

Objective

- To identify climate change issues that may engage institutional, policy and/or management groups in both the public and private sectors in tourism, where a risk management process would be beneficial in identifying adaptation options.

Challenges to Adaptation

- Uncertainties about:
 - the extent of regional climate change
 - its social, economic and ecological impacts
 - the ability of society to adapt

Climate Change Issues in Caribbean Tourism

- Sea Level Rise
 - Beach erosion / loss
 - Coastal inundation
 - Land ownership / taxes (legislation tied to high water mark which may change with SLR)

Climate Change Issues in Caribbean Tourism

- Sea Level Rise
 - Increased Storm Surge
 - Salt Water Intrusion (into freshwater aquifers / coastal agriculture)
 - Loss of Mangroves / wetlands: ecosystem depletion/damage
 - Relocating of Infrastructure (roads, buildings etc.)
 - Coastal Flooding

Climate Change Issues in Caribbean Tourism

- **Increased Temperatures**
 - **Coral bleaching → fisheries affected**
 - Watersports – diving, snorkeling
 - **Warmer winters – decreased demand for Caribbean destinations**
 - **Warmer summers in the region**
 - increased utility demand (energy, water)
 - Reduced appeal
 - **Increase in vector-borne diseases**
 - **Health impacts on animals and humans**
 - **Agriculture – reduced supply → higher imports / increased competition with domestic market**

Climate Change Issues in Caribbean Tourism

- Precipitation Patterns –
 - increased intensity → increased run-off flooding, erosion, infrastructural damage
 - run-off into the sea → increased turbidity will → affect reefs
 - Reduced precipitation → water stress / reduced availability of water for sector
 - Sewage disposal problems (reduced standards)
 - Hydro-power reductions
 - Ground water overdrafts

Climate Change Issues in Caribbean Tourism

- Hurricane / Storm Activity – possible increased intensity and/or frequency
 - Direct damage of tourism infrastructure
 - Direct damage of coastal ecosystems
 - Increased costs of insurance in vulnerable (coastal) areas

Which Issues Involve Risk?

ALL!

What Are the Risks?

- **The potential adverse impacts may further result in:**
 - **reduced contribution from tourism sector to Caribbean economy and further:**
 - Reduced standard of living for resident populations
 - Reduced employment in the industry
 - **degradation of natural attractions**

Adaptation Strategy

- *Enhancing Flexibility*
 - Any policies that improve the chances of adapting more smoothly and painlessly provide a **buffer** against the negative impacts of climate change. E.g water conservation vs. heavy investment in water capture infrastructure.
 - Flexible systems and policies are those that allow self-adjustments or midcourse corrections as needed without major economic or social disruption
 - *No regrets / low-regrets option(s)* - sensible to pursue now, even assuming no climate change

Adaptation Strategy

- *Enhancing robustness*
 - Minimize the risk of adverse effects from climate change by making systems less sensitive to climate. Robust systems are those that can tolerate a wide range of climate conditions and are, therefore, less vulnerable to climate change extremes - protect against the threat of large-scale losses or climate surprises. E.g. Adding capacity to dams, municipal water storage devices

Adaptation Options

- In general, research that clarifies how systems respond to climate change will help identify and expand the range of possible adaptive actions and will speed their successful implementation

Adaptation Options

- **Sea Level Rise**
 - **CZM plan to include climate change considerations**
 - **Setbacks**
 - **Groynes, breakwaters**
 - **Artificial reefs**
 - **Coastal defense structures**
 - **Land Use Planning Authority to include climate change considerations when evaluating projects.**
 - **Retrofitting: incentives and related penalties to be applied for not retrofitting. Studies should be done to determine which properties are at risk**
 - **Remove incentives that support development in vulnerable areas**

Adaptation Options

- **Increased Temperatures**
 - Control number of dive operations
 - reduce man-made stresses – pollution
 - creation of marine managed areas / sanctuaries
 - explore alternative markets - intra-region travel, areas that experience high temp. anyway
 - control vehicular emissions
 - Re health impacts– education, disease and pest control. Ensure public health authorities are active members of risk management teams; research and development strains of diseases

Adaptation Options

- **Changes in Precipitation**
 - desalination
 - rainwater capture
 - Increase ground water capture (dams)
 - water recycling
 - water conservation mechanisms and measures
 - legislation to support environmental management and adaptation

Adaptation Options

- **Hurricane and storm activity (since region is familiar with this climate extreme, it makes sense to engage in these adaptive responses anyway)**
 - Retrofitting
 - Building codes and standards
 - Disaster management plans – to include climate change considerations
 - Research and public awareness
 - Business recovery planning

Key Stakeholders

- Tourism public and private
 - hoteliers and staff
 - utility companies
 - tour operators
 - Airlines
- coastal communities
- fisherfolk and fisheries
- tourists
- NGO's / interest groups for endangered species
- insurance and financial services
- emergency services

Champion Organizations

- SLR
 - CPACC / ACCC
 - CZMU
 - hotel and tourism and organization
 - marine trust
 - land-use planning department
 - national climate committees

Champion Organizations

- Increased temperatures
 - CPACC / ACCC
 - public health authorities - CAREC, CEHI, PAHO
 - national climate committees
 - regional organizations

Champion Organizations

- Changes in rainfall
 - CPACC / ACCC
 - Regional / national agricultural organizations / department – CARDI
 - water and sewage department
 - energy department
 - emergency relief organizations

Champion Organizations

- Hurricane and storm activity
 - CPACC / ACCC
 - Emergency relief organizations
 - Government – evacuation plans
 - Tourism – private and public
 - CZM departments

Water Resource Management for the Tourism Sector in the Face of a Changing Climate

Initiation

- As a result of climate change, the tourism sector is facing a highly possible water shortage which raises risks for this water intensive industry.

Risk Management Team (Steering Committee)

- Senior member of hotel industry - champion
- Ministry of Tourism
- Ministry of Environment
- Hotel & Tourism Association
- Local Government (with responsibility for water)
- Waste Water Interest Group
- Public Health Rep.
- Water Management Company
- Tourist Board/Division of Tourism

Chairperson.....?

- Criteria for selection:
 - trusted by community
 - generally perceived to be fair and equitable
 - Possibly academic - familiarity with the issue

Stakeholders

- Groups that comprise steering committee
- ENGO's
- NGO's
- Community Groups – to represent households
- Media
 - Particularly Government Information Service
- Fire Service (linked to law re water usage)
- Breweries, distilleries
- Other major users of water

Preliminary Analysis

- Changes in water availability as a result of climate change could further affect already overburdened systems, and changes could occur in the frequency, duration, and intensity of floods and droughts
- Although climate change is a long-term phenomenon, adaptive actions should be taken now to reduce the vulnerability of, and risks to the tourism industry.
- By anticipating problems and applying best practices immediately will serve to reduce the impacts of water shortages in the future

Preliminary Analysis

- In the absence of precise information on the extent of a water shortage, the industry can:
 - Employ water conservation efforts
 - Water saving devices
 - Reduce / eliminate leaks in infrastructure
 - Involve staff and guests in reducing use of water
 - Reduce dependence on municipal supply by:
 - Recycling water
 - Capturing rainwater
 - Extraction of brackish water

Preliminary Analysis

- Risk Scenarios
 - Restriction from water source due to pollution
 - Deterioration of infrastructure resulting in wastage and/or inability to distribute to users
 - Overdraft on limited supply of water
 - Water catchment problems

Preliminary Analysis

- Stakeholder analysis
 - Profile of stakeholders to determine needs, concerns, areas of responsibility
- Information library
 - Secretariat to collect and house relevant information – historical data on water usage, cost of infrastructure, effect of past extreme events etc.

Risk Estimation

- Methodology
 - Use historical data where available to make judgements and projections
 - Use past experience in similar scenarios
 - It may not be necessary to expend funds to conduct research at this stage.
- *Outcome: High probability of reduction in water availability during high tourist season*

Risk Evaluation

- Have stakeholders been adequately informed?
- Have their concerns been taken into consideration?
- Analyse the data collected. What are cost and benefits of particular adaptation choices?
- Are risks acceptable to stakeholders?

Risk Evaluation

- Costs and Benefits
 - Financial investment in adaptation choice
 - Fears of stakeholders and lack of support for decisions
 - Operations less water intensive – savings
 - Comfort in having better credible data

Risk Control

- **Increase storage capacity**
- **Upgrade infrastructure**
- **Recycle water**
- **Reduce pollution sources**
- **Build desalination plants**
- **(Better) coordination of the many agencies with flood- or drought-related responsibilities**
- **Promote the use of new analytical tools. Further development, dissemination, and use of new modeling and forecasting tools could greatly enhance water resource management.**
- **Promote demand management to improve water-use efficiency – deny golf courses unless they can prove that they will not stress the municipal supply**

Action / Monitoring

- Implementation plan for chosen option
 - How much will this cost?
 - Who will pay for it?
 - Incentives / disincentives
 - Legislation
- Benchmarking
 - Consistent feedback
 - Information on new technologies

Resource Requirements for Risk Management Approach

Water Resource Management in the
Tourism Sector

Resource Identification Process

- Selected Water Resource Management as example for Question 6
- Identified resources required for each stage of the risk management process

Initiation

- Main action is selection of Risk Management Team & Problem Identification
- Resources needed
 - Risk Management team members' time
 - Secretariat - staff, location and equipment
 - Meeting facilities

Preliminary Analysis

- Definition of scope & initiation of contact with stakeholders are main activities
- Resources required:
 - Money for data collection and collation (primarily of existing data)
 - Money and location for setting up library
 - PR for the process to publish stakeholder list and inform general public about undertaking

Risk Estimation

- Stakeholder consultations, collection and collation of more precise data are main activities
- Resources required
 - Money to do stakeholder consultations
 - Collect & collate existing data e.g. utility data on sector consumption history, met. office rainfall data

Risk Estimation (cont'd)

- Also need
 - Other relevant technical reports or information e.g. water use quantification from case studies done for “green champion” hotels
 - The information gathered adds to library - may need expand library - more space

Risk Evaluation

- Main activities are determining costs of different options to reduce risks, evaluating level of risk, and stakeholder communication

Risk Evaluation (cont'd)

- Resources required
 - Lots of time and money to communicate the results of analysis to stakeholders
 - Financial expertise to help refine costs of various options
 - Communication mechanism to inform stakeholders about refined nature of risks

Risk Control

- Main activities are developing risk control options, and evaluating stakeholder acceptance of proposed actions & residual risk
- Resources required
 - experts for consultation with stakeholders e.g. desalination expert to make presentation to sector

Risk Control (cont'd)

- Resources required
 - Quantification of cost of proposed risk control option - financial advice to finalise costs
 - ‘Man-in-the-street’ surveys to determine stakeholder acceptance of residual risk
 - Preparation of PR synopsis for proposed action for distribution to public

Action & Implementation

- Main activity is actually implementing the selected risk control option, and monitoring the action over time
- Resources required:
 - Money to implement proposed action
 - Money to pay for monitoring programme on proposed action

Action & Implementation

- Resources required
 - Money & personnel to develop capacity within existing organisation to carry out monitoring e.g. national standards board
 - Insurance for option - to be used for decommissioning in the case of physical structures
 - Monitoring of cost recovery mechanism if applied