

**Outcome from Regional Project to Assess Regional Priorities,
Capabilities and Research Gaps on Climate Change and Poverty
Reduction in Latin America and the Caribbean**

The Caribbean Sub Regional Report

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Executive Summary

This report presents the findings from a project undertaken in the Caribbean sub-region to assess regional priorities, capabilities and research gaps on climate change and poverty reduction in the Caribbean sub-region. This project encompasses three major activities, which are; a regional consultation, an assessment of vulnerable communities in three countries and a bibliography compilation of a climate change studies, initiatives and other literature.

In the workshop, experts working in climate change in the Caribbean collectively identified some of the major research needs in science, adaptation and mitigation in all sectors (such as water, agriculture, biodiversity, health, energy, business and disaster management) for the Caribbean sub-region. The outcomes highlighted a dearth of scientific and other information relating to climate change and therefore there is a need to address these areas. Among the needs identified are furthering the understanding of how climate change will affect fresh water resources, food security, biodiversity and the economic sectors. Also in the realm of adaptation and mitigation, many areas for further research were identified especially in the energy sector and disaster preparedness and mitigation.

Vulnerable communities were identified as a special sub group, as the effects arising from climate change will likely have the greatest impact on the region's vulnerable communities. 11 vulnerable communities in Dominican Republic, Haiti and Jamaica were selected for this study and it was found that the needs are beyond that of scientific data gathering but rather include the need for social programs to deal with the effects of climate change among others.

The compilation of existing studies and reports revealed that many studies were done for the region but a large proportion exists as grey literature. Overall over 180 reports, articles and papers were sourced and compiled into a database.

Overall, the information contained in this report provides necessary information on the existing gaps which require attention in order to respond to the effects of climate change. It also provides a better understanding of the needs which exist in the region which stakeholders (academic, funding agencies, decision makers among others) can use to inform programmes and response actions.

SECTION 1

1. Introduction

According to Trotz (2008), over the last 15 years the Caribbean (including the small island states and low lying countries) has experienced socio economic and environmental impacts arising from climate change. This phenomenon has emerged as a major concern for governments and the people throughout the region. One way of responding to the region's concerns and assist decision making is timely research which can address the data gaps and information deficit.

In this regard, IDRC and DFID have partnered to promote a comprehensive research program for Latin America and the Caribbean (LAC) with the objective of strengthening the region's capacity to address the threats that climate change phenomena place on development and poverty.

The Cropper Foundation (TCF) based in Trinidad and Tobago in a consultancy managed by Dr. Asha Singh has undertaken to identify these needs for the Caribbean sub-region¹ as part of a collaborative agreement with Fundacion Futuro Latinamericano (FFLA).

One activity undertaken in the region was a consultation with key experts working in climate change. During 24th and 25th January, 2008, over 25 experts from across the Caribbean joined representatives from TCF, FFLA and IDRC at a meeting in Trinidad and Tobago to discuss and identify the major research needs (refer to Appendix 1 for list of participants). The outcome of this consultation is provided in this report. In addition research priorities were identified specifically in vulnerable communities in Dominican Republic, Haiti and Jamaica. A compilation of all the studies done with regard to climate change in the Caribbean was also made, of which a summary is provided in this report.

2. Consultation Programme

The meeting utilized both presentations and working group discussions (refer to Appendix 2 for programme), and was facilitated by Mr. Winston Rudder and Mrs. Yolanda Kakabadse.

Presentations made at this meeting are as follows:

- Regional Consultations on Climate Change in Asia and LAC – Dr. Rondon
- Climate Change in Latin-America and the Caribbean Region – Dr. Saldana
- Summary of Key Climate Change Impacts on Small Islands and the Caribbean Region – Dr. John Agard

¹ The Caribbean sub-region in this report comprised of the Caribbean CARIFORUM Countries, Guyana and Suriname.

- Rapid Assessment of the Current Situation of Climate Change Threats, Responses and Challenges in the Caribbean – Dr. Trotz²
- Update on the preliminary Findings regarding the Vulnerable Communities – Mrs Lafayette

For some sessions in both day 1 and 2, the participants were placed into working groups,

Day 1: Working Groups

Thematic areas were identified and each expert was assigned according to his/her area of work. Questions were posed to the groups on both days as shown below.

1. Major knowledge gaps and information needs (where applicable, research needs in the science, adaptation and mitigation categories in your thematic area should be identified).
2. Constraints which affect the optimal use of existing and new knowledge and also known good practices
3. An assessment of the current research capacities where known (such as local, institutional, national, regional), and also any planned or ongoing initiatives to incorporate climate change related research.

Day 2: Working Groups

4. Inter-sectoral issues/linkages related to the thematic areas.
5. Leaders (not present at this consultation) in the region working on climate change within your thematic area.
6. The most successful initiatives in place by stakeholders in the region to cope with severe climatic variation and extreme events.

Please refer to Appendix Three for Thematic areas and participants in each group.

² Dr. Trotz also provided for the consultation, a overview document of Climate Change in the Caribbean. Refer to “Climate change and development in the Caribbean Sub-region.

SECTION 2: CONCLUSION OF CARIBBEAN SUB-REGIONAL CONSULTATION

A: Main Information and Knowledge Gaps

Information not in a usable form or accessible

Although information regarding climate change may exist, the information may not be in a format that could be used easily by technocrats and decision makers.

There are also major resource constraints including financial, technical, institutional and technological which are affecting access, generation, dissemination and adequate use of the existing information regarding climate change.

B: Principal Gap in the Research Capacity, Management and Knowledge

Human resource capacity

Human resources in the region are limited; therefore it is necessary to devise an effective networking strategy for the region. As such, experts would be able to provide their services across the region when needed.

Translating implementation into cost (cost of adoption)

Many assessments are being carried out, but there seems to be an information deficit of the actual cost for implementation of these projects. As such, many of these studies are conducted with no follow up implementation.

Modalities to harness the R&D potential in the region to address climate change agenda

C: Priorities for Research, Management and Knowledge

Generation of Information

Water

1. Quantification of Resource

Not much is known about the region's consumption patterns and available water resources. Therefore it is important for a study to be undertaken aimed at investigating these issues.

2. Impacts of changing weather patterns on water supply

Climate change will influence the weather patterns which may result in unpredictable rainfall patterns. These will in turn affect some economic sectors in the region such as agriculture. Therefore, there is a need to determine the impacts that predicted changing weather patterns might have on water resources in the region along with the necessary adaptation and mitigation measures.

3. Management of floods

Not much is known about the most effective ways in managing the predicted increase in floods events as a result of climate change, therefore more information is needed.

4. Watershed Management

Many programmes have been initiated to promote watershed management in the region more so over the last decade. However, watersheds throughout the region continue to degrade, therefore as a priority, there is a need to identify the factors which are contributing to the failure in watershed management at all levels.

Agriculture/ Food Security

Addressing Food Security

The overall research theme is to determine the Impacts of climate change on agricultural farming systems (including fisheries), food availability, trade and market stability, access and utilization to aid in the development of a food security policy for the Caribbean.

1. Climate Change and the effects on Crops/ Livestock/ Forestry and Fisheries

Climate Change related issues will have an economic effect in all sectors of the Caribbean society. In the region, there is an urgent need to understand the effects of climate Change on the agricultural sector from food production to marketing. This includes crops, livestock, forestry and fisheries sectors.

2. Appropriate farming systems for adapting to Climate Change

In many areas in the Caribbean, agricultural activities are either 'rain-fed' or irrigated agriculture. Many of the farmers being small scaled practice mainly 'rain fed' agriculture. One of the likely scenarios emanating from climate change is the shift in rainfall patterns, frequency and intensity. Therefore, research should be conducted to identify what farming systems, alternative crops and livestock breeds will be more appropriate given these likely changes and also the alternative crops which could be cultivated in response to these changes.

3. Harnessing traditional knowledge in agricultural practices to inform adaptive strategies

Traditional knowledge, based on natural phenomena which many artisanal farmers used to measurable levels of success are being ignored and/or not documented. Therefore in order to ensure that these practices endure, efforts should be made to understand and harness the knowledge. These information of traditional practices could assist in developing or identifying early warning systems, in addition to being critical as an adaptive mechanism to the effects of climate change.

4. Quantitative Models to under-pin food security

Global Environmental Change and Food Systems (GECAFS) did a qualitative scenario analysis (www.gecafs.org/publications) in the region of the likely impacts of Global Environmental Change (including climate change) on food security. However, no modeling was conducted to investigate the correlation between food security and the effects of climate change. Therefore, one of the priorities would be to conduct research to model how effects of climate change will influence food security under various scenarios. The GECAFS programme also developed a Science Plan and Implementation Strategy (SPIS) for the region (www.gecafs.org/publications). Apart from a strategy for research, the SPIS identifies research gaps in CARICOM. Funding is now required to carry out this (aspects of) SPIS.

5. Design insurance schemes for small farmers

The Caribbean agricultural sector is characterized by a significantly large proportion of small scale farmers who operate in a climate of minimal protection; few incentives, little or no subsidies and no insurance schemes. There is a need therefore, to conduct a study to determine the likely financial vulnerability of small scale farmers in the region with regard to the effects of climate change. Such study should also determine and devise appropriate insurance and other risk management mechanisms to protect small farm holdings thereby sustaining the agricultural sector and the livelihood of a significant proportion of the region's population.

Health

1. Impact of Climate Change on vector-borne and respiratory diseases

Preliminary studies conducted in the Caribbean seem to suggest that climate change is linked to the rise in vector borne illnesses (warm temperatures will likely accelerate the breeding rate of mosquitoes, but this is just from an analysis of past data). Therefore, more studies are needed to determine whether there is a correlation between a warming climate and these diseases.

2. Examine/Review whether a correlation exists between dust and pollen and respiratory disease in the Caribbean

Information related to the implication of pollen and dust on human health is available in the Caribbean but there is a deficit of relevant attribution information. Therefore, more attribution studies need to be conducted to determine whether there is correlation between diseases such as upper respiratory infections and pollen/dust etc.

3. Impacts of increased temperature in the Caribbean

It is already established in places like Europe that increases in temperature can induce heat stress related illnesses which can lead to human mortality. However, a dearth of information exists for the Caribbean. Therefore, more research is needed to understand how increases in temperature due to climate change will affect the Caribbean populace and also what measures could be taken to reduce mortality arising from this phenomenon.

Biodiversity

1. Valuation of Ecosystem Services

Both the marine and terrestrial ecosystems in the Caribbean are being impacted by the effects of climate change. As these effects intensify, the services provided by the various ecosystems will be compromised. Studies similar to the one conducted for coral reefs by World Resource Institute, (2004) should be undertaken to provide a monetary valuation of the other ecosystems in the Caribbean.

2. Design and management of Protected Areas (PA)

Although there are many Protected Areas in the Caribbean, the success rate of these designated PAs (both terrestrial and marine) is questionable. One cited reason is the inadequate knowledge on the habitats and also the factors to consider in designing a PA. Given the likely impacts of climate change will have on biodiversity, research is needed on how to design and manage PAs for the amelioration of biodiversity.

3. Research the effects of inter-seasonal and inter-annual climate variations on Biodiversity

Projected disturbances in the annual seasons and climate will likely affect the biodiversity of the region. Therefore, there is a need to understand how these predicted variations will affect the biodiversity both marine and terrestrial, given that the Caribbean has many endemic species. According to the Convention on Biological Diversity, the Caribbean is one of the major hotspots in the world.

4. Effect of changing hydrological cycle on forest composition as a result of Climate Change

The predicted changes in rainfall patterns due to climate change will affect the forest species and composition in the region, including species of commercial importance. Therefore, there is a need to investigate what will be the likely changes in the hydrological cycle, how these changes will affect the forest ecology of the region and also how these are likely to feed-back to the hydrological cycle and climate in general.

N.B: for all the priorities listed above in the various sectors, the economic implications (economic loss, economic importance), governance and effective information dissemination must also be investigated through research

Energy

1. Addressing Caribbean Inefficiencies

The Caribbean has the potential to actively pursue alternative energy; however, the potential is still not fully explored. The region is highly energy inefficient especially in the realm of hydrocarbon consumption. Given the huge dependence on hydrocarbon and also the projected economic strain that increasing market prices will have on the small islands, there is a need to investigate why the region is energy inefficient, both in usage and generation and also what policies are needed to address these inefficiencies.

2. Alternative Energy

There is a need for more research aimed at exploring the potential of alternative energy including the appropriate source and technologies suitable for the Caribbean. Although alternative energy is being pursued in the region, the rate of change is slow. The reasons hampering the rate of adaptation should also be identified via research.

3. Carbon Sequestration to off-set Emissions

The abundant forest resources in some countries in the Caribbean (Guyana, Dominican Republic and Dominica) provide potential of using the resources to sequester carbon and contribute to the global drive of reducing the effects of carbon emission. Therefore research

should be conducted to provide the scientific information of carbon sequestration in the region and the economic benefits.

Business/Investment

1. Assessing of on-going and planned initiatives by the private-sector for adaptation and mitigation

The potential for Clean Development Mechanism (CDM) and adaptation/mitigation measures to respond to climate change are high in the region, and there are a few planned and ongoing private sector initiatives which are done on an ad hoc basis. Therefore, there is need to collectively assess the on-going and planned initiatives/options and the needed policy measures (including subsidies) to encourage more private sector participation in exploring these options. In addition, there is a need to conduct research into “Caribbean appropriate” corporate social responsibility, including the reporting guideline.

With regard to corporate social responsibilities, an assessment was conducted for Trinidad. For more information visit: www.stcic.org

NB: For all the research priorities identified above in all the sectors, there is a need to measure the social vulnerability to Climate Change both at the national and local levels. This will ensure that the human dimension with regard to the effects of Climate Change is taken into account.

Disaster Management

1. Tools for mainstreaming climate change information in disaster reduction

Some key features of Caribbean development include heavy built up coastal zone region and many of the infrastructure including houses which are not well designed to withstand impacts of intense natural disasters. These characteristics make for an urgent need to ensure that risks from climate change related activities are minimized. Therefore, there is a need to identify ways in which climate change information could be mainstreamed to reach all sectors of society in an effort to influence development and minimize the impacts (economic loss and fatalities etc) arising from climate change related natural disasters.

Tourism

1. *Advocate through (education and awareness) ways by which sub-sectors can contribute towards adaptation and mitigation in the various sectors.*

It is important to build awareness to encourage social responsibilities, and in the tourism sector in the Caribbean, this is much needed. Targeted awareness is needed on ways in which individuals can contribute through workable adaptation and mitigation measures to reduce the effects of climate change.

Other Research Identified

1. *Regional comprehensive disaster management plan*
2. *Specific data on climate hazards to inform disaster management*
3. *Best practices to enhance the resilience of vulnerable communities*
4. *Issues of salt water intrusion and how this affects water resources*
5. *The effects of climate change on the proliferation of invasive species*
6. *Regional comprehensive disaster management plan*
7. *Specific data on climate hazards to inform disaster management*
8. *Exploring drought and salt tolerant Varieties of crops to respond to Climate Change*
9. *Need for an Assessment of the impact of climate variability extremes on livelihood*

Dissemination of Information

There is a need for cooperation among countries, institutions (technical, academic and non technical) and also technical assistance to have a “clearing house” in an existing organization which can make information regarding climate change available to the public. Databases should be developed.

SECTION 3: VULNERABLE COMMUNITIES AND CLIMATE CHANGE

This assessment was conducted by Panos³ on behalf of TCF. The study utilized interviews, focus group type consultations and feature articles and radio programmes. In this section, a brief summary of the major research needs is presented. However, the report presented by Panos should be consulted as it provides more in-depth analyses of vulnerable communities in Jamaica, Dominican Republic and Haiti.

For this study, the communities were selected based on a combination of prior knowledge (Panos works with vulnerable communities as part of its programme mandate) as well as ecological/climate vulnerability criteria. A total of 11 communities were selected for this study (7 in Haiti, 2 in Jamaica and 2 in the Dominican Republic as shown in Table 1 (see full report for location and detail description))

TABLE 1: Characteristics of the communities selected

Community	Approx. population size	Characteristics
Haiti		
Carrefour-Mariani	30,000	Formerly rural community on outskirts of Port-au-Prince, between the foot of a high mountain and the coast
Philipeau	20,000	On the foot slope of a large mountain which oversees Port-au-Prince and Petionville
Thiotte	23,500	Isolated rural mountain community
Fonds-Verrettes	45,000	Low-lying inland community between mountain ranges, on the border of the D.R.
Gonaives	280,000	Low-lying coastal port city, at the mouth of a long valley where several water catch areas come together
Marigot	58,000 (6,000 in town)	Coastal city at the foot of high mountain range
Miragoane	40,000	Port-city on the Southern peninsula, with a large and deep pond
Dominican Republic		
El Duey	2,000-2,500	Inland community of houses constructed in a valley in a protected area
Jaquimeyes	4,000	Low-lying rural community between a major river and the coast
Jamaica		
Portland Cottage	10,000	Rural coastal community
Mocho	6,000	Inland rural mountainous farming community, mined for

³ Panos is an NGO. For more information <http://www.panoscaribbean.org/>

		bauxite for over 30 years
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Needs, Research and Support for Vulnerable Communities

DOMINICAN REPUBLIC

In Dominican Republic, it was identified in all the communities, the need to improve institutional capacities and stronger enforcement in order to improve planning and enforcement of zoning and land use laws. The creation of alternative livelihood for a number of people who are being affected is also needed.

Research is needed in providing effective social support services ranging from first aid and support after disasters, through rebuilding and resettlement to deal with restocking as well as the traumas. In relation to support, land degradation is not only devastating for communities, but also for individual farmers and their families whose means of livelihood disappear.

Specific research needs in the communities under focus:

El Duey

- The need to working with the communities on resettlement to areas which are more appropriate and not located in a protected zone
- Identify ways to establish warning systems, as much as possible those that are appropriate to local situations.
- Assist in the promotion of watershed management, involving small scale agricultural use and sufficient protection
- Livelihood issues; how to replace cutting trees for construction materials with more sustainable activities for this area and also alternative livelihood.

Jaquimeyes

- There is a need to identify through research whether a correlation exist between environmental health issues and deposits and sediments; (is it true that people get sick this way and how?)
- Identify ways and support counseling to traumatized farmers, as well as other people in the community.

HAITI

These are the research needs identified in all the communities in Haiti where the study was conducted

1. How to make lands that protect the country pay for themselves?

One aspect is to make available financial incentives to owners of mountainous lands for the setting up of agroforestry programmes.

2. Setting up the right environmental education and awareness programmes.

This is a linkage to poverty alleviation. Much information needs to be broadcasted to audiences in various ways (school, church, match of football, community meetings, spectator events , public market, etc.)

3. Agroforestry

There is a need to address land degradation and large scale deforestation along with the consequences (increased the risks of erosion, floods and landslides by exposing the soils to strong rains, while reducing absorption capacity) in Haiti. Therefore, devising an afforestation campaign of all the mountains above cities in the county should be done, in particular Morne Biennac in Gonaives and Morne de l'Hopital in Port-au-Prince.

4. Rainwater management

The annual rainfall is 1,500 mm and only 12% infiltrates the ground to feed the aquifer. The other 88% is lost as flow-off (31%) and evaporation (57%). Much more of this water should be used productively. Studies on how to do this should be implemented at community level.

Due to sea level rise, there is also a problem of marine intrusion, which causes salination of ground water, thus reducing the exploitable subsoil water. The level of intrusion is unclear.

Specific research questions in the communities under focus:

Carrefour-Mariani

- How to improve planning, or actually how to start planning. Issues to be researched inside this theme are: what brings people to Mariani and are there alternative places of settlement, more geared towards a sustainable future? Land in that area has (nearly) always been captured, and pathways towards ownership providing proper infrastructure should be researched. Resettlement of part of the population is part of this issue.

- Schemes for creating jobs at a large scale will also help in the fight against global warming, since poverty is an important factor in deforestation, building without codes, etc.

Fonds-Verrettes

- There should be some assessment conducted to relocate the city to higher grounds
- Need for effective soil conservation measures.
- Community team building (stakeholders need to come together: the community and NGOs working in various fields of the environment, political decision makers).
- Set up an incentive scheme : Issue credit to farmers

Gonaives

- An assessment should be conducted to determine effective ways for waste disposal and management.
- Research of actual sea level rise in the micro environment of the Bay of Gonaives.

Marigot

- Geological research is needed to determine if landslides and the creation of deep ravines are related to the climate or rather seismic activity.
- Determine if there is actual increase of sea level rise close to Marigot. (perceptions versus reality)
- Hydrological drainage of the area should be researched to determine if problems of the appearance of “sudden springs” in some areas and the sedimentation deposits on the streets can be alleviated.
- Fishery studies, alternative ways to generate seafood

Miragoane

- In-depth study on the effects of increased water levels of the Pond of Miragôane
- Design of systems for efficiently exploiting water for irrigation;
- Fishery management systems for exploitation of the fishery stock in a sustainable manner (ecologically responsible equipment);

- Ecotourism development around the Pond of Miragôane;

Philipeau

- An assessment regarding the issues relating to planning and potential resettlement;
- Providing the support to have effective enforcement of environmental protection of the mountain above Port-au-Prince and Petionville
- Provide financial and other resources to help in soil conservation measures around the ravine of Philipeau, as well as other places.

Thiotte

- Need for an early warning systems
- Design and implementation of risk reduction plan
- Training of the population in mitigation and education and awareness around disasters

JAMAICA

These are the research needs identified in all the communities in Jamaica where the study was conducted. The agricultural sector is on the decline in Jamaica, and the effects of climate change in the form of changing weather patterns have exacerbated the problem.

- 1. Can governmental subsidies and incentives play a positive role?*
- 2. How can value added processing at community levels be encouraged and enabled?*
- 3. At the community level, what is being done to assess knowledge on water management especially as increased droughts are an expected part of the climate change phenomenon?*
- 4. What is the feasibility of tanks and cisterns for water capture and storage, alternative energy (solar heating).*

5. *Climate Variability*

Much needs to be researched on micro-climate patterns, their variability and impacts on water resources planning, agricultural planning, relevant infrastructure, among others.

The access to information needs to be streamlined for communities: what are the models? What are the topographical surveys relevant to certain communities? Risks assessments and potential measures need to be brought earlier into community discussions.

Specific research questions in the communities under focus:

Mocho

- Agriculture has been modified already, over recent years. However there are many more alternative farming methods to be explored, such as Greenhouse Farming.
- There are additional vulnerability and capacity assessments to be done within the community
- There is a need for training and capacity building programmes around disaster mitigation: training in First Aid and Search and Rescue Techniques; climate and disaster management (infrastructure, retaining walls, etc)
- The question “Has bauxite mining contributed to Mocho’s vulnerability to climate change?” remains controversial and should be researched further.
- Community organizational development is a great need (technical expertise, funding, and strategic partnerships) to help it meet its adaptation needs

Portland Cottage

- Alternative livelihoods – since fish stocks are declining, what are the options?
- Regarding small farmers, there is much research needed on adaptation options
- Best practices regarding reforestation and mangrove replanting
- Explore community warning systems for hurricanes and rainy weather. For people in this area knowing the gradation of expected rainfall is important
- What are the options for alternative energy supply for communities?
- Relocation and migration to other places should be considered as one of the adaptation strategy for Climate Change response. There are many very vulnerable areas and likely the entire community could be cut off permanently by rising sea levels.

- Change cultural practices – Parrot fish is overfished, and this species play an important role in cleaning the reefs. But people like their taste. If fishermen change to line fishing they will catch different species of fish. Sustainable fishing techniques need to be researched and more effective enforcement.

SECTION 4: EXISTING METHODOLOGICAL TOOLS

Main Initiatives for Research regarding Adaptation

Water

Caribbean Water Initiative (CARIWIN):

CARIWIN is a project on Integrated Water Resources Management (IWRM) in the Caribbean. Government agencies from three partner countries - Grenada, Guyana and Jamaica - collaborate closely with the CIMH and Brace, to help achieve the overarching goals of poverty reduction and gender equality through a process of institutional capacity building in integrated water management.

For more information <http://www.mcgill.ca/cariwin>

Desalination Plants

Respond to Water Crisis in the Caribbean by constructing desalination plants. Countries such as Antigua and Barbuda, Barbados and Curacao

For more information on the Desalination Plants

Antigua and Barbuda:

Barbados: <http://www.water-technology.net/projects/barbados/>

Curacao:

Water Recycling

Many hotels are recycling and reusing grey water for other activities (water for golf course) for example:

Casuarina Beach Club in Barbados - <http://www.casuarina.com/>

Hilton Hotel in Tobago - <http://www.hilton.com>

Water Harvesting

Efforts are being made by some countries to harness the rain-fed water to use in various sectors.

For example: Barbados (have ponds to collect rainwater), Guyana has a water system which uses surface flow water trapped in its conservancy and purify for public consumption.

Other water harvesting related projects for example

- Caribbean Environment Health Institute has rainwater harvest project

- For information <http://www.cehi.org.lc/rainwaterharvest.htm>
- Food and Agriculture Organization
For more information <http://www.fao.org/ag/agL/aglw/wharv.htm>

Water Conservation

To respond to food security there are some initiatives such as drip irrigation project by CARICOM .For more information www.caricom.org

Agriculture

Harnessing traditional knowledge of Agricultural Practices to inform Adaptive Strategies

Indigenous people in Guyana and also some small scale farmers use traditional farming techniques which are harnessed to some extent to adapt to the effects of Climate change.

Scenarios Models for Food Security

Some scenarios were outlined for the Caribbean in the GECAFS project. For more information: <http://www.gecafs.org/>

Pilot Studies in Guyana (MACC): For more information: www.caribbeanclimate.bz

GECAFS Caribbean research framework & prototype scenarios:

http://www.gecafs.org/publications/Publications/GECAFS_Report_2_Caribbean_Scenarios.pdf

CIMH Climatological products: www.cimh.edu.bb

Instituto de Meteorologia de la Republica de Cuba (INSMET) : www.met.inf.cu/

Health

Climate Change and Health

CEHI has been working on a project aimed at formulating Adaptation Strategies to Protect Human Health. For more information <http://www.cehi.org.lc/cch.htm>

Main Initiatives for Research regarding Mitigation

Energy

*Alternative/ Renewable Energy Usage**

- CARICOM Renewable Energy Development Programme (CREDP) is an initiative for the CARICOM member countries to explore the use of renewable forms of renewable energy.

For more information: www.caricom.org/jsp/projects/credp.jsp?menu=projects.

- Organization of American States along with partners in the region has formulated the Renewable Energy and Energy Efficiency Partnership (REEEP) initiative. REEEP is a global public-private partnership that

structures policy and regulatory initiatives for clean energy, and facilitates financing for energy projects.

For more information:

http://www.portofentry.com/site/root/resources/industry_news/5042.html

*Carbon Sequestration**

Work is being done by Petrotrin investigating carbon dioxide injection in oil reservoirs:

For more information: www.petrotrin.org

Guyana pursuing carbon sequestration projects: For more information on the initiative by

Iwokrama: www.iwokrama.org/DWsite/Carbon%20Storage.html

* Still not widespread

Solar Water Heating/ Photovoltaic in Barbados

Barbados utilizes this technology in many homes and businesses.

Cogeneration

Guyana and Belize

For more information: Mr. Navin Chandarpal

Advisor to the President on Sustainable Development

Office of the President

New Garden Street, Georgetown, Guyana

Phone: (592) 223- 5233; Fax (592) 223 5186

Email: navinc51@yhoo.com

Wind Farm

Jamaica and Netherland Antilles: These two countries are exploring the use of wind farms for energy generation.

Geothermal

The island of Nevis commenced drilling its hot springs for the construction of a geothermal power plant at Spring Hill, Nevis, in January 2008. It is projected completion is 2010, the plant is expected to supply 50 megawatts of electricity, enough to fulfill all of Nevis' demand (approximately 10 megawatts), and also enough to export to Saint Kitts as well as other nearby islands via submarine cables. The project, being undertaken by West Indies Power, will make Saint Kitts and Nevis the first country in the Caribbean to utilize large-scale Geothermal energy, and, when complete, will make Saint Kitts and Nevis one of the least dependent nations in the world on fossil-fuels.

For more information

http://www.caribbeannetnews.com/stkitts/stkitts.php?news_id=5613&start=0&category_id=35

Initiative to power vehicles with natural gas in Barbados

This is an initiative by the Barbados Light and Power Company to use compressed gas to power buses in the public transport sector. For more information

Website: <http://www.blpc.com.bb>

Harnessing Hydro for Electricity Generation

The following countries Belize, Suriname, Dominica, Guyana, St. Vincent

These countries have functioning projects where they use water resources for electricity generation.

Biodiesel

This is an initiative by Institute of Applied Science and Technology (IAST, Guyana) to produce biodiesel for use. For more information: www.iast.org.gy

Ethanol

The Jamaica Broilers Group, Jamaica's largest commercial poultry producer, is investing over \$1 billion in a fuel ethanol dehydration plant.

For more information

Website: <http://www.jamaicabroilersgroup.com/>

Caribbean Green Globe 21 Certification

Hotels in the Caribbean are streamlining hotel operations to minimize resource waste. For more information, including Caribbean businesses that are certified under this scheme and those benchmarked for certification: <http://www.greenglobeglobal.com>

Main Initiatives for Research regarding Dissemination of Information

Water

Institute of Meteorological de la Republic de Cuba (INSMET)

INSMET conducts research on meteorological studies/modelling in the region. For more information <http://www.insmet.cu/asp/genesis.asp>

Agriculture

Impact of Climate Change on Agriculture

A study was conducted in Guyana within the Mainstreaming Adaptation to climate change (MACC) initiative in collaboration with The Guyana Sugar Corporation. This study investigates the impacts arising from the effects of Climate change on Guyana's sugar sector.

For more information www.caribbeanclimate.bz ; Dr. Neville Trotz, email utrotz@yahoo.com

and www.guysuco.com ;Dr. Harold Davis email haroldd@guysuco.com

Mainstreaming Adaptation to Climate Change with the implementation of the Vulnerability and Capacity Assessment (VCA).

This project was undertaken by MACC and is cross sectoral (considers water, tourism). For more information: For more information www.caribbeanclimate.bz ; Dr. Neville Trotz, email utrotz@yahoo.com

Health

Vector-borne diseases (An Assessment of Impacts and Adaptation to climate Change –AIACC Project)

AIACC study which examines climate Change Impact on Dengue in the Caribbean.
Published information: Climate Change Impact on Dengue: The Caribbean Experience
Edited A. Chen, D. Chadee and S. Rawlins. Climate Change Group and International Start Secretariat.

For more information on this study: contact authors

Dave Chadee, email dave.chadee@sta.uwi.edu

Sam Rawlins, email rawlinsaiacc@wow.net

Anthony Chen email anthony.chen@uwimona.edu.jm

UWI Climate Study Group: www.aiaccproject.org

CAREC: www.carec.org

For Presentation

http://www.aiaccproject.org/meetings/SanJose_03/Session6/Session6_AAmarakoon.ppt

UWI and CAREC

Respiratory Diseases (asthma)

For more information on this study: contact

UWI Climate Study Group: www.aiaccproject.org

CAREC: www.carec.org

Temperature and Ultra Violet radiation (heat stresses –illnesses, lesions, cancers etc

For more information on this study:

UWI Climate Study Group: www.aiaccproject.org

CAREC: www.carec.org

Climate Indices Related to Respiratory Diseases

Work done by Instituto de Meteorologia de la republic de Cuba (INSMET)

Website: www.met.inf.cu

Sahara Dust

Research ongoing by UWI St Augustine

For more information: <http://sta.uwi.edu/uwitoday/2005/may/shrdust.asp>

Dr. John Agard email johnagard@yahoo.com

Biodiversity

Identifying Data Gaps and Research needs- Biodiversity and Climate Change

Study being conducted by CANARI. For more information www.canari.org

Research regarding Protected Areas

Work being done by the following

OPAAL (OECS): For more information <http://www.oecs.org/esdu/opaal-docs.html>

UWI: for more information www.cermes.cavehill.uwi.edu

CANARI/McArthur: For more information www.canari.org

Hochan Marine Reserve Belize: For more information: <http://ambergriscaye.com/holchan/>

Iwokrama initiative: For more information www.iwokrama.org

St Lucia Soufriere Marine Park: For more information: www.canari.org/285smma.pdf

Tobago Cays Marine Park in St Vincent and Grenadines – www.tobagocays.com/index.html

Energy

Geothermal

EU is funding a project in Guadeloupe, Martinique, St. Lucia and Dominica into the generation of geo-thermal energy for electricity generation and also linking the electricity grids.

Methanol

There is also a joint research project between Methanol Holdings Trinidad Ltd. And University of Trinidad and Tobago on the use of methanol to generate power. This is currently in the pilot phase. For more information: www.ttmethanol.com

Wind Farms

Guadeloupe is also conducting research into the use of wind farms for the hurricane prone areas. For more information: see article published in **Renewable Energy** Journal Volume 24, Issues 3-4, November 2001, Pages 439-444; titled Wind Energy development in the Caribbean.

Compressed Gas

The Ministry of Energy in Trinidad and Tobago is conducting research to update compressed natural gas (CNG/ in the transport sector. For more information: see report by Deshpande and Economides at <http://www.spegcs.org/attachments/studygroups/6/CNG->

[An Alternative Transport for Natural Gas.pdf](#) and also the Ministry of Energy and Energy Industries at <http://www.energy.gov.tt>

- An overview of the alternative energy as compiled by CARICOM “Alternative Sources of Energy and Effective Implementation Policy” Roland Clarke, Ph. D. Project Manager, CREDP, CARICOM Secretariat, Tel: 592 220 0002 ext. 2631, rclarke@caricom.org
- There is also some Caribbean Projects within the Global Sustainable Energy Islands Initiative:
For more information:
http://www.cru.uea.ac.uk/tiempo/newswatch/xp_feature041219.htm

Academic Training

UWI through CERMES at Cave Hill Campus in Barbados currently offers a Masters of Science Degree in climate change: For more information: www.cavehill.uwi.edu/cermes

Other

Disaster Management

Climate Modelling (dissemination)

The University of the West Indies is conducting climate change related modeling which is lead by Dr. John Charlery and Dr. Taylor. For more information: www.uwi.edu.bb

Business

*Carbon Sequestration**

Work is being done by Petrotrin looking at carbon dioxide in oil reservoirs:
For more information: www.petrotrin.org

Guyana has being pursuing carbon sequestration projects: For more information on the initiative by Iwokrama: www.iwokrama.org/DWsite/Carbon%20Storage.html

Solar Water Heating/ Photovoltaic in Barbados

Cogeneration in Guyana and Belize

Wind Farms in Jamaica and Netherland Antilles

SECTION 5: AGENCIES AND RESOURCE PERSONNEL

Water

- Caribbean Water Partnership

Paul Hinds, Regional Coordinator
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43-45 Woodford Street
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Trinidad,
Tel: (868) 622 3117; Fax (868) 622 1589
Website: www.gwp-caribbean.org
Email: phinds@gwp-caribbean.org

- Caribbean Water and Wastewater Association

Caribbean Water and Wastewater Association (CWWA)
c/o Water and Sewerage Authority
Farm Rd, St Joseph
Trinidad, W.I.
Tel/Fax: 868-645-7849; Tel: 868-662-2302-7 Ext. 3747, 868-645-8681
E-mail: cwwa@carib-link.net

- Caribbean Basin Water Management Programme Inc

<http://www.cbwmp.org/about.htm>

- Caribbean Environmental Health Institute

Ms. Patricia Aquing
Caribbean Environmental Health Institute
The Morne, P.O. Box 1111, Castries, St. Lucia, WI
Telephone:(758) 452-2501/21412; Fax: (758) 453-2721
E-mail: cehi@candw.lc

- United Nations Environmental Programme – Caribbean Environment Programme UNEP/CEP

Mr. Nelson Andrade Colmenares
14-20 Port Royal Street
Kingston, JAMAICA
Tel.: (876) 922-9267-9
Fax: (876) 922-9292
Website: www.unep-cep.org

E-mail: rcu@cep.unep.org

- Water Resources Authority of Jamaica

Basil Hernandez, Managing Director
Hope Gardens
P.O.Box 91, Kingston 7
Jamaica
Telephone: (868) 927 0077; Fax (868) 977 0179
Website: [www. http://www.wra.gov.jm](http://www.wra.gov.jm)
Email: commander@cwjamaica.com

- Water Institute of Trinidad and Tobago

ARELPLAZA
234, Eastern Main Road
Tunapuna
Trinidad, West Indies,
Phone/Fax: (868) 645-6202
Website: http://www.wasa.gov.tt/Witt_main.htm

- Caribbean Community Climate Change Center (CCCCC)

Dr. Ulric Trotz
2nd Floor, Lawrence Nicholas Building
Ring Road, P.O.Box 563
Belmopan, Belize
Telephone: (501) 822 1094
Website: www.caribbeanclimate.bz
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- Caribbean Natural Resources Institute (CANARI)

Sarah McIntosh
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Trinidad, W.I.Tel: 868-626-6062 Fax: 868-626-1788
Website: www.canari.org
Email: info@canari.org

- Caribbean Institute for Meteorology and Hydrology

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P.O. Box 130, Bridgetown
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Tel.: 246-425-1362/3/5
Fax: 246-424-4733
Website: <http://www.cimh.edu.bb>
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Agriculture

- Caribbean Agricultural Research Development Institute

Dr. Arlington Chesney
CARDI Headquarters
UWI Campus, St Augustine
Trinidad and Tobago
West Indies.
Tel: 868-645-1205; Fax: 1-868-645-1208
Website: www.cardi.org

- Food and Agricultural Organization

Dr. Lystra Fletcher-Paul
Integrated Natural Resources Management Officer
Food and Agriculture Organization
Barbados
Phone: (246) 426 7110
Email: lystra.fletcherpaul@fao.org

- Caribbean Community Climate Change Center

Dr. Ulric Trotz
2nd Floor, Lawrence Nicholas Building
Ring Road, P.O.Box 563
Belmopan, Belize
Telephone: (501) 822 1094
Website: www.caribbeanclimate.bz
Email: utrotz@yahoo.com

- Interamerican Institute for Cooperation on Agriculture

Website: <http://www.iica.int>
This site will provide contact information for country offices in the Caribbean.

- University of the West Indies - Faculty of Science and Agriculture

St Augustine Campus
Trinidad and Tobago
Phone: 662 -2002
Website: <http://sta.uwi.edu/fsa>

Email: fsa2@fsa.uwi.tt

- National Agricultural Research Institute

Dr. Oudho Homenauth

Director

Mon Repos

East Coast Demerara, Guyana

Phone: (592) 220 2049

Website: <http://www.sdn.org.gy/minagri/nari/index.htm>

Email: nari@networksgy.com

- Caribbean Institute for Meteorology and Hydrology

D. Farrell and A. Trotman

The Principal

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- Guyana Sugar Corporation

Dr. Harold Davis/ Mr. Ashley Adams

Guyana Sugar Corporation

Ogle Estate, East Coast Demerara, Guyana.

Tel: (592) 222-6030/41 Fax: (592) 222-6048

Website: www.guysuco.com

Email: haroldd@guysuco.com; aoadams@yahoo.com

- University of Guyana

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Phone: (592) 222 4180

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- Caribbean Epidemiology Centre (CAREC)

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- Caribbean Environmental Health Institute

Ms. Patricia Aquing

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Telephone:(758) 452-2501/21412; Fax: (758) 453-2721

Website: www.cehi.org.lc

E-mail: cehi@candw.lc

BIODIVERSITY

UNEP- RAC

- United Nations Environmental Programme – Caribbean Environment Programme UNEP/ Regional Activity Centre

Commodore Anthony Franklin

Director

Institute of Marine Affairs

P O Box 3160, Carenage

Trinidad

Tel: (809)-634-4291/4

Fax: (809)-634-4433

Website: www.ima.gov.tt

E-mail: director@ima.gov.tt

- University of West Indies

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Trinidad and Tobago
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Email: j_agard99@hotmail.com

- IWOKRAMA Rainforest Project

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Georgetown, Guyana
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Fax: (592) 225 – 9199
Website: www.iwokrama.org
Email: iwokrama-general@iwokrama.org

- Caribbean Natural Resources Institute

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Caribbean Natural Resources Institute
Fernandes Industrial Centre, Administrative Building, Eastern Main Road, Laventille,
Trinidad, W.I. Tel: 868-626-6062. Fax: 868-626-1788.
Website: www.canari.org
Email: info@canari.org

- Organization of Eastern Caribbean States

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Castries, St Lucia
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- Buccoo Reef Trust

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The Buccoo Reef Trust
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- Caribbean Environmental Health Institute

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- UWI/CERMES

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- World Wildlife Fund

Monica Echeverria
(Senior Communications Officer)
WWF United States,
Washington DC
Phone: (202) 778 9626; Fax (202) 2965348
Website: www.panda.org

- Conservation International

Contact information for country offices
Website www.conservation.org

- World Resource Institute

Dr. Janet Ranganathan
Director
10 G NE Suite 800 Washington, DC 20002, USA
Phone: (202) 729 7600; Fax: 202- 729 7610
Website: http://www.wri.org/ecosystems#project_tabs-2
Email: jaetr@wri.org

- IUCN

Regional Office for Mesoamerica Apartado postal: 146 - 2150
Moravia, Costa Rica
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Email: mesoamerica@iucn.org

- The Nature Conservancy

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ENERGY

- CARICOM Renewable Energy and Development Programme (CREDP)

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- The Caribbean Electric Utility Service Corporation (CARILEC)

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- Caribbean Energy Information System (CEIS)

Mona White
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Scientific Research Council

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Website: <http://www.comnet.mt/ceis/contact.htm>
Email: ceis@src-jamaica.org

- Petroleum Company of Trinidad and Tobago (PETROTRIN)

Mr. Kelvin Ramnath
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- Solar Dynamics

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- AquaSol

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Christ Church, Barbados
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Fax: (246) 428-1719
Web site: www.aquasolonline.com
Email:

- Network of NGO's in Trinidad and Tobago

Strongly advocate the use solar boxes to make to bake bread.

- IICA

Use of solar dryers for food preservation drying
Website: www.iica.org

- Institute of Applied Science and Technology (IAST)

Dr. Suresh Narine
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F. BUSINESS

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- Petroleum Company of Trinidad and Tobago (PETROTRIN)

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- Solar Dynamics

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- Caribbean Tourism Organization (CTO)

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- Caribbean Hotel Association

Alec Sanguinetti,
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Tel. 305-443-3040; Fax 305-443-3005
Website: www.caribbeanhotelassociation.com

- Caribbean Association of Insurance Companies

Mr. Keith Cholmondeley
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St. Michael, 11115, BARBADOS.
Telephone: (246) 427-5608/9; Fax: (246) 427-7277
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- Caribbean Association of Industry and Commerce

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Website: <http://www.caic.org.tt>
E-mail: info@caic.org.tt

DISASTER MANAGEMENT

- Instituto de Meteorologia de la Republica de Cuba
<http://www.insmet.cu>

- CARICOM Community Climate Change Center
Dr. Kenrick Leslie
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- Caribbean Disaster Emergency Response Agency
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- Caribbean Risk Management Initiative
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- CARICOM Regional Organisation for Standards and Quality CROSQ

"The Heritage" 35 Pine Road
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BARBADOS BB11113
Tel: 246.437.8146
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Email: crosq.caricom@crosq.org
Website: www.crosq.org

- Pan American Health Organisation (PAHO)

525 23rd St. N.W.
Washington, D.C. 20037, U.S.A
Phone: (202) 974-3000
Website: <http://www.paho.org/>

- Caribbean Development Bank

(Incorporating Natural Hazard Management in EIA)
Dr Gillian Cambers
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- Guyana Environment Protection Agency

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University of Guyana Campus
Guyana
Phone: (592) 222 2277 EXT 14/13
Website: [www. http://www.epaguyana.org/contacts.htm](http://www.epaguyana.org/contacts.htm)

- USAID

USAID in collaboration with the Organization of Eastern Caribbean States (OECS) developed a regional disaster risk management benchmarking tool (BTool) to improve national governments, civil society organizations and the private sector to proactively plan to

reduce vulnerability. The work is provided in a report titled “Disaster Risk Management Benchmarking Tool”. For more information: contact

Mr. Keith Nichols
OECS Environment and Sustainable Development Unit
The Morne
P O Box 1383
Castries, St Lucia
Phone: (758) 453- 6208; Fax 758) 452 2194
Website: www.oecs.org/esdu

Other

More information

Work done by the Climate Change Project in the Caribbean

http://www.un.org/esa/sustdev/natlinfo/indicators/idsd/workshops/workshop10-27-31/07_IDSD%20CC%20Adapt%20%20Activities.ppt

SECTION 6: A BIBLIOGRAPHY OF CLIMATE CHANGE LITERATURE

The work was done by Ms. Simone Dieffenthaler from The Cropper Foundation. This work comprised of a report and also the bibliography, the latter which can be accessed from the IDRC website (**to be inserted**). This compilation includes published and unpublished literature and the existing initiatives in the Caribbean sub-region.

Based on the compilation, there is a paucity of peer-reviewed, published literature on climate change in the Caribbean region. Overall, 41 journal articles were sourced, with the highest number being in the area of climate change and biodiversity. This is partly due to the large amount of research on coral reefs and coral reef bleaching events.

The grey literature (unpublished reports) was more extensive when compared to the referred articles. Most are reports on the outcome of conferences and workshops. Other works referenced are theses from UWI's MSc. in Climate Change.

Policy-related literature which exists on climate change in the Caribbean are mainly from the CPACC and MACC projects.

Studies and projects dealing with adaptation to climate change are mainly initiatives from CPACC and MACC. Other areas where reports exist are disaster mitigation, health, food security and agriculture and energy related studies such alternative energy initiatives and clean development mechanisms.

In terms of research and initiatives being carried out in different countries of the Caribbean, there seems to be a disparity, with some countries, such as Barbados and Guyana, having a higher number of climate change activities/projects in all areas when compared to other countries such as Cuba and Haiti.

Organization of Data for the Database

In total, 190 references were collected for this database. The database which has been built in RefWorks is not a source of full documents, only a reference to what exists on a particular topic or in a particular country. However, more than 50% of the references have been accessed in full by the consultant – this applies to mainly the published and unpublished literature, which is compiled on a CD and is available to the public⁴. This does not apply to initiatives, which generally have a website link leading to more information.

32 Folders have been created under various categories. A summary is provided below.

- climate change (hereon CC) and adaptation,
- CC and agriculture and food security,
- CC and biodiversity
- CC and business
- CC and coasts
- CC and disaster management
- CC and energy
- CC and health
- CC and meteorology
- CC and risk
- CC and water
- CC education
- CC general
- CC initiatives
- CC presentations
- CC journal articles
- Country Folders e.g

⁴ Contact Simone Dieffenthaller : sdieffen@thecropperfoundation.org or info@thecropperfoundation.org

- CC - Antigua and Barbuda

CONCLUSION

The information presented in this report identifies research needs, data gaps, successful initiatives and leaders working in climate change. In addition main research needs for vulnerable communities and a summary of existing information and studies on climate change in the Caribbean are presented. Overall the outcomes demonstrate that there are major research gaps in all the sectors and areas in the Caribbean subregion. Therefore, the need to fill these information lacunae is urgent in an effort to response to the present and emerging threats of climate change.

Not for Distribution

Appendix One: LIST OF PARTICIPANTS

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2.	Dr. Dave Chadee	University of the West Indies, St Augustine Campus, Trinidad & Tobago Phone: 662-2002 ext 3740 Email: Dave.chadee@sta.uwi.edu	
3.	Dr. John Agard	University of the West Indies, St Augustine Campus, Trinidad & Tobago Phone: (868) 777 0860 Email: johnagard@yahoo.com	
4.	Dr. Asha Kambon	UNECLAC, 1 Chancery Lane, Port of Spain, Trinidad & Tobago Phone: (868) 623-5595 ext 2300 Email: asha.kambon@eclac.org	Portfolio - Regional Adviser, UNECLAC, with responsibility for Disaster Risk Reduction (Macro Socio Economic Assessments) Interests – Coordination of the regional mechanism for our follow-up of the Mauritius Strategy
5.	Mr. Navin Chandarpal	Office of the President, New Garden Street, Georgetown, Guyana Phone: (592) 223 – 5233 Email: navinc@yahoo.com	
6.	Dr. Ulric Trotz	10 Altunha Street, Belmopan, Belize Phone: 501- 822- 1094/1104 Email: utrotz@yahoo.com	Portfolio – Science Adviser, Caribbean Community Climate Change Centre. Since 1997, has been involved in organizing regional efforts to build capacity to address climate change impacts.

	NAME	CONTACT INFORMATION	PROFESSIONAL PORTFOLIO AND INTEREST IN CLIMATE CHANGE
7.	Dr. Leslie Simpson	CARDI, UWI, Mona Campus, PO Box 113, Kingston 7, Jamaica Phone: (876) 927- 1231/0652 Email: cardiz@cwjamaica.com lesliesimpson@hotmail.com	Portfolio - Soil Scientist, CARDI, Jamaica unit Interest – mainstreaming climate change into agricultural research in the Caribbean for sustainable agricultural development and food security
8.	Dr. Dax Driver	South Trinidad Chamber of Commerce, PO Box 80, San Fernando, Trinidad & Tobago Phone: (868) 652 – 5613 Email: ceo@stcic.org	Portfolio: Chief Executive Officer of South Trinidad Chamber of Commerce. Coordinator of the Agriculture Sector Reform Programme in Trinidad and Tobago. Interests:
9.	Mr. Ottis Joslyn	Lowmans Hill, P. O. Box 2968 Kingstown, St Vincent and the Grenadines Phone: 784-532-9581 Email: ojoslyn@yahoo.com	Portfolio: Environmental consultant/activist – currently the National Project Coordinator for the Second National Communication Project to the UNFCCC Interests - advancing climate change into national development programmes and key productive sectors; formulation, adoption and implementation of the national Climate Change Adaptation Policy and Action Plan (NCCAPAP); use NCCAPAP to formulate a National Environmental policy and supportive legislation that provide cohesion for the existing fragmented environmental agreements and legislation.
10.	Mr. Reginald Burke	Caribbean Youth Environment Network, St Michael, Barbados Phone: (246) 437 – 6055 Email: reggieburke@hotmail.com	Portfolio: Interests:
11.	Ms. Angela Cropper	The Cropper Foundation, Building # 7, Fernandez Industrial Complex, Trinidad & Tobago Phone: 626 2628/2564 Email: acropper@thecropperfoundation.org	Portfolio: Interests:

NAME		CONTACT INFORMATION	PROFESSIONAL PORTFOLIO AND INTEREST IN CLIMATE CHANGE
12.	Dr Gillian Cambers	Caribbean Development Bank, P O Box 408 Barbados Phone: (246) 431- 1740 Email: camberg@caribank.org	Portfolio: Interests – Interested in the outcome of this workshop/meeting as to ongoing deliberations within the CDB - our policies for environmental sustainability, disaster risk management and climate change. These policies are currently being revised; also I am personally interested in how communities are adapting to climate change on the ground and how we can maximize on these adaptation and local knowledge.
13.	Dr Reynold Murray	UNDP Marine Gardens, Hastings, Barbados Phone: (246) 467 6014 Email: reynold.murray@undp.org	Portfolio: Interests:
14.	Mrs. Indi McLymont Lafayette	PANOS, Caribbean, 9 Westminster Rd. Kingston, Jamaica (876) 920 0070/1 Email: indi@panoscaribbean.org indidlk@yahoo.com	Portfolio: Multi-award winning journalist, over 10 years experience covering the environment, gender and health issues, passionate about communicating development issues for sustained societal change. Interests – boosting the role of communication on climate change – between sectors, from governments to communities and vice versa; also media coverage. Key interest is developing a regional communications framework for climate change in the Caribbean.
15.	Dr. Asha Singh	The Cropper Foundation, Building # 7, Fernandez Industrial Complex, Trinidad & Tobago Phone: 626 2628/2564 Email: asingh@thecropperfoundation.org	Portfolio: Consultant and researcher with a focus on sustainable management/governance of regional seas. Interests: what are the implications for the Caribbean sea in the context of climate change and sustainable management

NAME		CONTACT INFORMATION	PROFESSIONAL PORTFOLIO AND INTEREST IN CLIMATE CHANGE
16.	Ms Keisha Garcia	The Cropper Foundation, Building # 7, Fernandez Industrial Complex, Trinidad & Tobago Phone: 626 2628/2564 Email: kgarcia@thecropperfoundation.org	Portfolio: Interests:
17.	Ms. Simone Dieffenthaler	The Cropper Foundation, Building # 7, Fernandez Industrial Complex, Trinidad & Tobago Phone: 626 2628/2564 Email: sdieffen@thecropperfoundation.org	Portfolio: Interests:
18.	Mr. Winston Rudder	The Cropper Foundation, Building # 7, Fernandez Industrial Complex, Trinidad & Tobago Phone: 626 2628/2564 Email: wrudder@thecropperfoundation.org	Portfolio: Interests:
19.	Dr. Owen Day	Buccoo Reef Trust, Cowie's Building, Carnbee Junction, Tobago Phone: (868) 635 2000 Email: o.day@buccooreef.org	Portfolio: Director, Buccoo Reef Trust Interests – coastal impacts, coral reefs, fisheries. Currently producing 3 videos on climate change in the Caribbean
20.	Dr. Rachael Williams	University of Trinidad and Tobago, O'Meara Campus, UTT, Arima Phone: (868) 760- 6294 Email: rachaew@yahoo.com	Portfolio: Assistant Professor, UTT, Member of Cabinet appointed working group on climate change, helping to develop programs in Environmental Engineering and Science; Biometrician – Ministry of Agriculture (1990-1994); Statistical Consultant – IMA, UWI (1990-1994) Interest:

NAME		CONTACT INFORMATION	PROFESSIONAL PORTFOLIO AND INTEREST IN CLIMATE CHANGE
21.	Ms. Marion Alleyne	FAO/UN, Port of Spain, Trinidad Phone: (868) 625-0467 Email: marion.alleyne@fao.org.tt	Portfolio: Education in comparative development and international policies; experience in agriculture programme development and implementation. Interests – The effect of climate change on food security
22.	Ms. Yolanda Kakabadse	Fundacion Futuro Latinoamericano,Ecuador	
23.	Ms. Gabriela Encalada	Fundacion Futuro Latinoamericano Ecuador	
24.	Dr. Lystera Fletcher Paul	FAO, PO Box 631-C, Bridgetwon,Barbados Phone: (246) 426 7110 Email: lystra.fletcherpaul@fao.org	Portfolio: Integrated Development Officer Interests – the effect of climate change on food producers and what mitigation and adaptation measures they could take; land and water issues related to climate change.
25.	Mr. Adrian Trotman	Caribbean Institute for Meteorology and Hydrology P.O. Box 130, Bridgetown BARBADOS. Phone: (246) 425 – 1362/3 Email: atrotman@cimh.edu.bb	Portfolio: Programme Officer Interests – economic analysis of climate change by productive sector
26.	Dr. Marco Rondon	Canada	Portfolio: Interests:

NAME		CONTACT INFORMATION	PROFESSIONAL PORTFOLIO AND INTEREST IN CLIMATE CHANGE
27.	Ms. Sarah George	OECS Environment and Sustainable Development Unit The Morne, P O Box 1383 Castries, St Lucia Phone: (758) 455 6365/3 Email: sgeorge@oece.org	Portfolio: Experience in fisheries management. Now work with the OECS Protected Areas and Associated Livelihoods (OPAAL) with the Environment and Sustainable Development Unit. Interests – seeing whether the region could better support and use protected areas to assist in adapting to climate change (forests as carbon sinks; reefs and mangroves as protective barriers). Also, we need to tailor our tools and mechanisms in climate change mitigation and adaptation to best address changing social reality with our region (youth strongly influenced by global trends; higher turnover and loss of human resources)
28.	Ms. Saudia Rahat	CDERA, Building # 1 Manor Lodge, Lodge Hill, Barbados Phone: (246) 825- 4577/425-0386 Email: saudia.rahat@cedera.org	Portfolio: CDM Programme Officer, CDERA Interests: networking with regional experts/stakeholders working in climate change through various sectors. The deliberations of the 2 day session will be useful towards comprehensive disaster management programming at the regional level
29.	Ms. Beverly Reynolds	CARICOM Secretariat, Turkeyen, Guyana Tel: (592) 222 0001 ext 2709 Email: breynolds@caricom.org	Portfolio: CARICOM Programme Manager, Sustainable Development Unit; MSc Development Studies with over 30 years experience in health and education sectors at national and regional levels. Interests: Impact of climate change on health. Vulnerable groups, poverty with a view to facilitating capacity building and the establishment of a policy framework to mitigate the negative impacts.

NAME		CONTACT INFORMATION	PROFESSIONAL PORTFOLIO AND INTEREST IN CLIMATE CHANGE
30.	Mr. Ashley Adams	58 Huges Street, Golden Grove, East Coast Demerara, Guyana Phone: (592) 220 3033; 643-3787 Email: aosadams@yahoo.com ashleya@guysuco.com	Portfolio: Agronomist with The Guyana Sugar Corporation Interest – Furthering research on the effects of climate change on agriculture in Guyana and the Caribbean
31.	Dr. Howard Nelson	Ministry of Planning, Housing and the Environment, Port of Spain Phone: (868) 788 5291 Email: howien@hotmail.com	Portfolio: Interests:
32.	Mr. Kishan Kumarsingh	Environmental Management Authority, 8 Elizabeth St. Clair, Port of Spain Phone: (868) 628-8042 ext 2257 Email: kkumarsingh@ema.co.tt	Portfolio: Responsible for National Communication process for T&T; approximately 10 years involvement in UNFCCC process; past Vice-Chair and Chair of expert group on technology transfer under the UNFCCC as well as past Chair of Subsidiary Body for Scientific and Technological Advice to UNFCCC Interests – Technology application for mitigation and adaptation; Promoting research in private, public and academia to inform climate change policy.

Appendix 2: Programme

DAY 1 - Thursday 24th

Morning 08:30 to 12:30

Welcome Remarks

President of The Cropper Foundation, *Mr. Winston Rudder*

Remarks

An Official of the Ministry of Planning, Housing and the Environment

Remarks

Fundación Futuro Latinoamericano (FFLA), *Mrs. Yolanda Kakabadse*

Presentation

Overview of the IDRC / DFID's Climate Change Project in Latin America and the Caribbean (LAC), *Dr. Marco Rondon*

Introduction of Participants

Presentation

Current Vision of Climate Change in LAC, *Dr. Sergio Saldaña*

Break

Presentation

IPCC Findings regarding the Caribbean, *Dr. John Agard*

Presentation

Climate Change in the context of the Caribbean, *Dr. Ulric Trotz*

Discussion

Remarks

Outlines of format for the working groups

Lunch

Afternoon 2:30 to 6:00

Working Groups discussions

Break

Plenary Discussions

Closure of Day One

DAY 2 - Friday 25th

Morning 8:30 to 12:30

Opening of Day Two and Outline of the Program
Brief Summary of the main topics discussed on Day One
Discussion

Break

Working Groups (inter-sectoral)
Plenary Discussion on the Priorities for Research
Lunch

Afternoon 2:30 to 6:00

Presenting the Research Priorities of the Region
Beyond this consultation - *Dr. Marco Rondon*
Closing remarks - *Mrs. Yolanda Kakabadse*

Appendix 3: Thematic Areas and Contributors

Working Groups Day 1

Group 1: Climate Change and Biodiversity (including vulnerable ecosystem), Agriculture, Physical Environment

Name

Dr. John Agard

Dr. Lystra Fletcher-Paul

Dr. Leslie Simpson

Dr. Asha Singh

Dr. Ulric Trotz

Mr. Adrian Trotman

Dr. Owen Day

Dr. Rachael Williams

Ms. Marion Alleyne

Mr. Ashley Adams

Group 2: Climate Change and Health, Poverty, Water, Vulnerable Communities

Name

Mr. Reginald Burke

Dr. Gillian Cambers

Dr. Dave Chadee

Ms. Keisha Garcia

Mr. Ottis Jocelyn

Mrs. Indi McLymont- Lafayette

Dr. Reynold Murray

Dr. Sam Rawlins

Group 3: Climate Change and Governance, Policy and Development Planning, Disaster Preparedness, Business, Energy

Name

Mrs. Angela Cropper

Mr. Navin Chandarpal (*Proposed Chairman*)

Mr. Dax Driver

Dr. Asha Kambon

Ms. Sarah George

Ms. Saudia Rahat

Ms. Beverly Reynolds

Working Groups Day 1 (Intersectoral)

Group 1

Name

Dr. John Agard
Dr. Lystra Fletcher-Paul
Dr Dave Chadee
Ms. Beverly Reynolds
Ms. Keisha Garcia
Mr. Dax Driver
Dr. Rachael Williams
Ms. Saudia Rahat

Group 2:

Name

Mr. Reginald Burke
Dr. Gillian Cambers
Mr. Adrian Trotman
Ms. Sarah George
Dr. Ulric Trotz
Mr. Navin Chandarpal
Dr. Owen Day
Dr. Sam Rawlins
Dr. Leslie Simpson

Group 3:

Name

Mr. Ashley Adams
Mrs. Angela Cropper
Mrs. Indi McLymont- Lafayette
Ms. Marion Alleyne
Dr. Asha Kambon
Mr Ottis Jocelyn
Dr. Asha Singh
Dr. Reynold Murray

Appendix 4

Report on the Vulnerable Communities

By Panos

Not for Distribution

Appendix 5:

**ASSEMBLING A BIBLIOGRAPHY OF CLIMATE
CHANGE LITERATURE**

By Simone Dieffenthaler

Not for Distribution