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THE IMPACT OF CLIMATE CHANGE ON THE TOURISM INDUSTRY IN THE CARIBBEAN

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ABSTRACT

Purpose: This paper identifies and analyses risks associated with climate change globally and in the Caribbean region, and proposes strategies to mitigate those risks in the context of green attitudes and initiatives at all levels.

Design/methodology/approach: The study has been conducted by analysing various secondary sources, including the 2014 World Economic Forum (WEF) Global Risk Report, which identified climate change and other interrelated effects such as extreme weather events, food and water crisis as four of the top ten global economic risks.

Findings: The warming of the Earth's climate system is unequivocal with the last three decades, in particular, being successively warmer at the Earth's surface than any preceding decade since 1850. Also, global governance failure is identified as a top ten global economic risk, with food security, global health or poverty reduction being undermined by climate change.

Research limitations/implications: The increased risk of extreme weather such as the 2012 heat wave and Hurricane Sandy in the United States or Typhoon Haiyan in the Philippines in 2013, is a reminder of the economic and social impact this challenge poses and its potential to be a significant drag on global growth prospects.

Practical implications: The study contributes to an understanding of the importance of green initiatives and attitudes on the economic and social impact of climate change globally and in the Caribbean region. The results will help in the mitigating of these risks, thus impacting on climate change.

Originality/value: Despite increasing awareness, the world has failed to act in a timely manner with the pressing concerns of climate change. There is mounting recognition that governments industry, civil society, international organisations and individual citizens can benefit from wider support in the task of addressing climate change and building a greener, cleaner, more efficient and resilient global economy, by drawing on the combined innovation, resources and effort from across the public, private and civil society sectors and through mobilising large-scale, practical collaboration and alliances.

***Keywords*:** climate change; global warming; extreme weather; economic impact; social impact; green attitudes; green initiatives; mitigating risk; Caribbean region and climate change.

INTRODUCTION

Caribbean countries have many common characteristics that they share including social, economic and environmental challenges. One of the most growing concerns besides rapid urbanisation, energy insecurity, lack of infrastructural resources is the common issue of climate change.

The Caribbean countries have great concern for the changing climate that they face. As a result the CARICOM Heads of Government publically recognised this challenge by requesting the Caribbean Community Climate Change Centre (CCCCC) to prepare a Regional Framework for Achieving Development Resilient to Climate Change as well an implementation plan to secure the Caribbean from climate changes. The Regional Framework acknowledges the role risk management must play in future decision making.

It should be noted that the CARICOM countries contribution to greenhouse gas emissions is negligible according to a recent report of the Intergovernmental Panel on Climate Change (IPCC, 2013), but still CARICOM countries will be impacted due to global emissions. These effects would further be impacted due to their characteristics of being Small Island and low-lying coastal states.

Though Trinidad and Tobago accounts for only 0.1% towards global warming, the per capita emission is higher than other Caribbean islands, but considered negligible as compared to the rest of the world. The effects of climate change from accelerated rate of global warming, increase the concerns of natural disasters with extreme weather conditions resulting in flooding and water crisis. This makes the Caribbean region vulnerable to the effects of food scarcity and infrastructural damage which ultimately affects the economy as well as tourism. Caribbean as a whole is also vulnerable to climate change effects due to their inter-dependence on regional players and international markets. With the arctic having shrunk by 2.7% in winter and 7.4% in summer and a projected temperature increase by 1.1°C to 6.4°C (National Climate Change Policy, 2011). It is evident that the last decade has been the warmest and therefore it is necessary to review how climate change will affect the region.

The link between trade and transport is important to review as it the mode of transport that emits Greenhouse Gases (GHG). Goods can be transported by air, road, rail and water, or via pipelines in the case of oil. However, most international trade will involve more than one mode of transport. International trade involves emissions of GHG through the transportation of goods. However, most transportation is through maritime transport, which accounts for a relatively small share of the greenhouse gas emissions of the transport sector, and in terms of some indicators, is the most energy-efficient form of transport in terms of greenhouse gas emissions.

In this paper, we will explore the global outlook of climate change as well as in the Caribbean. The effects of agriculture, tourism and international trade will be examined to show how these three GDP contributors to Caribbean will be impacted by climate change. Due to the fact that businesses have a significant role to play in climate change in all aspects from emissions to mitigation and adaptation as well as influencing corporate strategies, it is important that this topic is reviewed. Therefore, a case study on strategies taken by Unilever, a multinational company, on its journey towards sustainability combating carbon emissions in its operations in which Caribbean local and regional businesses can benchmark is reviewed.

GLOBAL OUTLOOK ON CLIMATE CHANGE

The World Economic Forum (WEF) identified five drivers of global warming; economic, environmental, geopolitical, societal and technological. However, the top 10 risks anticipated

for the decade ahead are directly linked to the effects of climate change; fiscal crises in key economies, water and food crisis, failure of climate change mitigation and adaptation, extreme weather and global governance. These trends noticed among these risks are their interrelation and how the effects of climate change can be directly related to food and water crisis with the greater occurrence of extreme weather.

It is being increasingly recognised by scientific and business communities that climate change is drastically creating weather extremes and impetuous natural disasters. For example in 2012, there has been the worst drought in the US since 1956, the European heat wave in 2003 and the drought in East Africa in 2011 (WEF, 2013). Another painful reminder is the impact of Typhoon Haiyan which was devastating and it demonstrated the interconnectedness of poverty and environmental insecurity. It also shown other effects that not only there was tragic loss of lives, but it also affected the economy in respect of loss of jobs, incomes, livelihoods and people's descent back into poverty.

From the WEF Climate Change Report in 2014, it stated that the World Bank would require financing up to US$100 billion annually in climate adaptation in developing countries for the next 40 years. However, it requires assessment of where the risk is the greatest, the cost involved, making sure that the investment is targeted in the most effective way.

CLIMATE CHANGE BACKGROUND AND KYOTO PROTOCOL

Climate is strongly influenced by changes in the atmospheric concentrations of a number of gases which absorb infrared re-radiation from the Earth's surface. GHG are those which contribute to the greenhouse effect when present in the atmosphere. Six GHG are regulated by the Kyoto Protocol, as they are emitted in significant quantities by human activities and contribute to climate change. The six regulated gases are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6).

The Kyoto Protocol is an international agreement together with the United Nations Framework Convention on Climate Change (UNFCC), which commits countries by setting internationally binding emission reduction targets. It was adopted in Kyoto, Japan, on 11 December 1997 and became enforceable on 16 February 2005.

This Protocol is seen as an important step towards a truly global emission reduction regime and can provide the basis for future agreements on climate change.

Recognising that developed countries are principally responsible for the current high levels of GHG emissions in the atmosphere as a result of more than 150 years of industrial activity, the Protocol places a heavier burden on developed nations under the principle of 'common but differentiated responsibilities'.

There has been an amendment to the Kyoto Protocol on 8 December 2012, in Doha, Qatar, whereby the 'Doha Amendment to the Kyoto Protocol' was adopted. The amendment includes:

- New commitments for Annex I Parties from 1 January 2013 to 31 December 2020.
- A revised list of GHG to be reported on by Parties in the second commitment period.
- Amendments to several articles of the Kyoto Protocol which needed to be updated for the second commitment period.

In the first commitment period, 37 industrialised countries and the European Community committed to reduce GHG emissions to an average of 5% against 1990 levels. However, in the second commitment period, countries committed to reduce GHG emissions by at least 18% below 1990 levels in the eight-year period from 2013 to 2020. Important to note, is the fact that the countries differ from the first commitment period.

CLIMATE CHANGE IN THE CARIBBEAN

The countries in the Caribbean would be the most susceptible to climate change according to the IPCC (Inter-Governmental Panel on Climate Change, 2013). There are many characteristics of the Caribbean countries such as its dependence on natural resources, high transportation and communication costs; extreme vulnerability to natural disasters, etc. The Figure 1 below depicts the Caribbean whereby the islands are small and low lying countries.

Source: Map resources, adapted by CRS.

Figure 1 Map of the Caribbean

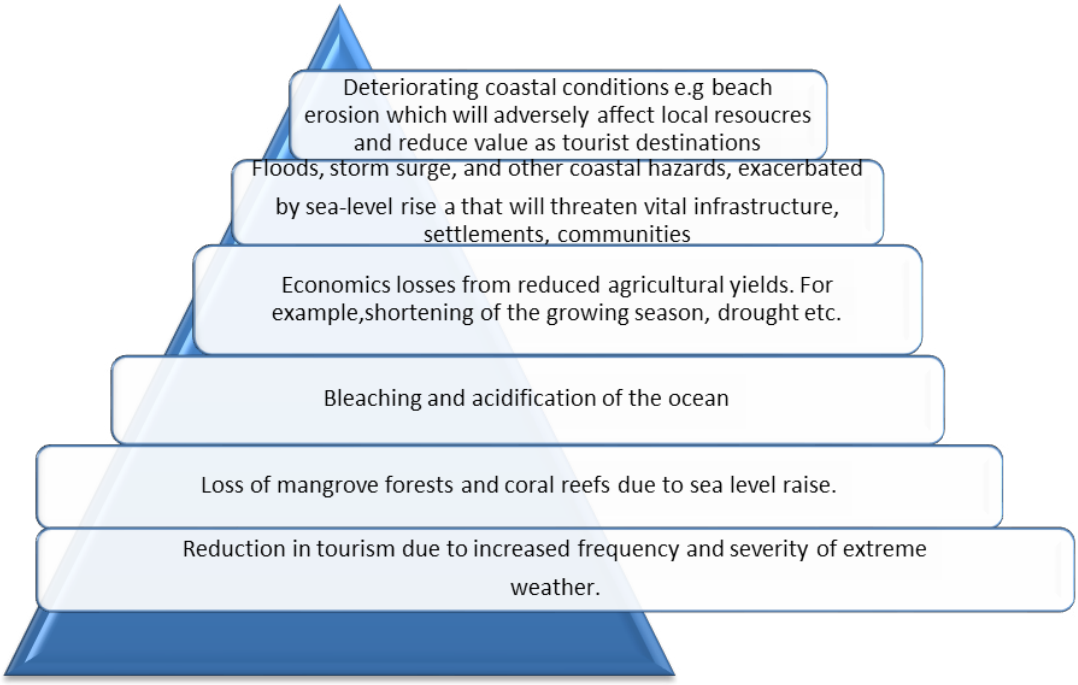
These effects from climate change mainly include extreme weather changes such as hurricanes and rising sea levels. Caribbean countries have little or no infrastructure to deal with significant coastal damage.

It is stated:

> "while Small Island Developing States are among those that contribute least to global climate change and sea-level rise, they are among those that would suffer most from the adverse effects of such phenomena and could in some cases become uninhabitable…."

(Global Conference on the Sustainable Development of SIDS, 1994). Figure 2 below outlines the impacts of climate change to the Caribbean also considered as Small Island Development States (SIDS).

The CCCCC report on Climate Change indicated that temperatures might increase between 2.3 and 3.4°C by 2050. It is also expected that the southern Caribbean was expected to be drier than the northern Caribbean. Overall, the climate change impacted cost projections to the Caribbean would be approximately US$ 5 billion which represents 5% of GDP annually projected until 2050 (CCCCC, 2009).



Source: IPCC (2007b) and UNFCCC (2007a).

Figure 2 Expected impacts on SIDS from Climate Change

In the agriculture sector losses can amount up to 2% of GDP (2008) approximately. The coastal and marine sector climate change effects would be in excess of US$ 33 billion projected until 2050 and in the health sector, these were projected at US$250 million. Tourism is also expected to be affected as the report indicated a significant loss in revenue due to the decrease in tourist arrivals.

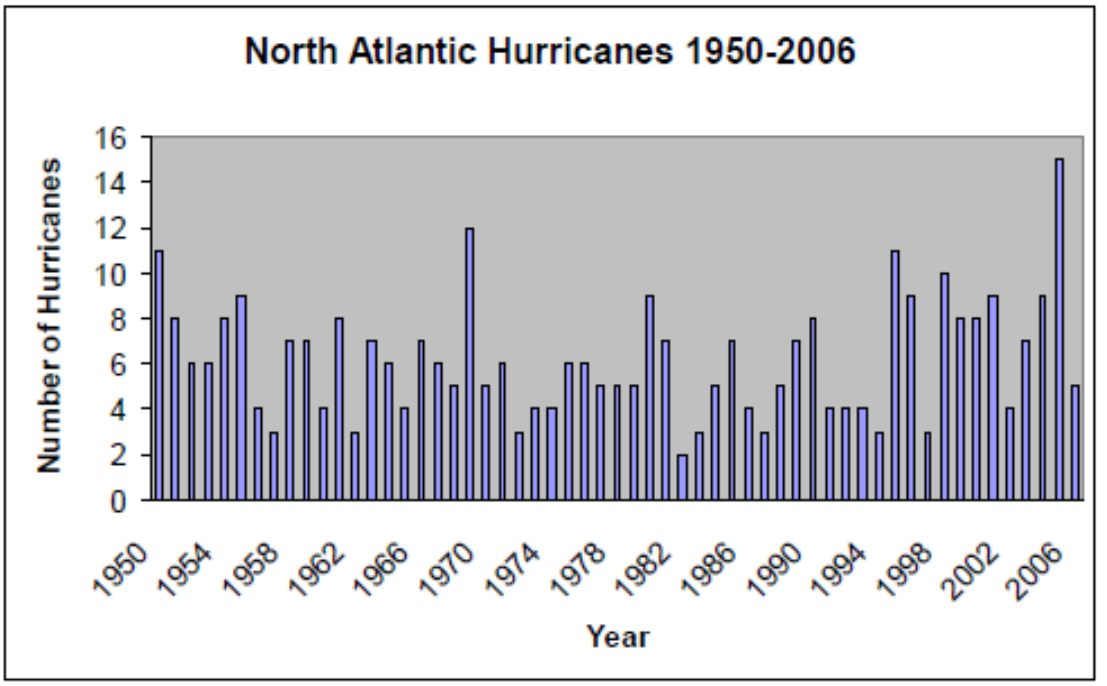
The Caribbean has already been feeling these effects from extreme weather events, such as hurricanes that affected the Caribbean in 2004 as seen in Figure 3 below. These natural disasters can devastate a developing economy and economic growth such as Grenada which had projected a GDP growth of 5.7% however declined to –1.4% after Hurricane Ivan (CCCCC, 2009).

Hurricanes also affects the distribution aspects of the supply chain as well as disruptions in air and ocean transport whereby it can cease operations until infrastructural damage is restored in order to accept shipments. This is a huge impact to regional and international trade which can result in losses of revenue and market share.

As seen in the Table 1 below, Hurricane Ivan impacted Grenada which resulted in USD$ 889 million which is substantial for their country. Another example for climate change vulnerability has been seen by the floods in Guyana in 2005 which affected 62% of their population with damages totaling 59.5% of their GDP.

Therefore, it is crucial that the Caribbean focus its attention to climate changes and be able to mitigate these risks before it spirals out of control.

The main two sectors and common among Caribbean countries are agriculture and tourism which is expected to be adversely affected by climate change. According to the CCCCC report



Source: Caribbean Community Climate Change Centre (CCCCC), 2009.

Figure 3 North Atlantic Hurricanes the period 1950–2006

Table 1 Hurricane Season 2004 Economic Impact in the Caribbean

Country	*Natural Disaster*	*Economic Impact (USD$) Millions*
Bahamas	Hurricanes Frances and Jeanne	551 millions
Cayman Islands	Hurricane Ivan	1.62 billion
Dominican Republic	Tropical storm Jeanne	296 millions
Grenada	Hurricane Ivan	889 millions
Haiti	Hurricane Jeanne	296 millions
Jamaica	Hurricane Ivan	595 millions
Total Cost		*4.247 billions*

Source: Caribbean Community Climate Change Centre (CCCCC), 2009.

in 2009, Trinidad and Tobago's annual beach erosion rate is between 2 and 4 m and two gauges have recorded a mean relative sea-level rise of 8–10 mm per year over the last 15 years. Regarding agriculture, due to the projected reduction in rainfall, this would have an impact on food production and exports. CARICOM must combat risk involved with climate change and has identified goals in achieving this by:

1. Assessing climate change risks and vulnerability – This step would allow the Caribbean to build harmonising systems in collecting the necessary data to review the effects of climate change impacts. It should be both at a local and regional level.

2. Adapting measures to reduce these risks and vulnerability – Once impacts and risks have been identified from climate change, the relevant policies and measures should be adopted to minimise these risks.
3. Assessing and utilising resources effectively for climate change measures – Ensuring that governments provide funding and necessary laws in mitigating climate change risks and able to position themselves in international forums to access funding.
4. Preparing and building an environmentally conscious society – This is critical as knowledge is power for society to understand the effects of climate change and in order to mitigate risks. Therefore, information on climate change should be understandable, accessible and updated.
5. Reducing the Caribbean's carbon footprint by promoting clean energy – According to the CCCCC report, Caribbean countries are generally inefficient energy users whereby over 200% more energy is consumed per unit of GDP compared to best practices. There is opportunity to decrease this consumption usage through promoting the efficient use of energy. It is noted that these countries have many sources of renewable energy such as solar, wind, hydro and ocean.

CLIMATE CHANGE AND TOURISM

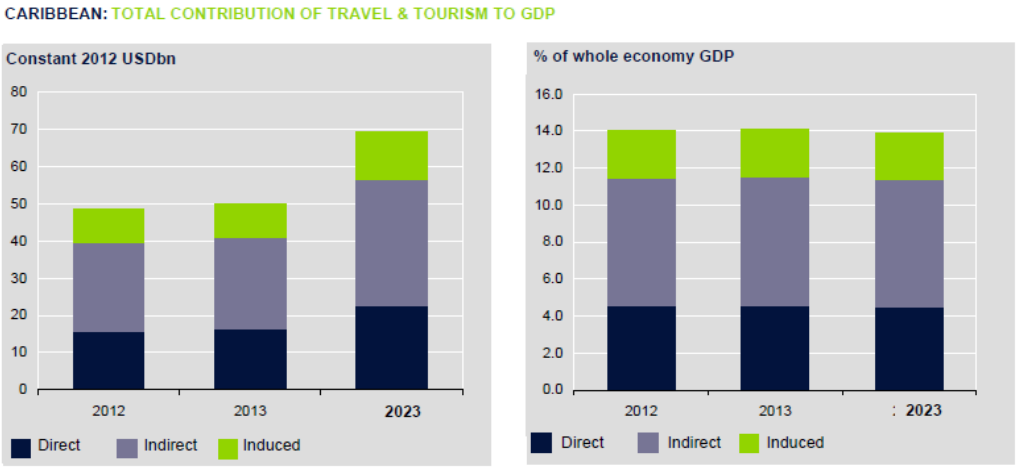
> "Climate change as well as poverty alleviation will remain central issues for the world community. Tourism is an important element in both. Governments and the private sector must place increased importance on these factors in tourism development strategies and in climate and poverty strategies. They are interdependent and must be dealt with in a holistic fashion" (Francesco Frangialli, UNWTO Secretary-General, 2007).

In a global context in October 2007, many organisations came together such as the World Tourism Organization (UNWTO), together with the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO), with the support of the WEF convened a conference on Climate Change and Tourism, in Davos, Switzerland. From this conference the following were noted:

- Tourism is sensitive to the impacts of climate change and global warming. There are many elements of climate change which is already being felt.
- "the tourism sector must rapidly respond to climate change, within the evolving UN framework and progressively reduce its Greenhouse Gas (GHG) contribution if it is to grow in a sustainable manner; this will require action to:
  - *mitigate* its GHG emissions, derived especially from transport and accommodation activities;
  - *adapt* tourism businesses and destinations to changing climate conditions;
  - apply existing and new *technology* to improve energy efficiency and
  - secure *financial* resources to help poor regions and countries" (UNWTO, 2007).

TOURISM SECTOR IN CARIBBEAN – GDP AND EMPLOYMENT STATISTICS

According to the World Travel and Tourism Council (WTTC) report in 2013, it indicated that the travel and tourism contribution to GDP was USD$ 48.4 billion in 2012 (14.0% of GDP) and is expected to grow by 3.5% to USD$ 50.0 billion (14.1% of GDP) in 2013. The below Figure 4 illustrates the total contribution of the tourism sector GDP impact to the Caribbean.



Source: WTTC (2013).

Figure 4 Total contribution of travel and tourism to GDP in the Caribbean

The Travel and Tourism sector in Caribbean generates 647,000 jobs directly in 2012 (3.9% of total employment) and this is forecasted to grow by 2.7% in 2013 to 665,000 (4.0% of total employment). This includes employment by hotels, travel agents, airlines and other passenger transportation services (excluding commuter services) as well as restaurant and leisure industries directly supported by tourists.

The total contribution of Travel and Tourism to employment including direct, indirect and induced was 2,028,000 jobs in 2012 (12.3% of total employment). Figure 5 below shows the impact contribution of employment to Caribbean.

Source: WTTC (2013).

Figure 5 Direct Contribution of Travel and Tourism to Employment

In comparison to other countries contribution of this sector to GDP, the Caribbean in 2012 holds the number one position in this regard as seen in Table 2 below.

Table 2 Global Travel and Tourism's total contribution to GDP

	Travel and Tourism's total contribution to GDP	*2012 % share*
1	Caribbean	14.0
2	North Africa	12.5
3	South East Asia	11.1
4	Oceania	10.7
5	Latin America	8.8
6	North America	8.4
7	European Union	8.4
8	North East Asia	8.3
9	Middle East	7.7
10	Other Europe	7.5
11	Sub Saharan Africa	7.3

Source: WTTC (2013).

CLIMATE CHANGE IMPACTS ON TOURISM IN CARIBBEAN

Tourism is a significant revenue earner for most Caribbean countries. For example, over 70% of employment comes from tourism in the Bahamas which heavily depends on beaches, reefs and proper coastal infrastructure (Trotz, 2004). Tourist would be less inclined to visit if there were degradation of coral reefs, flooding, increases in hurricanes, etc. In other islands such as Barbados, over 70% of hotels are located within 250 m of the high water mark, which places them at high risk from major structural damage (UNFCCC, 2007b).

From a UNDP-funded study by Simpson et al. (2010) concluded that major resort properties are at significant risk to 1 m sea-level rise in countries such as Belize (73%), St. Kitts and Nevis (64%), Haiti (46%), Bahamas (36%) and Trinidad & Tobago (33%). These impacts can transform the coastal tourism which impacts property value, insurance, destination marketing, employment, etc.

There are a number of questions on tourism impacts of climate change relating to consumer behaviour as outlined below:

- Would tourist still be interested in coming to the Caribbean if the hotel has a smaller access to the beach area as a flood risk measure?
- What will be the climate change risk impacts on ecosystems as tourism is dependent on this for Caribbean?
- From climate change impacts such as higher temperatures, less rainfall, etc., will it affect demand?
- Should there be a role for natural resource accounting?
- Identifying the wider tourism impacts on natural resources (direct and indirect)?

There are four categories in which climate change can impact tourism countries which are:

1. Direct climatic impacts – This would entail the redistribution of climate resources and changes in operational cost such as insurance and heating/cooling equipment depending on the weather.
2. Indirect environmental change impacts – This involves climate induced-environmental changes such as damages to infrastructure, water shortages, biodiversity loss, etc.

3. Impacts of mitigation policies on tourist mobility – This can lead to changes in tourist flow due to price increases and aviation routes.
4. Indirect societal change impacts – These are broader changes which affect economic growth and development as well as the overall growth of the industry.

While some information exist on international tourism trends from Caribbean Tourism Organization (CTO) it is important that it is analysed and specific recommendations can be adopted to protect the tourism industry.

Figure 6 below outlines the detail impact on the tourism industry from climate changes.

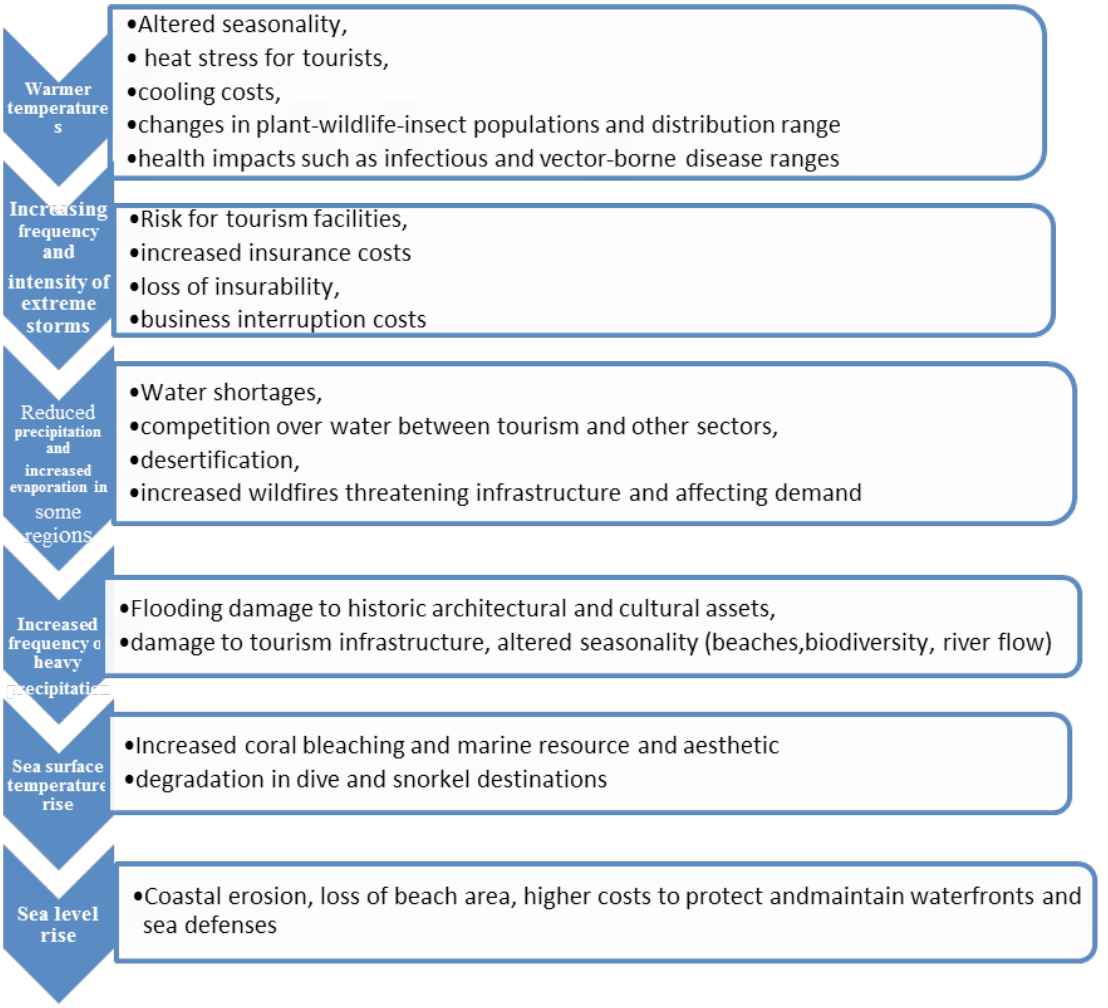


Figure 6 Impacts of climate change to the tourism industry

ADAPTATION MEASURES

"It is meaningless to study the consequences of climate change without considering the ranges of adaptive responses" (Adger and Kelly, 1999).

Adaptation to climate change is an adjustment in natural or human systems in responding to actual or expected climatic stimuli or their effects. Adaptation measures can be pursued by anyone such as societies, institutions, individuals, governments, etc.

Adaption copes with the effects of climate change whereas mitigation deals with the causes and effects of global warming in order to reduce greenhouse gas emissions.

From the *Stern Review*, "The Economics of Climate Change: Part V – Policy Responses for Adaptation, 2006, page 404", the following were noted on adaptation:

1. It is critical to treat with the unavoidable impacts of climate change to which the world is already committed.
2. It can silent the risks and impacts, but cannot by itself solve the problem of climate change. There are also limits to what it can achieve.
3. "Without strong and early mitigation, the physical limits to – and costs of – adaptation will grow rapidly" (Stern Review, 2009).
4. "But adaptation is complex and many constraints have to be overcome. Governments have a role to play in making adaptation happen, starting now, providing both policy guidelines and economic and institutional support to the private sector and civil society" (Stern Review, 2009).

METRICS OF CLIMATE CHANGE RISK

A precondition to determine the vulnerability of climate change requires society to assess the total climate risk by summing the following (WEF, 2014):

1. the risk today;
2. risk due to major global trends like urbanisation, population shifts and economic development and
3. further aggravation due to climate change by business activities, etc.

One other factor that should be taken into consideration in this metric is the ability for people to innovate, creative and problem solving.

Assessing 'total climate risk' *refers to* current and future risk from climate hazards. It does not mean only the expected additional risk from climate change but also risks due to current climate risks as well as developed loss models with multiple climate change scenarios to reflect uncertainty. Therefore, it is most imperative that decision makers respond to the total risk facing society and not only to the incremental risk.

"Metrics can help decision makers identify and prioritize adaptation measures to allocate investment most effectively, and in this way build resilience to climate change" (WEF, 2014).

However, the right questions should be asked to decision makers such as:

1. From climate related damage, what would be the damage to our economies and societies over the coming decades?
2. Can the damage from climate change be averted, if not, by how much it can? Also, what would be the measures?
3. What investment will be required to fund those measures?
4. Will the benefits of that investment outweigh the costs?

THE IMPORTANCE OF THE PRIVATE SECTOR AND ITS RELATIONSHIP WITH THE PUBLIC SECTOR

Currently, throughout the world most adaptation efforts have been provided by public funds a source which does not require returns on investment. Due to the number of adaptation projects

these sources are limited to avoid catastrophic risk in climate change conditions. It should be noted that adaptation projects rarely generate investor returns.

In most cases, governments intervene by collecting taxes or create other fiscal measures that private sector will have to contribute to these measures. However, the government's role should be balanced.

According to the WEF in 2014, it has been suggested that for the private sector to work synergistically governments to create projects that generate a return on investment.

Therefore, these types of investments and collaborations can enhance climate resilience of vulnerable populations and infrastructure.

ADAPTATION WITHIN CARIBBEAN

Due to the considerable negative impacts on Caribbean economies it is necessary that adaptation strategies are implemented to reduce the risks from such effects. It is imperative that countries act immediately on adaptation measures.

The below are some recommendations that the Caribbean region can implement in addressing climate change concerns in any sector:

1. Continuous empirical studies and reports on climate change for impacts both on a local and regional level.
2. Insurance schemes for sectors that would be very sensitive to climate change impacts such as agriculture in particular small-scale farmers and fishers.
3. Studies on climate change should take into consideration the effects from all events such as floods and drought that would have considerable damage to countries.
4. Countries should have access to adaptation fund to implement the necessary projects.
5. Common vision by all Caribbean countries in addressing climate change concerns.
6. Leadership and role of champions are critical in fast tracking and catalysing transformational change.
7. Clear roadmap that would have a strategic focus and allows the ability to be flexible allowing learning and realignment.

ROLE OF GOVERNMENT

Government alone would not be able to champion climate change adaptation on its own and it is the private sector that will have to fill this void by stepping in. This would allow private sector to mitigate global risk in its value chain due to climate change and also strengthen resilience in developing countries. The following are roles that governments both local and regional can adopt in dealing with climate changes:

- Promotion of actions to reduce greenhouse gas emissions. For example, providing incentives to switch to renewable and cleaner sources of energy, as well as conservation actions for energy.
- Communicating and promoting educational and public awareness programmes on a local and regional level.
- Providing the appropriate legal and administrative environment to deal with climate change.
- Determining funding for climate change adaptation projects in the mobilisation of new and additional financial resources.

- Encouraging the participation of all government entities in the development of appropriate climate hazard risk mitigation measures.
- Building and funding a regional body to deal with climate change effects as well as having the capacity to manage adaptation to climate change.
- Providing best practices of successful adaptation experiences to address the impacts of climate change on:
  - water supply;
  - coastal and marine ecosystems;
  - tourism;
  - agriculture and
  - health, which combined represent the largest threats to the well-being of the CARICOM countries.

ROLE OF THE PRIVATE SECTOR

As stated earlier in this paper, private sector has an important role to play in the issue of climate change. It is critical that private sector has a direct role to play. Private sector is expected to develop and implement relevant environmental policies that mitigate against greenhouse gas emissions and include climate hazard risk management principles within their operations.

ROLE OF CITIZENS

Citizens of each country must play a proactive role and take full responsibility for their actions in contributing to greenhouse gas emissions. Citizens are expected to be environmentally conscious and therefore monitor the activities of government and the private sector to ensure that government policies and private sector programmes enhance resilience against climate change.

CLIMATE CHANGE EFFECTS ON BUSINESS – DIFFERENT WAY OF DOING BUSINESS

Businesses are faced with looming resource challenges all linked to climate change conditions to water, energy, food, land, etc; it is the way that businesses responds to these changes will be most impactful in combating these risks in the future.

While there have been many studies on climate change, there are two things that are definite, it will directly affect business, society, eco systems and governments will try to reduce these risks by comprehensive regulations, etc. Businesses today recognise that green house gases have been increasing in monetary value as well as socially. According to Michael Porter in 2007, "companies that persist in treating climate change solely as a corporate social responsibility issue, rather than a business problem, will risk the greatest consequences".

Due to all the research, regulations, scientific evidence and public interest have all caused a shift in the way businesses react to these issues in order to protect the environment, resources and economy.

For a business to understand their carbon emissions, they must undertake a study on the firm's value chain which aims to measure GHG on all its activities including but not limited too-inbound logistics, operations, outbound logistics, marketing, sales, after-sales service. Also, companies must understand and evaluate vulnerabilities to climate change effects such as shifts in supply

chain functions such as purchasing of raw materials and packaging. Businesses can then look at other markets available to secure their supply of goods and services needed for their operations.

In their attempt to address climate change risks, there can exist opportunities to reduce cost and become more competitive in the market or innovate new products/services that consumers demand as they become more environmentally conscious for example, hybrid cars. Therefore, "companies need to anticipate the ways that climate change may directly affect their businesses, including supply-chain breakdowns, employee migrations, increases in disease, or even impact on reputation" (Peter Schwartz, 2007).

Businesses who take a leadership role in climate change and work with governments, NGOs, communities, etc., to combat climate change leads to building goodwill which may be of most importance in a very competitive market.

The below are some key Drivers that Motivates Businesses to become Environmentally Conscious but these are not limited to (The Carbon Trust, 2013):

1. *Competitive differentiation and creating competitive advantage*: businesses can set themselves apart by producing on the basis of environmental credentials. This can lead to companies increasing their competitiveness and strengthening their brand in the market.
2. *Leadership strategies*: businesses can become leaders and characterise themselves as sustainability ones as part of a strategy to enhance their reputation through action on sustainability. This will also have a positive impact on corporate social responsibility initiatives which results in increased goodwill for the company.
3. *Cost, efficiency, and value creation*: by innovating new ways of doing things more efficient which helps the environment as the same time, is a most compelling case for businesses if these projects can deliver savings or create new growth opportunities. Due to the fact that consumers are evolving due to climate changes and demands such products to protect the environment, it leads to a new market for businesses to tap into.

In a speech to the World Wide Fund for Nature (WWF) by Paul Polman in 2013 stated that:

> "There is a huge amount that businesses can do without help from the politicians – whether it is in their supply chains, their factories, the design of their products or in using their brands to educate people about more sustainable forms of consumption."

REFERENCES

Attzs, M. (2009) 'Preparing for a rainy day: climate change and sustainable tourism in Caribbean small island developing states', *Worldwide Hospitality and Tourism Themes*, Vol. 1, No. 3, pp.231–251.

Baban (2003) 'Responding to the effects of climate change on agriculture, fisheries and tourism in the Caribbean region utilizing geoinformatics', *Farm and Business: The Journal of the Caribbean Agro-Economic Society*, Vol. 6, No. 1.

Caribbean Demand of U.S. and Rest-of-the-World Starchy Rood, December 2001.

Climate Change and the Caribbean, (CCCCC) July (2009) *Climate Change and Caribbean Economies: Implications, Adaptation and Risk Management*, Caribbean Catastrope Risk Insurance Facility.

Farm & Business (2003) *The Journal of the Caribbean Agro-Economic Society*, October.

Food Outlook (2013) *Biannual Report on Global Food Markets*, November.

Gilbes, F. (2013) 'Improving climate change education in the Caribbean region', *Abstracts with programs – Geological Society of America*, Vol. 45, No. 2, p.17.

Hosein (2013) *Overview of CARICOM Economies*.

Macpherson, C. (2013) 'Impacts of climate change on Caribbean life', *American Journal of Public Health*, Vol. 103, No. 1, p.e6.

National Climate Change Policy (2011) 'Planning for adaptation of climate change in the Caribbean', *Caribbean Meeting of Experts on Implementation of the SIDS Programme*, July.

Scott, D. (2012) 'The vulnerability of Caribbean coastal tourism to scenarios of climate change related sea level rise', *Journal of Sustainable Tourism*, Vol. 20, No. 6, pp.883–898.

Taylor, G.T. (2012) 'Ecosystem responses in the southern Caribbean Sea to global climate change', *Proceedings of the National Academy of Sciences of the United States of America*, Vol. 109, No. 47, pp.19315–19320.

The economics of climate change in the Caribbean: summary report, 2011/The Economic Commission for Latin America and the Caribbean.

Woodward, J. (2008) *Eyewitness: Climate Change*.

World Economic Forum, Global Risks (2014) 9th edition 2011, 'Climate change', *Nature*, Vol. 479, No. 7373, p.267.

BIOGRAPHICAL NOTES

Zaffar Khan is a Member of the Energy Institute of the UK. He completed the Executive Education Programme in Business Strategy at Harvard Business School. He holds a PhD in Energy Economics and Management. He was a Senior Instructor at UTT and lectured in various disciplines including energy. He spent approximately 20 years at BP both at the Corporate and Operations Management levels functioning mainly as an internal consultant to all departments. He was a consultant to Chevron Texaco on the Loran/Manatee Exploration Project and was highly commended by the Country Manager as well as the President of Chevron for his significant contribution to the success of that project. He was a national award nominee and his efforts for his contribution to national development have been recognised by the Office of the Honorable Prime Minister and by the United Nations. He is an Associate Consultant at The Energy Management Institute of New York and a consultant/speaker with Petrostrategies Inc. He is the designer and implementer and Programme Director for the MBA in Sustainable Energy Management This programme was shortlisted as one of four finalists for the 2012 AMBA innovation award. He is also Programme Director for the MBA in International Trade, Logistics and Procurement as well as the Programme Director for the Masters in Port and Maritime Management at that institution. In 2013 he was selected as one of the top six nominees for the International Individual of the Year award by the Energy Institute of the UK. In addition he was one of four top international professionals shortlisted for the same award in 2014, he was selected as the winner of the International Individual Achievement Award by the Energy Institute of the UK. This was announced on 13 November 2014 at a Gala ceremony held in London.