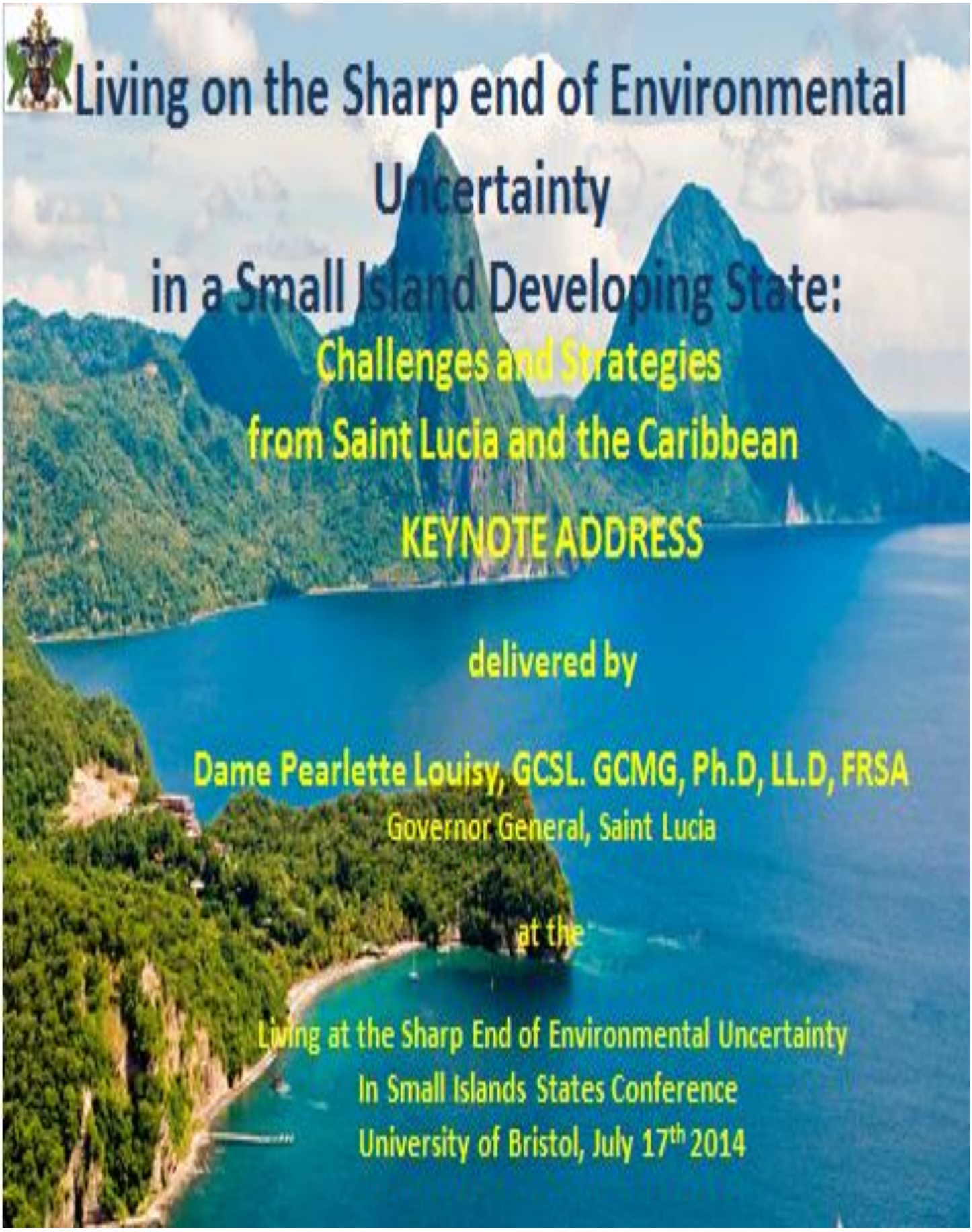

Living on the Sharp end of Environmental Uncertainty
in a Small Island Developing State:
Challenges and Strategies
from Saint Lucia and the Caribbean
KEYNOTE ADDRESS
delivered by
Dame Pearlette Louisy, GCSL. GCMG, Ph.D, LL.D, FRSA
Governor General, Saint Lucia
at the
Living at the Sharp End of Environmental Uncertainty
In Small Islands States Conference
University of Bristol, July 17th 2014

I want to start my address this morning by reflecting on the happy confluence of events, milestones and anniversaries that has brought me to Bristol this year and to take part in this Conference to which so many of you, from so many disciplines and walks of life, have responded. I certainly could not have planned, foreseen or imagined it.

This year marks the 20th anniversary of my graduation from the University of Bristol Graduate School of Education as a doctoral student. I had responded to a call by the 1988 Pan- Commonwealth Conference on Small States (held in St. Lucia, incidentally) for native researchers to look into the particular circumstances of their respective countries. So in a way, I have accepted the invitation extended by the Chairman of Convocation, Bill Ray, for the Class of 1994 to return to visit their University. But I am also here at the specific invitation of the Graduate School of Education to celebrate with them the 20th Anniversary of the establishment of the Education in Small States Research Group(www.smallstates.net) which, led by Michael Crossley, grew out of the research conducted at the time by post - graduate students from small island developing states. Therefore, I can be considered one of the founders of that Research Group whose "home" was, and still is, the School's Research Centre for International and Comparative Studies (ICS). How well do I recall Edmund King's insistence that

> …. the central and abiding need is to " get inside the context"… that means true factual knowledge, fidelity to the system " understood" by

> the natives and empathy for the problems seen by them (King, 1979:52)

Since then, and to this day, Professor Crossley, my doctoral supervisor and mentor then, and my colleague and mentor still, has never tired of reminding us that, especially in times of intensified globalization, "context matters"…more than many policy makers and researchers realise (see, for example, Crossley and Watson, 2003, Crossley, 2010, 2011).

This year marks as well the 20th Anniversary of the First United Nations Global Conference on Small Island Developing States (SIDS) which was held in the Caribbean Island of Barbados, to look into issues regarding the sustainable development of small island developing states. Out of this Conference came the United Nations Programme of Action (POA) on the Sustainable Development of Small Island Developing States, popularly referred to as the Barbados Programme of Action. This policy document was meant to address the economic, environmental and social developmental vulnerabilities facing islands, and to outline a strategy to mitigate those vulnerabilities. The POA has been described as the only internationally approved programme specific to Small Island Developing States (SIDS) which has been collectively and unanimously endorsed by them. Since that historic occasion there has been a Barbados + 5 Special Session of the UN General Assembly; and a Barbados + 10 Conference held in Mauritius in 2005. At that Conference culture was added as the fourth pillar of sustainable development, at the insistence of small island developing states. The Panel Discussion on Culture which I had the distinction of chairing was perhaps one of the most interactive sessions of any UN Conference for the whole assembly burst

out in a spontaneous rendition of Jamaican Bob Marley's iconic and universally recognized "No Woman, No Cry"! It was a powerful demonstration of the power of cultural products in SIDS! This year Barbados + 20 is scheduled for the Pacific Island of Samoa in September, and we look forward to receiving the score card for the performance both of SIDS themselves and of the international community. This year, of course, has been designated by the United Nations as the International Year of Small Island Developing States and it would be interesting to find out at what pace the wheels of progress have moved.

We are also observing this year a significant milestone in small states research. It is the 30th anniversary of the publication of Colin Brock's seminal work on small states: "Scale, Isolation and Dependence: Educational Development in Island Developing and other Specially Disadvantaged States."(Brock, 1984). Scale, isolation and dependence are all now accepted as perhaps the main vulnerabilities of small states, so that Brock's recommendation for on-going work on small states issues has significant relevance beyond the field of education. Four years after the publication of this treatise, he would argue further that

> "whatever the eventual answers to the problems of educational provision in small states might be, they will more likely be found if there is much more research both into the particular and general issues in this field. This means more in-depth case studies of individual systems as well as more comparative analyses across the numerous range of small states. (Brock, 1988.312)

Brock's work and those of others that followed him like Crossley, Holmes, Bray, Atchoarena and Martin, facilitated by the Commonwealth Secretariat and UNESCO's International Institute for Educational Planning (IIEP) have had a significant impact on my own work on small states issues and particularly on tertiary education in small states (Louisy, 1993, 1997, 2001, Louisy and Crossley, 2011). So I am indebted to him, as I am sure many are, for his pioneering work in that field.

The last Anniversary I want to highlight as being of particular significance to the theme of today's Conference is the 30th anniversary of the establishment of the World Commission on Environment and Development under the chairmanship of Gro Harlem Brundtland, former Prime Minister of Norway. The Commission was asked by the General Assembly of the United Nations to formulate "a global agenda of change", one that would recommend long term environmental strategies for achieving sustainable development by the year 2000 and beyond. It is the Report of this Commission, now widely referred to as the Brundtland Report that proposed in the Tokyo Declaration of 1987, the oft-quoted definition of sustainable development.

> …. An approach to progress which meets the needs of the present without compromising the ability of the future generations to meet their own needs" (Our Common Future p. 363).
>
> With it, came an urgent appeal for collective action by citizens' groups, non-governmental organizations, educational institutions and the scientific

community. The Commission's message of an integrated approach to sustainable development was addressed to Governments and Private Enterprise, but first and foremost to people whose well- being, in the words of its Chairman, is the ultimate goal of all environment and development policies, and to the Youth, in particular.

Permit me, therefore to say a special word of thanks to the main sponsors of today's Conference, who have heeded the Commission's appeal. The Graduate School of Education and the Cabot Institute at the University of Bristol, and Sazani Associates. For those of you who may not know, and I admit to being one of those until recently, the Cabot Institute is engaged in fundamental and responsive research on risks and uncertainty in a changing environment. As it turns out, this word of thanks is also a personal one, as the Cabot Institute through its MoSSaiC Project - Management of Slope Stability in Communities - has been involved in a landslide mitigation project in Skatetown, a vulnerable unplanned urban community in St. Lucia's capital city, Castries! Truly, the world is much more interconnected than we think.

Thanks to Sazani Associates for your work in small island developing states which are increasingly threatened by loss of sustainable livelihoods in coastal and rural areas as a result of environmental degradation. I know your work covers the Central American and Caribbean region, so I need either to locate your partners in St. Lucia, or to initiate contact between you and them, since sustainable rural development is one of three themes of a Community-Based Adaptation Strategy currently being addressed by the Global Environment Facility Small Grants Programme on the island.

This roll-call of anniversaries is not just simply a nostalgic look back at the past, but an attempt to bring together the many strands and perspectives that will inform my presentation this morning, a presentation entitled:

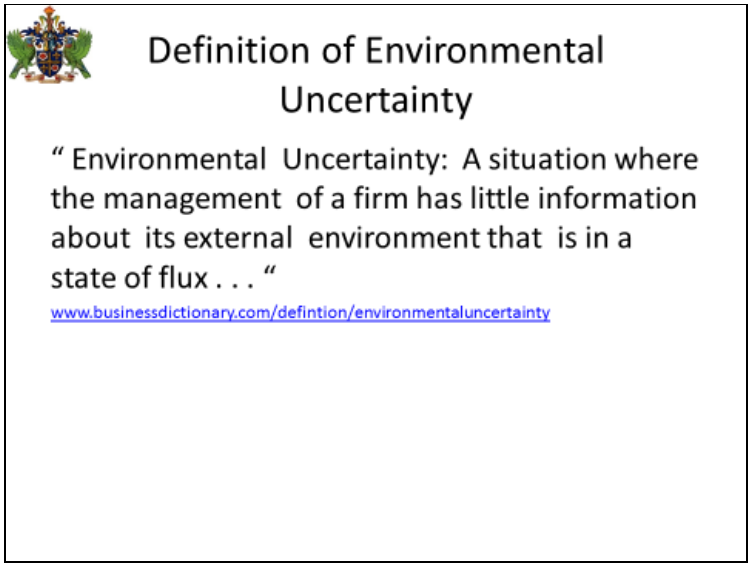
"Living on the sharp end of environmental uncertainty in a small island developing state: Challenges and strategies from St. Lucia and the Caribbean".

I propose to examine first of all, the concept of "environmental uncertainty". I will then speak to some of the challenges of simply being a small island developing state, and the difficulties associated with responding to these challenges in a climate of uncertainty. This will be followed by an examination of some of the strategies adopted and under consideration by one grouping of small island states - those of the Caribbean. For specific initiatives, programmes and projects, I will draw mainly on the experiences and strivings of my native island, Saint Lucia. I will end by examining the type of educational strategies that could assist the transition from "environmental uncertainty" to "environmental sustainability" in these small island states contexts.

Environmental Uncertainty

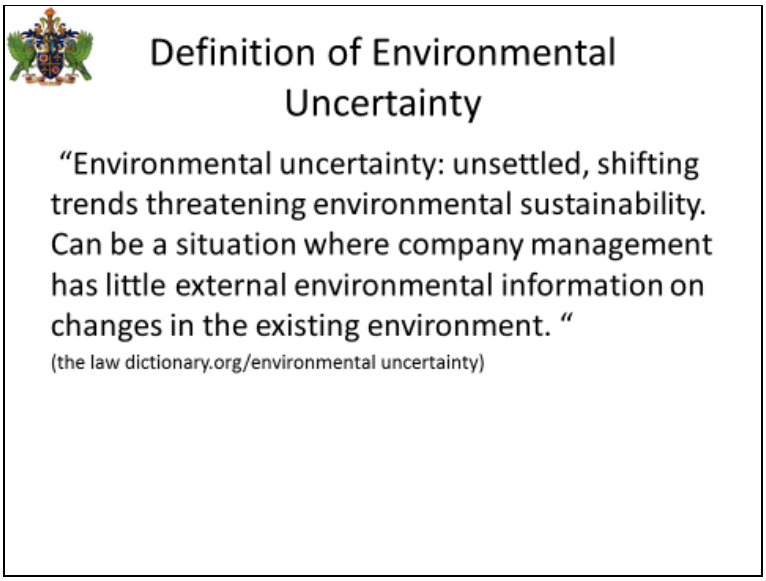
Uncertainty about the meaning ascribed to the term "environmental uncertainty" in the context of the Conference theme prompted me to "google" the phrase in search of a universally accepted definition. Had I had access to a different technology, I perhaps could simply have asked Siri for a definition! I was quite taken aback, in fact, by the first definition I accessed. It read:

"Environmental Uncertainty: A situation where the management of a firm has little information about its external environment that is in a state of flux . . . (www.businessdictionary.com/defintion/environmentaluncertainty)



The second was only slightly more re-assuring as it offered the following insight:

"Environmental uncertainty: unsettled, shifting trends threatening environmental sustainability. Can be a situation where company management has little external environmental information on changes in the existing environment. (thelaw dictionary.org/environmental uncertainty)



However, a few more variations on the theme offered some insights which I found considerably more instructive, particularly regarding the concept of "uncertainty". It was described as a situation where knowledge, nature of things, extent of consequences, events, conditions or possible outcomes are not known.

Navigating the literature on "uncertainty" was therefore quite a daunting exercise for the layman that I was. Eventually however I deduced that the concept could be reduced to two principal components.

- Lack of knowledge (for whatever reason) about the present state;
- Lack of knowledge regarding how a system will change in the future

However, the point is made elsewhere that environmental uncertainty at the organizational level can be not only a function of lack of quality information and knowledge, but also the reasons for this lack of knowledge; that is, that the organization is perhaps not doing what it needs to do.

The situation became clearer when I read the Summary to Policymakers in the Fifth Assessment Report of The Intergovernmental Panel on Climate Change (IPCC) in which guidelines were issued to enable them to interpret its findings. The IPCC expresses degree of certainty both as a qualitative level of confidence (from very low to very high) and as a quantitative likelihood (from exceptionally unlikely to virtually certain): where "virtually certain" is set at 99-100%, "very likely" at 90-100%, "likely" at 66 – 100%, "about as likely as not" at 33-66%, "unlikely" at 0-33%, "very unlikely" at 0-10%, and "exceptionally unlikely" at 0-1%. (IPCC, 2013).

But I also did find the perspective proposed by the UNDP Bureau of Crisis Prevention and Recovery particularly instructive. In that view, "uncertainty" is considered not in terms of the probability of the hazard but rather the "probability of harmful consequences resulting from interactions between natural or human-induced hazards and vulnerable conditions, while "vulnerability" is essentially the likelihood that the event will cause harm based on the social, political, economic and physical conditions of the population or system experiencing the hazard, (UNDP 2004).

In light of the commonly - held view that vulnerability is one of the main characteristics of small island developing states, this perspective was of particular relevance.

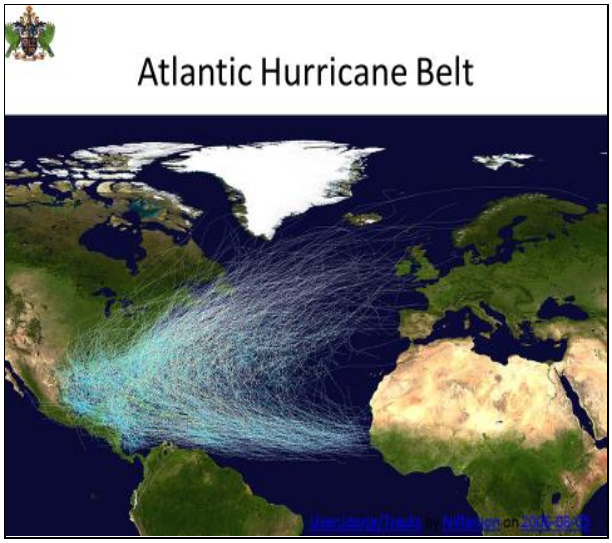
Small Island Developing States

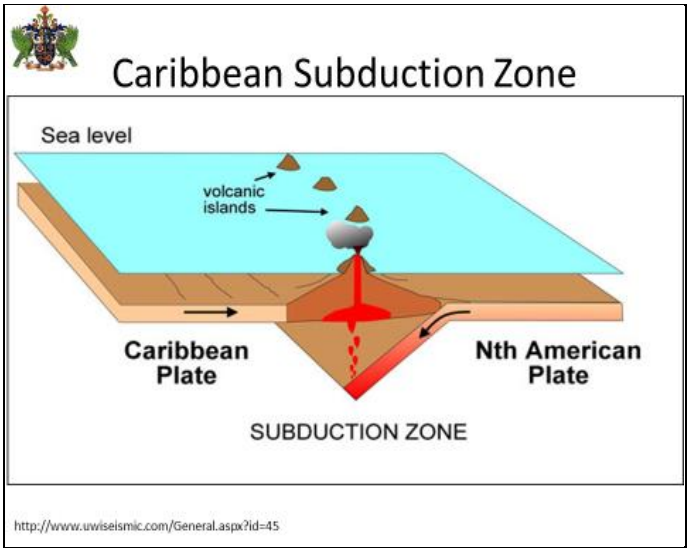
The particular circumstances of small states began gaining the attention of the international community in the 1960's with the work of economists and sociologists focusing on the economic problems and consequences of smallness of size (Louisy, 1994). This was followed by a second wave of interest in their educational development spearheaded by the Commonwealth Secretariat and UNESCO's International Institute of Educational Planning (IIEP). The third and current wave of interest in the consequences of environmental changes on the sustainable development of small island developing states began to gain momentum following the Rio Earth Summit of 1992 and the subsequent Global Conference on Small Island Developing States (SIDS) in 1994. It is this last wave of interest that is the main focus of today's presentation. The three other pillars of sustainable development - the economic, social and cultural dimensions - will of course come into play, since as Commissioner Brundtland points out:

> "The environment does not exist as a sphere separate from human actions, ambitions, and needs….. [It] is where we all live; and development is what we all do in attempting to improve our lot within that abode" (WCED, 1987, p. x1)

Challenges Facing the Caribbean

The Caribbean, like other small island developing states is highly prone to devastating natural disasters. It sits along a subduction zone within the Atlantic Hurricane belt, making it highly vulnerable to cyclonic as well as seismic and other associated natural hazards.





Its location is considered to be one of the highest-risk areas of the planet, in-spite of its long-held description as "paradise islands" and "islands in the sun". The vulnerability of the islands is also attributed to:

Caribbean Small Island Developing States
Area and Population

	Area		Population July 2013 Projection
	Sq. Miles	Sq. Kilometre	
Anguilla	35 sq.m	91 sq. km	14,000
Antigua & Barbuda	169 sq.m	440 sq. km	88,000
Barbados	167 sq.m	431 sq. km	276,000
Dominica	290 sq.m	750 sq. km	71,000
Grenada	120 sq.m	310 sq. km	103,000
Guadeloupe	327 sq.m	848 sq. km	409,000
Martinique	436 sq.m	1,128 sq. km	598,000
Monsterrat	32 sq.m	102 sq. km	5,000
St. Kitts	65 sq.m	168 sq. km	55,000
Nevis	36 sq.m	93 sq. km	
St. Lucia	238 sq.m	616 sq. km	170,000
St. Vincent & the Grenadines	133 sq.m	345 sq. km	97,000
Cayman Islands *			60,000
British Virgin Islands *			32,000
Turks and Caicos Islands			33,000

Source: en.wikipedia.orgwiki/list_of_caribbean_island_countries_by_population

a) their small geographic area (the island of Anguilla, for example, has a land area of only 91 sq km) which accounts for the fact that disasters sometimes take country-wide proportions;

b) their dependence for a substantial part of their Gross Domestic Product (GDP) on a few sources of income (agriculture and tourism, for the most part) which can be severely reduced for months on end by a single catastrophic event. This dependence is also the result of anthropocentric factors such as historic land use, protected markets, terms of trade, and the international economic system.

c) their limited capacity to re-activate the development process after a devastating event; in other words, their low level of resilience; and

d) the difficulty of developing and implementing meaningful disaster mitigation programmes because of the fragility of their ecosystems and their limited human resources.

The region is therefore teetering on the sharp end of environmental uncertainty as a result of the effects of climate change, climate variability, extreme weather conditions which often lead to land degradation from drought or flooding or landslides, or sea level rises. I can recall, for example, when the active

Atlantic/Caribbean Hurricane Season lasted for just one month, with the public awareness campaign contained in the rhyme:

June, too soon
July, stand by
August, come it must
September, all over
October, remember

Now, however the Atlantic Hurricane season lasts from June 1 to November 30, leaving the islands on tenterhooks and in disaster preparation mode for 6 months every year. This year is no exception, with twenty-one (21) named storms forecasted.

Most of the islands' settlements, including their capital cities, are coastal zone settlements. Some, like St. Lucia's capital city, even lie below sea level, on land reclaimed from the sea itself, and therefore prone to flooding by high water tides. There is also the continuous threat of damage to infrastructure and disruption of administrative and economic activity. Rural settlements are themselves seldom very far away from the coast, so that the threat of destruction of livelihoods (mainly in the agricultural sector) is a constant challenge. The islands rely heavily on coastal and marine resources which call not only for their constant management but also for appropriate land use policies in the inland settlements.

Partly because of their small size and partly because of their vulnerability to natural and environmental disasters, the Caribbean, like most small island

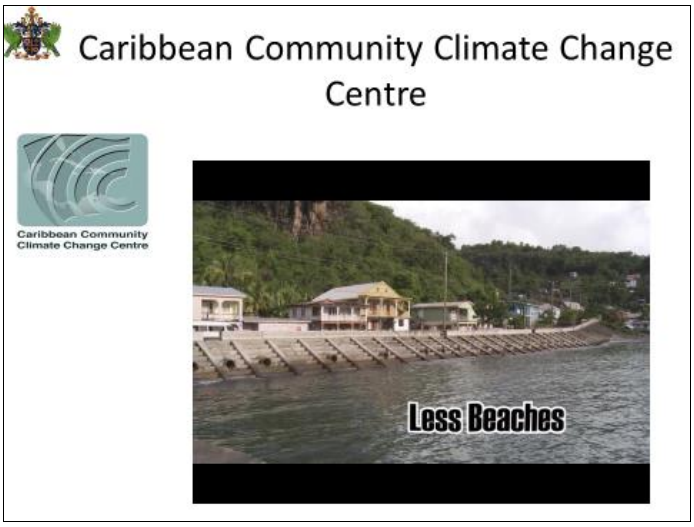
developing states are classified as high-risk entities. This has led to insurance and re-insurance being either unavailable or exorbitantly expensive with adverse consequences for re- activating the development process after a catastrophic event (Barbados Programme of Action, 1994, p.3). Derek Walcott, the St. Lucian Nobel Laureate in Literature (1992) could well have been referring to the precarious and vulnerable nature of the Caribbean when he warned in his Nobel Lecture that "a morning could come in which governments might ask what happened not merely to the forests and the bays but to a whole people" (Walcott, 1993).

Regional Caribbean Responses

It goes without saying that none of the small islands in the Caribbean could begin to successfully address these challenges on their own. I therefore turn now to some of the regional initiatives, strategies and frameworks that have been put in place to manage the responses to these challenges.

1. The Caribbean Disaster Emergency Management Agency (CDEMA)

With over US$5 billion in losses in the Caribbean during the last two decades of the 20th century, CDEMA was established in 2009 to deal not simply with disaster response, as its predecessor agency the Caribbean Disaster and Emergency Response Agency (CDERA) did, but with all aspects of Comprehensive Disaster Management for its participating States. It focuses on all cycles of a hazard, involving all sectors of the society and concentrating on all hazards. Its operations include training of personnel and development of course material; development of model Disaster Legislation and model policies and guidelines for use in emergencies, which Participating States can adopt or adapt; capacity building and strengthening of National Disaster Management Organisations as well as resource mobilisation for their programmes; development of Disaster Information and Communication systems; education and public awareness; and mobilising and co-ordinating disaster relief. CDEMA is governed by a Council, comprising Heads of Governments or their nominees, a Technical Advisory Committee representing National Disaster Co-ordinators and representatives of specialised regional organisations and a Coordinating Unit managed by an Executive Director appointed by the Council. All Caribbean Community states are eligible for CDEMA membership. (www.cdema.org accessed June 19, 2014).



2. The Caribbean Community Climate Change Centre

Based in Belize (a CARICOM Member State in Central America) the Caribbean Community Climate Change Centre (CCCC) is a regional mechanism that co-ordinates the Caribbean's response to climate change. It serves as the focal point for information on climate change issues and the region's response to managing and adapting to climate change. It provides policy advice and guidelines to the Caribbean Community Member States through the CARICOM Secretariat. The Centre is one of the elite few recognised as a Centre of Excellence by the United Nations Institute for Training and Research (UNITAR). Established in 2005 on the recommendation of CARICOM Heads of Government, the main goal of the Centre is to improve the ability of Caribbean people to reduce and manage climate change risks in order to adopt more sustainable lifestyles, and to engage in activities which help to reduce greenhouse gas emissions (notwithstanding the fact that the Caribbean only produces **a fraction of 1%** of those emissions). It does this through the provision of services such as training, consultancies, and clearinghouse facilities.

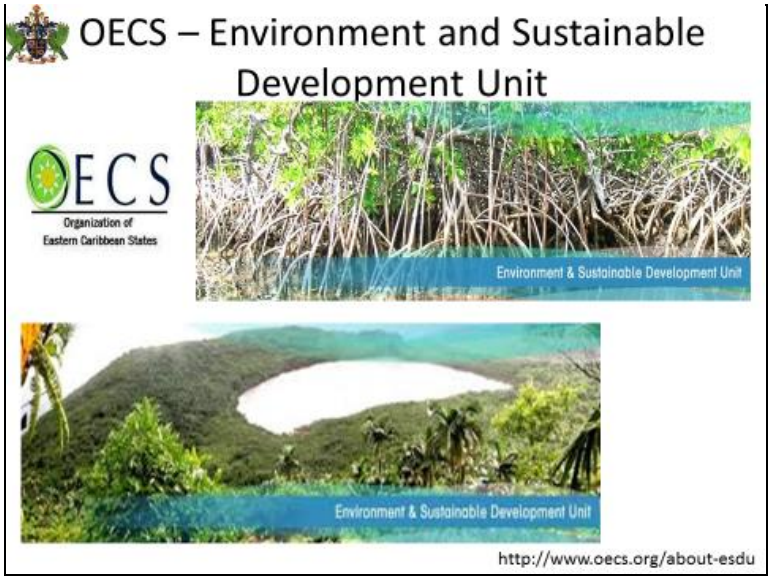
3. The Caribbean Catastrophic Risk Insurance Facility

The Caribbean Catastrophic Risk Insurance Facility is a Caribbean Governments' Fund for Earthquake and Hurricane Catastrophes. It is a risk-pooling facility, owned, operated and registered in the Caribbean to serve Caribbean governments and their communities in reducing the economic impact of natural catastrophes, by quickly providing short-term liquidity when a policy is triggered. It is said to be the world's first and, to date, only regional fund using parametric insurance. It gives Caribbean governments the unique opportunity to purchase earthquake and hurricane catastrophe coverage with lowest-possible pricing. The Facility is said to represent a paradigm shift in the way Governments treat risk, and in this regard, the Caribbean is seen as leading the way in pre-disaster planning. CCRIF was capitalised through the contributions to a multi-donor Trust Fund [by the Governments of Japan, Canada, UK, France, Ireland, Bermuda, the European Union, the World Bank, the Caribbean Development Bank] and membership fees paid by its sixteen (16) participating Governments. Since its inception in 2007, and as of 2013, it has made pay-outs totaling US$32,179,470 to

seven (7) member Governments with all payments made within one month of the event. Saint Lucia, for example, has so far received a pay-out of over US$3.6m following its November 2007 earthquake and the passage of Hurricane Tomas in 2010.

The significant contribution of the Facility to resilience building in the Caribbean region must not be understated. Since its inception there have been many achievements and many lessons learnt; many of which could be replicated in larger countries. Among them, one could highlight:

- A Technical Assistance Programme launched in 2009 to help participating states deepen their understanding of natural hazards and catastrophe risk and the potential of climate change in the region.
- A Scholarship Programme (regionally as well as extra-regionally) in areas related to disaster risk management
- Implementation of an Economics of Climate Change Adaptation Project in eight (8) member countries
- Provision of Climate Risk Adaptation Insurance. One such insurance product combines risk reduction and insurance for low-income groups such as small-scale farmers and day labourers. There is also a Livelihood Protection and Loan Protection Policy, and an Excess Rainfall Policy.



4. The Organisation of Eastern Caribbean States Environmental and Sustainable Development Unit (ESDU)

This is a Unit within the Secretariat of the nine-member Organisation of Eastern Caribbean States (OECS) with responsibility for the provision of natural resource and environmental management services to Member States to ensure the sustainability of livelihoods of its peoples. One of its main outputs has been the "St George's Declaration of Principles of Environmental Sustainability in the OECS" (signed in St George's, Grenada in 2001) which outlines 21 principles for environmental sustainability, at least three of which are of particular relevance to the issue of environmental uncertainty.

Principle #7. Broad-based Environmental Education and Awareness

The public of the region have the right to information, training and education on environmental management in forms which they can easily understand and obtain at minimal costs. In particular, information on the practices and products which have a negative impact on the natural and cultural environment and on public health will be shared.

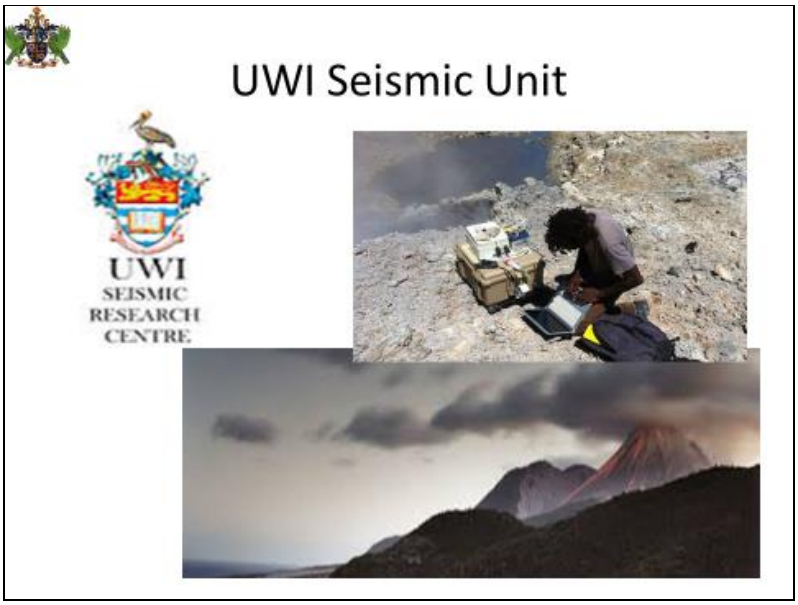
Principle #8. Preparation for Climate Change

Governments will enact laws, create organisations and institutions and provide money to assist people and communities to adapt to the impact of climate change.

Principle #9. Integrated Disaster Management

Governments will integrate disaster management initiatives with environmental priorities to help the peoples of the region in their preparation for and management of impacts of natural and man-made disasters.

The Unit's flagship project has undoubtedly been the Protected Areas and Associated Livelihoods Project (OPAAL) but it has also been very active in the areas of damage assessment training, hurricane risk reduction, environmental planning and watershed management. Most recently, it has spearheaded a new Global Climate Change Alliance Project on climate change adaptation and sustainable land management, aimed at improving the resilience of the region's natural resource base to the impacts of climate change. Areas to be addressed include soil and land stabilisation, river and sea defence, forest and ecosystem restoration and sustainable land management.



5. The University of the West Indies Seismic Research Centre

The islands of the Caribbean lie in an active volcano and earthquake belt with hundreds of earthquakes occurring each year. Consequently, the region has pooled its resources again to maintain a Seismic Research Centre at the St Augustine Campus of the regional University of the West Indies to serve as the official source of information for earthquake and volcanoes in the English-speaking Caribbean. While volcanic eruptions and earthquakes do not occur very frequently, they can be very deadly when they do, as happened in the eruption in 1997 of the Soufriere Hills Volcano in Montserrat which completely destroyed the capital city and the island's economy to the tune of US$500,000,000. To date, the population of Montserrat remains well below 6,000. During the first five months of 2014, the Centre has issued seven earthquake advisories, albeit very mild ones. However, the Director recently warned the Caribbean to expect a "massive quake" in the future following the 6.4 magnitude one which affected five islands in February this year. She fears that the region may have become too complacent, and has therefore sounded the warning that:

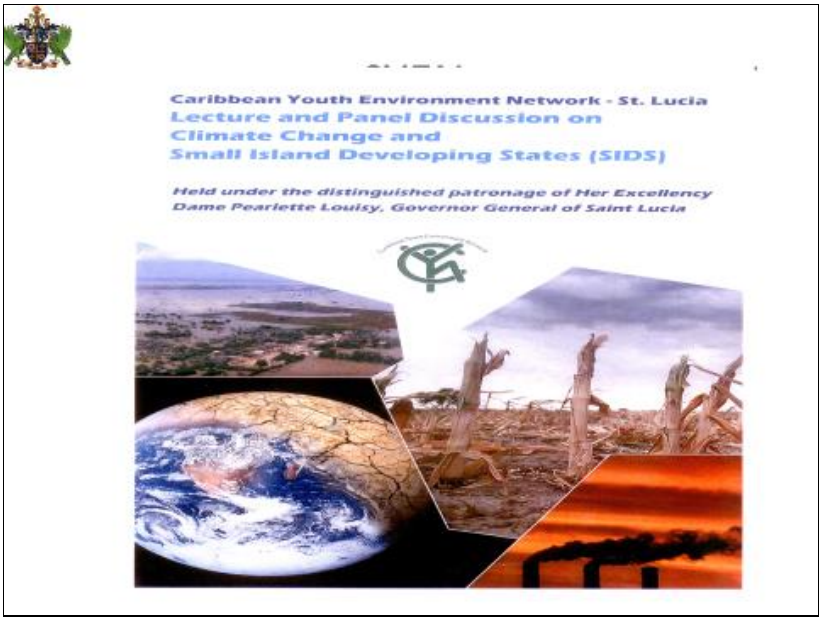
"The region generates very large magnitude earthquakes. … This earthquake is reminding us that the processes which generate these large earthquakes are alive and well. They are continuing and therefore we need to be prepared" (Caribbean 360 News, February 19, 2014).

Recently, a coming together of the UWI Seismic Research Unit and other seismic monitoring agencies from the Caribbean, Central and South America has paved the way towards making a regional tsunami warning system a reality.

6. The Centre for Resource Management and Environmental Studies (CERMES)

CERMES, headquartered at the Cave Hill Campus of the University of the West Indies promotes and facilitates sustainable development in the Caribbean and beyond. It has a strong focus on tropical island environmental management, and it has responded to the concerns of

member countries regarding incorporation of environmental issues into sustainable development by creating a multidisciplinary programme of study, research and outreach in areas such as coastal zone management, water management and climate change adaptation, and mitigation of alien marine invasions.



7. The Caribbean Youth Environment Network (CYEN)

The last regional initiative which I would like to highlight is the Caribbean Youth Environment Network. This is a non-profit organisation dedicated to improving the quality of life of Caribbean Youth by facilitating their participation in the development process, and promoting their full involvement in all matters pertaining to the environment and sustainable development. One of the Network's projects is the Caribbean Youth Climate Change Project which aims to make the youth sector aware of the impacts that climate change can have on the development process of the region. National chapters therefore organise education and public awareness activities to sensitise the general public as well as policy makers. One such

activity in Saint Lucia was the recent Lecture and Panel Discussion on Climate Change and Small Island Developing States, with the Director of the National Integrated Drought Information System of the National Oceanic and Atmospheric Administration (NOAA) as guest lecturer. A Declaration on Climate Change prepared by the Saint Lucia Chapter is soon to the presented to the Prime Minister and the Leader of Opposition. One of the Articles calls upon present and future Governments of Saint Lucia

> "not to compromise the ability of future generations to meet their needs, but to mainstream SUSTAINABILITY as the first and last principle in every decision and development, and operationalize RESILIENCE as a measurable outcome in every decision made now and in the future; and further, to exercise the PRECAUTIONARY PRINCIPLE in uncertain and complex decision environments, as stated in several international Conventions as well as the St. George's Declaration which Saint Lucia has ratified and signed;"

The World Economic and Development Commission had stressed the importance of youth involvement in addressing issues of the sustainable development of "our common future". The CYEN is one of the region's responses to this imperative.

These regional initiatives and strategies, however impressive they may seem, are not without their own challenges as far as their own sustainability is concerned. Most of them depend on external funding for their establishment and on-going operation. Should this level of funding be reduced it is debatable whether the region would be in a position to sustain

these efforts. The ideas are home-grown but their sustainability depends on the assurance of a strong partnership with the international community and on enhanced international co-operation and action to address their sustainable development challenges. It is to be hoped that the Samoa Conference will give serious consideration to this issue, even while acknowledging the current global financial challenges.

Saint Lucia: Challenges and Country Strategies

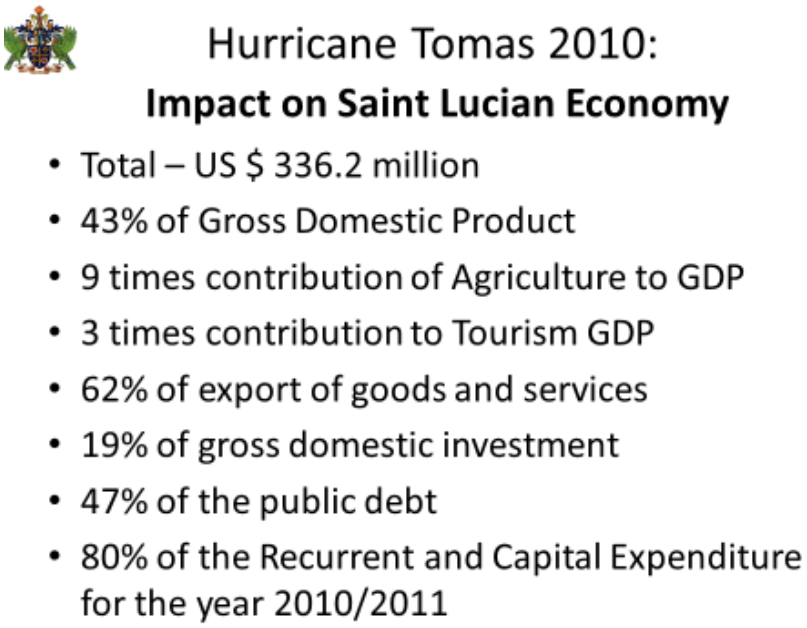
Like most of its sister islands in the Caribbean, Saint Lucia has made some significant efforts both at the national and regional levels to mainstream sustainable development principles into its national development plans, policies and strategies. But it does have its challenges and vulnerabilities which affect its ability to deal with life on the sharp end of environmental uncertainty.

Saint Lucia is situated in the Lesser Antillean Arc of the Caribbean Archipelago in one of the most active storm and hurricane belts in the world, and along a sub-duction zone where the Atlantic Lithospheric Plate is slowly **diving** beneath the Caribbean Plate. This location makes it highly vulnerable to weather, climatic and geo/seismic events, stresses and episodes. It has a land area of 616 square kilometres or 238 square miles (42 km long and 22 km wide – 27 miles long, 14 miles wide).

Saint Lucia - Topography

It is volcanic in origin, rugged in topography, with steep slopes cut by once fast flowing rivers, with most of the flat or gently sloping land situated along a narrow coastal belt. It lies within the north-east Trade Wind belt, and influenced by synoptic weather systems including the Atlantic High Pressure System, the Inter-Tropical Convergence Zone, surface, mid and upper level low pressure systems, tropical waves and cyclones and periodic frontal systems. It is therefore highly vulnerable to all the anticipated impacts of global climate change, including those

likely to be caused by the increase in the number of high category hurricanes expected and their economic impact.



The impact of Hurricane Tomas, for example, in 2010 is an indication of the level of damage which can be expected in the future. Although it was only a Category 2 hurricane, the damage was extensive, with total damages and losses estimated at US$336.2 million; an amount that represented 43% of the island's Gross Domestic Product (GDP), nine times the contribution of agriculture to GDP, three times the contribution of tourism to GDP (agriculture and tourism being the two main income earners), 62% of exports of goods and services, 19% of gross domestic investment, and 47% of the public debt.

Land slippage on main arterial road Barre de L'Isle

Damage to Infrastructure

Three years later, Saint Lucia was still recovering from that single natural disaster, only to be hit by a Trough which caused damage in the amount of US$100 million equivalent to 8.3% of its GDP.

Damage to Infrastructure – East Coast Road

Damage to slopes and water catchment area

In fact, at the recent Commonwealth Third Global Biennual Conference on Small States held in Saint Lucia in March of this year, under the theme "Building Resilience in Small States" there was a sobering and memorable remark made that, based on research thus far, Saint Lucia could very well be currently the most vulnerable country in the world.

The Caribbean has had a much more sobering situation following the passage of Hurricane Ivan in 2004 when Grenada suffered damage of well over US$1 billion or nearly 200% of its GDP, and a loss of over 30% of its housing stock.

The present and future impacts of climate change on Saint Lucia make mitigation and adaptation a critical need for all sectors.

Damage to hillside

Soufriere – Land Slippage

Strategies

The Government of Saint Lucia, through its Ministry of Sustainable Development, Energy, Science and Technology, has taken the lead in formulating policies and strategies to deal with looming threats of change, variability and uncertainty in the environment.

Strategies

Government of Saint Lucia

- Climate Change Adaptation Policy
- Saint Lucia Strategic Programme for Climate Resilience
- Special Programme on Adaptation to Climate Change
- Pilot programme for Climate Resilience
- National Environmental Education Policy and Strategy

Among them are:

- A Climate Change Adaptation Policy (a successor to the National Climate Change Adaptation Policy and Plan first formulated in 2002) to be adopted this year under the tag-line "One person, one household, one enterprise, one community at a time". This is to be complemented by a Public Education and Awareness Strategy.

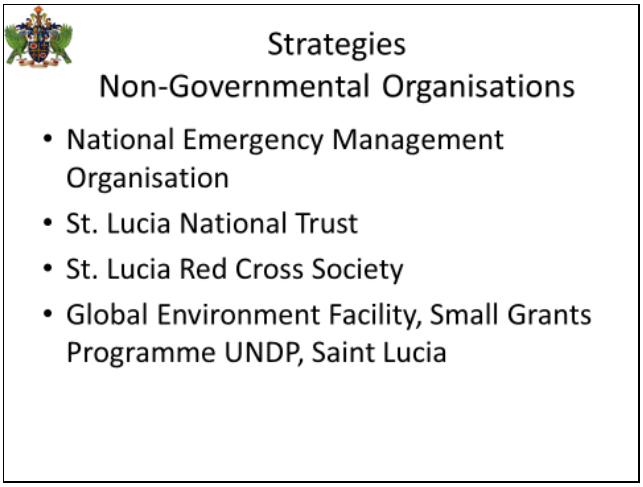
- The St Lucia Strategic Programme for Climate Resilience: recognised as one of the most inclusive and country-driven of the more than 25 programmes prepared by developing countries, big and small.

- The Special Programme on Adaptation to Climate Change Project: an evidence-based approach to climate change.

- The Pilot Programme for Climate Resilience, which supported and encouraged stakeholder-driven adaptation initiatives. Among them, a rain-water harvesting project with a major tourist resort; the development of new insurance projects for the Insurance Council of St Lucia; and the establishment of a Climate Adaptation Finance Facility with a local Development Bank to allow the public and the private sector to access loans at below-market interest rates to undertake adaptation activities.

- The formulation of a National Environmental Education Policy and a National Environmental Education Strategy. A work in progress.

- These strategies and initiatives reflect Government's continuing efforts at addressing its undeniably pressing environmental issues, but they require translation from policy to concrete action. Therein lies another challenge: how to make this transition in a situation of limited and dwindling financial resources, high levels of debt servicing, and continued dependence on external assistance: all common characteristics of small island developing states. A measure of the country's success in awakening the national consciousness to issues of environmental protection and conservation and to issues relating to sustainable development in general is the interest shown by various para-statal organisations, non-governmental organisations (NGO's), Civil Society Organisations (CSO's), Community-based Groups (CBO's) and affiliated agencies. Among them:



The Saint Lucia National Emergency Management Organisation (NEMO)

NEMO is a participating member of the Caribbean Disaster Emergency Management Agency with responsibility for ensuring the efficient functioning of preparedness, prevention, mitigation and response actions of both natural and man-made disasters on the island. It is currently co-ordinating a Caribbean

Disaster Management project aimed at strengthening and establishing a system for flood hazard mapping and enhancing the island's capability for community disaster management. Although still in its fledgling stages, a Flood Early Warning System has been set up in a pilot community and a Community Flood Preparedness Team has accepted the duty and the responsibility to receive the flood alert and to warn the community of the possibility of a flash flood. The system has had its challenges, but there are plans to replicate them in other flood-prone areas.

- **The Saint Lucia National Trust**

  The Trust is a non-profit membership organisation created by an Act of Parliament in 1975 to "conserve the natural and cultural heritage of Saint Lucia and to promote values which lead to national pride and love of country". It counts among its successes the formation of a Youth Environment Forum whose aim is to empower young people to become advocates for environmental and heritage conservation. The Forum has been credited with the formation of Environmental Clubs in schools, and with the success of the Greening Fair Helen Project – a project of tree-planting along river courses and slopes denuded by landslides following heavy rainfall.

- **The Saint Lucia Red Cross Society**

  As part of its mandate of bringing relief to persons and communities in the aftermath of disasters, the Red Cross has put in place Community Disaster Response Teams (CDRT's) trained in Vulnerability Assessments, preparation

of disaster plans for households and communities and disaster response and relief.

- **The Global Environment Facility Small Grants Programme United Nations Development Programme – Saint Lucia (GEF/SGP UNDP)**

  This Programme was established in 1992 as a corporate programme of the Global Environment Facility and is being implemented globally and in Saint Lucia by the United Nations Development Programme (UNDP) in five GEF Focal Areas of Biodiversity Conservation, Climate Change Mitigation, Climate Change Adaptation, Land Degradation and Sustainable Forestry, International Waters and Chemicals. The Programme funds projects only through Civil Society Organisations with an emphasis on the poor and on marginalised groups and communities, to achieve environmental sustainability, to reduce poverty and to build capacity. What is particularly useful in this context of environmental uncertainty is the capacity development approach built into the Country Programme Strategy. Eight principles underpin that approach: sustainability; creativity and innovation; participation and inclusiveness; accountability and transparency; equity; respect; learning; and results focused. The focus is on sustainability which is treated "as a never-ending process rather than as an end". Currently there are 26 projects underway in Saint Lucia with all but three of these dealing with Climate Change Adaptation and Mitigation, Biodiversity Conservation and Land Degradation.

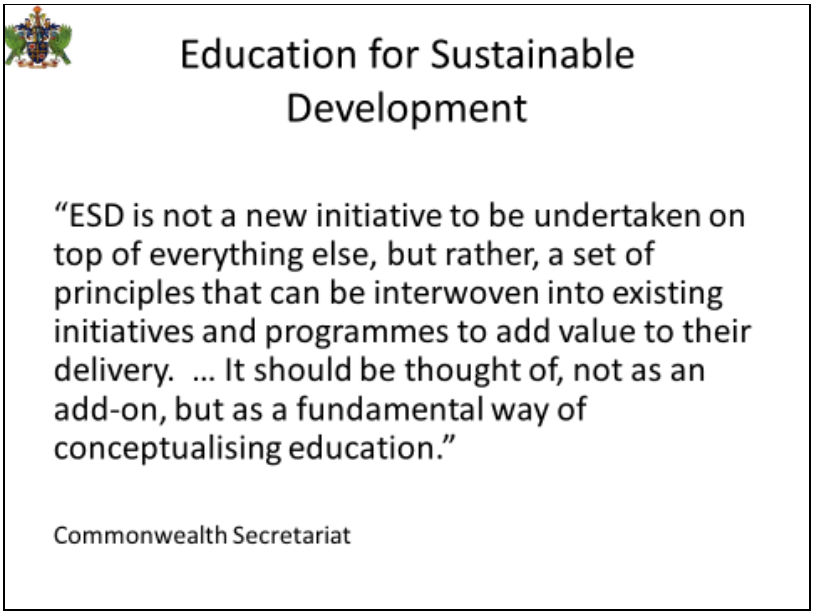
Apart from these structured programmes and projects there are many other interventions by all manner of Government Agencies, community groups,

religious organisations, school-based groups and corporate establishments, all aimed at raising awareness and at changing behaviours through the conduct of environmental improvement activities. They include "edutainment" via the electronic media; popular theatre, seminars and workshops, camps; field trips; tree plantings; beach clean-ups; school based extra-curricular programmes; essay, photography, jingle and poster competitions, environmental concerts, and observance of special days. If enthusiasm levels were indicators of the degree of sustainability, Saint Lucia could look forward with some hope to stemming the haemorrhaging of its lifeblood. But behaviour modification takes time, and time is not on our side.

Education for Sustainable Development in Small Island Developing States

How then do we accelerate this behaviour modification that would save small island developing states from losing their already precarious hold at the sharp end of environmental uncertainty and from falling into the deep end? The prevailing recommendation is that of mainstreaming Education for Sustainable Development into all aspects of education planning and delivery since it is seen to be a "key approach to bringing about the behaviour change necessary to tackle the consumption patterns resulting in climate change." (Commonwealth Secretariat, 2013). It is also seen to have an important role to play in building the capacity of stakeholders to mitigate or adapt to environmental change, and in promoting responsible sourcing and disposal of resources. But the Commonwealth Secretariat itself has conceded that, based on the findings of a research it

conducted on Education for Sustainable Development in Small Island Developing States, efforts to implement ESD had have mixed results. Could it be because there is not consensus on how it is to be implemented or not enough clarity on what the concept really involves?



The Commonwealth has defined it in the following terms:

> "ESD is not a new initiative to be undertaken on top of everything else, but rather, a set of principles that can be interwoven into existing initiatives and programmes to add value to their delivery. … It should be thought of, not as an add-on, but as a fundamental way of conceptualising education."

But the challenge for SIDS and indeed for other states, big or small, developed or developing, is to articulate those principles and to understand the nature of the value that is to be added to the delivery of existing initiatives. Are these guidelines and principles universal or contextual? Is ESD, as some have dismissed it, just another fad, another "Northern Agenda"? (Down, 2006) Indeed, there is

skepticism coming from the North itself, and many would subscribe to the conclusion that Nichols arrived at in her study of Education for Sustainable Development in the national curriculum of the United Kingdom in which she concluded that:

> "The severity of the environmental crisis as it is reported does not seem to be reflected in the type of action that is being taken in relation to education and the national curriculum. If the concern is as urgent as it is suggested, and education really is as significant in this change as many believe it is, then the government needs to take more drastic action. ESD needs to be better defined to allow for precise research and assessment; all levels of education and society have a vital role to play if real sustainability is to become meaningful and mainstream in order to cause real change."

ESD in the Caribbean

In the absence of any evidence to the contrary, it is fair to say that Education for Sustainable Development has not entered the popular lexicon of Caribbean governments or their peoples. In spite of convening a Caribbean Regional Conference on Education for Sustainable Development in 2005 under the theme, "New Approaches for the Future", to launch the United Nations Decade of Education for Sustainable Development, there are those who argue that, even at the close of the decade, no Caribbean regional policy for ESD exists; that although Caribbean governments have signed all the relevant international agreements, they have not formulated regional or national policies for ESD; that they appear

not to recognise the interrelatedness of these sustainability problems, nor do they seem to focus on education as the basis for developing a sustainable society (Down and Nurse, 2007). While this may be an over-generalisation of the situation across the board, as some of the strategies outlined earlier obviously show, it is true to say, for example, that there is no specific focus on ESD in the Education Strategy formulated by the Organisation of Eastern Caribbean States for its Member States for the period 2011-2021, nor in the current Five-Year Education Sector Plan of the Ministry of Education and Human Resource Development in Saint Lucia.

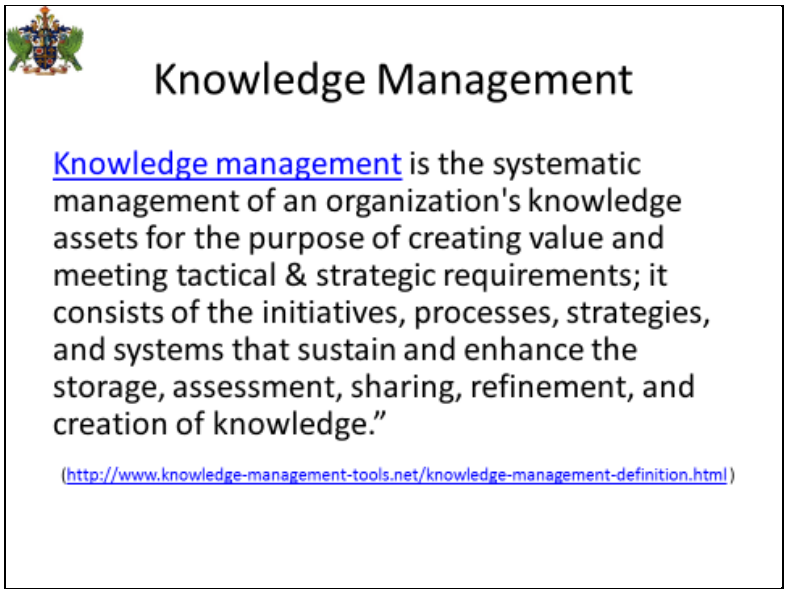
ESD in the non-formal/informal education sector

It would therefore be fair to say that in Saint Lucia, the non-formal/informal education sector therefore has been left to take the lead in education for sustainability. The gains that have been made so far can be attributed to the approach being used in their projects and programmes in which elements of sustainability are incorporated. The programmes and projects are in the main community-based, participatory and inclusive, intergenerational (which facilitates the transmission of local or traditional knowledge) and capacity-building-oriented with a strong focus on monitoring and evaluation, on the formulation of a Knowledge and Information Management Plan (though still in the fledgling stage) and on resource mobilization. One of the Agencies currently actively pursuing this strategy approach is the GEF Small Grants Programme referred to earlier. The Country Programme Strategy which has been rolled out

for the current operational period 2011-2014 is presented as the Agency's contribution to "achieving a healthy, productive and sustainable environment, which is indispensable for the well-being of all Saint Lucians." (Romulus, 2014)

Knowledge and Information Management: its role in ESD

One strategy that is currently being rolled out to achieve this, and which perhaps has not been given the prominence it deserves in the education system of some of our small island developing states, is Information and Knowledge Management.



The strategy has been defined as

> "the systematic management of an organisation's [individual's, community's, country's] knowledge assets for the purpose of creating value and meeting tactical and strategic requirements; it consists of the initiatives, processes, strategies and systems that sustain and enhance the storage, assessment, sharing, refinement and creation of knowledge". (http://www.knowledge-management-tools-net/knowledge-management-definition.html)

The manner in which we use knowledge and information affects how we work, share, create and sustain any form of development. The principle of sustainability is therefore a fundamental aspect of this initiative. Sir William Arthur Lewis, a 1979 Nobel Laureate in the field of Development Economics, and a national of the small island developing state of Saint Lucia, had argued that the fundamental cure for poverty is not money, but knowledge. He may very well have been way ahead of his time in this regard (he would have celebrated his 100th birthday next year, had he lived), since the concept of a knowledge society and a knowledge economy now enjoys widespread international favour.

Reference was made earlier to the two principal components of uncertainty: lack of knowledge about a current situation as well as a lack of knowledge about how this situation will change in the future. It could therefore be argued that an increase in knowledge would bring about a decrease in uncertainty. Knowledge creation or generation at all levels and in all spheres is therefore paramount, and so is knowledge sustainability. It is for this reason that there is renewed attention to the documentation and transmission of local and traditional knowledge in this new dispensation. A partnership between the Sir Arthur Lewis Community College in Saint Lucia and the local GEF SGP programme using the Information and Knowledge Management strategy holds exciting promise for the future of ESD in Small Island Developing States.

The strategy creates a platform for change that enables transformative learning that could lead to innovation and sustainable development. The key to this is the ability to help people share and document information and knowledge about their

environment in a manner that is useful and sustaining, to build enabling environments that support adaptable conditions. These dynamic sensitive environments provide support to reduce uncertainty about their circumstances and to build their resilience (St. Clair-Auguste, 2014). Climate change adaptation and mitigation requires more than ever that we begin to understand the environment so that we can understand the nature of the changes that are taking place and be better equipped and prepared to respond. One of the lessons to be learnt in this approach is that "context matters".

How easily this strategy can be mainstreamed in all levels of the formal education sector is what needs to be addressed. The Mauritius Strategy recognized that in the contemporary global context

> The wealth of a nation depends more on its ability to produce, exchange and transform knowledge than on its natural resources or industrial production. More than most, islanders are very conscious that the future of any institution, country or region depends in large part on the depth and quality of its human capital. More than any time in history, the 'success' of individual, corporation or nation is based on knowledge, connections, creativity and engagement and on how a country manages its workforce. (UNESCO, 2007:6)

Priority attention should therefore be directed at promoting educational development and sustained capacity building to strengthen knowledge societies throughout small island developing states (Crossley, 2011) to better prepare them for dealing with the challenges associated with today's environmental shifts.

The role of Information and Communication Technology in ESD

The Commonwealth is among the many institutions and agencies that argue that adopting ESD as a unifying theme in education reform can help change the way education is envisaged, if it focuses on positive behavior change, learning how to learn, understanding twenty-first century skills and promoting social development. But the wheels of education reform grind slowly. Given the urgency of the situation, there are those who suggest that serious consideration should be given to other ways of empowering civil society to promote sustainable development.

Among these, is the effective communication of the international sustainable development agenda to the population to enable an understanding of the global issues as well as the context in which national and sub-national development is to be pursued (Tulsie, 2014). In other words, getting people to adopt a global perspective while operating at the local level. This knowledge, it is argued, will build confidence at all levels to engage in national and sub-national dialogue about the development of their communities and countries and to help contribute as well to the global sustainable development agenda.

There is also the provision of improved access to information and communication technology, especially broadband networks and services, and timely access to relevant information presented in ways that allow for decision making and empowerment. To their credit, the Governments of the Caribbean region have conducted robust climate change vulnerability and adaptation assessments, and have formulated and put in place sound strategies and initiatives to address the

many challenges of environmental uncertainty, but as one former official from the Ministry of Sustainable Development in St. Lucia has pointed out, a lot of this information remains in official circles and has not reached those whose lives will be most impacted by the consequences of this uncertainty (Tulsie, 2014). This information and communication gap needs to be bridged, and bridged urgently.

The Way Ahead

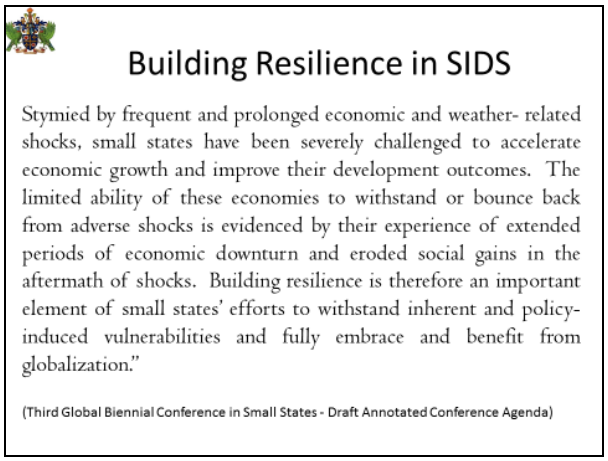
Small island developing states are a fact of life, and so too is increasing environmental uncertainty. One of the early commentators on the issue of smallness of national size took a very practical approach when he stated in 1975 that:

> "….. short of war and other hostile activities, there is not much that the new nations can do to increase their national boundaries. There is a certain finality about size. They start with it and will probably finish with it. They accept it as a fact of life and operate within the national geographic constraints which it imposes on them." (Abbot, 1975,107)

And now, another constraint has imposed itself upon them: the challenge of environmental uncertainty. They have no choice but to learn to live with it, to adapt to it and to build up their resilience to absorb the shocks when they do strike.

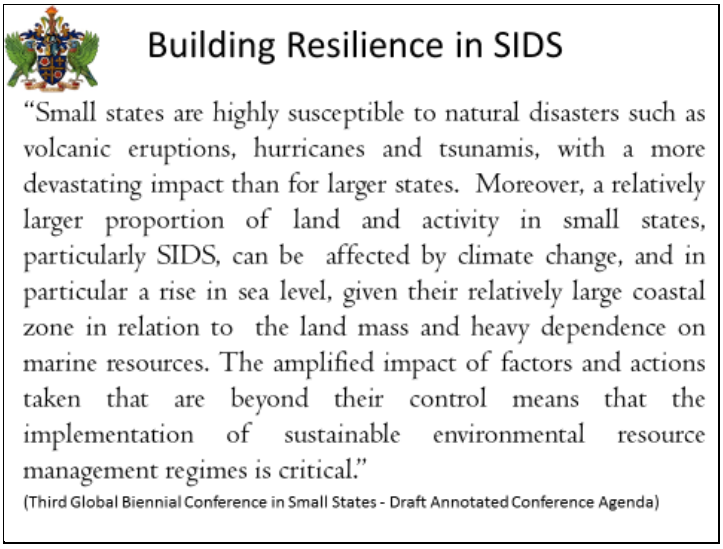
I want therefore to end my presentation by quoting two observations made at the Third Global Biennial Conference on Small States under the theme "Building

Resilience in Small States" which was held in St. Lucia in March of this year (The Commonwealth, 2014).



The first one acknowledges that,

> "Stymied by frequent and prolonged economic and weather- related shocks, small states have been severely challenged to accelerate economic growth and improve their development outcomes. The limited ability of these economies to withstand or bounce back from adverse shocks is evidenced by their experience of extended periods of economic downturn and eroded social gains in the aftermath of shocks. Building resilience is therefore an important element of small states' efforts to withstand inherent and policy-induced vulnerabilities and fully embrace and benefit from globalization." (Draft Annotated Conference Agenda)

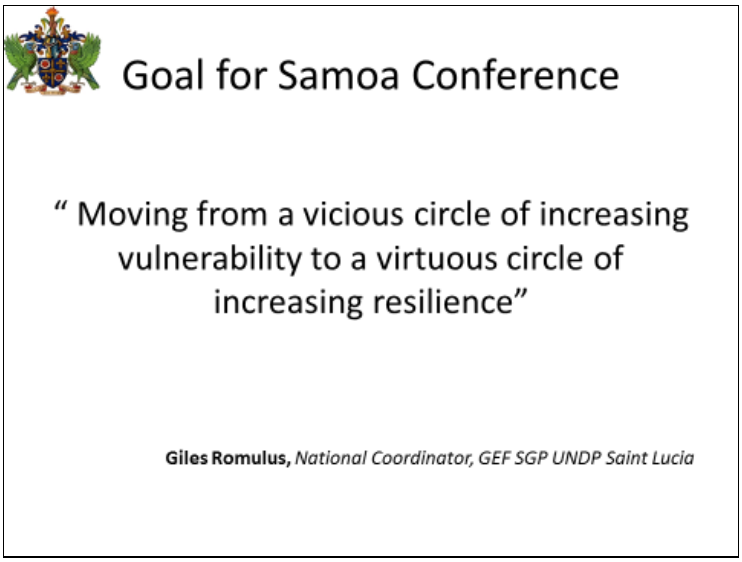


And the other notes that:

> "Small states are highly susceptible to natural disasters such as volcanic eruptions, hurricanes and tsunamis, with a more devastating impact than for larger states. Moreover, a relatively larger proportion of land and activity in small states, particularly SIDS, can be affected by climate change, and in particular a rise in sea level, given their relatively large coastal zone in relation to the land mass and heavy dependence on marine resources. The amplified impact of factors and actions taken that are beyond their control means that the implementation of sustainable environmental resource management regimes is critical." (Draft
> Annotated Conference Agenda)

The particularly precarious situation of small island developing states is therefore not one of their closely-guarded secrets. Environmental uncertainty, which manifests itself in climate change, remains their greatest challenge. They have shown leadership in international efforts against it, both in calling for ambitious mitigation targets to be adopted by the larger developed states and in undertaking

innovative adaptation measures at home. Some of these can be replicated elsewhere to good effect, proving that small states can be contributors to the world if they are given the right enabling environment. Every challenge, every vulnerability has a resilient response (Anthony, 2014). Such a response however is dependent on the type and quality of access one has to information and knowledge and the way it is used. The way ahead lies in finding sustainable responses to their challenges and vulnerabilities. "Education for sustainability", or shall we say with Edmund King, "Education for uncertainty" (King, 1978) must be the watchword for small island developing states now and in the foreseeable future. As we go into the Samoa Conference we look to support, assistance and co-operation from the developed world and the international community to build resilience and sustainability in the small island developing states of the world. Genuine and durable partnerships will go a long way towards addressing issues related to their sustainable development needs.



The hope of one delegate from Saint Lucia who will be travelling to Samoa is that small island developing states would soon be in a position to transition from a

"vicious circle of increasing vulnerability to a virtuous circle of increasing resilience"(Romulus, 2014).

Dame Pearlette Louisy
July 17, 2014

BIO

Dame Pearlette Louisy is the Governor General and Head of State of Saint Lucia. She holds a BA in English and French from the University of the West Indies, an MA in Linguistics from Universite Laval, Canada, and a Ph.D in Education from the University of Bristol in the United Kingdom. She served as Principal of the St. Lucia "A" Level College, then as Dean of the Division of Arts, Science and General Studies of the Sir Arthur Lewis Community College (Saint Lucia) and subsequently as its Vice Principal and Principal. She holds an Honorary Doctor of Laws Degree from the University of Bristol (1999), the University of Sheffield (2001) and the

University of the West Indies (2011). She has been conferred the Grand Cross of Saint Lucia (GCSL) and the title of Dame Grand Cross of the Order of St. Michael and St. George (GCMG) and Dame of the Order of St. John (D. St.J). She is also a Fellow of the Royal Society of Arts (FRSA).

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Dr. Merle St. Clair Auguste, Vice Principal, Sir Arthur Lewis Community College, Saint Lucia

Mr. Urban Dolor, Principal, Sir Arthur Lewis Community College, Saint Lucia

Professor Michael Crossley, Coordinator of the Research Centre for International and Comparative Studies, and Director of the Education in Small States Research Group, Graduate School of Education, University of Bristol

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