

XIII Assessment of Investment & Financial Flows for Adaptation in the Tourism Sector



13.1 Introduction

Tourism is a major economic sector in many countries; at the same time, it is considered to be a highly climate-sensitive sector¹. In addition, the sector is both widely distributed and highly concentrated in specific locations. The IPCC identifies tourism as an economic sector “sensitive to a range of climate variables such as temperature, hours of sunshine, precipitation, humidity, and storm intensity and frequency, along with the consequences that may follow, such as fires, floods, landslides, coastal erosion and disease outbreaks.”² However, due to the complex interactions between tourism, the climate system, diverse economic activities, the environment and society, the array of impacts of climate change upon tourism activity might be difficult to identify and quantify.

For the purposes of this chapter and according to priorities identified by countries, the emphasis is on tourism in coastal areas, by far one of the dominant focuses of touristic activities and of planned investments in capacity expansion and diversification. In many parts of the world, the built environment in coastal zones and small islands already face threats that will adversely affect tourism activities. In fact, climate change has major potential impacts on coastal tourism and local communities, highly vulnerable to impacts of climate change, and whose livelihoods and economies are intricately related with it. Climate change will influence tourism directly via the decision-making process by influencing tourists to choose different destinations; and indirectly as a result of climate change threats³ (sea level rise, higher sea water temperatures, changes in precipitation and run-off patterns, changes in storm tracks, frequency, and intensity, and changes in ocean chemistry). However, the tourism sector comprises various subsectors, ranging from tourism in coastal zones, the mainland, urban areas, world heritage sites, and others.

Climate change affects tourism and its activities and destinations, and the competitiveness and sustainability of the sector through impacts of different order. Direct impacts on climate variables such as temperature, sunshine hours, precipitation, humidity and storms, have effects on tourist decision making and activities, as well as in destination choice. Those climate conditions also influence operating costs, such as heating, cooling, snowmaking,

¹ Davos Declaration, Second International Conference on Climate Change and Tourism convened by the World Tourism Organization (UNWTO), jointly with the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO), Davos, Switzerland, 2007.

² Wilbanks, T.J., P. Romero Lankao, M. Bao, F. Berkhout, S. Cairncross, J.-P. Ceron, M. Kapshe, R. Muir-Wood and R. Zapata-Marti (2007): Industry, settlement and society. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 357-390.

³ Nicholls, R.J., P.P. Wong, V.R. Burkett, J.O. Codignotto, J.E. Hay, R.F. McLean, S. Ragoonaden and C.D. Woodroffe (2007): Coastal systems and low-lying areas. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 315-356.

irrigation, food and water supply, and insurance costs. Climate change also affects tourism through impacts on environmental conditions, including changes in water availability, biodiversity loss -terrestrial and marine-, coral reefs bleaching, sea level rise, reduced landscape aesthetic value, altered agricultural production, increased natural hazards, beach and coastal erosion and inundation, natural resource changes, damage to infrastructure and the incidence of vector-borne diseases that will all impact tourism to varying degrees. The consequences of these adverse effects on the tourism industry comprise increased infrastructure damage, additional emergency preparedness requirements, higher operating expenses, and business interruptions. Specific adverse effects and damages include: damage or destruction of sea defences (reefs and mangroves), beach and coastal erosion, storm surge damage to shoreline, damage to coastal infrastructure – roads, utilities, airports –, damage to hotels and other tourism facilities, and disruption of services. A third category of impacts are those that result from the implementation of mitigation policies that have implications on travel costs, mobility and destination choice. Finally, second or even third indirect order effects are those related to societal change impacts, including variations in economic growth at the global scale, and its effect on wealth and income, and increased security risks.⁴

“The implications of climate change are most notable for areas in which tourism represents a relatively large share of the local or regional economy, and these are areas where adaptation might represent a relatively significant need and a relatively significant cost.”⁵

Adaptation in the tourism sector typically focuses on building adaptive capacity in the sector in response to climate change threats. The scope of adaptation in the tourist sector should include previously identified adaptation options, such as those included in a national communication or in a NAPA effort.

One of the challenges in tourism adaptation assessment stems from uncertainties and knowledge gaps in climate change projections and identification and in the quantification of consequent impacts. The key issues identified by the IPCC in this area include uncertainties about climate-change impacts at a relatively fine-grained geographic and sectoral scale; the need for improved understanding of indirect second and third order impacts; still unspecified relationships between specific effects in one location and the improved competitiveness of other locations; uncertainties about potentials, costs and limits of adaptation; and uncertainties about possible trends in societal, economic and technological change.

Adaptation measures for the tourism sector typically focus on preventing impacts, or reducing or alleviating the damages of extreme events (droughts and floods) and are generally of two types: 1) operational-level measures, including technical (systems and equipment) and managerial measures (decisions and plans); and 2) sector wide measures,

⁴ World Tourism Organization and United Nations Environment Programme (2008). Climate Change and Tourism - Responding to Global Challenges. World Tourism Organization. Spain, 2008.

⁵ Mimura, N., L. Nurse, R.F. McLean, J. Agard, L. Briguglio, P. Lefale, R. Payet and G. Sem (2007). Small islands. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 687-716.

including research, education, infrastructure, policy and institutional measures (See Table 13.1).

13.2 Application of I&FF Methodology to Adaptation in the Tourism Sector

This section describes how the I&FF methodology described in Chapter II would be applied to adaptation in the tourism sector. Some of the information provided in Chapter II that is relevant to all sectors is not repeated here, so the reader should read Chapter II before reading this chapter.

Step #1: Establish key parameters of assessment

>>> *Define detailed scope of the sector*

In this step, the precise components of the tourism sector that are to be included in the I&FF assessment must be defined. The capacity to adapt to climate change is thought to vary between the components of the tourism value chain, also described as sub-sectors of the industry, for example tourists, tourism service suppliers, destination communities and tour operators⁶. Countries may also choose to focus only on certain touristic regions or locations, rather than the entire country, if appropriate. Others may choose to focus only on certain touristic activities, such as traditional tourism, adventure tourism, cultural tourism, gastronomic tourism, etc.

Which areas, regions, locations or activities are included should depend on national circumstances, including, for each its relationship to national and sectoral development plans. This choice should also depend on data availability, the structure of national government entities in which data reside, and the scope of related assessments that have been completed, especially the consideration of studies included in the National Communications, and other vulnerability assessments that have been completed.

>>> *Specify assessment period and base year*

This methodology recommends a 25-year assessment period and 2005 as the base year.

>>> *Identify preliminary adaptation options*

A preliminary set of adaptation options must be identified for each component of the tourism sector included in the assessment, which will be included in the scenarios later. Table 13-1 presents a list of general options.

Table 13-1: Tourism adaptation measures⁷

Adaptation Measure	Examples
Operational level	
Technical (Systems and equipment)	Rainwater collection and water recycling systems
	Cyclone-proof building design and structure
	Building design for efficient cooling

⁶ Becken, S. and Hay, J., (2007). Tourism and climate change – risks and opportunities.

⁷ Based on Climate Change and Tourism - Responding to Global Challenges. World Tourism Organization (2008).

	Storm early warning system and equipment
Managerial (decisions and plans)	Water conservation plans
	Recycling grey water in the industry (from sewerage systems or industry processes)
	Product and market diversification
	Regional diversification
	Use of short term seasonal forecasts for planning of activities
	Hurricane interruption guarantees
	Improved insurance cover
Sector wide	
Research	Site location
	Monitoring programmes
	Seasonal weather forecasting
	Forecasting, early warning, and disaster management
	Extreme event risk exposure
	Assess water quality
Education and training	Water conservation campaigns
	Environmental education and awareness for both local population and tourists
Infrastructure	Reservoirs and desalination plants
	Rainwater storage
	Soft coastal protection
	Enhancing preservation of natural sea-defences (mangroves)
	Coastal defence structure: Building seawalls and breakwaters
	Coastal zone protection: physical barriers
	Beach nourishment/erosion control project
	Reconstruction and stabilization of historical assets
Policy/institutional measures	Wastewater management
	Land and coastal management plans
	Fee structures for water consumption
	Building design codes and material standards
	Impact management plans
	Insurance policy and regulations
	Fiscal incentives for investments
	Lending policies
	Tourism regulation and codes
	Enhanced design, siting standards and planning guidelines
	Other institutional development, including capacity building, and improved management and governance systems

Source: World Tourism Organization (2007). Climate Change and Tourism - Responding to Global Challenges. Advanced Summary.

The selection of adaptation options should be based primarily on the sectoral scope, prior analysis of adaptation options, and the technical feasibility, logistical feasibility, and sectoral acceptability of the options. Consideration should also be given to the relevance of the options under consideration as well as economic and social benefits and costs of those options.

Given the numerous linkages between tourism and other sectors, the potential for synergies between adaptation in the tourism sector and mitigation or adaptation in other sectors, is somewhat large. The tourism sector is cross-sectoral in nature and has linkages to a variety of sectors. Tourism is linked, among others, to the water management sector through demand for freshwater; to the energy sector through the demand for energy, to the waste management sector through waste generation; to health through disease outbreaks management; and to ecosystem health when it is inextricably based on interactions with ecosystems. For example, the tourism sector may in some cases be able to adapt to increasing temperatures by investing in additional air-conditioning, creating additional

energy demands and consequent emissions, or through increased pressure on water resources and ecosystems. Countries should be alert to such synergies and cross sectoral effects, and discuss them qualitatively in their reports.

>>> *Select analytical approach*

Countries need to determine the analytical approach that will be used to develop baseline and adaptation scenarios, and associated streams of annual IF, FF, and O&M costs.

The analytical approaches that could be used for an I&FF assessment of adaptation in the tourism sector range from simple spreadsheet models that can be built by members of the project team to very sophisticated multi-agent dynamic models that identify or highlight the interactions between economic and ecological dynamic systems. For example coastal zone management models that are designed to provide a detailed tracking of annual investment costs across multiple scenarios.

Consideration of the uncertainties inherent in the prediction of future climate change and its impacts on tourism, linked with the dynamic socio-economic contexts creates a need to assess a range of climate and socio economic scenarios within a vulnerability assessment. These scenarios need to embrace the range of potential change. The aim of screening and vulnerability assessments is to focus attention on critical issues concerning the coastal zone rather than to supply precise predictions. The available tools include, among others:

- **DIVA and DINAS-COAST:** The Dynamic Interactive Vulnerability Assessment (DIVA) is a tool for integrated assessment of coastal zones designed to explore the vulnerability of coastal areas to sea level rise. It is specifically quantitative.
- **SIMCLIM:** The Simulator of Climate Change Risks and Adaptation Initiatives (SimClim) software enables examination of future climate scenarios.
- **COSMO (Coastal Zone Simulation Model):** COSMO is a decision-support model that allows coastal zone managers to evaluate potential management strategies under different scenarios, including long-term climate change.
- **CORAL:** The Integrated Coastal Zone Management Decision Support Modeling for Coral Reef Ecosystems is a multi-variate least-cost integrated coastal zone management model.

As the timeframe for completing the I&FF assessment is typically 6-8 months, it is encouraged to build on existing information from models used in national level documents. If countries do not already have extensive experience with a particular model or models, it is recommended that other approaches be used for developing their scenarios.

Simpler approaches, like extrapolation of trends from historical evolution, may also work, though they need to be based on expert knowledge in order to be reliable.

Step #2: Compile Historical IF, FF, and O&M Cost Data, Subsidy Cost Data (if included explicitly), and Other Input Data for Scenarios

>>> Compile historical annual IF and FF data, disaggregated by investment entity and source

The methodology recommends that countries compile 10 years of historical I&FF data, i.e., for the base year and the previous nine years. At a minimum, countries should collect at least three years of data (i.e., for the base year and two years during the previous decade). Data should be compiled for each investment type, and should be annual, be disaggregated by investment entity, and, if possible, by funding source, and also be divided into investment flows and financial flows (see Table 2-3 in Chapter II).

In the tourism sector, investment flows would include assets such as hospitality facilities, resorts, buildings, communication and transportation infrastructure, communication equipment, vehicles, infrastructure (e.g., hard coastal structures such as seawalls, marina facilities), etc.

Investment flows would also include assets for research, education, assistance, infrastructure, policy and institutional arrangements (e.g., meteorological equipment, vehicles). Financial flows would include non-asset investments in the research, education, assistance, and institutional areas (e.g., labour costs).

To facilitate the task, the following table (Table 13-2) lists the different investment and financial flows types that are being made in the tourism sector. It is necessary to bear in mind that the purpose of this table is simply to organize the information that is going to constitute the set of inputs to complete Table 2.4., as presented in the General Methodology chapters 1 & 2.

Table 13-2: Examples of investment flows and financial flows in the tourism sector

Year 2005		
List of investment flows and financial flows	IF (2005 US\$)	FF (2005 US\$)
Government		
Policies and institutional measures		X
Regulations		X
Government / private		
Infrastructure	X	
Technical	X	
Managerial	X	
Education and Training		X
Job diversification		
Use of new technologies		
Management		
Public		
Insurance		X
Cluster insurance		
Pooling of risks		
Financial instruments		
Research		X
Forecasting		
Risk analysis		
Resource monitoring		

X Indicates likely type of flow

The above mentioned I&FF data needed will likely reside in several domestic locations (e.g., ministry records and plans, industry records, statistical agencies, research institutions and national accounts).

Information on the past 10 years regarding investments (i.e., GFCF) and financial flows in tourism is needed. It is important to note that international forms for national accounts I&FF in tourism may cross categories, including “Wholesale, retail trade, restaurants and hotels”, “Construction”, or “Transport, storage and communication” which implies that disaggregating the actual investments in tourism alone may be challenging . Another consideration is that much of the tourist industry may be privately held or operated, which could difficult the access to I&FF data unless the private sector is included in the assessment from the start.

>>> *Compile historical annual O&M cost data, disaggregated by investment entity and source*

Historical O&M data are also needed to provide a historical basis from which to estimate future O&M costs for new physical assets, as well as to provide data for the first year of the scenarios.

Annual O&M costs for the physical assets that are in operation during the historical period should be collected (or estimated) for the same years for which historical I&FF data are collected. Information about the expected lifetimes of assets such as buildings, vehicles and equipment that are in operation during the historical period, and annual fluctuations in O&M costs (if any), also need to be collected. O&M data should be collected at a level of disaggregation consistent with the I&FF data, and the O&M data for assets purchased *during* the historical period should be tracked separately from the O&M data for assets purchased

before the historical period (see Table 2-4 in Chapter II). Climate has an important influence on operating costs, such as back up water and power systems costs, or waste management costs.

The O&M data that need to be collected may reside in one or more of the same locations as I&FF data (e.g., national accounts, ministry records and plans, industry records, statistical agencies, research institutions), and in sources described below. If such data are not available, countries should utilize one of the following approaches to derive estimates (see methodology chapter of the Guidebook):

- Adopt O&M cost data from similar assets in other countries, and adjust the O&M data to in-country production and consumption rates.
- Derive estimates from proportional relationships between O&M costs and total costs, or between O&M costs and capital costs (e.g., 10%, 25%, or 75%). Use either standard assumptions about proportional relationships, or proportional relationships observed in other countries.

A classification scheme only for O&M costs is shown in Table 13-3 that can be collapsed or expanded as required by policy needs and permitted by data. The framework explicitly excludes consumption of fixed capital, interests, and capital expenditures at large.

Table 13-3: Components of O&M for the tourism sector

O&M Cost categories	
	Current outlays
Salaries or wages of personnel	Compensation to human resources: Wages Social contributions Non wage labour income
Running costs	Costs of fuel and lubricants Heating or cooling Equipment maintenance Communication
Materials Supplies and consumables	Supplies and services: Material supplies • Food • Other supplies Services
Other	Other current expenditures

Table 2-5, as indicated in the methodology chapter, should be completed by including historical annual O&M (associated exclusively to the investment flows types) described in Table 13-3, with the exclusion of financial flows corresponding to government programmes (essentially FF in that table).

>>> Compile other input data for scenarios

In addition to historical I&FF and O&M cost data, the characterization of the scenarios and estimation of annual costs for the scenarios will require the collection of other historical and non-historical data relevant to the sector. What data are needed will depend on the sectoral scope and analytical approach. The kinds of information that will be needed may include:

- Characterization of the tourism activities, including past trends and current trends, level of activity, occupation rates, investments plans, customers profiles, tourists flows, etc.
- Characterization of adaptation options, including technical feasibility, cultural acceptability, scalability, costs (capital and O&M), and economic feasibility. For example, any new technology relevant to tourism and climate change (e.g. coastal defences), natural resources available to assist in adaptation strategies (e.g. beach sand, fresh water), existence of disaster response plan, awareness and knowledge.
- Possible externalities and linkages with other sectors should be noted and described, such as energy, health, agriculture, water resources and biodiversity, all of them related with the tourism sector.
- Information about major sectoral and macroeconomic policies (both recent and expected) that could significantly affect the evolution of tourism should also be collected, for example agriculture promotion could reduce the attraction of a particular site and thus reduce tourist flows.

These data and information may be available from the domestic sources mentioned above for I&FF and O&M cost data. In addition, the UN World Tourism Organization maintains several publicly available statistical databases and information systems that contain potential useful national tourism statistics and related information.

Step #3: Define Baseline Scenario

Constructing the baseline scenario for coastal tourism requires projecting the investment in businesses (e.g., hotels, restaurants) and the associated physical infrastructure (e.g., roads, communications) and service industries (e.g., travel agencies, tourism information centers), to support the expected tourism that would occur in the absence of additional changes in climate, e.g., additional sea level rise, increased storm activity/intensity, changes in precipitation and temperature.

This step entails describing what is likely to occur without the implementation of additional adaptation policies and measures to address climate change over the assessment period. It should reflect current sectoral and national plans, expected socioeconomic trends, and expected investments in the components. It should include a quantitative description of the socioeconomic factors that affect the components (e.g., demographic change, economic growth), as well as other relevant characteristics. The baseline scenario description should include specific information about equipment, facility, and infrastructure investments that are expected (and as is relevant) in each component, as well as research, education, assistance, and institutional investments.

To define the baseline scenario the national team should:

- Identify relevant contacts, reports, and databases at national/international agencies and other organizations; assembled current inventory of tourism sector characteristics, including commercial infrastructure e.g. hotels, restaurant, physical barriers, such as breakwaters, and coastal zone protection like beach nourishment regimes.

- Obtain national (and/or provincial) tourism sector growth forecasts to 2030 by coastal region/province, as possible. For example, ministry plans typically have detailed budgetary breakdown for current and future investments.
- Obtain major recent policies or expected actions that might affect the Baseline scenario projections.
- Assemble information on resource potentials and costs for alternative coastal management strategies.

Table 13-4: Data organization

Tourism sector characteristics	For each component of commercial infrastructure and physical barriers quantity per year, for example number of hotels in that specific zone
Forecasts	For each component quantity projected per year, for example number of hotels to be constructed in that specific zone
Changes in baseline scenario projections	For each component quantity modified per year, for example number of hotels to be constructed in that specific zone if a precise policy is on force

In a situation without coastal tourism investment plans available over the planning period, it may be necessary to develop the I&FF based on an analysis of past touristic patterns for the country. The project team will need to make an estimate of the type of options for meeting this demand (e.g., additional hotels and more utility service such as water supply, electricity, local transport) that can be reasonably assumed to meet future requirements, given the current policy and regulatory framework in the country.

Step #4: Estimate Annual IF, FF, and O&M Costs for Baseline Scenario

>>> Estimate annual IF and FF for each investment type, disaggregated by investment entity and funding source

In this step, annual IF for the baseline scenario facility and infrastructure investments, such as hospitality buildings construction or transportation infrastructure, and annual FF for the baseline scenario research, education, assistance, and institutional investments (e.g., meteorological equipment and vehicles) are estimated for each subsector.

The output of this step will be a stream of annual investment flows and/or financial flows for each investment type in each subsector for the entire assessment period, by investment entity and funding source. These data should be organized as in Table 2-3 in Chapter II.

>>> Estimate annual O&M costs for each IF, disaggregated by investment entity and funding source

Annual estimates of O&M costs for assets purchased during the assessment period, and for assets purchased before the assessment period and that are expected to still be in operation, need to be collected (or derived). For example the estimates of O&M cost for heating or cooling, snowmaking, additional irrigation, back up water and power systems.

The source of these data, or method of derivation, will depend on the analytical approach selected, the scope, and the types of investment entities that are relevant for the tourism sector.

The output of this step will be a stream of annual investment flows and/or financial flows for each investment type in each subsector for the entire assessment period, by investment entity and funding source. These data should be organized as in Table 2-3 in Chapter II.

Step #5: Define Adaptation Scenario

This step entails developing a description of what is likely to occur in each relevant tourism component, over the assessment period, with implementation of additional adaptation measures. This would include comprehensive descriptions of the specific adaptation measures that would be implemented, and the implications of those measures for the evolution of the components.

The adaptation measures need to be defined clearly and completely so that IF, FF, and O&M costs can be estimated in the next step. This should include specific information about facility and infrastructure investments that would occur in each component, as well as non-asset investments. In-country expertise, and prior work on climate change adaptation in tourism (e.g., National Communications, vulnerability assessments, NAPA, etc.) should be utilized in this step.

If the available information indicates that adapting to sea level rise now is only marginally better than current practices throughout the country, the country team will likely judge that this particular option will not play a strategic role in future adaptation planning. On the other hand, if available information shows that certain coastal management practices could reduce vulnerability to extreme storms at reasonable cost, or mitigate damages associated with storms, this could identify a potentially strategic area for investment. In addition, a set of alternative technologies, management practices or policies that may enable them to better cope with the anticipated impacts of climate change may be developed in order to elaborate the assessment.

At the end of this step, the national team should have identified the set of alternative tourism infrastructure designs for a range of locations, characterized the potential for new touristic investment strategies, identified changes needed to create an enabling environment for investments in more resilient coastal development paths, developed a database for all potential tourism service practices and technologies and established (or developed) an alternative national schedule of new practices, technologies, and building standards to meet future demand in the sector.

Step #6: Estimate Annual IF, FF, and O&M Costs for Adaptation Scenario

>>> Estimate annual IF and FF for each investment type, disaggregated by investment entity and funding source

In this step, annual IF for the adaptation scenario technology, managerial facility and infrastructure investments, and annual FF for the research, education, extension, and institutional investments, are estimated for each of the options and measures identified in the previous step.

The output of this step will be a stream of annual investment flows and/or financial flows for each investment type for the entire assessment period, by investment entity and funding source. These data should be organized as in Table 2-3 in Chapter II.

>>> *Estimate annual O&M costs for each IF, disaggregated by investment entity and funding source*

As in step 4, the O&M are estimated but for the adaptation scenario. The output of this step will be a stream of annual O&M costs for each investment type for the entire assessment period, disaggregated by investment entity and source.

Step #7: Calculate the Changes in IF, FF, and O&M Costs needed to implement adaptation options

The changes in IF, FF, and O&M costs that are needed to implement the Adaptation measures in each component are calculated in this step by subtracting baseline scenario costs from Adaptation costs. There are two primary objectives of this step: 1) to determine how cumulative IF, FF, and O&M costs would change; and 2) to determine how annual IF, FF, and O&M costs would change. These calculations, which should be completed for each subsector, if appropriate, are described in detail in Chapter II.

Step #8: Evaluate Policy Implications

Climate change adaptation represents long term investment of human and financial resources. To ensure the optimal realization of the ongoing investment, the final step is to continuously evaluate the effectiveness of the implemented policies.

The purpose of this step is to evaluate the policy implications of the results of the assessment for the sector. The analyses in the previous step estimate the magnitudes and timing of changes in IF, FF, and O&M by each investment entity and from each funding source that would be needed to implement the adaptation measures in each subsector.

In order to focus closely on the policy implications for the tourism sector, i.e. investment decisions, marketing programmes, physical development; tourism sector and related coastal zone management policies are likely to be needed to induce the relevant entities identified in the assessment to implement proposed measures and incur the related I&FF. It will be important to convene a discussion among relevant stakeholder regarding the set of regulations or incentives necessary to influence investment decisions.

Several evaluation criteria are possible (e.g. cost, ease of implementation, delivered intended benefits, adverse effects). The evaluation criteria should be selected by stakeholders.

Policy measures include a variety of instruments that would affect the magnitude and direction of I&FF, for example, the investment in structural adaptation such as construction of new dams to avoid water shortage, or building codes in order to prevent damage from storm surges and sea level rise. The instruments are economic (e.g., taxes to certain tourism related activities), regulatory (e.g. limit new tourism development), insurance regulatory

measures, lending policies, voluntary agreements, information dissemination and strategic planning, and research, development, and demonstration (RD&D).