

briefing note

CARIBSAVE Climate Change Risk Atlas (CCCRA)

February 2012

A practical evidence-based approach to building resilience and capacity to address the challenges of climate change in the Caribbean

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Climate change is a serious and substantial threat to the economies of Caribbean nations, the livelihoods of communities and environments and infrastructure across the region. The CARIBSAVE Climate Change Risk Atlas (CCCRA), Phase I, provides response strategies to build capacity, reduce vulnerability and enhance resilience in 15 countries across the Caribbean. It is evidence based, inter-sectoral and examines climate change risks, vulnerabilities and adaptive capacities.

The Risk Atlas provides robust and meaningful new work on the key sectors and focal areas of Community Livelihoods, Gender, Poverty and Development; Agriculture and Food security; Energy; Water Quality and Availability; Sea Level Rise and Storm Surge Impacts on Coastal Infrastructure and Settlements; Comprehensive Disaster Management; Human Health; and Marine and Terrestrial Biodiversity and Fisheries. This work was conducted through the lens of the tourism sector; the most significant socio-economic sector to the livelihoods, national economies and environments of the Caribbean and its people.

SELECTED POLICY POINTS

- Regional Climate Models, downscaled to the national level in the Risk Atlas, have provided projections for Caribbean Small Island Developing States (SIDS) and coastal states with enough confidence to support decision-making for immediate adaptive action.
- Planned adaptation must be an absolute priority. New science and observations should be incorporated into existing sustainable development efforts.
- Economic investment and livelihoods, particularly those related to tourism in the coastal zone of Caribbean countries are at risk from sea level rise and storm surge impacts. These risks can encourage innovative alternatives to the way of doing business and mainstreaming of disaster risk reduction across many areas of policy and practice.
- Climate change adaptation will come at a cost but the financial and human costs of inaction will be much greater.
- Tourism is the main economic driver in the Caribbean. Primary and secondary climate change impacts on this sector must both be considered seriously. Climate change is affecting related sectors such as health, agriculture, biodiversity and water resources that in turn impact on tourism resources and revenue in ways that are comparable to direct impacts on tourism alone.
- Continued learning is a necessary part of adaptation and building resilience and capacity and there are many areas in which action can and must be taken immediately.
- Learning from past experiences and applying new knowledge is essential in order to avoid maladaptation and further losses.

The Risk Atlas, funded by the UK Department for International Development (DFID/UKaid) and the Australian Agency for International Development (AusAID), was carried out by The CARIBSAVE Partnership in collaboration and coordination with regional, public, private and community stakeholders across the Caribbean. Phase I of the CCCRA worked with the countries of Anguilla, Antigua & Barbuda, The Bahamas, Barbados, Belize, Dominica, The Dominican Republic, Grenada, Jamaica, Nevis, Saint Lucia, St. Kitts, St. Vincent & the Grenadines, Suriname and the Turks & Caicos Islands.

The Risk Atlas has increased the awareness, understanding and capacity of multi-sectoral stakeholders to address the impacts of climate change. It is integral to practical and effective planning for sustainable development and socio-economic resilience in a changing climate. Over two hundred meetings, workshops, and discussions have been held with national, local and regional stakeholders across the Caribbean. This important work is useable by all stakeholders from every sector. CARIBSAVE representatives have also been involved in a wide range of regional and national dialogues disseminating the results and outcomes of the CCCRA.

Detailed climate modelling projections were conducted for each country by renowned regional and international climate scientists; physical vulnerabilities and impacts were analysed by sector and focal area along with socio-economic impacts; adaptive capacities of nations and stakeholders; and sectors were assessed and documented. This culminated in practical, effective strategies for implementation, devised in collaboration with decision-makers and local, national and regional stakeholders. The information from each stage of the program has been shared with the key ministries and policy-makers in each country, highlighting the fact that climate change impacts are not only environmental but are also economic, social, physical and financial.

Governments, private sector and communities have contributed greatly to the detail and depth of analyses and worked to ensure the practical, evidence-based nature of the Risk Atlas. Excellent feedback has also been received on a sectoral-basis. The cross-cutting areas of sea level rise (SLR)



Figure 3: Map of sea level rise impacts generated from coastal survey field work in Portland Parish, Jamaica

modelling and assessment of the vulnerability of community livelihoods to climate change were of particular interest and relevance to many of the stakeholders. Both of these focal areas include extensive primary work that addresses the gap between science and local experiences of climate-related impacts in the Caribbean; and the community work provides the evidence-base for how gender roles and relative socio-economic status in pre-disaster situations affect responses to climate-related impacts, vulnerability and capacity to adapt.

An additional strength of the Risk Atlas is that the 15 profiles (250+ pages each) provide data and results to enable meaningful and unique comparative analysis across 15 nations and numerous study sites across the Caribbean. This is not only of significant benefit to the Caribbean, enabling greater understanding, lesson learning and capacity building for the region, but also to other small island and developing states around the world.

Within the methodological framework numerous detailed approaches were used to gather and analyse data from the variety of sectors. This included the evaluation of the vulnerability of coastal infrastructure and beaches to sea level rise (SLR) and storm surge at key sites in fourteen of the countries. The sites were surveyed using a Global Positioning System (GPS) and research grade Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER). Global Digital Elevation Model (GDEM) data sets were integrated into a Geographic Information System (GIS) and 1 m and 2 m SLR scenarios and beach erosion scenarios of 50 m and 100 m were calculated to assess the potential risks to major

tourism resources working hand-in-hand with the agencies responsible for coastal zone management in each country.

As well as working closely with governments, national agencies and the private sector the Risk Atlas team worked directly with communities in all of the countries. The extensive primary work conducted with communities was fundamental to bridging the gap between science and local experiences of climate-related impacts, vulnerability mapping, focus-groups and household surveys which were developed

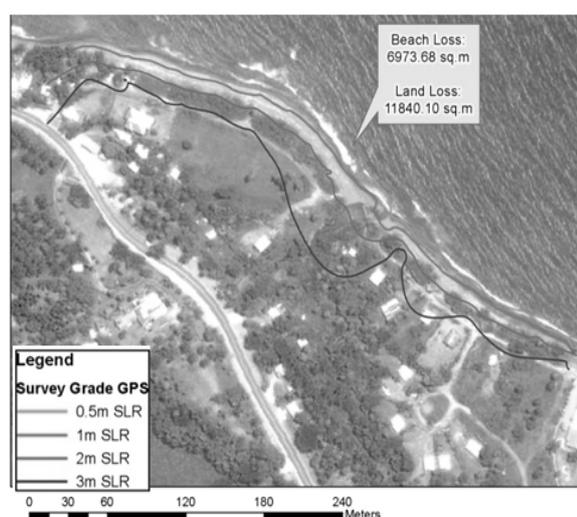


Figure 2: Map of sea level rise impacts generated from coastal survey field work in Portland Parish, Jamaica

according to a sustainable livelihoods approach. This work provided an understanding of how the main tourism-related activities, including fishing and other micro- and medium- sized commercial activities located along the coast and have been affected by climate-related events; the community's adaptive capacity and the complex factors that influence their livelihood choices; and the differences in the vulnerability of men and women. The work enabled the collaborative development of adaptation interventions that are needed for communities. Care was taken to ensure that strategies address poverty issues, take gender roles and perspectives into consideration, avoid maladaptation and are designed to break the poverty-vulnerability cycle.

Energy was one of the core sectors analysed as part of the Risk Atlas; it is known that Caribbean countries, as a group, contribute only small amounts to global greenhouse gas emissions, however, seven of the fifteen countries still generate 100% of their electricity from fossil fuels. It is clear from the work conducted that the Caribbean needs to join in the effort to mitigate as much as the region needs to adapt. Belize and Dominica produce more than 30% of electricity from renewable energy (mainly hydro) and Suriname produces 95% of its electricity from hydro. In fact, the two responses (mitigation and adaptation) should be addressed in tandem, since reducing dependency on imported fossil fuels makes sound economic and ecological sense for many reasons, including:

1. Funds that are now used to purchase fuel could be reallocated to other national priorities, such as adaptation.
2. Low carbon, energy efficient and environmentally friendly development, especially in the tourism sector, is attractive to tourists.
3. The development of 'green economies' provides opportunities for economic development, employment and increased competitiveness.
4. Climate-related events can disrupt fuel supply in ways that can be avoided by the use of indigenous resources.
5. Renewable energy and energy efficiency measures contribute to emissions reductions that cause climate change in the first place.

A further very important aspect of the CCCRA is the democratisation of climate change science. This was conducted through targeted awareness, tools (e.g. data visualisation, GIS imagery, animated projections and short films), and participatory approaches (workshops and vulnerability mapping) to improve stakeholder knowledge and understanding of what climate change means for them. Three short films, in high-definition format of broadcast quality, are some of the key outputs and focus on Climate Change and -Tourism; -Caribbean Fish Sanctuaries; and -Living Shorelines (www.youtube.com/Caribsav)

The Risk Atlas received strong stakeholder (public, private and community) support in all of the 15 countries, both those who had previously been engaged in climate change consultations and those who were relatively new to the challenges and issues of climate change. The programme was particularly welcomed because:

1. the CCCRA did not duplicate existing or planned work, but rather built on it and enhanced existing work;
2. the inter-sectoral research approach was unique, robust and very practical to national, regional and local development;
3. the scientific and methodological approach basis, a vital component, was thorough, evidence-based and proven; and
4. the objective of the CCCRA Phase 1 was to move beyond studies (“which just sit on a shelf”) and to actually develop and implement adaptation and mitigation projects to build capacity and enhance resilience.

Many of the countries have already started to incorporate results from the Risk Atlas into national planning initiatives and policies.

The Risk Atlas has produced pragmatic strategies for addressing climate change that are specific to individual countries and key sectors within each country, these can be found in the Full National Risk Profiles (www.caribsavet.org). The practical and evidence-based nature of the strategies and the fact that they have been developed in collaboration with the stakeholders in each country is important for the distinctive, effective and individual nature of the strategies. An additional strength of the strategies is that there are also some commonalities that have widespread significance across the region, listed in the box, right.

KEY PROGRAMME OUTCOMES

1. Pragmatic regional, national and local inter-sectoral profiling of climate change risks in 15 countries across the Caribbean through the lens of the largest socio-economic sector and main economic driver for nations, communities and livelihoods.
2. Cross-sectoral regional, national and community-based Evidence-Based Pragmatic Strategies
3. Energy analysis of largest economic sector
4. Bridging gaps between public, private sectors and communities in addressing climate change impacts
5. Data visualisation techniques and democratisation of science delivery to inter-sectoral stakeholders
6. Capacity building in a wide selection of ministries, academic institutions, communities and other stakeholders in the areas of:
 - climate modelling
 - gender and climate change
 - coastal management methods
 - community resilience
7. Meaningful cross-regional comparisons leading to identification of action, lesson learning and skills transfer
8. Created muscular platform for significant future work e.g. implementation plan; sea level rise; costing of impacts, losses and damages; protection of fish sanctuaries; support and increased resilience of the private sector and micro, small and medium enterprises (MSMEs)
9. Proven methodologies for vulnerability analysis and approaches for replication across other countries in the Caribbean, Central and Latin America and other regions around the world
10. Cross-ministerial and inter-sectoral approach to dealing with the largest socio-economic sector in the region

SOME CONSOLIDATED STRATEGIES

- Conduct cost-benefit analyses for sectors or specific vulnerable sites to support the case for adaptation action.
- Review and update databases of national assets and natural resources, including their economic value, to encourage conservation and sustainable practices
- Calculate losses and damages associated with climate change across sectors and nations
- Conduct assessments of water and energy infrastructure to ensure that they are adequate and appropriate for the efficient and sustainable distribution of resource supply and demand.
- Increase the efficiency of resource use by creating incentive mechanisms for those who reduce consumption and/or penalties for heavy resource use.
- Support a series of climate change workshops and pilot projects on relevant mitigation and adaptation activities (especially related to disaster risk reduction) for vulnerable communities.
- Implement pragmatic, 'no-regrets' and low risk adaptation measures at national and sub-national levels and support micro, small and medium enterprises in coastal communities.
- Develop national and sectoral action plans which take climate change into account.
- Review and revise legislation to ensure climate variability and change are explicitly addressed and use regulation and enforcement to stimulate adaptation and mitigation responses.
- Encourage proactive cooperation between government, public and private sector stakeholders in order to address current and future vulnerabilities to climate change.
- Increase data collection and monitoring programmes to ensure that all vulnerable groups are accounted for, and continue the assessment of direct and indirect impacts of climate change on socio-economic sectors and natural systems.
- Enhance awareness and knowledge through education and capacity building targeted to the specific needs of stakeholders to enable them manage their own risk levels and build resilience to climate related events.

Implementation of Key Projects and Strategies Identified and Derived from the Risk Atlas

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The strategy sections of the Risk Profiles for each of the individual countries, by definition, have been developed with the implementation of actions as the primary objective. CARIBSAVE is working with local, national and regional stakeholders to develop projects and implement the identified actions and strategies to build national capacity and use an evidence-based climate compatible development approach to enhanced resilience across the Caribbean.

Examples of this include the development and implementation of: **the Climate Change, Coastal Community Enterprises – Adaptation, Resilience and Knowledge (CCCCE-ARK) Project** being implemented in two communities in each of four Caribbean countries – The Bahamas, Barbados, Belize and Jamaica; **the Partnership for Canada-Caribbean Community Climate Change Adaptation (ParCA) Project** being implemented in partnership with the University of Waterloo, Canada over 5 years conducting community-based vulnerability assessments at two learning sites in the Caribbean (one in Tobago and one in Jamaica); **the Caribbean Fish Sanctuaries Partnership Initiative (C-Fish)** working in collaboration with regional, national and local stakeholders to build resilience to climate change and improve the sustainability of livelihoods in coastal communities; the managing of a Caribbean **Climate and Development Research Call** with CDKN providing resources for research across the region; and the **Global Islands Vulnerability Research for Adaptation Policy and Development (GIVRAPD) Project** designed to integrate scientific and local knowledge from comparative learning sites in the Caribbean (Jamaica and Saint Lucia) and the Indian Ocean (Mauritius and the Seychelles) by using a common community-based vulnerability assessment (CBVA) framework.

Other national and regional strategic projects, prioritised for action and flowing directly from the work conducted in Phase I of the Risk Atlas, have been developed and are being implemented in collaboration with national governments and more are being planned for the future. The Risk Atlas continues to build capacity, enhance resilience and provide evidence-based planning, understanding and practical strategies to national governments, communities and the private sector. Plans for Phases II and III of the Risk Atlas and key regional, national and local programmes are underway to continue this pragmatic and valuable work, and to build capacity in order to protect and enhance the livelihoods, environments and economies of the Caribbean.

Author

The CARIBSAVE Partnership is an independent not-for-profit company based in the Caribbean with its regional headquarters in Barbados. CARIBSAVE works with regional, local and international stakeholders to address the impacts and challenges surrounding climate change, the environment, economic development and community livelihoods across the Caribbean Basin, using an integrated and holistic approach. Working with governments, communities, universities and the private sector CARIBSAVE is providing practical strategies, and implementing capacity building and skills transfer activities across the region for pro-poor and national economic development in the Caribbean in an era of economic restructuring and global environmental change.

CARIBSAVE believes in the power of working together and building capacity. The organisation prides itself on establishing and growing collaborative and productive relationships with regional, international and local organisations, national governments, communities and the private sector. The combined efforts and initiatives to enhance and protect the environments, livelihoods and economies of the Caribbean and to share information and resources creates a critical mass which is fundamental to addressing the challenges of climate change on a sectoral basis. The Caribbean, like the world as a whole, requires a collaborative and partnership approach to comprehensively address and have a practical and positive impact on the issues of global warming.

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Download the PDF of this document, the Full National Risk Atlas Profiles, Technical Reports and Summary Documents at www.caribsave.org

The CARIBSAVE Partnership, Tel: + (1) 246 426 2042
Hastings House, Balmoral Gap, Email: admin@caribsave.org
Christ Church, Barbados Web: www.caribsave.org

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