B

Caribanti needs indoor bathrooms and snack bar equipment.

#### 4.9

"For women, TV soaps are a serious distraction to attending public meetings. To engage men, we must go to the fishing areas where they play cards, etc." (A.D.) "The only way to engage people about potential climate threats is to convince them of the benefits now, especially the cost benefits." "The best thing is to talk directly to each person, this makes

them feel important enough to come to meetings” (A.D.). We also use the Village Council community bell for hurricanes and clean-ups. At night, fishers blow the conch shell to provide danger warnings. (A.D.)

#### 4.11

The first banana stock crashed. Meanwhile, the fishery has provided us with essential revenue. The Scott’s Head Improvement Committee is registered with local government (Ministry of Community Development, Local Government Branch).

#### 4.4/4.5/4.9

Radio Stations: DBS (Dominica Broadcast Service); Kari FM; Q95; Voice of Life (Christian)

In Soufriere, 60-80% of residents have domestic water. The rest rely on public stand-pipes. Some have septic tanks. In Scott’s Head, 95% have domestic water and all appear to have septic tanks.

#### **Point Michel (Sign Post Population: 1576)**

Here, fishing activity is even more artisanal than at Soufriere. I was unable to meet with the Head of the Fisheries Group. My schedule also did not permit research interviews in the SSMR neighbouring villages of Gallion or Bagatelle.

## Chapter IV

### Climate Change Adaptation and Development:

#### Data Presentation and Analysis

*Give a person a fish, and feed her for a day. Teach a person to fish, and feed her indefinitely until fish stocks are depleted from over fishing and climate change impact. Pioneer participatory grassroots adaptation, with improved fishery techniques and conservation practices, and make a sustainable fishery possible for the next generation in a climate-changing world.*  
(Author, amended from Chinese proverb)

My central thesis argument is divided into three premises. First, that despite some impressive advancements in CCA programming, the paucity of community (micro-level) development theory within the development, climate change, disaster management and adaptation disciplines has led to an imperfect coordination of analysis and praxis between mainstream and grassroots adaptation efforts, and a propensity to develop less sustainable centralized and externally driven macro-remedial adaptation models. Second, there are significant institutional, economic and socio-cultural impediments to community integration into broader adaptation development strategies. Third, that the pioneering and integration of participatory micro-adaptation models by marginalized coastal communities into broader adaptation development strategies supports sustainable livelihoods and the commons more effectively.



To validate these three premises, I will evaluate the various theoretical underpinnings laid out in Chapter II in relation to research observations gleaned during my field study in the Eastern Caribbean.

## **1 Why Participatory Climate Change Adaptation (CCA) Is Lacking**

*There is a “pervasiveness of modernization notions in development work, leading to an emphasis upon macro strategies and bureaucratic management, with consequent associations of village institutions with backwardness and traditional values.”*

(Donald Curtis in Nelson and Wright 2000: 115).

Current risk management policies and climate impact and adaptation programs are quite removed from the development principles of community participatory and transformative development. Instead, these regimes disproportionately favour redistributive risk within the economic sector and meso-macro level government institutions. They also favour aggregate macro-level growth over redistributive social justice. Furthermore, there is an unhealthy preponderance of scientific research on climate change management substituting for community risk reduction and development discourse. As such, there is indeed a “critical ontology” (Foucault 1989) surrounding community development and adaptation in development theory and praxis. This notion of modernization and subsequent macro-strategies (Nelson and Wright: 2000) permeates the risk management sector, as witnessed in my review and analysis of current macro-adaptation funding initiatives in the previous chapter.

While many of the World Bank’s (and other IFIs and UN dependencies) poverty alleviation/reduction efforts of the 1980s and 1990s were being evaluated as failures, and

the income gap between rich and poor continued to dramatically rise between the 1960s and 1990s (UN 1993), participatory development began to be considered occasionally during the project implementation phase (volunteer labour and public outreach), but only rarely in project concept, design and evaluation stages. This imperfect coordination between mainstream and grassroots development practices, and consequently within the climate adaptation discipline, and a propensity to develop macro-remedial adaptation models thus begins to explain why participatory community adaptation is not part of the impact and adaptation lexicon.

The development community, and more recently the adaptation community, seems to have compartmentalized the 'developing world' in neat little objectified packages: In the 1950s, the North intervened "To" the South. In the 60s, help was "For" the developing world. During the 70s, development assistance came "Through" southern partners. While in the 80s and 90s, "We" empowered "Them." In the current post-2000 decade, the development paradigm seems to propagate a combination of all of the aforementioned objectifications of the South, with some reversion back to the 1950s model of growth development in the form of neoliberalism.

Looking at the development record over the years, and the innumerable global campaigns of poverty alleviation, one wonders whether poverty alleviation is in fact a genuine goal at all. Consider that, "(i)n 1960, the Northern countries were 20 times richer than the Southern, and in 1980, 46 times" (Development Dictionary 1992). Furthermore, the number of LDCs (least developed countries) has doubled since 1971 – from 25 to 49 (McNally 2002). In the UN's 1997 Human Development Report, the income gap between the fifth of the world's people living in the richest countries and the fifth in the poorest

was 74 to 1 in 1997, up from 60 to 1 in 1990, and 30 to 1 in 1960 (UN 1993: 3 in Long 2001: 6).

One might also wonder what genuine commitment exists to reverse the ravages of climate change (if it isn't already irreversible). During a CBC radio interview, Mike Davis (author of *The Ecology of Fear: Los Angeles* and *The Imagination of Disaster*), referenced the US regime's wholesale denial of climate change, stating: "Even if dunes appeared on the White House lawn, and tropical monkeys were found chattering in Congress, the US Government is so tied-up with fossil fuels<sup>103</sup> that they would continue to adamantly deny the connection between greenhouse gas emissions and environmental crisis."<sup>104</sup>

It has been suggested that we may liken the 'fledgling adaptation industry' or emerging 'adaptation awareness movement' to the environmental movement as it was in the 1960s. It took twenty odd years to gain the momentum, social buy-in by civil society and the private sector, and corresponding financial commitments from ODA's and development banks to begin to respond to environmental degradation, and recognize that social deprivation, sustainable livelihoods and biodiversity are interlinked. Without the requisite policies and resources, how can risk management and social adaptation tools be developed for target communities subject to climate extremes?

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<sup>103</sup> "Oil, gas, coal and utility companies donated \$50 million to the Republican party's election campaign in 2000. Moreover, the President, Vice President, Commerce Secretary, and National Security Advisor, all either owned, ran, or worked for oil companies. Clearly, fossil fuel interests no longer need to lobby the US governments; they are the government" (The Ecologist 2001: 19). Furthermore, the US with just over 5% of the world's population produces a quarter of the world's carbon emissions. Instead of reducing its emissions by 7% below 1990 levels, under current policies, the US is projected to increase them by 23% by 2010. Japan is heading for a 20% increase, and Canada an 18 % increase (Ecologist Report, Nov 2001: 20)

<sup>104</sup> Mike Davis: Canadian Broadcasting Corporation morning interview, radio FM 90.5 mghz, January 2, 2004.

My response to this apparent dilemma is simple. What happened to the precautionary principle and no-regrets approach endorsed by the UNFCCC, IPCC, and CARICOM host government to take action and minimize climate damage? Why not take some of the wealth of existing adaptation funds (GEF Adaptation funds, CARICOM and FAO fisheries funds, MACC, ODA resources) currently directed to vast numbers of scientific research institutes for modelling and information management systems and redirect it to village associations and their efforts to develop adaptation toolkits and participatory actions on the ground? What is stopping the reasonably well-heeled disaster preparedness and development industries from engaging vulnerable communities in an effort to mitigate climate extremes, and save money?

Where western intervention has not yet despoiled traditional practices that effectively respond to the ebbs and flows of environmental and climate variability, and where climate extremes have not yet undermined these time-honoured coping skills, traditional adaptive expertise will continue to flourish whether formally instituted by nation-states and international programmes within the adaptation discipline or not. However, macro-remedial adaptation programming, emphasizing centralized growth, with a heavy reliance on scientific enquiry, and a two-stage approach recognizing host governments first and vulnerable communities sometime later, will only serve to undermine community adaptive efforts and place vulnerable coastal communities at greater risk.

## **2 Growth Theory Impedes Micro-Adaptation**

Development theory and praxis seem to have been completely subsumed by the prevailing economic growth paradigm or, as Herman Daly (Daly 1996) put it, 'growthmania.' This status quo economic determinism seems to be the driving force

behind the World Bank's current global efforts to build adaptive capacity within national economies and commerce. The Bank and other international funding agencies mechanically argue, "economic growth and the alleviation of poverty are the surest means of building adaptive capacity" (Burton, I. and Van Aulst, Maarten 1999: 24).

To add industrial insult to environmental injury, the climate change industry is heavily reliant on productive or consumptive growth models of development. This is especially true in the case of international climate mitigation trade initiatives, where emissions carbon credits are freely traded on the open market. This market-driven approach legitimizes, and provides incentives to actually generate more GHG emissions, as profitable emission credits are commodified and then traded in an unfettered global market. A similar growth strategy applies to the climate adaptation sector. Development consulting companies, re-insurers, and fossil fuel manufacturers benefit from greater emissions and consequent extreme weather disasters as they can monetarize this damage through increased post-disaster rehabilitation contracts, increased insurance premium ratings for non-adaptive or high-risk liabilities, and the sale of carbon credits between UNFCCC member nation states for future funding of adaptation programmes.

In the case of the Caribbean Community Climate Change Centre, financial investment partnerships are being sought with key private sector stakeholders within the insurance and petroleum industries.<sup>105</sup> Arguably, these mega industries represent the antithesis of sustainable development, as they support the sorts of neo-liberal fiscal policies of privatization, deregulation, and macro production and consumption practices that reinforce an unfettered 'free-market' system of unrestrained growth. It is this economic system that favours unrestricted fossil fuel consumption patterns, consequent increases in

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<sup>105</sup> See Review of Adaptation Programs and Funds

GHG emissions precipitating global warming, extreme weather variability, and increased vulnerability to climate change in coastal communities.

As mentioned in Chapter II (Moore 1995), since the 1960s the concept of 'sustainability' continues to be used as a corollary to growth theory, essentially as a tool to support macro-level production-oriented development policies and activities. By the same token, macro-level adaptation programs (further critiqued below) will inordinately focus on quantitatively productive sectors such as forestry, agri-business, commercial infrastructure, and tourism. They focus very little, if at all on qualitative development (Daly 1996) such as the artisanal fishery, town public works, or community-based vulnerability reduction activities.

Following this logic, sections of the Dominican government bureaucracy view the SSMR as a target for economic growth opportunities. Others see the marine reserve and surrounding communities as an inter-dependent enviro-social habitat supporting a sustainable artisanal fishery. In the former case, tourism is envisioned 'as an alternative to the fishery.' According to the Permanent Secretary of Tourism, tourism development "was the driving force for the development of the SSMR..." Honychurch makes a more poignant observation when he states, "In the mid-eighties, the village consciousness has gone from fishing for a livelihood, to a tourist environment."

In Dominica, the National Fisheries Development Plan reiterates this modernization, expansion, and consumption philosophy with the statement that fisheries planning should attempt to "maximize the socio-economic benefits from the exploitation of the resources, subject to the resource constraints" (Fisheries Development 1994: 59). For instance, the central government ranked the magnitude of climate impact on the fishery as 'medium'

and the sectoral significance of the fishery as 'low' (Mahon 2002: 5). This is likely because the contribution of Dominica's subsistence fishery to the GNP and foreign exchange earnings is low, when compared to the highly prosperous agri-business sector. As well, it is unlikely the interdependency between eco-tourism (an economic priority) and the fishery was sufficiently considered in this ranking exercise.

These growth and consumption plans may come with few or no regulatory requirements, conservation and climate change adaptation measures in place, on an island that is fundamentally nature dependent. An invigorated manufacturing sector and greater dependency on tourism visitation will surely increase pressure on already burdened settlements and public infrastructure, increase the ecological footprint, and raise climate vulnerability and risk.

Considering the systemic ravages of free-market consumerism, with its deleterious impact on the world's ecology and climate, and the extraordinary rate of environmental change, one can see the apparent impossibility of adapting quickly enough, particularly for vulnerable communities. In this context, it is easy to conclude that 'sustainable growth' is a distinct oxymoron.

### **3 Participatory Adaptation: Definitions Revisited**

#### *Community Adaptation in the SSMR*

In contrast to the utilitarian concept of community used by macro-level institutions to denote consensus and 'needs,' the definition of community as "the lowest level of aggregation at which people organize for common effort" (UN 1975:31) supports

community as a primary social agent of change in adaptation programming. Historically, it is from this recognition of community as a primary social agent, the owners and authors of their own destiny, that we derive the notion of community development.

Judging from the poor track record of existing and planned macro-adaptation schemes, and recognizing that self-determined social agency is arguably better able to engage and sustain community resources over time than external agencies, it would seem that available local expertise in existing community institutions would more effectively attain the desired goals of an adaptation venture.

Caribbean coastal communities vulnerable to the ravages of climate extremes are crying out for assistance and involvement, as is clearly evident in the literature on community development and climate change. Moreover, this desire for communities to control their environment and community interests is heard loud and clear in the multitude of local radio talk shows, social gatherings, during card games by fisher folk, and in the focus groups that were conducted. Yet, host governments are either not listening or are disinterested in participatory contributions from the grassroots.

In the SSMR, the Village Council and Improvement Committee are 'locally run polities' that have 'organized for a common effort' (UN 1975) in support of various goals such as managing the Disaster Preparedness Committee, and the construction of the Caribanti community center. Because of their established credibility in the eyes of fisher folk and local residents, these pivotal community organizations are extremely well placed to assume joint responsibility with other social groups for social adaptation and risk management activities, and bridge local community interest with national and even Caribbean regional climate change projects.



### *Adaptation Culture in Dominica and the SSMR*

*'Culture' in its broadest sense means the whole way of life of a distinct group of people (Honychurch: 2).*

To its credit, the government of Dominica recognizes the importance of identifying with local language and culture in its climate change public education and outreach priorities. It has plans to develop public educational material on adaptation in the local 'Kweyol' language. An adaptation project committed to engendering substantial behavioural change and distributive justice must, however, go beyond public education programming.

Respecting the community's social traditions and the desires of the target population (MacDonald in Nelson and Wright 2000), acknowledging people's 'collective efficiency' (Sachs 1992) and reinforcing the community's drive to self-actualize and self-determine development goals and direction will enable marginalized communities to effectively galvanize their resources through adaptive action and ensure genuine empowerment and project sustainability.

Opportunities abound for identifying with the local folklore and cultural celebrations of the SSMR. The following are examples of possible traditional cultural entry points for community adaptive action and education in the Commonwealth of Dominica:

A carnival, or 'Masquerade' as it was popularly called in Dominica, is an Afro-French festival celebrated during two days of feasting before Lent. During this indigenous

cultural celebration, 'chantuelles' rehearse a theme from the local traditional folklore, with *La Peau Cabrit* drummers. People in the districts then join in the *chante mas*, and sing the *lav-way* chorus. Groups known as 'darkies' and 'red ochre' engage in *bois bataille* or stick battles symbolically representing some noted struggle.

An example of a recounting of an historical disaster is 'Defay Mama Defay' which records a disastrous fire in Roseau. Climate-related natural disasters could also be recounted with dialogue between the chantuelles and local *chante mas* about the impact of the storm. 'Darkies' and 'red ochre' groups might engage in *bois bataille* or stick battles symbolically representing their actions to protect their communities from the impact of the storm, and the perennial struggle between nature's wrath and community security. The *chanson* could integrate or reinforce issues such as traditional fishing and cultural conservation practices within her *chanson*. People in the districts would then join in the *chante mas* about a natural disaster or event, and sing the *lav-way* chorus. Sideshows and acrobats (i.e. *bois bois* or stilt men) could perform culturally appropriate skits and performances (not dissimilar to the Cirque du Soleil/Theatre Parminou education program I was involved in with Brazilian, Chilean and Canadian street youth<sup>106</sup>) depicting the community's vulnerability to extreme weather impact such as a hurricane or landslide from a flash flood. With a specific appeal to parents and children, ideas about local response to disasters such as retreating from, accommodating to or protecting themselves against these risks could be highlighted.

This indigenous cultural celebration may offer a window of opportunity to galvanize community interest and collaboration around grass roots adaptive action. Using a cultural medium to incite interest in climate adaptation-related activities is in essence a form of

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<sup>106</sup> I was privileged to have spearheaded this multi-partner international effort.

adaptation risk-consciousness raising or ARC. This is a bottom-up and self-generated community effort to awaken or motivate members of a defined or defining community to understand their climate vulnerability and impact, and act upon this awareness through adaptive action.

Another possible cultural entry point for GrAD or ARC within the artisanal fishery is during La Fete St. Pierre, also called the feast of St. Peter and St. Paul, patron saints of fisher folk. This cultural celebration occurs during the months of June and July in all fishing villages. One can follow the festivities, from village to village, from Cachacrou up the west coast along the north east, down to Castle Bruce and San Sauveur/Petite Soufriere (not to be mistaken for Soufriere) and around to Fond St. Jean and Grand Bay. Soufriere also celebrates the patron saint feast Our Lady of Lourdes, and Pointe Michel celebrates La Salette (Honychurch: 22,23). With religious sensitivity, honouring these patron saints could be combined with an honouring of the sanctity of the oceans and God's creations within, and the spiritual and civic duty to protect the environmental commons. Adaptive fisheries ideas could be incorporated into the cultural discourse, as has been done with other environmental issues over centuries.

These cultural entry points for proposed adaptation risk consciousness would ideally be directed by the local Village Council, Fisheries Groups, Improvement Committee and LAMA. To mobilize additional host national resources, it would be advisable to partner with the Fisheries Division and the Movement for Cultural Awareness (MCA). The MCA seeks to preserve and develop national cultural forms, and organize and promote popular education and theatre as a vehicle for consciousness-raising, mobilization and development action (IFAD 1995, p.15). The MCA works with Village Councils, community groups, churches and schools. It plays a pivotal role in sourcing traditional

knowledge and engaging community members in dialogical action for incorporation of their local expertise and resources in community project design and implementation activities.

To be sure, mobilizing community interest through these sometimes complex grassroots activities may require more time than governments are willing to commit. However, where there are existing efforts to raise awareness, or opportunities for synergies between social concerns such as coastal erosion and fish stock depletion, threatened livelihoods and food security, galvanizing communities around specific priorities, like coastal risk management, can happen almost spontaneously.

#### *Adaptation Sustainability*

*(S)ustainable development - development without growth - is qualitative improvement without quantitative increase (Daly 1996 on Mill)*

The Brundtland Commission's emphasis on sustainable development and human needs (Our Common Future) indicated a demonstrable break from economic growth theory toward a 'human needs' approach. Nonetheless, little if any reference was made to popular or community-level participation in the 'sustainable development' process. This focus on sustainable (economic) development set the stage for the 1990s 'Decade for Sustainable Development.'

What exactly constitutes genuine sustainable development? Adaptation methodologies best suited to foster sustainable development within the realm of climate change

adaptation likely rest with community members whose livelihoods depend on sustaining their environment.

While emphasis continues to be on 'sustainable *growth*,' the concept of 'sustainable development' (or sustaining development as Sachs would claim) continues to legitimize macro-level development efforts, but fails to reinforce participatory bottom-up practices. Thus, current mainstream climate adaptation projects overwhelmingly support regional and national risk management practices for industry (commercial infrastructure, the fishery, tourism, etc), but not the vibrant communities that sustain these environment-dependent socio-economic constructions.

Instead of 'growth for development' and externally-driven adaptation mainstreaming efforts, what is sorely needed to defend climate vulnerable and resource marginalized communities is community-driven redistributive development and adaptation risk consciousness-raising (ARC) to undercut climate-related risk factors. The challenge is for community stakeholders, in partnership with the Government of Dominica to establish adaptive fishery conservation and sustainable resource protection strategies, social equity programs, and a viable no/low-impact enviro-cultural tourism sector. This would enhance local adaptive capacity, both traditional and contemporary, promote locally derived conservation efforts, build the communities' resource base, and generate domestic and foreign exchange earnings to reinforce the local economy and livelihoods, sustain local buy-in, and support ongoing activities.

Some have suggested that regulated growth and largely local ownership, combined with coastal facility improvements have sustained Dominica's fishery and tourism growth. Tourism growth, with anticipated increases in stay-overs, will likely generate increased

demand for fish consumption (Fisheries Development 1994: 77). Nevertheless, questions remain as to whether a cash-strapped economy, with a burgeoning debt load can successfully diversify its economic interests towards nature products, and increased tourism visitations, without compromising on ecological sustainability, and embarking upon a more risk-oriented environmental venture.

With no profound paradigmatic changes in sight supporting transformative development, redistributive justice, or micro-participatory action, “and little effort to build local skills, interests and capacity, local people have no stake in maintaining structures or practices once the flow of incentives stops” (Nelson and Wright 2000: 159). The possibility of truly sustainable development without the requisite participatory action by and for communities thus becomes a developmentalist’s fantasy.

#### *Participatory Adaptation in Development*

*But everywhere, there are individuals and organizations that spit seeds of empowerment into a wind of disempowerment, in an abiding effort, beyond hope, to ensure a future flowering of human potential.*

(Spitting In The Wind, Lessons of Empowerment In The Caribbean 2000)

As previously stated, the UNRISD has championed community-based, socially inclusive and participatory sustainable development. Furthermore, the African Charter (1990) on popular participation clearly emphasized the need for “empowerment of the people to effectively involve themselves in creating structures and designing policies and programmes to serve the interests of all ... and share equitably in its benefits.”

In reality, '(t)rue popular participation goes much beyond the mere provision of labour and other inputs into projects initiated from outside the community; it involves decisions being taken and plans being formulated at the local level' (Ghai and Vivian 1992: 53). The UN Declaration of Social Progress and Development [General Assembly Resolution 2542, XXIV, December 11, 1969] states as its first principle that: "Social progress and development require the full utilization of human resources, including in particular: "(c) The active participation of all elements of society, individually or through association, in defining and in achieving the common goals of development ..." and "(d) The assurance to disadvantaged or marginal sectors ... of equal opportunities for social and economic advancement in order to achieve an effectively integrated society" (UN 1975: 1).

Over the years, the paradigm of participatory development as an idealized notion of community homogeneity has blurred the development community's understanding of community-centred participation. The groundswell of post-war anti-colonial national and social movements caused a qualitative development shift from a focus on things to people, from a temporary focus on mainstream remedial efforts to participatory self-sufficiency. However, community participation has largely remained as an instrumental means to support the development (and more recently the adaptation) process, not a strategic or transformative end goal.

In my review of current adaptation programming in the region, community-based and socially inclusive participatory adaptation projects that empower locals are virtually non-existent. The only exceptions are the occasional token public education and outreach (PEO) efforts to co-opt target communities into externally designed and delivered projects requiring local labour and public buy-in to strengthen proposal submissions and legitimize project activities in the eyes of the public. As Pretty and Scoones suggest,

these token efforts undermine the goals of sustainable development (Nelson and Wright 2000: 159).

In spite of the World Bank being the greatest theoretical champion of 'participation of the poor,' in the 1980s and 1990s, the development concept of participatory social determinism was largely appropriated by IFIs, in their "monetarist 'structural adjustment policies,' which moved functions from the state to the private and non-governmental sectors" (Nelson and Wright 2000: 3).

The Bank's various participatory programs, such as the Presidential flagship projects, FIAHS, PAL and LAMP (see Chapter III: Participatory Adaptation and Development) launched throughout the 1990s 'decade for sustainable development,' were all quickly abandoned. Moreover, the Bank's macro-economic neoliberal policies are profoundly exclusionary (Veltmeyer 2003), and represent the antithesis, en-masse, of community involvement. This exclusionary practice is clearly reflected in the Bank's adaptation programmes.

For instance, World Bank and CARICOM regional adaptation projects, although broader in reach, continue to rely largely on blue-print development planning to attain their prescribed project goals. As for the MACC, its agenda supports "capacity-building for regional and national institutions' (ibid: 12), with some undefined provisions for 'capacity building efforts with stakeholders in local communities and key sectors ...' (ibid: 23, 24). Participating member nations—not vulnerable coastal community CBOs, village representatives or local actors—are requested to define capacity building requirements and project priorities.



From the 70s through 80s, the 'third sector' civil society was relatively entrenched in the development process. By the mid eighties, the abandonment of, or reduced reliance on civil society and NGOs/CSOs by donor agencies in favour of a tripartism between the public, private business and civil sectors became a distinct feature of development practices, and current adaptation efforts. Consequently, an increasing scarcity of resources for grassroots/community service organizations (GSOs/CSOs), small NGOs, and private voluntary organizations (PVOs), has caused many community-based organizations to focus on more conservative fundraising efforts, and on hierarchical institutional and program priorities, while retreating from their grassroots principles. The result is a detraction from bottom-up grassroots efforts that build on self-organization, confidence and self capacity-building, and transformative social change, and a return to top-down foreign (outside) deterministic approaches.

A clear benefit of using participatory methods within local NGOs, PVOs, and GSOs is that they 'level the playing field between trainers from working class backgrounds and middle class colleagues' (Spitting 2000, p.190). Furthermore, in a decentralized society, the local community is an increasingly important constituency. There has been a tiny shift from intermediate NGOs building CBO capacity, to CBOs displacing NGOs as independent actors (ibid: 192). In effect, CBOs are addressing local problems with input from local people who intimately understand their problems, and through their own commitment are able to respond effectively with local social and environmental solutions supported by local and external resources.

Those donor agencies involved in climate adaptation must be reminded that Article Four of the UNFCCC commits signatory countries to "promote and cooperate in education, training and public awareness related to climate change and encourage the widest

possible participation in the process, including that of non-governmental organizations” (UNFCCC Article Four, in Sheppard & Osterwoldt 2002: 12).

The use of (popular) participatory methods has a long history in the Caribbean, and has often been linked with popular theatre organizations that use drama to engage people in discussion and analysis of their circumstances (Spitting in The Wind 2000: 189). In Jamaica, Sistren and the defunct Grundwork Theatre Company were groundbreakers in popular artistic pedagogy. Other more recent innovations in popular theatre include Quebec’s Cirque du Soleil and Theatre Parminou work with street youth in Brazil, Chile and Canada.

In Dominica, it is this third sector of civil society, the PVOs, CBOs, NGOs, village councils, fishery groups and improvement committees, that can successfully galvanize the community’s dynamism and resource momentum for participatory risk reduction actions to respond to changing environmental conditions impacting community members’ way of life.

#### *Participatory Adaptation Planning*

*(E)ffective participation implies involvement not only in information collection, but in analysis, decision-making and implementation – implying devolution of the power to decide. (Nelson and Wright 2000).*

As important to adaptation development is the planning and praxis across vertical and horizontal decision-making regimes. Like development planners, climate change adaptation planners are beginning to design programs that are larger than the local

community unit, but smaller than the nation-state. While adaptation planning “is usually most efficiently done at the national level, it fails to take into account the special needs of communities.” However, planning within the traditional national-local framework gives rise to organizing at an intermediate level. Planning at this level creates “a link between the macro and micro levels of development – the vertical connection; and integrating resources within the region – the horizontal function” (UN 1975: 57).

Between the two levels (nation and community), “it has often been found useful to encourage intermediate-level institutions capable of aggregating local needs and activities, and disaggregating national plans, programs and policies” (UN 1975: 5). As Robert T. Watson, Chair of the IPCC explains, ‘(I)t is important to assess the adaptive capacity locally, regionally and sectorally’ (Ecologist 2001: 17).

It has been suggested time and again within the ‘community development industry’ that bottom-up or ‘micro-to-meso’ participatory development (and by logical extension GrAD), is more responsive than top-down participatory development, and can more effectively and economically address local climate change issues with local adaptation solutions and indigenous resources. In the seventies, development agencies and International Financial Institutions began to identify with grassroots organizations (i.e., community groups and community-based NGOs) as their ‘development infrastructure.’ Because local communities are grounded in their own reality and challenges, without participatory grassroots involvement, socio-economic sustainability of vulnerable coastal communities subject to extreme climate variability seems unattainable.

In 1985, the World Bank’s Operations Evaluation Department (OED) documented the link between grassroots participation and project sustainability (Long 2001: 9). By

December 1990, the World Bank actually established a Learning Group on Participatory Development. World Bank Senior Vice-President Moreen A. Qureshi stated in 1991 that: "The World Bank has learned from its experience of development that popular participation is important to the success of projects economically, environmentally and socially. Our most important lesson has been that participation and empowerment are questions of efficiency, as well as being desirable in their own right."<sup>107</sup>

The World Bank therefore defined participation as 'a process through which stakeholders influence and share control over development initiatives, decisions and resources which affect them' (Nelson and Wright 2000: 5; Tandon and Cordeiro 1998 in Long 2001: 14). However, the Bank interpreted the participatory approach as 'instrumental' in getting people to buy into a donor's project, versus 'transformative' in getting communities to decide on their own priorities" (Nelson and Wright 2000: 5; and Long 2001: 3). One unconvincing reason for this was that the Bank was "explicitly prohibited from becoming involved in a country's political affairs ... and views transformational participation as political" (Long 2001: 34-35). Yet, 'the very nature of development is political – not in a partisan way but in the generic sense of enabling people to assume more power over their lives and their economic and social circumstances' (Long 2001: 139).

Through its *Strategy For Rural Development*, Swedish SIDA had already established its participatory position in 1980 (Long 2001: 2). Canada's CIDA also established participatory development as a development priority in the late eighties. In 1986, the German development agency GTZ named the 'participation of the poor' as one of five quality program criteria (ibid). In 1991, GTZ defined participation as 'co-determination

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<sup>107</sup> Quoted in Mark E. Denham, 'The World Bank and NGOs,' paper prepared for presentation at the Annual Meeting of the International Studies Association, Atlanta, April 1992: 5.

and power sharing throughout the ... programme cycle.' In 1993, USAID re-oriented itself towards its 'customers' (the poor) (ibid). Lastly, the UK's DFID became concerned with participatory development and in 1995 wrote a guidance document for operational staff entitled: "Technical Note on Stakeholder Participation in Development Projects" (Norton, 1998 in Long 2001). By the mid 1990s, virtually all the bilateral agencies had policies on participation (Nelson and Wright 2000: 4).<sup>108</sup>

Participatory development approaches are now supported as much by such mainstream institutions as the World Bank, CIDA, UNEP, USAID, CARICOM, the UNDP, Save The Children, and World Vision, as they are by alternative development groups such as the Dag Hammerskold Foundation, Oxfam, Friends of The Earth, The Ecologist, and Vandana Shiva's Research Foundation For Science, Technology and Ecology. Although there is acceptance within the World Bank, DFID and GTZ of the need and value of (adaptive) participation of the poor, however, there is very little such participation within the project cycle (Long 2001: 65-71).

Generally though, as we saw in the literature review in Chapter II, and in the review of adaptation program funds in Chapter III, mainstream development and climate adaptation groups by design understand participation 'as a means' (i.e., to accomplish the aims of a project). Whereas, community-based groups commonly see participation 'as an end' (where the community or group sets up a process to control its own development). According to Nici Nelson and Susan Wright, "the extent of empowerment and involvement of the local population is more limited in the first approach than it is in the second" (Nelson and Wright 2000: 1). Frequently, "the organizational 'needs' of development agencies place constraints on participatory development" ... as

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<sup>108</sup> Actual donor agency definitions of "Participation" can be found in Long 2001: 15

“participatory development is too slow to fit into the normal funding cycle of most agencies” (ibid: 16).

‘Popular Participation’ goes a step further. A UNRISD Discussion Paper defines this as ‘the organized efforts to increase control over resources and movements of those hitherto excluded from such control’ (Stiefel and Wolfe 1984: 12<sup>109</sup>). This social empowerment approach would support genuine interactive development, effectively replacing the top-down subject-object association between interventionsists and recipients.

More recently, the concept of empowerment was reinforced during a GAPP (Group for Anthropology in Policy and Practice) conference that critically explored the theories and practices of participatory development (although climate adaptation was not a core theme of the event, the development conclusions and operational practices still apply). The conference concluded, “that, ‘participation,’ if it is to be more than a palliative, involves shifts in power” (Nelson and Wright 2000: 1). The terms ‘people’s participation’ and ‘popular participation’ are now part of the normal language of many development agencies (ibid: 159). SPEAR,<sup>110</sup> in Belize, defines ‘empowerment’ as ‘...providing the tools and the space for people to understand their problems, and themselves act, individually and collectively, towards sustained solutions that improve their lives (Spitting In The Wind 2000: 183).

For the purposes of this research, a key consideration within the adaptation development discipline is the use of suitable participatory development approaches in the context of coastal community adaptation. To be sure, the achievement of popular participatory

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<sup>109</sup> ‘The Quest for Participation,’ UNRISD, Mimeographed Preliminary Report.

<sup>110</sup> Belize NGO that we supported during my tenure as Director, Caribbean Programming for CODE

decision-making is contingent upon the desire and will of the state, and of local host governments to work in concert with self-determined community populations. “Advocating participation means using the state’s ... still intact capacity as ‘educator’ to further popular struggles for equity, democracy, and sustainability” (Moore 1995: 29).

This coordination between mainstream (conventional) and grassroots traditional adaptation efforts allows for the blending of macro/meso resources and interests with meso/micro initiative, knowledge and commitment. As the World Bank points out, “Governments cannot do it alone. Adaptation measures are and will continue to be implemented primarily by communities, the private sector, and individuals. But the role of ... island governments will be essential in mainstreaming<sup>111</sup> adaptation into policy and development planning, in creating partnerships with communities, non-governmental organizations and the private sector...” (Cities, Seas, and Storms 2000: 34).

For genuine mainstreaming to occur, “governing institutions will need to be involved or be informed of what is happening, and be teased into the (community vulnerability and adaptation) process’ (CIDA, circa 2002: 13). As the World Bank 1998 Report on aid effectiveness clearly demonstrated, “(i)n cases where aid projects have used a

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<sup>111</sup> Mainstreaming has two distinct definitions. The Webster Dictionary, 1996 defines mainstream as: ‘the principal or dominant course, tendency, or trend.’ There are two distinct but potentially complimentary definitions of mainstreaming. The first ‘instrumentalist’ definition of mainstreaming is used primarily by larger IFIs and donor agencies, referring “principally to making more routine those practices by us, as donor institutions and development implementing organizations, whose effect is the fuller engagement of people in their society’s decision-making processes (USAID definition, La Voy and Charles, in 1988 in Long 2001: 17). Similarly, the World Bank Working Group defines mainstreaming as: “(T)he full and systematic incorporation of a particular issue into the work of an organization so that it becomes an accepted and regular part of the organization’s policies an practices” (Long 2001: 18).

The second ‘transformational’ definition of mainstreaming is used largely by grassroots organizations, and refers to: ‘The popularizing of specific social issues and/or practices through local decision-making, by and for target communities via their primary partners, stakeholders’ and the broader community membership (author’s definition). This thesis endorses the second definition.

participatory approach to service delivery, huge improvements have often resulted. Conversely, a top-down technocratic approach to project design and service delivery has failed in areas critical for development” (Long 2001: 153).

#### *Impediments To Micro-Adaptation From Above and Below*

*“Poverty reduction in the region will not be successful without also addressing the complex determinants of social exclusion” (IADB About Social Exclusion: 2003).*

Impediments to community adaptation seem to be largely generated by an industry-wide propensity toward institutionally centralizing adaptation research and programming. This is painfully evident in the following sections critiquing macro-adaptation efforts. A top-down approach to adaptation programming engenders, by design and default, macro-to-meso adaptation models leaving out community as an essential agent of change. It creates programmatic barriers impeding target coastal communities’ involvement in risk and vulnerability reduction policies and actions.

#### *National Adaptation Impediments*

With a top-down approach, projects ultimately belong to governments, and this has at times been “the single largest constraint to mainstreaming participation in (The World Bank’s) operations” (Long 2001: 155). For instance, in my review of CARICOM adaptation programming, National Implementation Coordinating Units (NICUs) and National Focal Points (NFPs) were successfully established to create enabling environments for the long-term mainstreaming of climate change. However, at this meso



national level, there are severe resource constraints, low levels of inter-departmental decision-making, and resistance to prioritizing longer-term climate change concerns amidst governments' shorter-term political agendas. An active member of the Scott's Head Improvement Committee crystallized this government limitation when she stated, "A serious lack of political continuity by central government causes them to retract their many promises for disaster preparedness resources." The same dynamic applies to host national impact and adaptation projects.

Furthermore, because of a lack of community integration into national campaigns of one sort or another, local capacity and buy-in are absent, creating, at times, a sense of dependence on unreliable national resources. "Because of a governance structures 'from above' by Dominica's national government, the power of decision-making has been sapped from the community, and has created a relative environment of dependency and reliance on government coffers" (Honychurch: 1995).

The following quotes obtained from community focus groups adequately reflect this dynamic of community dependency with government, and the potential structural limitations of developing adaptation programming with meso-micro level institutions. "Whatever assistance was given after Hurricane Lenny was to people living in the hills, not the coast, ... because of political connections. Assistance is not there for us." "We are waiting on the Fisheries Department to help. We would prefer if Fisheries provided the leadership. They need to tell us where to fish or not fish. We need markings of open and restricted areas." (Soufriere Fishers Group member).

As well, although the Scott's Head Fishers Group is not registered, it would certainly like to be, 'though government bureaucracy is a barrier and there is some reticence on the part

of the Fisheries Division to help register us' (as a fishery cooperative). 'This would allow us to get funds for our community projects.' These same restrictions apply to possible attempts to organize community around other priority issues such as climate impact on the marine reserve and artisanal fishery.

All too frequently, there is a disconnect between national and community level representatives when it comes to designing and implementing development projects. Oftentimes, it is because of centralized planning and decision-making (with underfunded decentralized resource responsibilities), that fails to incorporate local input. In an ideal world, with government and civil society collaborating from the ground up, economic, social and cultural barriers can be overcome in favour of genuine community adaptation programming.

What is essential is that island governments (national and local), and their community counterparts, take community-based risk reduction goals into account in future expenditure planning, develop adaptation policy in support of local programming (such as legislation empowering communities to manage their own coastal resources), and provide logistics, technical, and operational support to locally administered adaptation efforts.

As indicated in *Knowledge For Development*, "Some low-income economies find that they learn most effectively from the middle-income economies" (World Bank World Development Report, 1998/99, p145). Just as nation states with like-minded leaders in CARICOM, or the South Pacific, confronted with similar climate challenges, resource bases, and socio-economic conditions have engaged one another through the MACC Program in knowledge sharing, intra-state knowledge exchange should also take place

between national governments and societal groups, or between parallel communities. It is, however, critical that the decision-making stick be bent in favour of a bottom-up exchange of responsibilities and resources to correct the disproportionate imbalance in power distribution.

*Community Impediments: Stakeholders' Perceptions of Climate Change Adaptation*

*"Generally, climate change is not really construed as a threat or point of discussion within the community, yet, storms, surge, and unpredictable (hurricane) weather are popular and worrying themes..." "If we don't take action, we will lose our credibility and our conscience. Our livelihoods and security (houses, work, and roads) will be at risk. If we do take action, we will get enormous satisfaction. We'll save lives." (Adelina Detouche, Scott's Head Improvement Committee)*

The involvement of Grassroots Service Organizations (GSOs) or Community-Based Organizations (CBOs) in local adaptation projects would help channel resources more effectively to local groups or marginalized/disadvantaged communities. In their capacity as intermediary institutions, GSOs and CBOs provide the necessary link between the 'uninstitutionalized' beneficiaries, who may lack administrative capability and legal status, and the bureaucracy of government and donor institutions.

The participation of target communities 'may be resisted by existing hierarchical management structures, such as implementing aid agencies or a line ministry' (Nelson and Wright 2000, p195). For example, although cognisant of the immense challenge of climate extremes facing the island, the Director of the government Office of Disaster Management stated that: "Climate change is more of a priority for the Ministry ECU and

Meteorology office,” but not for the Office of Disaster Management largely because of staffing and resource limitations.” “In fact, climate change at the community level is somewhat of a novelty.”

GSOs and CBOs are also privy to local concerns and idiosyncracies. Larger governments are not. For instance, the SSMR Disaster Preparedness Committee, under the auspices of the Scott’s Head, Soufriere, Gallion, Bagatelle Village Council, has a direct link with local activists and volunteers, and is able to effectively mobilize these resources during preparedness or response activities. They might play a similar role in helping to assess coastal vulnerability and mobilize local support for risk reduction exercises. Conversely, there is a distinct scepticism of central government and its ability to ‘deliver the goods.’ This sentiment was widely expressed during three focus group discussions: “The (central) government doesn’t include us in their plans.” “We can’t get information from the (central) Disaster Preparedness Agency....”

This separation between Government and local Fisher Groups inevitably generates misunderstanding, and eventually mistrust. Unless community is integrated into the entire project lifecycle, public buy-in is compromised. An economic reason why communities might not engage in a proposed adaptation project is “that sustained collective action will only be achieved when beneficiaries perceive that the opportunity cost of their participation is more than offset by the returns brought by the project” (Nelson and Wright 2000, p193). “Participation around a productive resource (fisheries or water supply) may be more welcome than that focused on an individual benefit such as education or health” (Nelson and Wright 2000, p198). The delivery of a product provides incentive (i.e., a gas station for marine craft, disaster shelter or community marine conservation tourist shop).

Although there is a general perception within the minds of SSMR residents that climate change is not relevant to their day-to-day activities, there is certainly a sense of impending worry about the constant threat of extreme weather, beach erosion and a gradual reduction in certain fish stocks. "It's hotter in the summers and cooler around Christmas. There's no wind now and more low tides, and tuna stocks are decreasing."

From local fisher folk's perspective, they believe that perhaps climate change or over-fishing has affected their livelihood through a reduction in fish catch ... "Today, there are less fish to catch. Twenty years ago, we used to catch more fish like bonito, tuna, jacks, mahi-mahi, and red fish." "Hurricanes are the biggest threat to us, and our houses are constantly at risk." (interview comment from Scott's Head Improvement Committee members).

It is also the case that "attempts to organize collective decision-making or action may exacerbate existing conflicts and structural tension within and between 'households' (Nelson and Wright 2000, p197). A community-based example of some existing structural tension was described in a comment made by a member of the Fisheries Division, who noted some competitive rivalry between Scott's Head and Soufriere. Yet, in times of disaster (or community project development), there are frequently efforts of solidarity. "In a crisis such as Lenny, both communities (Scott's Head and Soufriere) unite forces."

Another impediment to fishery adaptation is climate change itself.<sup>112</sup> Intensification of the storm cycle<sup>113</sup> would generate additional costs to the local fishery consisting of increased travel time to productive fishing grounds, greater fuel costs in rougher seas, higher maintenance costs from vessel and gear damage, destruction of fish traps, and displaced fish stocks. These climate impacts will continue to undermine the ability of the community fishery to adapt as it attempts to adapt and catch up with constantly changing environmental and socio-economic benchmarks.

### *Demographic Impediments*

According to the Fisheries Division, with an aging socially conservative workforce running the artisanal fishery in the SSMR, and the low income attributed to the fishery failing to attract younger fisher folk, tradition-oriented low impact technology rules. This has a chilling effect on technological or adaptive innovation, which may not be eagerly embraced without sensitization and training. Traditional fishing practices do, however, offer their own form of conservation practices and adaptive responses to climate variability.

### *Gender Impediments to Adaptation*

There are enormous social and economic barriers facing the women of Dominica. These include a disproportionate division of labour burden, state sanctioned machismo through resource restrictions on gender mainstreaming and political restrictions through unrepresentative government, teenage pregnancy, paternal negligence, and obstacles to

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<sup>112</sup> See Dominica's Development History and The Socio-Economic Anatomy of Hurricanes

<sup>113</sup> See section Caribbean Climate Change, and Ecosystem and Fishery Impact

employment and economic mobility. These socio-political barriers in turn isolate women, and are likely to restrict their potential contribution to broader economic, community and climate adaptation goals.

Another institutional impediment at the national level is the challenge for Dominica's Women's Bureau of effectively integrating gender issues into mainstream programmes despite serious resource limitations. "We cannot open ourselves to many issues when our resources are so limited." "Nevertheless, we are in fact seeking to mainstream gender issues in Dominica, but acceptance (in government) has been limited" (Director, Dominica Women's Bureau). The fact that there were only three women political figures in national government in 1999 (Women's Bureau 1999: 19), all members of the ruling United Worker's Party, adds to this challenge.

#### *Gender Perceptions and Women's Contributions To Artesanal Fishery Adaptation*

What is most interesting is the perception by fishermen (and the women themselves) that women do not contribute in a meaningful way to the fishery and 'fishermen's' livelihoods, when they actually play an essential role. This incongruity was innocently revealed during a community focus group interview when a couple of senior Fishery Group representatives from Soufriere stated the following: 'Women are not part of the fishery. There are no women members in the Group, other than the President. It's a man's job. We used to have many women members in our group. They were all shareholders. They don't actually fish, but they help to pull in the beach seines, separate the fish from the nets, and put the same types of fish together. After hurricanes, they cooperatively help to rescue boats. They are fish mongers, and sell our fish.' All told,

contributions by women to the subsistence fishery include: beach seining, fish sorting, gutting, product preparation, packaging, hawking and post-hurricane boat rescue.

Through their courage and persistence, Dominican working women have the potential to galvanize marginalized communities around priority issues and activities such as impact and adaptation risk management in the face of climate change vulnerability. According to accounts by the SSGB Village Council, Fisher Groups, and numerous comments from local area community members, the most influential groups within the Scott's Head/Soufriere Marine Reserve (SSMR) able to best integrate women into micro-adaptation activities would probably be the Scott's Head Improvement Committee, the Scott's Head Disaster Preparedness Committee, and the Scott's Head-Soufriere-Gallion-Bagatelle Village Council. During focus group interviews with these organizations, it was obvious that these community groups are led by articulate, very enthusiastic, and highly committed women.

As for organizing residents for prospective adaptation development programming, one woman being interviewed explained the challenge of getting women (and men) involved in community activity: "For women, TV soaps are a serious distraction to attending public meetings. To engage men, we must go to the fishing areas where they play cards, etc." (Scott's Head Improvement Committee). "After Lenny, local fishermen and women were cooperative in helping to rescue boats. Women play a pivotal role in organizing water supply, groceries, emergency supplies. Men's role includes nailing down roofs, barricading windows, and hauling fishing supplies off the beachhead.

Adaptation approaches that successfully integrate the equal participation of men and women (gender equity) into program design and implementation will encompass a



broader cross-section of the community membership, and ensure more efficient development synergies.

### *Adaptation Integration*

Integrated development is: 'a total, multi-relational process that includes all aspects of the life of a collectivity, of its relations with the outside world and of its own consciousness' [UNESCO, Plan a Moyen Terms (1977-1982), Document 19c'4, 1977].

In contrast to this inclusive and social determinist definition of integrated development, the immense majority of the regional integration movements and development programmes in the Caribbean (West Indies Federation, CARIFTA, CARICOM) and Americas (LAFTA, Andean Pact) were driven by member states and IFIs to promote economic development or trade growth. Social, cultural, and especially community issues (relevant to the bulk of the populace) were secondary considerations at best. This regional economism has greatly influenced the direction of development discourse, and consequently impacted development attitudes and practices, and by extension adaptation priorities.

At the supranational level, "(a)chieving economic development has therefore been associated with regional integration in the Caribbean" (ibid: 4). However, according to Boxill, CARICOM's inability to achieve genuine regional integration is because "the movement is not based upon nor guided by an ideology of regionalism" (ibid: 7). If we were to extend this reasoning to the existing disaster preparedness and emerging climate adaptation movement in the Caribbean, it might be argued that the disaster and adaptation

sectors are not based on an ideology of genuine regionalism (mainstreaming is another term used) at the macro-meso level, or communalism at the micro-level.

It is in this context of regional economic determinism that CARICOM and member state adaptation programming has been developed. To be sure, commonly shared climate vulnerability and risks factors amongst CARICOM and OECS SIDS have also precipitated a regional approach to climate risk management initiatives. Nonetheless, risk management practices, hazard mapping, climate modelling, and land-use practices indicate an express interest in preventing climate-attributed damage to economic and physical infrastructure assets. There are no clear examples however, of any community-targetted or community-driven impact and adaptation projects.

This ideology of integration and of adaptation mainstreaming seeks the inclusion of CARICOM island states, but selectively restricts other OAS or British Protectorate island nations from participating in or benefiting from climate change risk management resources or knowledge. Former Prime Minister of Jamaica Michael Manley stated: “(i)t is the absence of an ideology of regionalism which explains the weakness of integration” (ibid).

Although Demas suggests that “there is a single Caribbean identity which sets the basis for political integration (Demas 1974 in Boxill 1997: 74), one can easily surmise that multiple identities coexist in the region. Consider: the region’s complex colonial conflicts with Britain, Holland, Spain, and France; the 1970s left nationalism of Guyana Jamaica and Grenada versus the 1980s neo-conservative governments of St. Kitts/Nevis, Dominica, Belize and Grenada; the diversity of cultures (and languages), including Afro and Indo-Caribbean, European and Amerindian (‘Carib’, Maya, Garifuna, Mucushi and

Wapishana); and the social class divisions (e.g., comprador elites and marginalized coastal fisher folk<sup>114</sup>).

As Colin Clarke poignantly contends, “there are a number of identities within the region which are oftentimes conflicting, preventing closer regional integration (Clarke 1984 in Boxill 1997: 74, 90). Nevertheless, there are distinct geographical, climatological and cultural unifying features that might enhance adaptation integration efforts. “Apart from cricket, Caribbean music (i.e., Reggae, Calypso and Carnaval) is probably the single most important source of cultural interaction among the peoples of the region” (ibid: 111). However, one might argue that these cultural affinities are mainstream phenomenon not necessarily grounded in community-level tradition.

Thomas-Hope explained the absence of regional integration another way, with the following statement, “The failures of Caribbean integration are chiefly ascribed as a lack of sense of identity” (ibid: 25). Again, if we were to set our sights at the micro-level on ‘community’ as an essential agency of socio-economic development, one might extend the logic of the above quotes and arrive at the realization that ‘it is the absence of an

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<sup>114</sup> Other than the occasional use of ‘fishermen’ in a quote or reference, I have chosen to use the gender-neutral term fisher folk, instead of ‘fishermen’ or ‘fishers.’ Fishing is mistakenly considered a men’s traditional practice. There are indeed barriers to women’s involvement in many aspects of the industry. However, when one actually observes community subsistence fishing or even commercial harvesting in praxis, the ‘catch’ or collection of fish with gill nets, long-lines, or fish pots<sup>114</sup> (fish traps), and the gutting, processing, and hawking, etc, are generally not restricted to one gender. In fact, women play a primary role in the overall fisheries process. Women’s pivotal activities include: beach seining, fish sorting, gutting, product preparation and packaging, and hawking. Gender stereotypes, rife throughout most modern societies, contribute to the systematic exclusion of women, and impede their integration into this primary economic activity. The term ‘fisher folk’ thus reinforces the real traditions of fishing practice: where divisions of labour, although existent, may be blurred especially where collective effort is involved. The term ‘fisher folk’ also helps promote the idea of a collective effort as subsistence and commercial fishing is a socio-economic activity connected to community, and is rarely experienced by isolated males.

ideology of communalism which explains the weakness of micro-adaptation integration, and a lack of local identity.'

Therefore, tying in with local identity appears to be a pivotal strategy in engaging local sanction and support. The cultural festivals of Carnival ('Masquerade'), fishery's Fete La St. Pierre (feast of St. Peter and St. Paul), Soufriere's Our Lady of Lourdes, and Pointe Michel's La Salette are popular celebrations that bring together community. These cultural traditions are rooted in the community psyche, and provide potential entry points for community integration into local opportunities. They can galvanize community interest and collaboration around other equally important cultural issues, such as respect for traditional environmental practices in the fishery.

Karl Deutsch is a major exponent of transactionalism, a regionalism approach preoccupied with the development of a sense of community. He argues that, "integration is the condition in which people of a particular region have a sense of community" (Boxill 1997: 14). Again, downscaling this concept to the micro community level we might say that 'people of a particular locality have a sense of community.' What is consistently absent from mainstream development integration (and adaptation integration) discourse is a political-economy impact and vulnerability analysis of social class, and the socio-economic forces impacting community. There is also a disproportionate emphasis on economic development sustainability to explain regionalism and integration. This same emphasis also appears to dominate status quo agency thinking in the adaptation sector.

Because of its comparatively small economic and political stature, and its structural dependence on neighbouring Caribbean and metropolitan capital and communication

flows (Baker 1994), the Commonwealth of Dominica has inevitably been pulled into broader regional integration and adaptation development efforts. Arguably, the incentive for building risk reduction practices into Dominica's national operational frameworks is likely the desire and need to sustain a reasonably competitive edge in regional trade. Within the ruling government, community-level risk reduction and vulnerability activities seem to be distant considerations.

To be fair though, Dominica's *National Adaptation Strategy* on climate change does indeed reinforce the need to integrate 'climate change concerns into decision-making at all levels.' However, how, when and with whom this decision-making will be performed is unclear. Furthermore, as we will see below (Section 4.8.2 Meso-Level Adaptation: Dominica's National Adaptation Priorities), Dominica's *Framework For Dominica National Climate Change Adaptation Policy* makes impressive reference to 450 potential government and institutional partners, but only muted references to NGOs and one trade union (Policy Framework 2002: 20-40). This approach might raise doubts about the country's ability and commitment to integrate civil society and vulnerable coastal communities into its broader national climate adaptation strategy.

#### **4 Micro-Endogenous Over Macro-Autogenous Adaptation**

*(U)sing participatory 'bottom-up' methods ... pass decision-making progressively to the people* (Laura Macdonald in *Debating Development Discourse* 1995: 201).

Because of the wholesale failure to satisfy basic human needs during the UN's First Development Decade in the 1970s, UNESCO developed and promoted the concept of 'endogenous development' in sharp contrast to Rostow's 'growth and industrial

determinism.' The World Bank has seemingly embraced this endogenous development concept over the last 40 years, but continues to apply autogenous or externally driven development policies, funding criteria, and operational strategies. This can be witnessed in the Bank's various Technical Trust Funds, designed to support internal technical requirements, as opposed to combating poverty in marginalized communities. This exogenous mind-set affects programming outcomes. For example, the Bank's own project appraisal of the Bank funded MACC programme highlights the lack of vulnerable community involvement and social agency at the grassroots (see section 4.8.1 below).

Thus, if we focus on the relationship between emergent properties and the developmental process, there is an imperfect coordination of analysis between mega-macro and meso-micro adaptation initiatives, resulting in the operationalization of more 'autogenous' or externally driven macro-adaptation policies and projects over 'endogenous' or internally driven micro-adaptation initiatives.

Another prime example of this imperfect coordination is reflected in the assessment of the Working Group participation subgroup during the international meeting of the NGO-World Bank Committee in 1996. The Committee concluded that the World Bank: excluded the poor in Bank projects; did not involve them in project formulation and design; provided no continuity of key participants or shared decision-making regarding resource allocation; failed to provide resources for capacity-building; and did not provide a forum for participation by the poor in Bank policy formulation (Long 2001: 45; InterAction 1999 in Long 2001: 52). In the absence of participation from the marginalized, it seems that Bank and other ODA-financed work in a target country or sector is typically determined even before the views and field of the core protagonist and beneficiaries are ever considered.

David Moore goes a step further in critiquing this imperfect analysis within the development process, suggesting that the international political economy of development (and adaptation development by extension), and development agency discourse, is actually engineered by IFIs. He explains: "(I)f seventy-five per cent of a national economy is derived from 'aid,' its agencies 'call the shots,' ... 'if the (IFIs) did indeed 'persuade' more than 25 countries to privatize \$137.8 billion worth of assets from 1988 to 1991, if in 1990 they had 60 countries under the discipline of 187 structural adjustment loans ..., then the IFIs are the orchestrators of many national hegemonies'" (Moore 1995: 13).

Veltmeyer and Petras call this development 'from above (nation-state) and outside' (ODA) rather than 'from within and below' (community-based action) (Veltmeyer and Petras: 2000). Jimoh Omo-Fadaka speaks of 'bottom-up development,' recognizing that top-down development strategies have generally failed (Omo-Fadaka in Sachs 1992: 7).

Nevertheless, a significant number of these NGDOs have compromised their autonomy and civic roots. Consider the 'nearly total (95%) financial dependence of southern NGDOs on international (macro-exogenous) aid' (Fowler 2000: 10). As such, Fowler argues that these NGDOs cannot necessarily 'be taken as reasonable proxy for civil society organizations (CSOs) or civic organizing' (ibid: 11).

Unfortunately, '(s)ocial structure and political action (remain) essentially outside the map of development policy at the micro-level, and (are) given scarcely any attention in discussions of the natural environment' (Reclift in Ghai and Vivian 1992: 37). Eventually, because of this exogenous or external approach to development, and the

consequent social unrest resulting from structural deprivation and resource inequity, 'micro change agents' or community NGOs and GSOs have emerged through popular social conflict. These organizations have also been created by governments, and Official Development Assistance (ODA) to intervene as co-actors in community development activities presented as participatory.

Although many NGOs are grounded in community-based activities and espouse genuine development goals, nonetheless, indigenous and ex-patriot development professionals running the shop frequently retain their own preconceived notions of 'what (is) needed,' and remain dependent on and influenced by the propensities of their macro-funding patrons (Laura Macdonald in *Debating Development Discourse* 1995: 202). They also become limited by funding conditionalities such as 'non-denominational status,' and taste-of-the-day development themes that are externally driven. Charles Reilly suggests (in his article *Who Should Manage the Environment?*) that perhaps donors should "examine their operations, their tools of the trade, and to discover how they themselves might *scale-down* to more effectively reach the poor."

Unlike the South Pacific, coastal lands in the Caribbean are largely state and private sector managed. With limited community ownership, land-use and coastal management planning prerogatives and corresponding adaptation policies, guidelines and program methodologies and decision-making tend to be institutionally-driven, hence top-down. As David Moore points out, the development process "is a very political and ideological process. This is especially the case as one goes from the 'project' level to that of country level macro-economic programmes – informed by global strategies – which are now the realm of the most important development agencies" (Moore 1995: 7).



To be sure, “(t)here is strong evidence that political legitimacy derives fundamentally from widespread popular participation in decision-making” (UN 1975: 13). Thus, macro-meso adaptation projects generally will not get the public endorsement they need from vulnerable coastal communities and pluralist groups, such as local environmental GSOs and community associations. Furthermore, the right of local community residents to contribute to the development of civil society is a function of their integration into the democratic and development processes.

These adaptation initiatives that do not engage community are prone to socially fragment and falter especially if they intend to rely at all on endorsement by civilian populations. In reality, planned macro-changes by IFIs and governments are frequently the indirect result of a multiplicity of micro-events. Participatory adaptation programs delivered ‘from above’ are unlikely to engender qualitative behavioural changes in target communities. Nor will these autogenous risk management or public education and outreach programs significantly alter environmental, or socio-economic conditions at the community level. Chances are, the intended results of these top-down climate change programs is not to transform the social base, but to secure consent.

A thorough analysis of these adaptation policy and program priorities is required at the macro and micro levels considering: the lack of mechanisms to integrate traditional or indigenous knowledge and responses to climate variability into broader CCA development strategies; the virtual absence of adaptation capacity-building (toolkits/training), biodiversity resource management, and risk monitoring practices at the community and municipal level; and coastal zone inhabitants’ relative underestimation of climate change vulnerability and its inherent risks.

Genuine socio-economic development and climate risk reduction goals cannot be readily achieved without the full and transparent integration of core community actors in the life-cycle of adaptation programs, and more broadly, in decision-making processes that have a bearing on civil society.

## **5 Contemporary and Traditional Adaptive Knowledge: Which One Is Sustainable?**

### *Sustainable Traditional Adaptive Knowledge*

*Many traditional adaptation measures have been tested and adjusted over the years in response to extreme events” and “(t)hese measures are likely to be more effective than top-down solutions.” (World Bank)*

Long before climatologists were studying hemispheric oscillations, Andean farmers were, in effect, forecasting El Niño. For perhaps 400 years, indigenous farmers have observed the Pleiades star constellation to gain insight into possible weather patterns months ahead. If stars appear clear in the pre-dawn sky, early abundant rains and a rich potato crop are anticipated. Dim stars suggest delayed and diminished rainfall and smaller harvests. This traditional knowledge helps local farmers adjust their planting schedules and harvests. Scientists have determined that constellation visibility may be related to wispy cirrus clouds in the high atmosphere, associated with the warm phase of El Niño (Poverty and Climate Change 2002: 19).

In Honduras, traditional practices have proven to be valuable as an adaptive strategy for climate change. Traditional Quezungal farming practice is to plant crops in a terraced

fashion, under trees whose roots anchor the productive soils. In this way, Quezungal farmers protect the upper catchment and avoid erosion and the damaging effects of the slash and burn method widely practiced by conventional agricultural colleges. They prune surrounding vegetation to nourish crops, and conserve soil water. Remarkably, these farmers lost only 10 per cent of their crop to hurricane Mitch. The Honduran government and UNFAO are now incorporating these traditional adaptive methods into national farming practices.

In Dominica, fisher folk and early cultivators chose their sites carefully, being acutely attuned to the ecology around them for their subsistence (Honychurch 1995: 14). The Scott's Head fisher folk subscribe to the custom of claiming a school of fish by such methods as '*fe pay*.' To '*fe pay*' – literally to 'make straw' – is to strew bits of grass or straw on the ocean. This attracts several species of fish, notably balaw. Once the school appears, it belongs to the crew that 'made straw' (Ringel and Wylie 1979: 43). This camaraderie reduces conflict, and may also informally regulate pressure on local fish stocks, as a form of 'social adaptation.'

In the SSMR, self-employed artisanal fisher folk are at the lowest socio-economic echelon in Dominican society at US \$370 per year. With little external entrepreneurial interest in this sector, the industry self-perpetuates simple, traditional, and technologically limiting fishing practices, some dating back to pre-Columbian Kalinago or 'Carib' fisher folk of AD 400. Dug-out canoes, 'p' pwi' wood rafts, hand-lines, and onshore/inshore gillnet seining are commonplace, and hand-crafted woven bamboo Z-trap pots are still used.

These practices may be construed either as a self-administered adaptive and conservation approach to a long-standing livelihood, or as an impediment to socio-economic and commercial progress. Whatever the case, it can be said that non-intensive 'old' fishing methods, such as the "tombé levé" (Kreyol for 'drop-raise) fish pots, baited with fish or octopus to catch grouper and morays, are successful conservation methods 'thought to inflict minimal damage on that (demersal stock) resource' (SSMR 1993: 17).

Keelboats and dug-out canoes<sup>115</sup> are less seaworthy in variable weather, and this, combined with the disruption of seasonal hurricanes and tropical storms, and lack of training and new innovations for adapting to extreme weather variability, severely limits fisher folk's ability to maintain the momentum of subsistence fishing.

Increasingly limited mooring and landing spaces along open and poorly sheltered bays adds to the community's and the local fishery's vulnerability. As well, a lack of holding facilities results in the local population being deprived of fish protein, and fisher folk being compelled to pay for transportation (and take the time) to market their product elsewhere (Fisheries Development 1994: 22).

For communities so heavily reliant on the natural environment for their livelihoods, traditional conservation practices are constantly evolving with the ebbs and flows of the environment. For instance, SSMR locals took the initiative to install a cottage-style fish-aggregating device (FAD) with rope on an anchor, and old nets, a tarpaulin and wooden crates to act as a shelter and lure for nearshore demersals. This was long before LAMA authorities secured funds for the SSMR project, including the purchase of modern FADs, and before they had the climate science to predict reductions in demersal fish stocks on

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<sup>115</sup> A Taino or 'Carib' term.

coralline shelves because of warming seas. Locals didn't wait for coastal housing guidelines to tell them to place stone casting around their vulnerable foundations because of sea level rise of 3-5 mm per year, or storm surge, or to install hurricane ties on their roofs. "With hurricane David, I built my house with concrete instead of galvanized sheets" (Scott's Head Improvement Committee member).

In traditional fishing communities, fishing technology is appropriate merely to sustain their livelihood, and fishing practices are 'passive' in nature to limit resource extraction. Thus, traditional fishing technologies evolved to suit the particular ecological context of the seas and the varying behaviour patterns of the fish' (Ghai and Vivian 1992: 226). In fact, the multiple fishing techniques used by artisan fishing communities in the Caribbean represent a bona fide form of traditional conservation and adaptation, as the specific techniques (fish pots, 'pwi pwi,' long-lining, trolling, and on-shore net casting) rely on a broader spectrum of fish species with insignificant impact on a specific species' biological load.<sup>116</sup>

These coastal community inhabitants are constantly applying traditional environmental adaptive knowledge (TEK) to their everyday climate challenges. In effect, they are applying 'RAP' adaptation strategies (retreat, accommodate, and protect) each time they prepare for a hurricane or some other climate-induced event. They retreat from oncoming storms by moving their boats and fishing gear to higher ground; they accommodate by relocating to other marine currents to improve their catch of fish or change fishing techniques; they change water collection and cropping practices because of salt water intrusion; and they protect their livelihoods and dwellings by gathering the livestock and

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<sup>116</sup> Biological over fishing occurs when the marginal yield of an additional unit of fishing effort is negative. At such a level of effort the fish population stock is prevented from generating its maximum sustainable yield (Ghai & Vivian 1992: 225).

boarding-up their windows in their homes, schools and community centres during tropical storms. 'We temporarily retreat from the water, and move our gear and boats upland.' 'Then we rebuild because there is no remaining space elsewhere.' 'Houses are secured by boarding up windows, roping houses, storing drinking water.' 'During Lenny, there was no water or telephone' (local Soufriere Fisher folk).

The SSMR was designed, in part, to support the three target communities' traditions built on generations of subsistence fishing. The economy, culture and lifestyle of Soufriere and Scott's Head unmistakably revolve around, and are heavily dependent on the fishery and marine biodiversity. Recently, the fisheries activities of artisanal fisher folk have become regulated within the SSMR Reserve. The implementation of marine reserve ocean delimitations and conservation practices had the initial effect of displacing some land-based fishers who utilized seines and fish pots off the beach. These regulations however had an unexpected desired effect of encouraging off shore pelagic trolling, thereby increasing overall catch volume.

In addition to managing the fishery, the SSMR 'has the potential if adequately managed, to expand to accommodate some of the new trends such as tourism, which are fast developing as a threat to fishing and the culture of (these) small communities" (SSMR 1993: 3). As in so many subsistence fishing communities across the Caribbean region, traditional fisher folk will be up against increasing competition from eco-tourists attracted by the unique marine features in the area, from income diversification efforts, and from climatic deterioration of marine biodiversity. Expanded fishing practices and the introduction of tourism may, over the long haul, discourage or diminish the long-standing tradition of artisanal fishing.

We must resist the tendency to dismiss all traditional practices as 'backward' because some may contribute to the systemic poverty we seek to alleviate. We must embrace the wealth of tried and true traditional fishery and conservation and adaptation practices that can complement contemporary adaptation efforts. A fisher's ability to observe the ocean's swells and the direction of trade winds to forecast storm conditions and prepare for cover is just as valid as hurricane monitoring equipment and public storm warnings. "We depend on PSAs ... we observe the swells, and if the winds are easterly, then we expect a storm ... so we prepare." Because of hurricane Lenny's unpredictable northwesterly path, villagers were not publicly alerted of the danger by government authorities, but were able to take some independent precautions such as dry-docking their boats and equipment all the same.

In its public discourse and promotional literature, the World Bank is a proponent of community-based interventions. Often, centrally designed climate change schemes clash with locally based traditional knowledge of conservation and adaptation to climate variability. Local stakeholders, in cooperation with regional bodies and funding entities, are far better placed to assess damage and social impacts, prepare and implement directed social assistance and rehabilitation measures for affected groups such as local area fishing households, prepare comprehensive rehabilitation plans, and conduct ongoing monitoring and evaluation of their community-driven efforts.

The cited examples of traditional environmental responses to climate change are adaptive in nature. When these informal but effective adaptive practices are generalized throughout the community, particularly in the context of climate variability and risk, and local residents are made aware of the benefits of these practices through self-determined

dialogical action, this may be defined as ‘Adaptation Risk Consciousness-Raising (ARC).’

In the 1980s and 90s, social movements promoted grassroots community action to respond to structural poverty and environmental degradation. Freirian grassroots discourse influenced development thinking. ARC is an extension of Freirian dialogical action within the adaptation discipline: a bottom-up and self-generated community effort to awaken or motivate members of a defined or defining community to understand their climate vulnerability and impact, and act upon this awareness through adaptive action. Mediums to promote ARC might include: popular environmental training via experiential shared learning; peer instruction on climate impact and adaptation; and, group problem solving to respond to climate extreme variability.

In spite of the enormous wealth of traditional (informal) adaptive capacity to climate variability, grounded in the daily practices of marginalized communities, to date there are few if any formal mechanisms or institutionalized methodologies to integrate this pragmatic expertise into broader disaster preparedness and adaptation in development strategies.

*Unsustainable Contemporary (Western) Development Knowledge*

*(C)limate change has been confined largely to the technocratic and elitist domain of scientific and policy analysts, not the popular arena.*

Simon Retallack (Ecologist 2001: 42)



Much larger external social forces are undermining the age-old knowledge in subsistence fishing, and in many other socio-cultural realms. In Dominica, “changes are taking place rapidly in the quality of family life, social behaviour, attitudes to each other, community spirit and enterprise, the unselfish giving in voluntary service, among many others.” “These changes have been brought about, largely, by rapid and intense communications systems of modern technology, mainly through the television media. Fashionable though these changes may be, they are all wrong.” ... but the “neo-colonialism of metropolitan-controlled communications technology is directly opposed to ‘independence of thought and action’” (Honychurch 1995: 289). Because people’s attention is focussed on the attainment of foreign realities constructed abroad, they reject their own reality. Thus, the overall power of small island developing state leaders to create an enabling environment for development and adaptation efforts best suited to the needs of their island constituents is severely challenged by Western/Northern dominance.

Recognizing how communities use local or traditional environmental knowledge (LEK/TEK), particularly in the South, will help with developing more integrated community-based risk practices. Yet, northern development ‘experts’ frequently discount the value of local knowledge in project policy and design. Within local communities, “(p)articipatory organization can stimulate the people to reflect on specific issues and to recover age-old knowledge and experience” (Ghai and Vivian 1994: 321).

Furthermore, contemporary adaptive practices have allocated substantial resources for climate monitoring and data collection such as CDERA’s and the CARICOM MACC’s marine monitoring stations and data collection and interpretation networks. This proliferation of hierarchical structures [including specialized electronic information systems incompatible with, and inaccessible to marginalized communities (see UNDESA

and OAS 2003)] feeds into centralized vertical knowledge exchange and decision-making at the macro level.

This monitoring, though informative, does nothing to defend marginalized Caribbean coastal communities whose systemic poverty makes them most vulnerable to storm surge, flashfloods and landslides, coastal erosion and fish stock depletion. As one SSMR fisher declared: “We have no money for plywood (to board up windows and doors), or to anchor our roofs.” There is a clear need to develop horizontal adaptation knowledge sharing, to generalize time-honored traditional and contemporary expertise to the periphery of marginalized communities that would most benefit from this knowledge.

As indicated in chapters II and III,<sup>117</sup> contemporary (unrestricted and unsustainable consumption) fishing practices, such as trolling fleets and immense trammel and seine nets, have had a devastating permanent impact on Caribbean (and global) fish stocks and marine ecosystems. Alternatives to generate local employment, such as enviro-cultural tourism (versus eco-tourism) may mitigate anthropogenic species depletion. To be sure, following the conventional fishery’s failure to prevent overexploitation of fish species within major fishery regions of the world, innovative ideas to ‘green’ the coastal commons would hopefully be embraced.

With traditional fishing techniques still the predominant practice, current emphasis on developing better capability to harvest offshore resources may be the most effective short-term means of reducing pressure on nearshore stocks repeatedly identified as overexploited (Fisheries Development 1994: 9). Goodwin suggests, “nearshore fishery

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<sup>117</sup> Fisheries Development 1994: 9; Goodwin, Country Environment Profile 1991: 108; The Fishery 1996: 13; Mahon 2002: Esp. the International Commission for the Conservation of Atlantic Tunas (ICCAT) data; CARICOM CFRAMP data collection system.

stocks are probably being exploited close to or beyond sustainable levels” (Country Environmental Profile 1991: 108).

Some contemporary adaptation techniques, such as sea defence, are practical at the community level, although local communities are entirely unable to predict or prepare for sea level scenarios. “We need a sea wall. We don’t know how high the sea will come, so we just raise the sea walls, the stone castings, and our boats ... We also need sea level predictions” (Soufriere fisher). The blending of local preparedness capacity with modern sea level monitoring and warning systems would likely reduce coastal residents’ risk.

Nunn et al (1999) argues that ‘adaptation efforts require more than just the use of traditional management strategies as over the years the overwhelming demands on coastal areas have changed so significantly that this alone would not be appropriate. It is suggested therefore that adaptation strategies should apply a mix of traditional and modern practices, which aim at satisfying both the subsistence and commercial demands on coasts’ (Initial National Communication 2001: 68).

Another example of the practicality of low impact modern adaptation is Dominica’s promotion of tuna surface long-lining which has increased yellowfin tuna landings, the use of 3.5 inch meshed gill nets to protect the reef base and diversify species landings, and bottom long-lines to target snapper on steep slopes not accessible by traps. According to Dominica’s 5-Year Fisheries Development Plan and Corporate Plan, these modern diversification techniques help relieve fishing pressure on near shore marine eco-systems and stressed fish stocks. Dominica’s Fisheries Department has been collaborating with fishing communities and co-operatives to develop the sector. The success of recent government efforts to modernize the fishery has been somewhat limited, however, as

“fishermen enjoy a spirited independence born out of labouring amidst the most unpredictable elements of nature” (Honychurch 1995: 221). This commitment to the traditional fishery was reaffirmed during a focus group meeting when Soufriere Fisheries Group members emphatically agreed that “we would go back to fishing no matter what, because of our traditions!”

Dominica’s fisheries development strategy encourages increased domestic harvesting and consumption of fish through the introduction of fibreglass “transition” craft, such as the Yamaha FRP W-25S and W-22S models. This is to encourage fisher folk to shift from using canoes in nearshore nursery sites with stressed stocks, to using more versatile and seaworthy vessels in offshore locations. The national government has also provided incentives, such as duty free concessions on outboard motors and gear, and a fuel rebate system (with funds going to a fisher folk distress fund) (Fisheries Development 1994: vii). Moreover, as indicated in the previous chapter, considerable resources have been invested in the fishery by IFAD, the UNDP, FAO and WFP, ICOD, the governments of Canada (CIDA), Taiwan, and Japan (JICA).

These modernization efforts to develop offshore capability demand caution, however, as the customary response is to secure the ‘common property resource’ as expediently as possible with little recognition of medium to long range impacts to species and ecological sustainability, or recognition of the immeasurable value of local adaptive knowledge and community capacity.

## 6 Dialectic of Subjective Over Objective Social Agency in Adaptation

In contrast to the dominant development and adaptation practices that rely on exogenous, results-based, economistic, centralized and top-down models and methods, transformative or 'dialogical' (Freire) adaptation relies on local resource input through consciousness-raising (Freire's '*conscientização*') or popular education and social agency at the community level.

I would propose that genuine adaptation in development cannot be obtained without the integral participation of indigenous community stakeholders at all levels in the development cycle. Marginalized coastal communities must champion the participatory modelling, planning and programming of climate change adaptation (CCA) strategies, as authors, owners, and actors, of their own future. By effectively reducing their overall risk and vulnerability to climate variability and extreme weather events, they will directly contribute to the sustainability of their socio-economic livelihoods, and supporting marine ecosystems.

This emphasis on marginalized community members as the subjects of their own risk management and biodiversity conservation is sure to offer more substantive long-term results than remedial projects relying on external conditions. With a preponderance of top-down adaptation programs being delivered from the outside, there is a desperate need for adaptation risk consciousness-raising (ARC) within organizations that spring from the grassroots.

One prime example of a Dominican grassroots CBO is SPAT (Small Projects Assistance Team). SPAT is widely acknowledged as a community-based NGO with an established record in promoting participatory community programs. It was suggested that this team would be a likely NGO recipient/partner for a CCA community development initiative. SPAT has an office and a couple of staff members.

Village Councils can be also be quite innovative centres for social agency, as they currently manage transportation, disaster fundraising and clean-up, public safety and post-hurricane chainsaw committees. Community willing, an impact and adaptation risk management committee would be a logical complement to this roster of community volunteer groups.

As stated by the Village Council's Executive Director: "Likely stakeholders of a climate change adaptation program would include: Fisheries; Tourism; the Meteorological Office; Village Councils and other community interest groups; the Fisheries Environmental Coordinating Unit (ECU); and schools." Note that the Disaster Preparedness Committee (DPC), comprised of teachers, carpenters, nurses, and fishers, forms a part of, and is administered by the Village Council.

## **7 Is Decentralized Adaptation Superior to Centralized Adaptation?**

*Local knowledge creation – and its transfer from one country to another – thus has the potential to unleash powerful development forces.*

(World Development Report, Knowledge for Development, World Bank 1998/99: 133)

To further explain the centralist tendency within this emerging field of adaptation, we will need to look at current IFI and aid agency centralization and decentralization efforts to determine their operational worth and impact in relation to adaptation development in marginalized coastal regions. This task is partially accomplished in the next section.

The vast majority of development and climate change adaptation funding mechanisms and projects currently underway rely on centralized models for project design and evaluation, and on very limited local input through PEO activities to extract local labour and resources from the poor and ensure local compliance. Regional and national adaptation authorities distinctly reject popular participation 'to retain bureaucratic power at the centre' (Nelson and Wright: 2000).

During development discourse in the sixties, it was acknowledged that popular participation implied "some measure of decentralization of decision-making" (UN 1975: 15). In development practice today, top-down centralized approaches persist, in part because of 'normal bureaucracy'—the concepts, values, procedures and behaviour dominant in the bureaucracies, with their tendencies to centralize, standardize and control" (Nelson and Wright 2000: 32). Clearly, "where state power continues to be concentrated in a centralized system, efforts to create participatory projects are often obstructed" (Long 2001: 143).

Nevertheless, decentralized adaptation development projects are better able to account for social and cultural conditions and technical requirements locally, and projects are more likely to succeed and sustain community interest, avoiding the risk of social rejection. "Local people could have an increased stake if they were empowered to make decisions;

local governments could achieve developmental goals more effectively; donors could see a more efficient use of funds; but state-wide institutions, with competing interests, may be threatened” (Nelson and Wright 2000: 161). “Learning from others, assimilating that knowledge, and adapting it to local circumstances offer the opportunity to make rapid advances without repeating others’ mistakes” (World Bank 1998/99: 133).

An advantage of transferring program decision-making from the meso to the micro level is that citizens will accept greater responsibility and will be less inclined to blame a government official or foreign agency. Yet another qualitative difference in the nature of participation at the national and local levels is that participation at the local level is more likely to be sustained over time as the community group or individual participant can continually perceive the direct link between actions performed, local resources invested, and their concrete results. Moreover, the diffusion of knowledge is generally faster in village communities where the social network is more densely knit and better organized.

Thus, in the SSMR decentralized micro-adaptation could effectively be led by the well organized and community endorsed Scott’s Head-Soufriere-Gallion-Bagatelle Village Council. The Council is charged with undertaking small-decentralized projects in partnership with central government resources. This form of local government ‘continues to harness the energies and goodwill of the citizens through self-help, and channel this towards the welfare of the community’ (Honychurch 1995: 196).

In fact, it was strongly suggested by the Soufriere Fishery Group that ‘if a project were considered, it should be conducted through the Village Council for both communities!’ Furthermore, with the community-based Disaster Preparedness Committee being administered by the Village Council, and armed with the practical membership expertise



of its teachers, carpenters, nurses and fisher folk, integration of adaptive activities within this institution would be a natural fit.

As for impediments to decentralized adaptation programming, opportunities are squandered where existing community institutions place greater value on outside promoters or locals with outside experience and discourage local participation and organization. As well, relatively privileged traditional local leaders may resist community-level decision-making. This stalemate may be resolved by “broadening the leadership base ... especially where new leadership supplements rather than replaces traditional leadership ...” (UN 1975 : 41).

The lack of resource uniformity between Scott’s Head and neighbouring Soufriere (and Pointe Michel) has occasionally generated ill feelings. With the possibility of leadership resistance to newly introduced community impact and adaptation decision-making mechanisms, the local leadership base of Village Councils, Improvement Committee, LAMA and other established social groups could be broadened to include supplemental leaders from the Fishery Groups. This would imbue new blood and resources into already existing entities, revitalize membership energy levels, and further legitimize existing authority. Leadership resistance would be an unlikely outcome where ongoing economic and social problems already prioritized by the community are addressed as part of the adaptation project goals.

## **8 Critique of Macro-Meso Remedial Adaptation Versus Grassroots Participatory Adaptation to Climate Change (GACC)**

### *Mainstreaming Adaptation To Climate Change or MACC, From Above and Outside*

Despite some impressive advancements in climate change impact and adaptation research, methodologies, program planning, and regional and national implementation initiatives (and corresponding funding), participatory adaptation opportunities at the community level are being systematically neglected, or appended as afterthoughts to adaptation and development strategies.

Dedicated funding for community-level adaptive programming is essential to identify grassroots traditional expertise and locally available resources, and institutionalize participatory approaches to risk management. Nonetheless, it is not the financial capital generated through economic growth or forced regionalism that will engender regional harmony, transform inequity and reduce the climate vulnerability of marginalized communities. It is the social capital in civil society, comprised of individuals and grassroots community groups collectively participating towards a common objective by and for themselves.

Presumably, the ultimate beneficiaries of international development aid are the 3 billion+ marginalized citizens of the world. With an estimated US\$16 trillion in climate-related losses expected over the next 20 years (Ecologist 2001), the basic needs of these marginalized populations will be ever greater. Ghai and Vivian have made the sober

statement that, “it often appeared as if the larger the financial commitment of an organization to ‘development’ goals, the smaller was the commitment to discovering how to assist the empowerment of the poor, drawing on their knowledge, their priorities and their politics’ (Ghai and Vivian 1992: 37).

This lack of macro to micro development focus has been confirmed repeatedly throughout my development career, with numerous large and small funding agencies having failed to grasp even basic concepts of community self-determination. Furthermore, my thesis examination of regional and international adaptation funding mechanisms (i.e., CCCDF, GEF MACC, CPACC, etc), and national efforts (Dominica’s Policy on Planning for Adaptation) also seems to confirm this sorry reality.

The following is an assessment of macro-level risk management efforts and their juxtaposition to community-level adaptation.

*COP7, GTZ, VARG, DFID, Netherlands, AusAID, JICA, UNFAO, and UNDP  
Adaptation Funds/Programs*

A prime example of failure to integrate grassroots involvement in adaptive programming is COP7’s three international climate funds. The LDC fund is strictly for national (NAPA) efforts. The second Climate Change Fund supports economic (national) diversification of oil exporting economies. The third Adaptation Fund (yet to be established) is not likely to have a community mandate if current centralization, exogenous, and top-down macro-level tendencies continue to prevail.

In spite of the IPCC and the COP1 acknowledging climate change as a global concern in 1995, it is only very recently that adaptation has become an articulated priority of the UNFCCC. Joké Waller-Hünter, Head of the UNFCCC, made some historic comments during the UNFCCC Ninth Conference of Parties (COP9) *Adaptation Day* held on December 10, 2003 in Milan. With great confidence, she stated 'that adaptation programming is now recognized as a fundamental element of climate change negotiations, on par with mitigation priorities and activities.' Once again however, community was not mentioned.

Germany's GTZ has recently dedicated adaptation funds through its Climate Protection Programme (CaPP). The author has been unable to identify a substantive community focus within this program. Considering GTZ's responsibility as a crown agency to promote private sector development ventures, a community orientation within its adaptation activities is unlikely.

The Vulnerability and Adaptation Resource Group (VARG), although designed to examine adaptation from a poverty reduction perspective, focuses on integrating adaptation measures into national development strategies. DFID's adaptation program encouragingly views adaptation as an integral component of its poverty alleviation strategy. It currently has no assigned adaptation funds or a defined program strategy to work with communities and adaptation, but may consider integrating community adaptation into its existing development framework.

Both the Netherlands and AusAID have combined adaptation programming with poverty reduction, but are heavy on research and policy development at the host-national level. The author was also unable to assess AusAID's South Pacific poverty reduction program

to determine whether it had a substantive community adaptation focus, emphasizing grassroots participatory approaches. JICA Japan, and the UN FAO currently have no designated community adaptation programming, though there appear to be efforts underway to develop partnerships for community-level activities. It remains to be seen whether the principle of participatory grassroots adaptation will be embraced by these pivotal development organizations.

Worlds apart from all other climate change adaptation funding mechanisms and their lack of focus on community-level participatory development, is the UNDP GEF Small Grants Program, that attempts to link global (macro), national (meso) and local (meso) development issues through a participatory and country-driven approach to project planning, design and implementation. With grants made directly to CBOs and NGOs, unlike virtually all other international donor funding mechanisms, the SGP encourages micro-endogenous community-level input, ownership and decentralized administration, thus identifying with the community as subjective social agent. However, no official approval structure exists to promote or assess the value of community adaptation projects, as adaptation is surprisingly not yet on UNDP's program agendas.

As witnessed above, in spite of the immense global effort by multi and bilateral donor and development agencies to institutionalize adaptation within their disaster management, international development, and climate change frameworks (some initiated five to ten years ago), the international record for developing actual participatory climate adaptation project components grounded in local community is disturbingly absent. CICERO's summary of the 13 largest international development agencies and their climate change (including adaptation) and development assistance shows that the vast majority of resources were dedicated to technical advice, concept papers, case studies, pilot studies,

scientific reports, UNFCCC participation, planning, and information dissemination [CICERO 2003 (2): 23-24].

To its credit, the World Bank designated funds from its Emergency Recovery and Disaster Management Program for OECS SIDS. Dominica (and the SSMR research area) was a beneficiary, having received support for sea-defense. Nonetheless, few resources have been allocated to actual community-based adaptation project decision-making, local capacity building, and grassroots projects for those marginal and vulnerable communities most affected.

Under this prevailing centralist 'politique,' of adaptation development, there is a propensity for macro development donor agencies (UN dependencies, development banks, host national governments), the private sector and even grassroots NGOs, to make top-down policy and program decisions that discount meaningful decision-making input or participation at the meso (country regional) to micro (community or village) levels, except perhaps through resource-scarce municipal decentralization programs, and Public Education and Outreach or PEO campaigns.

As explained in a World Bank report, these structural changes taking place in vulnerable small island economies are being driven 'by exogenous forcing mechanisms—technological development, climate change, and the WTO process' (World Bank Dominica 2001: 93). Similar 'institution-centric' comments can be made of the IDB Action Plan on Climate Change that solely looks at host country efforts, and research and policy development (see 3.3.2 Review of Macro-Adaptation Programs and Funds: IDB).

In reviewing other prominent adaptation programs below (CCCCDF, CPACC, ACCC, MACC, GACC), bear in mind the distinction between ‘instrumental’ and ‘transformative’ mainstreaming of adaptation. The instrumental definition suggests the ‘regularizing’ of a particular issue or practice into an institution’s normative policies and practices, independently of field requirements. Current adaptation programming by IFIs and ODAs reflects this practice. The transformative definition of mainstreaming posits the ‘popularizing’ of an issue or practice through local decision-making for local benefit.

*Canadian Climate Change Development Fund (CCCCDF)*

CIDA’s CCCCCDF was primarily a mitigation (GHG reductions) program, with the commendable goal of addressing climate change in developing countries while attempting to contributing to poverty reduction. However, its institutional structure, and program criteria and administrative practices appear to be governed by centrally-driven host national decision-making structures, and pre-established funding criteria. Arguably, the program falls far short of identifying with, and integrating vulnerable and marginalized communities in any significant way.

Generally, and within the CCCCCDF Adaptation Program component (10% of CCCCCDF program funds), the CCCCCDF: prioritizes advantageous ‘technology transfer’ using Canadian know-how and expertise; functions under a Policy Branch Secretariat, Interdepartmental Working Group and Governance Board comprised of Canadian government civil servants; has centralized internal project approval and development procedures which largely ignore socio-economic field conditions and community decision-making; and must contribute to objectives of Canada’s International Strategy on Climate Change, including Canada’s Kyoto emissions targets at the lowest cost, and

maximizing business opportunities for Canadian business interests in international projects and initiatives on climate change” (CIDA 2000, p. 7, 11, 12, 13, 15, 18).

Apart from some unsolicited proposals through bilateral (country-to-country)<sup>118</sup>, regional and special expenditure programs, the bulk of CCCDF fund allocations were disbursed through CIDA’s bilateral competitive tendering process, with the centrist biases inherent in a Canadian business competitive process. There is no evidence of any consultations with southern NGOs, CBOs or host national target communities during the design, fund criteria or project approval stages. It is likely that secondary programmatic considerations may have taken place through the Canadian missions, in consultation with host national officials and possibly local NGOs.

Reporting and evaluations are based on logframe and results-based management (RBM) analysis. This goal-oriented quantitative methodology, by design, limits qualitative field analysis. As well, Programming and Policy Branch-based eligibility and RBM criteria are developed by Canadian stakeholders (ibid, 22-23, 20), with little meaningful input from community stakeholders in the field, and from those protagonists who are expected to benefit from this assistance.

The CCCDF did make Small Projects Fund provisions (Can \$10 million over four years), administered through CIDA’s Canadian Partnership Branch (CPB). This CCCDF-CPB fund requires that projects provide consideration of appropriate local conditions and culture for technical viability and impact, and for building synergies with other stakeholders. (ibid, p.14, 19, 20). This small fund was designed to ‘assist developing

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<sup>118</sup> \$16 million in funding for seven adaptation projects: India, El Salvador, the Sahel, Bangladesh, Vietnam, Caribbean, and South Pacific.



countries to reduce their vulnerability and adapt to the adverse effects of climate change,' ... and 'contribute to strengthening capacity of developing countries to participate in global efforts to combat climate change' (CIDA Criteria 2001, p.3). This approach however, limits local buy-in because it is centrally administered (with limited intervention from the host Canadian missions), including proposal appraisals and monitoring requirements.

*Caribbean Program for Adaptation to Climate Change (CPACC)*

CPACC was almost entirely focussed on the Caribbean region and host member countries. There were no substantive development components, in terms of social, decentralized equity, or transformative social agency, in this initiative. Vulnerable communities, poverty reduction, and local stakeholders were not primary or secondary considerations in this initiative. Instead, emphasis was placed on: data network management, coastal inventories, national policy planning, reef monitoring, economic valuations, regulatory proposals, and national (government) capacity building.

According to the World Bank's own project appraisal, CPACC's limited vulnerability assessment approach has "ignore(d) the social vulnerabilities and does not incorporate community level information in the assessments" (World Bank 2003: 5). In fact, during a CPACC Implementation Completion Report Workshop, stakeholders rated overall achievement of objectives as "negligible" for sector policies and poverty reduction (World Bank 2002: 28). Moreover, CPACC resources were not sufficient "to be effective at enhancing public and political buy-in to the climate change agenda..." (ibid: 34).

To be fair, National Implementation Coordinating Units structured under CPACC “had community representation and participation, and their major function locally was to ensure full community level participation in defining risks and their perception of risks, prioritising actions for adaptation, and feeding into the process, knowledge as to how they coped with “adaptation” over the years” (Trotz notes 2004). During the implementation stage (Component 4), there was a recognizable ‘process of engagement providing for wide consultations in each country with communities at risk’ (Trotz notes 2004). There was however, no structural or longer-term provision for poverty alleviation or community-level decision-making input into this program’s design or implementation strategy. “The major constraint to the widest possible involvement was that of resources which were not explicitly provided for in the original project design” (ibid).

One community-level exception seemed to be the CPACC hiring of a Jamaican consulting firm to conduct CPACC-related public awareness activities: in secondary schools (teacher’s kit on global climate change); with Government Planners and Decision Makers; and through two global climate change articles disseminated through the regional press (RPIU Update 1999). Dr. Trotz has pointed out that, “CPACC did pioneer stakeholder consultations and community participation in crafting National Climate Change Adaptation Policies and Implementation Plans” (Trotz notes 2004). That being said, MACC and most other referenced adaptation focussed programs do not provide any provisions for actual social vulnerability, poverty reduction or impact and risk management measures to be conducted by and for vulnerable target communities.

### *Adaptation to Climate Change in the Caribbean (ACCC)*

The ACCC and MACC programs have helped to create an essential enabling environment within regional and national policy and information network structures for adaptation work. The ACCC program was premised on the impact of climate change on development projects and human security, and the consequent need to integrate Natural Hazard Impact Assessments into environmental impact assessments (EIA's). MACC and ACCC programs were considered essential stepping-stones for the development and promotion of broader adaptation efforts that would focus on vulnerable communities.

Because of this two-stage approach, with initial emphasis on nation states' capacity-building, leaving the focus on vulnerable communities for later, both programs fall significantly short of identifying with community stakeholders in the design and implementation stages. There is no direct support for concrete field activities that qualitatively reduce vulnerability of coastal communities to climate change impact.

Several reports, including one from the CPACC and MACC Program Manager, acknowledged the need for "sector-based projects that would help ... sectors adapt to climate change as well as to promote sustainable development" (Trotz 2002, GCSI 2001, Springer 2002, in Sheppard and Osterwoldt 2002: 39). Interaction 'did take place with communities in the development of the PEO strategies at the country and regional levels' (Trotz notes 2004). Nonetheless, based on a program review of ACCC reference documents, no substantive community-driven or community-based projects have been designed, implemented or supported within the mandate of this program.

*Global Environment Facility (GEF) Mainstreaming Adaptation to Climate Change (MACC) Program*

Under the GEF-funded NAPAs, country obligations include the need “to recognise the local community as a main stakeholder and take into account current vulnerability and existing coping strategies at a grassroots level to identify priority adaptation activities rather than focussing on scenario-based modelling in shaping long-term policies” [CICERO 2003 (2): 19]. In this context, vulnerable SIDS in the Caribbean and South Pacific have been lobbying large ODAs and IFIs to support host national and community adaptive action. “We in the Caribbean and the South Pacific have argued that we have developed a “bottom up” approach to Adaptation by putting people and communities first, and have at international fora made a distinction between this (bottom-up) and the top-bottom approach which the international community has embraced” (Trotz notes 2004).

As one of four core objectives, the MACC program will assist participating countries to identify and formulate enabling measures to address climate impact on fishing communities, their marine resources and supporting ecosystems. The objective of the MACC fishery sub-component (admittedly a secondary input) is ‘to strengthen the capability of the national fisheries administrations and fishery organizations to anticipate and minimize negative impacts of climate change and sea level rise on the fisheries sector in the CARICOM region’ (Mahon 2002: iii). This sub-component will utilize guidelines developed in the South Pacific where the emphasis has been on community participatory processes in their CCCDF supported project.

MACC also has a public education and stakeholder awareness component targeting schools and the general public, and primary stakeholders. To date, however, no actual community-oriented vulnerability reduction activities within Dominica's or the OECS's national or artisanal fisheries are envisioned within the MACC program matrix. It is worth noting that the MACC "has crafted a pilot project to examine approaches to this type of work (and) the outputs from such a pilot will inform future efforts in this area" (Trotz notes 2004).

The MACC Program is not designed, however, for actual adaptation pilot projects in vulnerable communities (World Bank 2003: 30), nor any "direct impact on specific populations" (World Bank 2003, p.30). As stated in the MACC Appraisal Report, "(A)lmost all funding is either for climate and coral reef monitoring equipment, or for building knowledge base and capacity amongst participating countries through workshops and training, to use tailored models for climate projection, climate impacts, and vulnerability and risk assessment, or to educate the stakeholders (regional and national) about the climate change risk management strategies" (ibid: 26-27).

Although the MACC does emphasize capacity building at the regional and national level, the mainstreaming of adaptation into host government's planning and development processes (development of Second National Communication), and a focus on nationally administered public education and outreach (World Bank 2003: 3, 6), nonetheless, it too is virtually absent on the community front. Even though the MACC program has recently championed the mainstreaming of adaptation in the climate change matrix, risk management regime, and development process, the aforementioned World Bank Report underscores my contention that the current adaptation (disaster/hazard risk management, and climate change) industry has failed to generalize adaptation measures to broader

community stakeholders after a decade of institutional discourse and numerous workshops.

This bypassing the integration of civil society in regional adaptation programming was confirmed by the Caribbean Group for Cooperation in Economic Development (2002) on Hazard Risk Management in The Caribbean. Its Report on adaptation programming preceeding FY2002 points out that “(ii) wide sharing of information with affected stakeholders or policy-makers has not taken place; and mainstreaming climate change responsive adaptation measures into the planning and development process, both in the public and private sectors, has not yet commenced” (World Bank 2003: 4).

However, because of the Group’s focus on Caribbean economic growth (growth theory), and macro-level development, it identifies with meso-level host governments and business. There is no indication of its support of grassroots social agency in the adaptation context. In fact, no community-based adaptation projects are actually envisioned as “no funds are expected to be transferred to the NICUs for country-level activities” (World Bank 2003: 17).

This structural concern is further reinforced in CICERO’s Pro-Poor Climate Adaptation Report on the UNFCCC’s NAPA process, “(a)lthough (grassroots adaptation activities are) good in principle, ... the NAPA process may favour large infrastructure projects rather than smaller efforts aimed at vulnerable and poor communities” [Saleemul Huq, pers. Comm.. in CICERO: 2003 (2): 19].

Worth noting is that the composition of the MACC Lead Beneficiary/Coordinating Agencies is heavy on large organizations (particularly natural and physical science), and

is short on community-level social development, civil society (local community NGOs, CBOs, community associations, trade unions), and other grassroots representatives. NGOs (and presumably other vulnerable community stakeholders) ‘will participate in project implementation through representation on the project Advisory Committee’ [Saleemul Huq, pers. comm. in CICERO: 2003 (2): 31]. However, considering the macro composition of the MACC Lead Beneficiary/Coordinating Agencies, MACC’s continued focus on host national adaptation plans and strategies, and the fact that actual vulnerability reduction projects at the community level are not envisioned, suggests that the likelihood of grassroots communities’ and their CBOs/GROs’ involvement in core decision-making is minimal.

*World Bank and Inter-American Development Bank (IDB)*

In a review of World Bank policies concerning vulnerability and adaptation, Burton and Van Aalst (1999) concluded, “there are considerable gaps in procedures regarding project design, implementation and evaluation” (ibid: 20). Moreover, of the World Bank’s 102 post-disaster reconstruction projects reviewed between 1980 and 1998, only “3% had an institutional development component aimed at mitigating the likely effects of disasters before they occur” (Gilbert and Kreimer 1999, in World Bank 2000). To hammer the point home, the absence of a climate vulnerability and risk management focus within the global development and climate change community is such that the IPCC’s first-ever workshop on climate adaptation was not held until 1998, fully ten years after the IPCC was created (ibid 55).

The World Bank GEF’s US \$50 million enabling fund entitled: *Piloting An Operational Approach to Adaptation* is designed for “developing country efforts for pilot or

demonstration projects to show how adaptation planning and assessment can be translated into projects, and integrated into national policies and sustainable development planning” (Good 2003)<sup>119</sup> These pilots would serve as a follow-up to the development of National Adaptation Plans of Action (NAPAs, referenced in Chapters I and III) and national adaptation strategies, and would unlikely identify with community agencies in vulnerable coastal communities.

As for the IDB and other development banks, they have ‘only recently been brought to the adaptation table after years of negotiations led by the Alliance of Small Island States (AOSIS)<sup>120</sup> group in particular’ (Trotz notes 2004). In fact, the Intergovernmental Negotiating Committee of AOSIS has pushed for stronger consideration of downscaled risk reduction projects in its instructions to the GEF and other IFIs for funding adaptation.

To foster climate change knowledge and capacity in the Americas and Caribbean regions, the IDB has committed to “future areas of focus through the (Bank’s) Research Network that will address mitigation and adaptation policies and strategies” (IDB website: 10). However, current knowledge building appears to be focussed internally through “training seminars and periodic workshops to train Bank staff about climate change, and mitigation and adaptation strategies and methodologies” (ibid: 11).

Although the IDB has initiated a program in partnership with the UNDP to assess likely impacts to Caribbean SIDS member countries at greatest risk, concerning Caribbean

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<sup>119</sup> Statement to the Ninth Session of the Conference of Parties to the U.N. Framework Convention on Climate Change, Leonard Good, Chief Executive Officer and Chairman, Global Environment Facility (GEF), Milan, Italy, December 10, 2003

<sup>120</sup> The Alliance of Small Island States (AOSIS) is a coalition of small island and low-lying coastal countries that share similar development challenges and concerns about the environment, especially their vulnerability to the adverse effects of global climate change. It functions primarily as an ad hoc lobby and negotiating voice for small island developing States (SIDS) within the United Nations system.



tourism for economic growth and climate impact, it has been stated that this work will most benefit host governments, private sector industry stakeholders, and bank staff, not vulnerable communities directly.

### *Macro-Adaptation Funding Lacks Community Vision*

The almost complete absence of macro-funding for grassroots adaptation supporting the most vulnerable communities calls into question the value of international aid assistance as an institution. Fowler goes so far as to suggest that the international aid system (and adaptation industry by extension<sup>121</sup>) is “essentially duplicitous and morally impoverished” (Fowler, 2000, p. 44).

If there is any hope for aid agencies to successfully integrate micro-adaptation efforts into broader adaptation development strategies to qualitatively address some of the root causes of inequality, while reducing climate vulnerability, funding and program mechanisms will have to be radically altered through transformative and integrated policies and synergistic micro-to-macro partnerships.

### *Meso-Level Adaptation: Dominica's National Adaptation Priorities*

*Micro approaches are patently insufficient, and macro recipes have yielded many unintended and unwanted consequences* (Charles Reilly in Ghai and Vivian 1992: 326).

A distinct macro-adaptation tendency is for IFI's to support regional or state-driven adaptation initiatives, without integrating community into the overall

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<sup>121</sup> My emphasis.

developmental process. For example, a cornerstone of the GEF's operational strategy is the requirement that project ideas be country-driven (World Bank World Development Report 1998/99, p133). Yet, community integration is a distant consideration.

Especially at the host-national level, because "(c)limate change will occur across time frames that far exceed the normal time horizon for political decision-making" (Policy Framework 2002: 6), anticipatory adaptation actions are 'likely to be resisted (at least initially) by important stakeholder groups and are likely to be politically sensitive' (Policy Framework 2002: 6).

The external approach of the GEF's implementing agencies (UNDP, WB, UNEP, IDB, ADB), and of host governments and donor agencies, engenders the virtual exclusion of primary (community) stakeholders. Although the GEF's country-driven approach may presuppose involvement at the community level, it does not require community participation as a prerequisite for success.

By design and default, this instrumentalist approach generally promotes macro-meso agency instead of transformative community-driven activities by civil society. Yet, meaningful risk assessment, planning, management and institutional capacity are required at the target community level for greater project and social impact.

Currently, Dominica has no comprehensive strategy for hazard vulnerability reduction at the national level. Twenty years after the devastation of Hurricane David in 1980, and the completion of the first comprehensive sea defense protection plan, Hurricane Lenny in 1999 exposed 'the weaknesses of the island's sea defenses and very limited progress

made in implementing the sea defenses upgrading plan drawn up in 1990 and revised in 1997' (Mouchel 1997 in World Bank Dominica 2001, p. 91).

For example, if we look at the *Framework For Dominica National Climate Change Adaptation Policy*, of the nine priority sectors designated for integrated impact and adaptation planning and management, and the 64 corresponding Strategies and Actions, there are over 450 stakeholder/partner references of national government departments and organizations, about 20 references of private sector financial institutions, associations, consulting firms, and media outlets, only four references to NGOs and one reference to a trade union (Policy Framework 2002: 20-40).

In the national context for Dominica, CARICOM's MACC program makes passing reference to supporting 'a strong public education and outreach program, and a comprehensive communications strategy.' The MACC focuses on "the mainstreaming of adaptation to climate change into national and sectoral planning and policies" (World Bank 2003: 9). Thus the agency of change is the host nation state, and the project may support at best an instrumentalist approach to community involvement. That being said, Dominica's Initial National Communication on climate change does offer some progressive approaches to integrate community into future adaptation efforts.

Dominica maintains that adaptation efforts should include the sensitization of community educators in government and non-governmental organizations, as well as the media. It goes on to suggest that adaptation educational material should be produced in the 'Kweyol' language<sup>122</sup> as well as English (Initial National Communication 2001: 79).

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<sup>122</sup> Note that French Patois (French Creole) is almost universally spoken in Soufriere.

Because of the relative immediacy of the need for action to combat coastal climate vulnerability and risk, government needs to 'bend the stick' from its emphasis on collecting vulnerability data and creating policy and public awareness (useful as they are), to activity-oriented micro-projects that engage local expertise and further build local adaptive capacity.

### *Dominica's National Recommendations For Adaptive Action*

Dominica's Initial National Communication is quite comprehensive, and gives the distinct impression of the government's commitment to community inclusion and validation of traditional adaptive capacity.

Current suggestions for adaptation action include the following: coastal re-vegetation which can be adopted by local communities and governments to reduce shoreline erosion; setback strategies to reduce risk, and reduce direct human impact on the coast; public education to sensitize local populations (school curricula, community groups and clubs) on climate change issues; enhancing the understanding of local NGOs who can then play a critical role in awareness-raising about sustainable coastal adaptation; developing appropriate adaptive legislation; developing baseline information on coastal resources and shoreline profiles and erosion rates; conducting hazard mapping to define risk; incorporating climate adaptation methodologies into Environmental Impact Assessments (EIAs);<sup>123</sup> promoting public participation in the development process to ensure acceptance; and, making available catastrophic insurance especially for vulnerable groups

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<sup>123</sup> The World Bank GEF Project Appraisal for the MACC recommends the introduction of climate EIAs as part of the mainstreaming of adaptation (World Bank 2003: 6)

and communities traditionally excluded from insurance markets, such as low-income households and fisher folk.

The Initial National Communication also suggests the following for fisheries adaptation options: encouraging the use of fishing boats able to withstand rougher seas to target the offshore pelagic fishery; enforcing fishing controls; raising the level of coastal structures (docks and piers); implementing sea-worthiness and safety programmes; providing facilities for removal of vessels from sea to safety sites above the reach of storm surge; and strengthening fisheries personnel capacity to better assess and plan for adaptation responses (Initial National Communication 2001: 77,78). However, it is understood that no community-oriented or community-driven adaptation programs or campaigns are underway in Dominica.

In May 1994, a new Bolivian *Law of Popular Participation* was enacted, providing the legal framework for local institutions inside municipal boundaries (previously unrecognized) to participate in planning, management and auditing activities related to how resources will be used, and how development activities are carried out. The Law is “seen to provide a context for users of participatory methodologies to move from micro to macro-influencing strategies” (Long 2001, p141).

The enactment of similar legislation for the Commonwealth of Dominica and other SIDS would create an enabling environment for community participatory development and micro-adaptation practices to potentially flourish.

### *Dominica's No Regrets Climate Adaptation Strategy*

As stated in Dominica's Initial National Communication, 'Dominica's approach will not be based on climate considerations only' ... but 'would be linked to wider considerations and would be directed in the first instance, towards existing vulnerabilities and risks to present day weather and climate extremes, as well as advancing wider development objectives.' The document goes on to state that 'given the low levels of greenhouse gas emissions, the emphasis will be placed on the adaptation aspects, as this is the area where Dominica will experience the most serious adverse impacts' (Initial National Communication 2001: 62). Thus, adaptation measures are considered complementary to other development goals such as poverty reduction and sustainable biodiversity.

Clearly, 'no-regrets' adaptation measures do not involve significant development dollars or private sector investment if initiated early enough to avoid the excessive costs of cumulative or extreme climate impact. Similarly, donors should not mistakenly believe that a 'no regrets' adaptation approach, which benefits the country independently of climate variability, suggests that a justification for incremental financing is feeble. One could convincingly argue that poor preparedness or adoption of reactive adaptation strategies could force the diversion of scarce resources earmarked for development projects to relief and reconstruction efforts resulting from an extreme weather event.

The Permanent Secretary of Tourism indicated the Ministry's potential climate change priorities when he suggested that: "We see tourism as an alternative to the fishery. This was the driving force for the development of the SSMR, and for alternative revenue

generation. There, we need a public awareness program on the impact of climate change.”

“Housing construction codes need to be reflected in climate change strategies.” “Land variances and setbacks on coastal infrastructure are needed but very difficult.” “Tourism could be a key partner in a CCA project, and the industry has some interest.” “As far as risk goes, climate change is not a high priority for the Tourism Development Corporation (TDC). However, the TDC has been cognisant of the need to identify a haven from volcano disasters...” “and hurricanes have seriously impacted tourism accommodation.” “A logical adaptation pilot for Fisheries and Tourism is the Scott’s Head/Soufriere communities.”

Under the auspices of the Ministry of Agriculture - Secretariat to the National Climate Change Committee - the Environmental Coordinating Unit (ECU) is the national focal point for all adaptation related initiatives with the World Bank GEF. Under the guidance of the ECU, the Fisheries Development Division is the custodian of the marine environment, and is responsible for any potential fishery adaptation activities at the parish, village and community level. The Division would therefore be the most likely host national link for any grassroots adaptation projects in partnership with the SSMR Fisheries Groups, Village Council, and CBOs.

Facing uncertainty about the magnitude of climate change, most experts recommend that governments adopt a flexible adaptive strategy for coping with these changes. For example, a rigorously enforced coastal setback policy would be appropriate where no infrastructure has been built. To significantly improve natural disaster planning, institution-strengthening, training, and facility improvement need to be conducted at the village, township, and national levels. Furthermore, national school curricula should cover disaster prevention, avoidance, and climate change awareness.

Considering the magnitude of climate change impacts on Caribbean settlements, public and private sector infrastructure, and ecosystems over the short-to-medium term, and recognizing the profound impact climate-related disasters will have on development priorities, adaptation goals must be prioritized within host government's, donor agencies and IFI national/regional policies, and development and disaster management plans, in vertical collaboration with community-based agencies. More importantly, the transformative mainstreaming of impact assessment, vulnerability reduction, and risk management efforts would convert attitudes toward climate change from 'something that might occur in the future' to 'an integral component of development planning.'

*Grassroots Climate Change Adaptation or GACC, From Below*

*(Climate change) simply cannot be solved at the national level.*

(Worldwatch Institute, in State of The World 1989, p17)

It is vital that participatory micro-adaptation measures be embraced and integrated into broader sustainable development, poverty reduction, and climate risk management strategies to support the Millennium Development Goals, and ensure human settlements, livelihoods, and ecological biodiversity are more effectively sustained.

*Community Participatory Adaptation*

The UN and the international development community have declared that the Millennium Development Goals of eradicating extreme hunger, ensuring environmental



sustainability, and achieving universal primary education are threatened by climate change impacts.

Considering Dominicans' long history of climate change variability and 'natural' disaster management, it is little wonder that villagers have acquired their own form of collective albeit informal 'adaptation practices.' The 'coup d'main' or lending a helping hand with a community task was, and still is, a frequent occurrence in Dominican society. Thus, in preparation for a storm, villagers will gather to tie down their roofs, board up windows, and store their boats and fishing gear in safe locations. Fisher folk will often collaborate with one another in solidarity during a storm, or during their fishing expeditions as they accommodate to changing environmental conditions.

Because local communities are grounded in their own reality and challenges, my contention has been that bottom-up or micro-to-meso participatory adaptation and development is more responsive and can more effectively and economically address local climate change and development priorities with local solutions and resources. I believe this contention has been adequately substantiated through my review of development discourse and existing adaptation programs that have largely forfeited participatory involvement of communities, and through my observance of and discussions with village leaders and fisher folk who recognize that climate risk management approaches are essential if they are to effectively respond to the ravages of climate extremes.

Furthermore, considering the overwhelming international evidence reflecting the symbiotic relationship between climate variability and development sustainability, environmental climate change impacts must be factored into development goals and objectives.

Considering the subsistence fishery's dependence on beach seine harvesting, anticipated climate change erosion of beaches and near shore bottoms would seriously undermine landing yields and compromise local food security, especially for poorer inhabitants. With possible impacts to shore-based fishing facilities, planning adaptation to climate change impacts on the fishery must include community -- national impact monitoring, and co-management and interaction with national planners. In this way, land-use issues, facility siting and setback and erosion protection measures will be properly addressed (Mahon 2002: 23).

Furthermore, impact monitoring is especially useful at the community level because conventional science has been applied, without great success, to assessing the state of the large-scale fishery in developed countries to the virtual exclusion of the village fishery. At the micro-level, Mahon proposes that a landing site monitoring system could be established that relies on participatory feedback from a cross-section of resource users (ibid). Information might include the incidence of coastal erosion, storm and seasonal wave damage, flooding and sedimentation, etc.

#### *Enviro-Cultural Tourism & Livelihood Alternatives*

With respect to exploring alternative livelihoods to the artisanal fishery, during a focus group interview Fisheries Group members indicated that they would and currently are considering alternative livelihoods to the fishery: "Unlike Soufriere, in Scott's Head there are few gardens because of steep inclines and rocky volcanic terrain. Tourism may provide options."

During an onshore fishing activity, I was able to interview some local Soufriere fisher folk about possible alternatives to their fishery livelihood. They claim that 'dive tourism demands too much overhead for artisanal fishers to consider it viable.' However, these same fisher folk suggested that if their livelihood as fisher folk was impeded by events beyond their control, such as depleted fish stocks resulting from a climate change event, they could provide economically viable tourism services such as nature tours or snorkel tours, as a complement to the dive tourism package. They might provide eco-education beach and coral monitoring services to government, and tour operator visitors, during their 'off-season,' or to supplement their meagre incomes. As stated above, because of the symbiotic relationship between the biodiversity and eco-stability of the marine reserve, and corresponding health of the local fishery, tourism and fishery priority sectors need to be managed together, with climate change and local adaptive approaches in mind.

#### *Adaptive Programming and Related Development Priorities*

According to CICERO and the World Health Organization (Climate Change and Human Health: 2003), other development priorities such as population health need to be married with adaptive programming. For example, considering that the communities of Scott's Head/Soufriere suffer the highest incidence of water-borne diseases and parasitic infections in the country, an ecologically sound wastewater disposal system - designed to resist extreme climate variability - is essential to lower the incidence of child morbidity and mortality. Down pipe treatment of effluents will help prevent harmful waste from entering the marine reserve and damaging the local ecology.

Additionally, the local fishery, and any enviro-cultural tourism plans, would immediately benefit from improvements in wastewater management as the health of the SSMR marine

ecosystem would noticeably improve, and demersal and nursery fish stocks would potentially rebound. Furthermore, complementary environmental conservation practices would reinforce the importance of efficient potable water use and wastewater reuse and disposal practices. As well, micro-adaptive traditional practices in marine management, when blended with contemporary hazard reduction and coastal zone management measures would reinforce and preserve existing fishery traditions, and conserve coastal tourism assets.

Simultaneously, other priority areas such as beach subsidence and reef destruction, depleted demersal stocks, and coastal exposure to storm surge require a more comprehensive adaptive management strategy for the SSMR. High-risk management priorities, such as protection of the SSMR Cachacrou isthmus, and upgrading of the emergency access path between Gallion and Scott's Head school require a participatory effort by local community leaders and activists.

#### *SSMR Micro-Social Agency*

In valuing the pragmatism and effectiveness of participatory micro-adaptation, the most logical agents of vulnerability impact assessment and risk management activities with the SSMR community would have to be the local area government and civil society organizations. These include: the SSMR Fisheries Groups of Scott's Head, Soufriere, and Pointe Michel, the Scott's Head Improvement Committee and Disaster Preparedness Committee (public education is performed by a Sub-Committee of the DPC), the representative Village Council, local school and sports (Jewels of The South Women's club and cricket team), and church associations (Social League, St. Vincent de Paul).

These largely social organizations are not limited by current government funding conditionalities or external donor interests such as 'non-denominational status,' taste-of-the-day development themes or sectoral biases. They are in a good position to assume autonomous control over project design and evaluation, with diverse local and national linkages, and have a clear understanding of their vulnerability and social needs, unbiased by outsiders. Because they are within the community, they are in a better position than outside 'experts' to foster traditional adaptive knowledge and local capacity.

These community leaders would be well placed to develop micro-adaptation projects in partnership with meso-level national authorities, such as the Fisheries Division of the Ministry of Agriculture and the Environment, Community Implementation and Advisory Committees (CIACs), Movement for Cultural Awareness (MCA), and Ministry of Local Government and Community Development (LG & CD), and the SSMR LAMA Sector Committees.

From the meso to micro level, there are two host national institutions in Dominica that would productively complement a participatory micro-adaptation initiative in the SSMR are the Community Implementation and Advisory Committees (CIACs), and the Ministry of Local Government and Community Development (LG & CD).

Community Implementation and Advisory Committees (CIACs) have been set-up under the IFAD-Dominica Rural Enterprise Project<sup>124</sup> to: "refine overall Project targeting criteria for their communities. They were mandated to conduct community planning and evaluating activities and proposal submissions, coordinate skills training and community

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<sup>124</sup> Project value of US\$6.2 million over 6 years from 1996-2001, including a fisheries component worth US\$838,000

education, and engage beneficiaries. This would ensure “community participation in basic Project decision-making” (IFAD 1995, p.22, 36). Furthermore, this project was involved in fisheries development, including the provision of covered secure space for 40 locker rooms, a net loft, 6 fish filleting tables, and the construction of a concrete slipway (ibid, p.29). The project also engaged in a boat-revolving scheme for crews lacking sufficient collateral for financing.

The Ministry of Local Government and Community Development (LG & CD) engages in community-based projects through local organizations such as Village Councils, farmers’ groups, and NGOs (ibid). To ensure community representation from the micro-to-macro level, adaptation efforts should identify with the LG&CD, which is well placed to lead coordination of CCA PEO programs, with Village Councils. They could help mobilize community risk management activities, and the Ministry of Communications, Works and Housing would assist with infrastructure development coordination.

To be sure, participatory climate change adaptation in development (CC AID), and its community corollary, grassroots adaptation development (GrAD) when supported by adaptation risk-consciousness-raising (ARC) will galvanize local resources and channel traditional environmental knowledge (TEK) and contemporary adaptive practices for effective risk management.

## Chapter V

### Summary of Findings and General Conclusion

*Certainly all historical experience confirms the truth – that (humans) would not have attained the possible unless time and again (they) had reached out for the impossible. (Max Weber)*

#### 1 Conceptual Paucity Surrounding Transformative Social Agency

This analytical and consultative research was designed to address the current void in community development thinking related to climate change adaptation (CCA) in the artisan fisheries and enviro-cultural tourism sectors. After evaluating the various theoretical underpinnings laid out in Chapter II in relation to research observations gleaned during my field study in the Eastern Caribbean, this thesis research reveals that in spite of the impressive array of international climate adaptation programs, there is an overwhelming lack of analysis, understanding and recognition within the development, disaster response, climate change, and climate adaptation regimes regarding sustainability, participatory development, integration, social agency, and decentralization from a transformative perspective benefiting vulnerable communities.

With total losses resulting from natural disasters in developing countries amounting to an estimated 70% of net Official Development Assistance or US\$40 billion in 1998 (Swiss Re 1999), and with estimates that climate extremes could cost developing countries up to £6.5 trillion over the next 20 years, many times anticipated aid flows' (Ecologist Report

2001: 23), virtually all former and future environment and development efforts are at stake in this climate-changing world.

As stated earlier, “climate change would have the greatest impact on the poorest and most vulnerable segments of the population” and those most dependent on subsistence fisheries and crops destroyed by cyclones and droughts” (Cities, Seas, and Storms 2000: 3). Because of the tenuous nature of their surrounding environment and precarious living conditions and restricted coping skills, impoverished communities are at even greater risk from climate extremes.

Traditionally, development practices have emphasized project impact on the environment. In a climate-changing world, if sustainability is a key objective, consideration must now also be given to the impact of climate change on development projects and human security, especially from a grassroots community stand-point.

However, the unhealthy preponderance of economic growth theory, and emphasis on scientific investigation and macro-remedial adaptation efforts compromises the precautionary rule and no-regrets principle of responding to climate variability and minimizing risk and vulnerability, irregardless of the state of climate science. In fact, scientific climatology is unlikely to reach a definitive stage of development, because the very nature of climate change is variable.

There is a need to redirect a portion of existing adaptation resources away from macro-meso level climate modelling and information management systems which focus on the priorities of host governments first and vulnerable communities sometime later, toward downscaled village level efforts to develop adaptation methodologies, toolkits, and



participatory community action to more effectively respond to the realities of civil society and actual field conditions.

Historically, macro-approaches generally have little grounding in the realities of civil society, and cannot possibly address the intricate challenges facing local populations in the absence of meaningful consultations and marshalling of communities' collective intellectual and material resources. Five or ten years of adaptation discourse is ample time to arm and implement pragmatic community-driven risk reduction campaigns. Yet, adaptation methods are being developed, and projects are being implemented, in the same way as many traditional development programmes, that is, externally and quantitatively. They are not being designed in consultation and partnership with the self-determined interests of vulnerable fishery groups, village town councils, or community-based organizations.

## **2 Growthmania Undermines Community Adaptation**

Growth is viewed as the primary target for poverty alleviation. Thus deterministic economic growth development (versus social development growth) appears to be the overriding 'normative' concept permeating the field of international development, and by reasonable extension, the field of climate impact and adaptation. Thus, there is a disproportionate focus on vulnerability and risk management efforts addressing economic growth sectors (forestry, agri-business) to the virtual exclusion of non-productive ones (artesanal fishery, residential land).

### 3      **Cultural Sensitivity A Window To Adaptive Empowerment**

Reinforcing marginalized communities' social traditions and their drive to self-actualize their adaptation in development goals will enable community members to effectively galvanize their resources through adaptive actions and ensure genuine empowerment. In Dominica, whether through the collective *chante mas* and *bois bataille* symbolic stick battles of carnival or *masquerade* or the Fete St. Pierre fisherfolk festivities, popular cultural celebrations may offer a window of opportunity to incorporate elements of risk reduction education, and galvanize community interest and collaboration around grassroots adaptive action. In essence, this is a form of bottom-up adaptation risk-consciousness raising or dialogical action, a la Freire.

### 4      **Risk Consciousness-Raising Sustainability**

Current (mainstream) climate adaptation projects overwhelmingly support regional and national risk management practices for industry. They are woefully lacking in focus on supporting the very dynamic communities that sustain these environment-dependent socio-economic sectors. What is sorely needed to defend climate vulnerable and resource marginalized communities is community-driven redistributive development and adaptation risk consciousness-raising (ARC) to undercut climate-related risk factors. The challenge is for community stakeholders, in partnership with village councils and municipal and national governments to establish adaptive actions and social equity programs.

## **5 Transformative Participatory Adaptation**

In spite of a temporary shift in development thinking in the 1970s and 80s from a focus on remedial development efforts to supporting participatory self-sufficiency and the special needs of community, community participation largely remains as an instrumental means to support the development and adaptation process. In reviewing current adaptation programs, community-based and socially inclusive participatory adaptation projects that empower climate vulnerable communities are virtually non-existent. Par contre, short of some externally defined provisions for capacity building efforts with community stakeholders, these macro-level adaptation programs in many cases are actually exclusionary.

With increasingly scarce resource support for third sector civil society throughout the eighties and nineties, and a political vacuum on the development left, CBOs, GSOs, and small NGOs, have been forced to retreat from their grassroots principles and popular participation methods. This has of course had a chilling effect throughout the development community, and a subsequent conservatizing impact on the risk management sector. Even though the World Bank has played a leading role in promoting the links between grassroots participation and overall project sustainability, it views participation as instrumental (project buy-in) versus transformative (community self-determination). In fact, throughout the nineties virtually all mainstream development agencies eventually embraced the principle of participatory development – albeit as an instrumental means.

## 6 Overcoming Impediments To Micro-Adaptation

Impediments to community adaptation seem to be largely generated by an industry-wide propensity toward institutionally centralizing research and programming within macro-adaptation efforts. This inevitably creates programmatic barriers impeding target coastal communities' involvement in risk and vulnerability reduction policies and actions.

With centralized government planning and decision making placing serious structural constraints on local community input into adaptation initiatives, it is critical that the decision-making stick be bent in favour of a bottom-up exchange of responsibilities and resources to correct the disproportionate imbalance in power distribution. Furthermore, because GSOs and CBOs and Village Councils are privy to local concerns, conditions, and idiosyncracies, in their capacity as intermediary institutions, they may provide the necessary link between the informal community groups and the institutions of government and donor agencies. Therein lies the true potential for success of integrated adaptation and development actions.

There are a host of other noted impediments to community involvement in adaptive responses to climate variability. For instance, the general perception within the minds of local area residents and fisherfolk is contradictory. On the one hand, they will say "climate change" is not relevant to their day-to-day activities. On the other, there is a distinct ongoing concern about extreme weather, beach erosion, changes in and the gradual depletion of coastal fish stock, and tidal changes. "(F)ive years ago we pulled in 100 pounds of jacks (night-fishing). Now we pull in about 10 pounds." "Climate change

doesn't affect us, except during hurricanes (!)." The connection needs to be made between public conceptions/misconceptions surrounding climate change, real climate phenomena and associated risk, and appropriate community action to circumvent those risks.

Another impediment is climate change itself, which undermines the traditional adaptive coping skills of SSMR fisher folk and other marine-dependent groups. In addition, an aging fishery workforce may be resistant to adaptive innovations, and through attrition, their traditional adaptive knowledge may wither away unless their skills are passed on. Gender divisions of labour also may impede community involvement in future adaptive fishery efforts. Generally, neither gender perceives women as important contributors to the fishery even though women assume primary responsibility for most onshore community fishery activities. Moreover, the SSGB Village Council, the Scott's Head Improvement Committee, and numerous other social groups in the SSMR are largely led by women. In spite of the gender impediments to women's involvement in future adaptive efforts, these groups are best able to galvanize vulnerable coastal communities around cooperative risk management activities, and ensure more efficient development synergies.

Finally, the defining geopolitical, climatological, linguistic, and cultural characteristics permeating Dominica and the broader Eastern Caribbean may serve as unifying features to enhance micro-adaptation integration efforts, if they are perceived as affinities grounded in community-level traditions and communal needs. Thus, tying adaptive initiatives in with local identity and tradition (Carnival, Masquerade, Fete La St. Pierre) would be a pivotal strategy in providing entry points to engage the broader community. Whether a country-level adaptation framework will allow for effective integration of

community-level risk reduction efforts will depend as much on external regional economic pressures, as it will on grassroots social pressures.

## **7 Defending Micro-Endogenous Adaptation**

If we focus on the relationship between emergent properties and the developmental process, there is an imperfect coordination of analysis between mega-macro and meso-micro adaptation initiatives, resulting in the operationalization of more 'autogenous' or externally driven macro-adaptation policies and projects over 'endogenous' or internally driven micro-adaptation initiatives.

With the World Bank failing to identify with marginalized groups, and neglecting to provide poverty forums and capacity-building resources (World Bank Working Group 1996), and considering southern NGOs' overwhelming dependence on external financing (Fowler 2000) and funding conditionalities, this largely exogenous approach to development has invariably fostered a similar top-down attitude within those same organizations involved in adaptive responses. Moreover, country-level development programs that are the realm of the larger development agencies are informed by global strategies (Moore 1995). As such, climate adaptation strategies will generally follow suit, thereby discounting any significant micro-contributions by community stakeholders in the project cycle. Consequently, macro-meso adaptation projects will not receive the political legitimacy required from vulnerable coastal communities and pluralist groups in civil society.

Failure to factor local and sub-regional socio-cultural, economic and ecosystem variables into adaptation strategies, and to consider local community risk, local resource

management capability and endogenous local decision-making, will result in the design and application of superficial programs founded on imperfect levels of analysis, and the social and economic exclusion of important layers of civil society. Without endorsement from civilian populations, these larger autogenous risk management initiatives are prone to socially fragment and falter.

## **8 Traditional Adaptive Knowledge Prevails**

Traditional adaptive knowledge and practices abound throughout developing world communities, ranging from the Andean El Niño stargazers, to the Honduran Quezungal terraced farming practices, and the pre-Columbian ‘fe pay,’ ‘pwi pwi,’ and tombé levé fishing customs in the Commonwealth of Dominica. These boña fide traditional conservation and adaptive practices are effective responses to the ebbs and flows of environmental and climate variability (where climate extremes have not yet undermined these time-honoured coping skills).

The economy, culture, and lifestyle of marginalized coastal communities such as Soufriere and Scott’s Head unmistakably revolve around, and are heavily dependent on the fishery and local marine biodiversity. However, an almost continual disruption in seasonal cycles, and increases in extreme weather events severely limits fisher folk’s ability to maintain their momentum of subsistence fishing. In addition, macro-institutions with vertical decision-making tendencies and an orientation to scientific research have a propensity to centralize programming and discount the value of community-based knowledge. Moreover, traditional fisher folk are up against increasing competition from eco-tourism campaigns to diversify the income of island economies, while contemporary

fishing technology and huge commercial ventures continue to devastate Caribbean fish stocks.

In spite of these climatological, institutional, and commercial obstacles, local ingenuity prevails with cottage style technology (community FADS, relocation to alternate fishing grounds, stone casting around home foundations, pre-storm dry-docking, hurricane roof ties, storm forecasting) responding to their climate vulnerability and local community need.

Instead of dismissing traditional adaptive practices as 'backwards,' and undermining the age-old knowledge of the subsistence fishery with notions of modernization, these community-based adaptive innovations can be:

- A. Disseminated throughout the target community (and neighbouring communities to broaden knowledge dissemination and cluster program efforts) through self-generated dialogical awareness and action (Adaptation Risk Consciousness-Raising or ARC) around climate change impact, vulnerability and risk reduction priorities, along with other community development issues to develop more integrated community-based practices;
- B. Integrated into broader disaster preparedness and adaptation in development strategies through horizontal knowledge exchange, vertical decision-making, and cooperative programme efforts between local stakeholders, host-national and regional bodies, and funding entities;
- C. Blended with scientifically appropriate contemporary practices benefiting vulnerable coastal communities.



## **9 Adaptive Social Agency At The Grassroots**

My literature review, evaluation of existing adaptation programming and funding, and field research demonstrate that genuine adaptation development is unlikely to be accomplished without the integral participation of indigenous community stakeholders at all levels in the development cycle. To optimize local resources, benefit from traditional and contemporary adaptive knowledge, and foster greater socio-economic and ecological sustainability, the community should be the primary agent of, and driving force for social adaptation.

It is from our recognition of community as a primary social agent of their own destiny that we need to rekindle the notion of genuine community development. Self-determined social agency through fishery groups, CBOs/GSOs, and Village Councils (and respective social committees) is arguably much better able than externally designed macro-remedial projects to engage and sustain community resources over time, and obtain the desired goals of an adaptation venture. This is especially so where there are opportunities for synergies between social development and climate risk reduction, such as coastal erosion and fish stock depletion, threatened livelihoods and food security.

## **10 The Benefits of Resource-Supported Decentralized Adaptation in Development**

Within the development industry today, and within the inter-related adaptation discipline, the majority of funding mechanisms and programmes tend to be centralized, standardized and externally-driven. Local input for these macro-level projects is

invariably limited to labour support and narrowly defined capacity-building and promotional efforts.

This occurs in spite of the fact that decentralized adaptation projects, if provided with the requisite resources, are more likely to succeed and sustain community involvement because of community stakeholders' greater sensitivities to socio-cultural, micro-economic and technical conditions. Furthermore, the diffusion of knowledge within the village network is generally more pragmatic and expedient, especially where the leadership base is broadened and other social and economic development goals are addressed. Finally, community participants can perceive the direct link between adaptive actions performed, and their concrete risk-reduction results.

## **11 The Failings of Macro-Meso Remedial Adaptation and The Power of Grassroots Participatory Adaptation**

### *The Failings of Macro-Meso Remedial Adaptation*

Based on my extensive review of numerous IFI and ODA-led regional and host-national adaptation programs (also see CICERO 2003 critique), in spite of the immense global efforts to institutionalise adaptation within their disaster management, international development and climate change adaptation frameworks, community-level participatory adaptation is nonetheless being systematically neglected or appended as an afterthought. Yet communities are painfully aware of extreme weather and its devastating impact on their lives. It is the social capital of grassroots community groups, in marginalized and vulnerable communities, collectively participating towards a common

objective by and for themselves, that will engender genuine development and effectively reduce their climate vulnerability through adaptive measures.

Because of the 'centralist politique,' COP 7's three international climate funds do not provide for a community focus, Germany's GTZ appears to concentrate on private sector involvement, VARG poverty reduction and adaptation priorities focus on host-national adaptation strategies, as do the Inter-American Development Bank and World Bank with internal and host-country policy and research efforts. Although the United Kingdom's DFID has developed very encouraging and insightful prescriptions regarding pro-poor adaptation mainstreaming, these prescriptions are heavy on research and policy, and are designed for DFID staff and stakeholders as opposed to CBO or GSO community players. The Netherlands and AusAID are also heavy on research and policy development.

Apart from a *Small Project Fund*, which focussed on 'strengthening capacity of developing countries,' (albeit at the host national level), Canada's CIDA-funded CCCDF administrative structure and pre-established program criteria are federally driven, bilateral (country-to-country), and business focussed. CCCDF subsequently lacks meaningful identification directly with grassroots stakeholders residing in climate vulnerable communities.

Both the World Bank Global Environment Facility (GEF)-funded MACC, and CIDA-funded CPACC and ACCC programs were essential stepping-stones for the development of broader (regional and national) adaptation efforts that would eventually enable vulnerable communities to partake in host national adaptation programming at some unspecified future date. With the GEF and MACC, the overriding focus is country-driven

(i.e., host government) adaptation planning and development. Other than a possible national fisheries pilot to examine future approaches, no actual adaptation projects or direct impact on specific populations are envisioned (World Bank 2003).

Although the NICUs developed under the Caribbean CPACC program had a process for community representation and participation, the program focussed almost entirely on macro-regional and host country efforts, “ignore(d) social vulnerabilities, and does not incorporate community level information in the assessments” (World Bank 2003). One of the few community-based exceptions seems to be UNDP’s Small Grants Program which encourages community social agency, but has no articulated climate impact and adaptation funding criteria.

As we progress from the macro to the meso host-national level, there are increasing indications that governments (particularly small island governments like the Commonwealth of Dominica) need to consider civil society’s involvement in public awareness and outreach programs so as to garner public support for country-driven projects. This necessitates engaging local NGO expertise, conducting government-led public consultations, and designing culture or language-appropriate promotional and pedagogical material. However, actually engaging grassroots organizations in self-directed micro-adaptation projects is not on the agenda.

Hence, the instrumental mainstreaming of adaptation (institutionalising a practice in policies and procedures) is the favoured approach within the adaptation in development industry. Transformative and proactive adaptation mainstreaming (popularising a practice through local decision-making for local benefit) will likely be resisted by ODAs and IFIs

as this approach conflicts with centralized adaptation and poverty reduction planning and management.

Given the two-stage approach of the aforementioned ODA and IFI adaptation programs, with initial emphasis on nation states' capacity-building, these macro-adaptation programs have yet to generalize adaptive measures to community stakeholders after a decade of international inter-agency discourse (COP 1 and IPCC in 1995). Without substantive community-based consultations and grassroots social agency, these global development and climate change programs fall significantly short on practical activities to qualitatively reduce the vulnerability of coastal communities exposed to climate variability.

Recognizing the disproportionate increase in climate-related disasters, the IPCC's prognosis for climate change, and the ample time international ODAs, IFIs, UN dependencies and UNFCCC Annexed member states have had to establish funding and arm adaptation programs for vulnerable communities, the international development, disaster management, and climate change industries could arguably be characterized as negligent.

With funding and program emphasis on stage III enabling of host national NAPAs and national adaptation strategies, it is highly unlikely these monies will be destined for community-driven climate vulnerability and adaptation projects in Dominica or elsewhere. Furthermore, considering that the "international funding philosophy has not made that quantum leap as yet" (for large-scale adaptation policies and funding) (Trotz notes 2004), resources for community adaptation will likely not be forthcoming over the

medium term without substantial social pressure from below, similar to the social movements of the 1960s and 70s.

With little provision for poverty alleviation and community climate adaptation strategies, no structurally designed mechanisms for parish, town or village grassroots decision-making or resource contributions, and an institutional refutation of traditional adaptive capacity, it is little wonder that the aforementioned macro-remedial adaptation projects generate so many institutionalized impediments to community integration. Without incorporating knowledge of local conditions, resources, and community capacity into programming methodologies, these mega-projects will surely falter along sustainability lines, and likely suffer a 'legitimation crisis' (Habermas).

On the other hand, the marriage of humanitarian aid, disaster management, environmental management, and poverty-alleviation regimes (in other words, development practices), with impact, vulnerability and risk minimization (adaptation) practices, makes for the emergence of a new and necessary "Climate Change Adaptation in Development (CC-AID)" discipline for an effective response to climate variability and extremes.

### *The Power of Grassroots Participatory Adaptation*

In learning to accommodate to changing environmental conditions, and cope with extreme weather and ongoing climate variability, coastal villagers have acquired, and will continue to collaboratively practice their unique forms of collective adaptation. For their part, macro-development agencies have essentially abandoned or ignored the participatory involvement of vulnerable communities in program dialogue and adaptive action.

Yet blending traditional adaptive practices with contemporary methodologies, and incorporating endogenous grassroots adaptation approaches into broader township, municipal, national adaptation strategies, and even sub-regional adaptation strategies, would decrease the vulnerability of marginalized coastal communities to variable climate impacts. This blending would ensure the promotion of more transformational adaptation in the community in the here and now, ensuring more sustainable fishery, enviro-cultural tourism and other alternative livelihoods.

To be sure, high-risk priorities such as protection of the Cashacrou isthmus and upgrading of the inter-community emergency access path would be more effectively resolved through the combined use of traditional and contemporary risk management practices.

In an attempt to bridge the local needs of vulnerable coastal communities, and the institutional governance and societal obligations of government, synergies need to be developed between action-oriented community-based groups and intermediary organizations of government. In the case of Dominica, the Community Implementation and Advisory Committees (CIACs) and the Ministry of Local Government and Community Development are two host national organizations that have legitimately engaged Village Councils and community organizations, and would effectively complement a participatory micro-adaptation effort in the SSMR. The Local Area Management Authority (LAMA) is another core stakeholder that has both the support of central government through legislative means, and relative credibility and influence in the SSMR target communities.

Whilst the aforementioned meso-micro agency synergies are invaluable, primary social agency for adaptive programming (and any community decision-making) must remain with grassroots agencies such as the traditional Fisheries Groups, the dynamic Scott's Head Improvement Committee (and Disaster Preparedness Committee), the representative SSGB Village Council, and the various active social community groups. These locally sanctioned groups must be the as authors, owners, and actors of their own future.

With their diversity of resources and skills, these grassroots experts are in a better position than outside 'experts' to accurately assess local needs, effectively mobilize and coordinate local capacity, and carefully develop the necessary partnerships with exogenous entities in support of participatory modelling, planning and programming of climate change adaptation (CCA) strategies.

To improve coordination between the requisite needs of vulnerable coastal communities on the periphery, and economize on national and external resources without compromising on traditional adaptive expertise and decision-making leverage, adaptation risk consciousness-raising (ARC), and grassroots adaptation in development (GrAD) practices must be advanced by and for climate vulnerable marginalized communities. It is vital that these grassroots and participatory micro-adaptation measures be embraced and integrated into broader sustainable development, poverty reduction, and climate risk management strategies.

Only in this way will marginalized and vulnerable communities control their destiny, thereby assuring that the Millenium Development Goals be attained, and human settlements, livelihoods, and ecological biodiversity more effectively sustained.



## **12 Summary Recommendations For Participatory Micro-Adaptation for: Host Governments and Donor Agencies; Dominica, CARICOM SIDS and Implementing Agencies; and SSMR Target Communities**

Following from the dialogue between my theoretical framework of working ideas upon which to examine mainstream and grassroots adaptation (literature review), and empirical evidence collected in the field, I have formulated some key recommendations for host governments, donor agencies, and implementing agencies/vulnerable communities. These recommendations support participatory micro-integration of vulnerable coastal communities into broader adaptation and development strategies. Micro-Adaptation recommendations (some interchangeable within sub-sections) are as follows:

### **For Host Governments and Donor Agencies**

1. Apply operationally pragmatic and enviro-culturally sensitive CCA approaches, such as adaptation risk consciousness-raising (ARC), and grassroots adaptation development (GrAD), to facilitate the integration of vulnerable coastal communities into broader municipal, national and regional climate change adaptation and poverty reduction strategies and programmes.
2. Recognize and incorporate traditional or local environmental knowledge (TEK/LEK) at all levels of the adaptation project development cycle to improve sustainability practices, optimize local resources, and galvanize local stakeholders in CCA activities.

This would be accomplished by: creating the requisite conditions for popular participation in regional adaptation development, starting with the delimitation of the target-planning region by geographical area, socio-cultural basis, and administrative reach; identifying common interests and challenges affecting all inhabitants in the target area; articulating a hierarchy of goals through analysis and experience of local stakeholders; and, providing effective communication channels between pan-regional, national, intra-regional, and base-level decision-makers to help strengthen the stakeholder consultative process.

Decentralized government climate change decision-making, with the requisite resources, and more decentralized communication links, would help establish a normative framework for popular CCA participation, in which participation is viewed as a citizen's duty and a citizen's right.

3. With the 'greening of the GNP,' just as there is a tradable pollution permits scheme, and a Kyoto mitigation clean development mechanism, serious effort should be given over to the creation of a (Community) Adaptation Certificate and financial incentives scheme for UNFCCC Non-Annexed II member nations that have instituted official micro-adaptation planning policies and practices. Furthermore, IFI's and donor agencies should give extra project approval and environmental assessment markings to projects that incorporate integrated micro-adaptation components into program design and proposal submissions.
4. For each project, conduct a costs benefit analysis of business as usual versus micro-CCA activity. A generic methodology used in the costs benefit analysis would utilize

information gleaned from previous extreme event impact. Standard techniques in micro-economics and development economics that rely on poverty statistical analysis, market values and the GINI and other poverty co-efficients would be used to estimate value for community and village assets, and costs for proposed adaptation measures.

5. Assess the impacts of the environment (i.e., climate change variability) on local climate impact and adaptation, poverty reduction, and infrastructure development projects via climate adaptation-related Environmental Impact Assessment (EIA) Guidelines.<sup>125</sup> In addition, integrate relevant traditional adaptive practices into adaptation impact assessment, land-use planning and micro-adaptation project activities.
6. Implement measures to protect beach vegetation (i.e., reduce boat launching area and anchorage); implement and communally enforce appropriate coastal setbacks (a rigorously enforced coastal setback policy would be appropriate where no infrastructure has been built); introduce voluntary measures to reduce reef damage such as alternative fishing days and rotating closures to allow species repopulation during the spawning cycle, and during periods of seasonally sensitive species migrations.

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<sup>125</sup> ClimAdapt ([www.climadapt.com](http://www.climadapt.com)) has developed a Practitioner's Guide for incorporating climate change in the environmental impact assessment (EIA) process. The Guidelines were presented to the World Bank sponsored IAIA conference in Marrakesh, 2003, and at the World Bank adaptation presentation in Washington.

7. Make available catastrophic insurance especially for vulnerable groups and communities traditionally excluded from insurance markets (i.e., low-income households and fisher folk).
8. Implement a comprehensive coastal zone management (CZM) program, including: carefully assessed construction and maintenance of sea-defence; management of protected areas; increased nature-tourism recreational activities to diversify the economy and allow fisher folk the opportunity to supplement their diminishing incomes (or retire from the fishery due to overfishing); and broad-based participatory coastal resource management.

**For Government of Commonwealth of Dominica, CARICOM SIDS and Implementing Agencies**

9. For all micro-adaptation initiatives, consider the government of Dominica's six Priority Areas enabling meaningful adaptive response measures to climate change.
10. To ensure successful Micro-CCA PEO at the village level, and advocate adaptive activities within the co-dependent fishing and enviro-cultural tourism sectors, the Environmental Coordinating Unit (ECU), the Ministry of Communications and Public Works, and other national stakeholders need to have close ties with Village government representatives through the establishment of a Community to National Adaptation Sub-Committee (C-N ASC) housed within the ECU, Fishery Division, and/or Tourism sector. "From the perspective of Village Councils and community coops, the Ministry of Community Development is well placed to lead coordination of CCA PEO programs, in equal partnership with Village Councils. They could help

mobilize the community, and Communications and Public Works would assist with infrastructure development coordination such as minimizing soil erosion, and agricultural and forestry adaptation, and the Fishery Division is the custodian for all marine protection and fishery issues.”

11. Ensure adaptation measures are compatible with the socio-economic needs, and cultural, religious and language traditions of local target communities, and do not cause any social divisions or cultural degradation. Culturally sensitive recognition of vernacular and indigenous language and dialects (i.e., Kweyol, Patois, Creole, Pidgeon, Spanish, Garifuna/Carib/Kalinago, Rasta, etc.), and corresponding cultural practices and understanding will optimize adaptation development results.
12. For CARICOM adaptation programming to be truly successful and cost-effective, the World Bank GEF, MACC, and UN and ODA stakeholders must consider funding a coastal community micro-CCA pilot to begin to address micro-integration policies, methodologies, strategies, and practices. Considering sectoral, socio-economic, risk, and cultural similarities between neighbouring Leeward and Windward islands, a Grassroots Adaptation in Development (GrAD) pilot needs to be considered for regional application within other target communities that are dependent on the subsistence fishery and enviro-cultural activities.

#### **For SSMR Target Communities**

13. To ensure successful Micro-CCA PEO at the village level, and advocate adaptive activities within the co-dependent fishing and enviro-cultural tourism sectors, the Environmental Coordinating Unit (ECU), the Ministry of Communications and

Public Works, and other national stakeholders need to have close ties with Village government representatives through the establishment of a Community to National Adaptation Sub-Committee (C-N ASC) housed within the ECU, Fishery Division, and/or Tourism sector. "From the perspective of Village Councils and community coops, the Ministry of Community Development is well placed to lead coordination of CCA PEO programs, in equal partnership with Village Councils. They could help mobilize the community, and Communications and Public Works would assist with infrastructure development coordination such as minimizing soil erosion, and agricultural and forestry adaptation, and the Fishery Division is the custodian for all marine protection and fishery issues."

14. Given the potential pragmatism and effectiveness of micro-adaptation, integrate adaptive program activities into LAMA's SSMR stakeholder activities, and pursue a strong adaptation partnership between the LAMA, SSGB Village Council, Scott's Head Improvement Committee, and the 3 or 4 community Fishery Groups.
15. Defending the Scott's Head isthmus against sea-level rise and successive storm surges is a high priority, as it physically separates the Atlantic Ocean and Caribbean Sea. The isthmus, which has suffered serious shoreline subduction and coastal erosion, provides the SSMR villages and their fishery and other marine activities with a vital natural barrier preventing damaging surge and waves from the Atlantic, especially during the storm season.
16. Identify approaches to integrate equal participation of men and women into the project/activity. Considering women's pivotal (although understated) role in the fishery and their proven ability to effectively organize the Scott's Head and Soufriere

communities, efforts should be made to promote women into key decision-making positions within Village Councils, Fisheries Groups, and other socially productive agencies involved in micro-CCA project management.

17. Develop an integrated SSMR climate adaptation and development centre comprised of: coastal zone management, land and coastal conservation and monitoring training, adaptive fishery education, and enviro-cultural marine interpretation displays for islanders and visitors to be housed in a restored EL Rose heritage building in Soufriere (for the three target communities).
18. Consider the following six micro-adaptation priorities identified by the Fishers Groups:
  - A) Official coastal zone hazard mapping for the SSMR, as the beachhead has been identified as the one of the region's most vulnerable fishery and eco-tourism resources;
  - B) Ocean navigation, community communication, and weather forecasting;
  - C) FADS and fish finding techniques;
  - D) Climate change adaptation organizational management;
  - E) Stone casting around residential buildings and for home foundations against extreme weather flooding, hurricane gusts, and storm surge; provision of plywood (to board up windows, doors, roofs);
  - F) Sea walls construction (using more economical 'gavion' steel-netted stone retention walls) for low-lying high-risk areas, as well as sea level predictions ('We don't know how high the sea will come, so we just raise sea walls, the stone castings, and our boats').

19. Consider the following two adaptation/disaster preparedness priorities identified by the Scott's Head Improvement Committee and Scott's Head/Soufriere/Gallion Village Council:
- A. Improve Scott's Head's sole community storm shelter to ensure building integrity and safety during extreme weather. This requires reinforced windows and a public washroom facility.
  - B. The Scott's Head DPC is frequently isolated from Soufriere because the access road is frequently flooded or damaged by storms and occasionally by road landslides. Neighbouring villagers are unable to assist or collaborate with the Soufriere community in times of crisis. When the SSMR road is impassable, there is a highland track between Gallion and Scott's Head school. The original path was developed between 1997 and 2000, but needs upgrading (stabilizing, levelling, expansion) to improve emergency access.
20. Ensure adaptive upgrading of vessels and aboard vessel safety programs to increase sea worthiness, and help target the offshore pelagic fish stocks to mitigate near shore species depletion/stressing. The SSMR thus requires additional transition (FRP) crafts (3 for Scott's Head, 2 for Soufriere, 1 for Pointe Michel), outboard motors and more reliable gear to improve boat sea worthiness and safer trips in inclement weather. As well, installation of 20 locker rooms for Soufriere, and 15 for Pointe Michel to protect gear with more frequent storms.
21. Creation of one micro-enterprise communal fish plant benefiting all three villages, including chill room, ice machine and insulated box; fish vendor stalls in all three. This will reduce or eliminate expensive night runs to Roseau with product before it spoils, provide a local outlet for sales to residents and tourists, and especially a



ensure readily available safe supply of protein during more frequent tropical storms and hurricanes.

22. Reduce fuel costs with pre-departure assessment of weather to avoid rougher seas and consequent higher gas consumption. Also, establish a local fueling station, in Soufriere (between Scott's Head and Pointe Michel) accessible to the three target villages for boat fuel to ensure fishing activities and a supply of protein (and island access for needed food supplies and emergency transport), when villages are temporarily cut off by storms and road damage.
23. Reduce travel time to productive fishing grounds through seasonal weather planning, pre-departure charting, and familiarity with fish stock migrating and habitat behaviour. Lower maintenance costs from vessel and gear damage using advanced resins and adhesives, and lower incidence of damaged fish traps using five-day forecasting and assessing daily weather patterns. Also, reduce coral and beach erosion through installation of a floating jetty for Scott's Head, and a ramp with roller for Scott's Head, Soufriere, and Pointe Michel.
24. Extension of the existing Caribanti Building in Scott's Head to include a micro-enterprise opportunity: a tourist and food and drink stand (with snack bar equipment) for the sale of local marine cuisine and local area crafts, a public fish and produce market place to generate local sales vs. in distant Roseau), and indoor washroom. There would be equal representation from all three villages. This effort would help supplement fisher folk's and their families poverty-level incomes, engage all five communities (including Pointe Michel, Gallion and Bagatelle), and

avoid any community rivalry. These activities would likely help bolster SSMR's cottage craft and accommodation sectors.

25. Development priorities such as health need to be married with GrAD programming for fishery and SSMR management. An ecologically sound sewer treatment system (with an updated 100-year storm redesign) will lower the high incidence of child morbidity in the area, and prevent harmful waste damaging the marine ecology and subsistence fishery. At the same time, the SSMR urgently requires a comprehensive adaptive management strategy to respond to beach subsidence and reef destruction, depleted demersal stocks, water pollution, and coastal exposure to storm surge.

### **13 Casting the Adaptive Net**

In a climate-changing world, long-term socio-economic sustainability and poverty reduction targets (as outlined in the *Millennium Development Goals*) in the Caribbean and other climate vulnerable regions are under threat. Consequently, the endorsement of participatory micro-adaptation models by and for marginalized coastal communities, and integration of these methodologies into broader climate change adaptation in development strategies, will support these broader development goals.

Considering the current 'critical ontology' in developing thinking, a profound paradigm shift must be made throughout the disaster response and climate adaptation disciplines, and the development community in general, to help clearly navigate through the immense swamp of stale and backwards development ideas, and grapple with visionary concepts grounded in community that are floating amongst the micro, meso and macro development realms.

With the development and integration of participatory micro-adaptation strategies, human settlements will be safer, fisheries dependent eco-systems better managed, and the livelihoods of artisanal fisherfolk more sustainable. It is also hoped that the integration of grassroots micro-adaptation development may facilitate improved coordination between international cooperation and local and national authorities in vulnerable coastal communities in the Commonwealth of Dominica and other neighbouring island states. Potential supporters of micro-adaptation integration may include development agencies such as GTZ, JICA, SIDA, DANIDA, and FINIDA, as they also continue to support the development of National Climate Change Adaptation Strategies and Action Plans in response to the UNFCCC's climate change mitigation and adaptation goals.

It is hoped that the host country of the Commonwealth of Dominica and its stakeholders, and neighbouring island states within the OECS, will embrace these micro-research results as they potentially contribute to an advanced understanding of new possibilities for community adaptation. Results and conclusions flowing from this research may assist the host organization(s) as they consider micro-integration as part of their national strategic planning and development processes, especially related to the local fishery and coastal tourism. This is in line with the UNFCCC to develop National Initial and Second Communications for climate change.

It is also expected that this research will contribute to NGOs', UN dependencies' and development agencies' (i.e. CARICOM Climate Change Secretariat, OAS, CIDA Climate Change Team, GEF MACC project, FAO Climate Change Working Group) increased understanding of participatory approaches to climate change adaptation by drawing on local and regional adaptive knowledge and experience of community stakeholders

regarding risks arising from their vulnerability to present day climate variability. Furthermore, findings may also encourage CCA funding entities, already committed to adaptation, to support grassroots pilot programs.

To be sure, *Wai'toucoubouli* (Commonwealth of Dominica), the region's premier nature island, rich in knowledge of traditional artesanal fishery, with a vibrant social fabric and its communities' desire to cast their proverbial nets into the future, can qualitatively contribute to grassroots climate impact and adaptation practices in concert with poverty elimination, disaster management and humanitarian assistance strategies within the region.

## APPENDIX A

### Project Genesis & Target Country Selection

Through ongoing partnership development with adaptation contacts in Canada (CIDA, DFAIT, and NRCAN), and support from World Bank GEF contacts and CIDA's RPIU Program Manager in the Caribbean, I was encouraged to pursue practical research on community adaptation targeting vulnerable coastal communities. I am grateful for the Barbados Deputy of the Environment's encouragement to pursue this work, "to build bridges between the science and the community" (Dr. Leonard Nurse). This research work is in line with contemporary thinking on sustainable community development, and current work on adaptation resource management and planning approaches for risk reduction."

Dominica is currently developing its National Action Plan for Adaptation, as part of its commitment to the UNFCCC. Dominica (a CARICOM target country) was selected for adaptation research after reviewing OAS, CARICOM, CIDA, WHO and World Bank regional adaptation initiatives. I also reviewed OAS, CARICOM, OECS, and FAO development priorities re poverty reduction, biodiversity sustainability, institutional capacity building, and fisheries and aquaculture food security. Several Dominican organizations were approached including the Forestry & Wildlife Division, the Fisheries Division of the Ministry of Agriculture & Environment, and National Development Corporation (includes tourism). This followed discussions with the Program Manager of CIDA's RPIU in Barbados [CPACC and MACC], and a ClimAdapt colleague [managing CIDA's *Adapting to Climate Change in the Caribbean* (ACCC)]. Other neighbouring

OECS island states share similar socio-economic conditions, climatic variability, and risk, and merit the attention of this research.

### **Research-to-Pilot to Complement Host Country Programming**

The Permanent Secretary of the Ministry of Agriculture and The Environment formally acknowledged my research intentions. The Environmental Coordinating Unit and Fisheries Division of the Ministry of Agriculture and the Environment in Dominica have expressed interest in research that focuses on coastal fisheries and coastal tourism sustainability via climate change adaptation. Furthermore, the (LAMA) Local Area Management Authority, and the SSMR Marine Reserve acknowledge community adaptation integration as a sustainable priority for fisheries and eco-tourism.

Given that Dominican authorities, and other neighbouring island states are currently involved in the OAS CPACC program, and recently approved World Bank GEF project *Mainstreaming Adaptation to Climate Change (MACC)*, my research on peri-rural/urban coastal community integration into CCA strategies is a perfect fit. Thus, the Dominica Fisheries Division offered their host support.

The Senior Fisheries Officer recommended the peri-rural/urban community of Scott's Head/ Soufriere as target communities, as these communities (the second largest on the island) rely heavily on revenue generated from the coastal fishery (and coastal tourism sectors) for their livelihoods. These two subsistence and commercial sectors are subject to increasing risk from climate variability.

### **Extent of Host Support During Implementation**

The host organization graciously provided invaluable support during my research in Dominica. This included: an introductory orientation of Dominica and the Division; field logistics support; the provision of relevant organizational, sectoral and contact information; access to pertinent research documents and events; inter-agency coordination (i.e. the Local Area Management Authority; the Marine Reserve, Fisheries Division, Ministry of Agriculture and the Environment, and the Office of Disaster Management); and participation in meetings related to the field of research.

### **Host Country Endorsement**

This relatively new and innovative area of developmental research will contribute to a greater regional understanding of participatory integration of coastal communities into CCA development strategies. Through case study of the peri-urban/rural coastal community of Scott's Head/Soufriere, in concert with local authorities, micro consideration can be identified and presented for integration into municipal sustainable city strategies and within the National Adaptation Strategy in a practical manner. This is in line with the UN Framework on Climate Change (UNFCCC) to develop National Adaptation Plans of Action (NAPAs).

### **Regional Endorsement & Cooperative Linkages**

By incorporating community adaptation approaches into broader municipal, national and regional adaptation strategies, integrated coastal communities become less

vulnerable to variable climate impacts thereby promoting more sustainable communities and ecosystems, and ensuring substantial resource savings.

These results will inevitably reinforce the need for participatory community CCA approaches within broader sustainable development strategies. Results will likely provide a richer understanding of participatory approaches to climate change adaptation among local stakeholders, CARICOM, OAS, World Bank, and CIDA.

Because research results will likely resonate with regional IFIs that support poverty alleviation through adaptation strategies for risk reduction in SIDS coastal communities, conclusions and recommendations will be disseminated to primary adaptation stakeholders for additional research and program funding consideration (see Dissemination of Thesis Research Results).

Proposed micro-adaptation methodologies and tools may further assist IFIs to effectively integrate marginalized target communities into sustainable adaptation strategies. Moreover, because of similar climatic risks and socio-economic vulnerability, other OECS states will surely benefit from and are expected to buy into proposed micro-integration strategies. It is therefore hoped that bilateral and multi-lateral cooperation between the CDB, OAS, World Bank, UNDP, FAO, CIDA, other IFIs, OECS authorities, and Dominican state representatives and community stakeholders would galvanize adaptation efforts in the region.



## **APPENDIX B**

### **Focus Group Research Questionnaire**

#### **1.0 Resources (Perceived) at Risk:**

- What are your perceptions of climate changes: weather, ocean, fish, coast...Are you at risk? What is your awareness of climate change?
- Where does climate change rank in your assessment of your development priorities? (similar to 2.12);
- Explain the land tenure situation in the target community.
- What coastal changes have you perceived over the last few years, especially in relation to the fisheries/ tourism?
- Is your livelihood at risk because of climate changes? Explain.
- What are the advantages/disadvantages of risk management?

#### **2.0 Organization/Stakeholders:**

- Who are the primary focal points for climate adaptation and risk management?
- Who are the main public/private sector and residential stakeholders?
- Describe your sphere of influence, and how environmental (risk) management decisions are made and implemented in practice;
- Describe your agency's/community's current adaptation programming.
- Describe your level of organization, management and absorption capacity (resources...); Does the capacity/experience exist in your community to manage or prepare for increased climate change risk & extreme weather? Is there collaboration between Scott's Head & Soufriere (Pt. Michel to participate)?

- Are you aware of any climate change adaptation activities practiced such as shore protection measures, hazard mapping and risk assessment, set-back strategies, or popular adaptation education and training?
- Describe adaptation approaches at the community level, their strengths and challenges, as well as barriers to integration with broader strategies;
- Who are the likely representatives for climate change adaptation and risk management? Other possible candidates? Identify current/future stakeholders, their perception of CCA strategies and their potential gain/loss from the implementation of these strategies;
- Identify resources perceived (by stakeholders) at risk from climate change;
- Provide a description of land tenure in the case study area (repeat of 1.3);
- Provide a description of the sphere of influence of the stakeholders, and how decisions are made and implemented in practice;
- Identify where climate change ranks in your assessment of your development priorities;
- Identify gender equality barriers (what are the barriers to women's involvement in participatory processes? Suggestions as to how these can be overcome should be included in recommendations section of the report);
- Identify the principal socio-cultural and institutional barriers to micro (community) integration into broader adaptation and poverty reduction strategies, especially related to coastal fisheries and coastal tourism sustainability;
- Identify approaches to integrating equal participation of men and women into the approach being recommended;
- Recommend ways to ensure links between CCA and local development priorities, particularly in the context of other competing development priorities;

- Can you register your organization/participate in NICU/solicit & manage funds?
- What is the relationship with the Dive sector?

### **3.0 Traditional and Contemporary Responses:**

- What traditional climate adaptation practices/knowledge are you currently applying/practicing (i.e., 'RAP' strategies: retreat, accommodate, protect)?
- What community adaptation tools would/should be used?
- Which ones have had the greatest positive impact/negative consequences?
- Provide examples of adaptation (re food, water, health, fishing): Also equipment, weather, work, family, income;
- What risk areas, hazards have you identified?
- Do you have hazard sites? (maps)
- Have you ever conducted vulnerability and risk assessments?
- What are your social vulnerabilities?
- Is a community assessment of risk necessary? Who would conduct this community assessment of risk? How? Why?

### **4.0 Impediments and Opportunities:**

- What would you consider the main public/social/economic/cultural/institutional/environmental obstacles to organizing programs to respond to climate risk? What are the obstacles to integrating community into broader adaptation and poverty reduction strategies (especially fisheries/ coastal tourism)?
- What would you suggest to improve coordination between international cooperation and local and national authorities in vulnerable coastal communities?

- At what level of society/government do you see the greatest opportunity for partnership on adaptation projects?
- What recommendations would you make to promote decentralized grassroots (popular) community adaptation projects?
- How would we best engage civilians/community groups in township/ municipal/ country risk reduction activities? What resources might be required?
- What are the cultural barriers to women's involvement in the participatory processes and how might they be overcome?
- How can further support for local participation be secured at the national and/or regional levels?
- What types of risk management training would most benefit the community?
- Are there/can you suggest public education and outreach (PEO) activities?
- What incentives would motivate you to become involved in climate adaptation (risk management) activities?/What local resources might be made available?
- If the fishery was seriously damaged, are there alternatives (agriculture/tourism)?

## APPENDIX C

### Meteorological Hurricane Data (Canefield Airport)

During an informative meeting with the Acting Senior Meteorological Officer at Dominica's Canefield airport weather station, the following meteorological data was collected:

#### Dominica, Canefield Airport Weather Station: Meteorological Data

Hurricane	Dates	Mean Atmospheric Pressure (mbs.)	Rainfall (mm)	Maximum Gusts (knots/miles/hr)
<b>David</b>	////////////////	////////////////	////////////////	////////////////
<b>Iris (Aug 22-Sept 4)</b>	Wed, Aug 23 1995	1011.5	2.0	////////////////
	Thurs, Aug 24 1995	1010.9	1.1	////////////////
	*Fri, Aug 25 1995	1008.8	51.6 (2+ in)	28/
	*Sat, Aug 26 1995	1006.9	77.8 (3 in)	////////////////
	*Sun, Aug 27 1995	1007.7	70.8 (2.8 in)	24/
	Mon, Aug 28 1995	1011.9	4.2	////////////////
<b>Luis</b>	Sun, Sept 3 1995	1016.1	Nil	////////////////
	*Mon, Sept 4 1995	1012.0	171.7	40/
	*Tues, Sept 5 1995	1007.8	2.9	48/
	*Wed, Sept 6 1995	1010.4	Nil	34/
	Thurs, Sept 7 1995	1012.0	Nil	////////////////
<b>Marilyn (Sept 12-22)</b>	Wed, Sept 13 1995	1012.5	0.5	////////////////
	*Thurs, Sept 14 1995 Direct hit	////////////////	97.3 (4 in)	55
	Fri, Sept 15 1995	1012.7	Nil	21
<b>Lenny</b>	Thurs, Nov 18 1999	1009.9	2.8	18
	*Fri, Nov 19 1999	1007.2	154.2 (6 in)	24
	*Sat, Nov 1999	1002.2	0.7	24

\*Highlights peak period of storm

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