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Compilation of case studies on national adaptation planning processes

Note by the secretariat

Summary

This report contains a compilation of case studies on national adaptation planning processes, including tools and approaches used for the prioritization and implementation of adaptation actions. The report focuses on existing strategies and plans that some countries have developed to adapt to the adverse effects of climate change, including on elements of the prioritization and implementation of adaptation activities. It also provides a synthesis of relevant additional examples of adaptation planning and practices undertaken in other countries, which were reported under the Nairobi work programme on impacts, vulnerability and adaptation to climate change. This report could inform the ongoing process related to national adaptation plans.

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I. Introduction

A. Mandate

1. The Conference of the Parties, at its seventeenth session, requested the secretariat to prepare a compilation of case studies on national adaptation planning processes, including tools and approaches used for the prioritization and implementation of actions, building also on previous adaptation planning activities undertaken under the Nairobi work programme on impacts, vulnerability and adaptation to climate change to date, by the thirty-seventh session of the Subsidiary Body for Scientific and Technological Advice (SBSTA).¹

B. Scope

2. This report focuses on existing strategies and plans that countries have developed to adapt to the adverse effects of climate change, including on the prioritization and implementation of adaptation activities. The report reflects on common approaches as well as differences regarding criteria and indicators used for the different elements of adaptation planning and covers case studies from eight countries. It also provides a synthesis of relevant additional examples of adaptation planning and practices undertaken in other countries, which was prepared under the auspices of the Nairobi work programme. This report could inform the ongoing process related to national adaptation plans.²

C. Approach

3. The information contained in this report has been compiled and synthesized from the following:

- (a) A review of available information on national adaptation planning processes;
- (b) A review of existing knowledge and experience on relevant adaptation activities reported under the Nairobi work programme, including contributions by relevant organizations.

4. Case studies on national adaptation planning processes have been selected according to their scope and geographic coverage as well as by the diversity of planning tools and approaches used, and thus do not represent a comprehensive review of all existing strategies. Case studies that were national in scope have been selected, with the exception of New York State, the United States of America, representing a state-wide strategy, and the Caribbean, representing a region-wide strategy. Case studies are distributed geographically across four continents, including developed, developing and least developed countries.

¹ Decision 6/CP.17, paragraph 7.

² More information on national adaptation plans is available at <<http://unfccc.int/6057>>.

II. Case studies on national adaptation planning processes

A. Introduction

5. The process of adaptation planning poses challenges relating primarily to the high complexity of the process, resulting from the different levels of vulnerability of social, economic and ecological systems to the various impacts of climate change, the large number of actors involved, the different levels of decision-making and the cross-sectoral relations and interactions required.

6. Despite the challenges, several countries have initiated the design of national adaptation plans and strategies with the aim of moving from individual activities to a more coherent approach to addressing potential climate impacts. That coherent approach is meant to contribute to climate-resilient development, suggesting a long-term, continuous process. Therefore, most existing adaptation strategies and plans consist of various interrelated and often overlapping elements and require periodic revision, allowing for the consideration of changing circumstances and the availability of new information and knowledge.

7. Most countries with existing adaptation strategies started with an assessment of climate risks, which requires a thorough analysis of potential climate impacts and the underlying vulnerabilities of affected systems. Those risk assessments often require the help of expert judgements for the evaluation of risk. As identified by several existing national adaptation planning approaches, risk assessment benefits from a comprehensive and coordinated approach that applies the same methodology across regions and sectors, which allows for comparison and a subsequent ranking of risks and prioritization of adaptation activities.

8. Once risks have been identified, a ranking is usually undertaken in order to direct limited resources to addressing those risks that are considered most urgent or that could result in unmanageable consequences in the future. This ranking leads to the implementation of prioritized adaptation action, which requires the involvement of various stakeholders and the distribution of adequate responsibilities. A monitoring and evaluation system must be developed and accompany the implementation process so that corrective measures can be undertaken as required.

9. Chapters II.B and II.C define and discuss two elements of national adaptation planning processes, namely the prioritization of risks and adaptation options and the implementation of actions, using case studies from eight countries or regions (see annex I for an overview of different approaches implemented in the eight countries or regions). The case studies are the following:

(a) The United Kingdom of Great Britain and Northern Ireland climate change risk assessment;³

(b) Responding to Climate Change in New York State: the Integrated Assessment for Effective Climate Change Adaptation (ClimAID);⁴

(c) The Bangladesh climate change strategy and action plan 2009;⁵

³ Department for Environment, Food and Rural Affairs. 2012. *The UK Climate Change Risk Assessment 2012: Evidence Report*. Available at <<http://randd.defra.gov.uk/Document.aspx?Document=TheUKCCRA2012EvidenceReport.pdf>>.

⁴ Rosenzweig C, Solecki W, DeGaetano A, O'Grady M, Hassol S and Grabhorn P (eds.). 2011. *Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change Adaptation. Technical Report*. Albany, New York: New York State Energy Research and Development Authority.

- (d) Implementing the Caribbean Community (CARICOM) Regional Framework to Achieve Development Resilient to Climate Change;⁶
- (e) An Australian Government position paper on adapting to climate change in Australia;⁷
- (f) The German adaptation strategy;^{8,9,10}
- (g) The national adaptation strategy and plan of action on climate change for Nigeria;¹¹
- (h) The adaptation strategy of the Netherlands.^{12,13}

10. All eight countries or regions have designed a broad structure for the implementation process, including, at different levels of detail, the assignment of responsibilities, alignment with other national plans and strategies, a timeline, sources of financial support and potential programmes. However, the countries or regions are at different stages of the development of their national adaptation strategies or plans and thus provide different sets of inputs to the case study review. For example, for the evaluation of their climate risks, Netherlands, New York State and United Kingdom have undertaken a comprehensive risk and vulnerability assessment, whereas Germany plans to finalize such a comprehensive process by 2014. All other countries or regions have based the evaluation of their climate risks on existing studies and some additional field research.

11. With regard to the prioritization of risks and adaptation options, the United Kingdom has finalized the analysis of its risks and ranked them according to specific criteria. However, an economic evaluation of the risks and potential adaptation options is still ongoing and planned to be integrated into a comprehensive national adaptation programme by 2013. Hence, adaptation measures have not yet been implemented. Germany has developed an adaptation plan and defined criteria to prioritize action. However, it is still in the process of developing a comprehensive set of criteria to carry out a detailed prioritization of climate risks. In parallel, a study on the economics of climate risks and adaptation options is ongoing. The Netherlands and New York State have already undertaken a comprehensive assessment of the economics of planned adaptation options

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- ⁵ Ministry of Environment and Forests. 2009. *Bangladesh Climate Change Strategy and Action Plan 2009*. Dhaka: Ministry of Environment and Forests.
 - ⁶ Caribbean Community Climate Change Centre. 2011. *Delivering Transformational Change 2011-21. Implementing the CARICOM 'Regional Framework to Achieve Development Resilient to Climate Change'. Executive Summary*. Belmopan: Caribbean Community Climate Centre.
 - ⁷ Government of Australia. 2010. *Adapting to Climate Change in Australia. An Australian Government Position Paper*. Canberra: Department of Climate Change.
 - ⁸ Stratenwerth T. 2011. *The German Adaptation Strategy*. Available at <<http://www.wmo.int/hlt-gfcs/meetings/hlt-4/documents/GermanAdaptationStrategy.pdf>>.
 - ⁹ Umweltbundesamt. 2011. *Entwicklung eines Indikatorensystems fuer die deutsche Anpassungsstrategie an den Klimawandel (DAS)*. Germany: Umweltbundesamt. Available at <<http://www.umweltdaten.de/publikationen/fpdf-l/4230.pdf>>.
 - ¹⁰ Ecologic. 2012. *Kriterien zur Kosten-Nutzen Analyse von Anpassungsmassnahmen an den Klimawandel*. Presentation made during the workshop on economic aspects of adaptation to climate change – sectoral and regional evaluation, 19 January 2012, Berlin.
 - ¹¹ Building Nigeria's Response to Climate Change. 2011. *National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA – CCN)*. Nigeria. Available at <<http://nigeriaclimatechange.org/naspa.pdf>>.
 - ¹² Nillesen EEM and van Ierland EC (eds.). 2006. *Climate Adaptation in the Netherlands*. Bilthoven: Netherlands Environmental Assessment Agency.
 - ¹³ Van Ierland EC, de Bruin K, Dellink RB and Urijs A (eds.). 2006. *A Qualitative Assessment of Climate Adaptation Options and Some Estimates of Adaptation Costs*. Wageningen: Environmental Economics and Natural Resource Group, Wageningen University.

and thus have made progress in the ranking of the options. Nigeria, Australia and the CARICOM States have included criteria for prioritization in their adaptation plans but have not carried out a detailed economic assessment. The Bangladesh plan includes provisions for assessing the costs of implementing its 10-year action plan in consultation with line ministries in order to come up with a list of priority activities.

B. Approaches and tools for prioritization

1. Approach

12. In most countries with existing adaptation strategies, the prioritization of adaptation activities is based on the ranking of climate risks for a territory or specific regions or sectors (e.g. Germany, New York State, United Kingdom). After the most important risks have been identified, specific adaptation measures to address them can be developed and prioritized in accordance with a second set of criteria referred to in paragraphs 18–21 below.

13. Both the ranking of climate risks and the prioritization of adaptation measures are usually undertaken for different time periods considering the impacts of climate change in the short, medium and long term and the need for the implementation of adaptation measures. In most cases, short-term impacts and measures address a time frame of five to 10 years, medium-term impacts 10–40 years and long-term impacts more than 40 years.

14. The ranking of options can be undertaken according to different climate change impacts or within specific sectors or regions. For example, in Nigeria the drafting team of the adaptation strategy and plan first considered the key sectoral adaptation goals to be achieved, and then defined the broad high-level sectoral strategies required to achieve those goals.

2. Criteria for ranking risks

15. The ranking of climate risks for a country depends on specific vulnerabilities, but also on the perspective and interests of that country or even the evaluating stakeholders. Some criteria that are commonly used by countries in ranking climate risks include the following:

(a) Magnitude: the order of magnitude of the potential climate change impact plays a decisive role. Some impacts can be quantified (number of people harmed, area of land affected, etc.), while others need to be expressed in qualitative terms. The United Kingdom climate risk assessment uses three categories (high, medium and low) for evaluating the magnitude (i.e. threat and opportunity) of a climate change impact in economic, social and environmental areas. The thresholds used to classify risks into a high, medium or low magnitude draw widely on expert judgement to correctly categorize each risk;

(b) Probability, likelihood and level of confidence: given that adaptation planning is designed to mostly deal with future climate impacts, it needs to rely on scenarios, projections, predictions and estimations that have a certain degree of uncertainty. Thus, the probability of a certain climate hazard occurring or changing, the likelihood of that hazard resulting in a certain impact and the level of confidence in those estimations is very important in ranking prevailing risks. As observed in most cases, more than one climate scenario is used to estimate future risk and those risks that rank high across different scenarios receive a high final ranking;

(c) Reversibility: impacts that will have irreversible consequences are ranked higher;

(d) Urgency of action: those risks that require urgent attention and action, either because they have a high immediate damage potential or because they will have irreversible and high-damage consequences in the longer term, are ranked higher.

16. The classification and evaluation of the criteria depend on the country's individual situation and perspective. In developed countries, where the objectives and principles are more economically driven, risks that might have negative impacts on the country's economy and distribution of welfare are usually ranked higher. For example, in Germany risks that would impact on the national objectives of price-level stability, high employment rate, foreign trade balance and continuous and appropriate economic growth would be prioritized when developing adaptation measures. In Bangladesh, however, where one of the main national objectives is to eradicate poverty, risks that might exacerbate that objective will be prioritized.

17. Table 1 summarizes some examples of criteria applied by countries to rank identified climate risks.

Table 1
Examples of criteria for the ranking of climate risks

<i>Location</i>	<i>Criteria for the ranking of climate risks</i>
United Kingdom	<ol style="list-style-type: none"> (1) Magnitude (2) Level of confidence (3) Urgency of action (4) Rates of change and geographical extent (5) Connectivity (cross-cutting risks) (6) Policy relevance (7) Agency (can government action address the risk) (8) International dimension (climate change effects on other countries that might affect the United Kingdom, e.g. through supply chains, trade)
New York State, United States of America	<ol style="list-style-type: none"> (1) Magnitude of consequence (2) Probability of climate hazard (3) Timing (e.g. seasonality) (4) Persistence (5) Likelihood of impact (based on estimates of uncertainty) (6) Distributional aspects within a region or among socioeconomic groups (7) Importance of the at-risk systems (8) Thresholds or trigger points that could exacerbate the change (9) Equity and environmental justice (considering different degrees of vulnerability and adaptive capacities across urban and rural regions, sectors and demographic groups)
Australia	<ol style="list-style-type: none"> (1) Magnitude (2) Timing (3) Urgency of action to confront it
Nigeria	<ol style="list-style-type: none"> (1) Impacts currently experienced (2) Impacts expected to be most significant

3. Criteria for prioritizing adaptation measures

18. Once the most important risks for the country or sector under consideration have been identified, adaptation measures can be designed and prioritized according to a second set of criteria. This process will again be shaped by national objectives. The prioritization of adaptation measures will not only depend on their efficacy but also on the availability of financial, technical and human resources. The following set of criteria have been commonly used in prioritizing national adaptation strategies and plans in the selected case studies:

- (a) Efficacy: the extent to which the measure is able to effectively reduce the risk;
- (b) ‘No regrets’: ‘no regrets’ solutions are those that will have a positive impact even if climate change impacts do not occur. Those measures are especially useful when the type or degree of climate change impacts is still linked to a high degree of uncertainty;
- (c) Flexibility: measures that allow for adjustment or change in the future if climate change impacts turn out to be different from what had been expected;
- (d) Co-benefits/side effects: measures that provide positive or negative side effects for other stakeholders or sectors (e.g. mitigation) or where costs can be shared;
- (e) Costs and benefits: the application of tools analysing the costs and benefits of adaptation measures plays a predominant role when prioritizing them.

19. The Government of Australia, for example, recommends focusing on well-known risks when starting to implement adaptation measures and to apply the usual flexible and creative approaches when dealing with those risks that are still surrounded by scientific uncertainty. Nigeria, in its adaptation plan, divides the implementation of actions into two levels: (a) priority implementation actions that consist of broad, high-level enabling activities; and (b) other implementing actions that consist of other priority actions that have been identified through the set of criteria listed in table 2.

20. Table 2 provides an overview of criteria that countries have applied when prioritizing adaptation activities.

Table 2
Examples of criteria applied by countries to prioritize adaptation options

<i>Location</i>	<i>Criteria for the prioritization of adaptation measures</i>
Germany	<ul style="list-style-type: none"> (1) Strategic relevance (2) Side/secondary effects (3) Flexibility (4) Acceptance (5) Effectiveness (6) Economic aspects (macroeconomic efficiency and efficiency in terms of required public funds) (7) ‘No regrets’ measures (flexible, reversible, modifiable)
New York State, United States of America	<ul style="list-style-type: none"> (1) Costs (2) Feasibility (3) Efficacy (4) Timing of implementation (5) Resilience (6) Impacts on environmental justice communities (7) Robustness (8) Co-benefits/unintended side effects

	(9) Others (e.g. equity, social justice, sustainability, institutional context, unique circumstances)
Netherlands	(1) Importance of implementation (2) Urgency (3) 'No regrets' characteristics (4) Ancillary benefits to other sectors and domains (5) Mitigation linkages
Australia	(1) Magnitude and timing of impacts (2) Comparative assessment of taking early action to reduce or eliminate risks of locking in inefficient policies and investing in assets that have not factored in climate change risk (3) Degree to which the action falls under a Commonwealth responsibility or requires Commonwealth leadership to deliver a nationally consistent and/or effective outcome
Caribbean Community States	(1) Necessity with which activities are required to be started within the next two to five years (starting in 2011) (2) Degree to which activities lead to transformational change instead of single project approaches, including institutional and governance building blocks
Bangladesh	(1) The needs of the poorest and most vulnerable groups (2) The need to create an enabling environment to promote climate-resilient investment (3) The need to ensure that knowledge, data and experience on adaptation are shared with other countries in the region
Nigeria	(1) Importance and urgency (2) Degree to which policies, programmes or measures address an identified priority issue related to climate change adaptation (3) Feasibility, effectiveness and likelihood of significant impact of the measure (4) Degree to which measures modify and enhance existing policies or programmes that support proven local, state and national efforts (5) Relationship with existing responsibilities of people, organizations and agencies (6) Cost-effectiveness, efficiency (7) Flexibility

21. The evaluation of climate risks and adaptation measures and their subsequent prioritization according to the criteria listed in table 2 requires the input and advice of a variety of stakeholders. As the evaluation depends very much on the perspectives of the different stakeholders involved, there might not always be a single outcome of the prioritization process but rather a compromise that needs to be reassessed at regular intervals in order to account for changes in climate trends as well as shifting vulnerabilities and interests. It is thus important that the prioritization of risks and adaptation action is not seen as a one-time action, but as an ongoing process.

4. Tools

22. Countries have employed various tools in prioritizing adaptation actions, some of which are described below.

23. Cost-benefit analysis:

(a) An important step in planning for and prioritizing adaptation action is not only reviewing existing planning instruments but also assessing existing financing instruments. ClimAID, for example, carried out a cost–benefit analysis derived from standard pricing protocols and discount rate measures. For each of the sectors, the costs and benefits of adaptation measures were analysed for three different time horizons: short term (about five years), medium term (five to 15 years) and long term (beyond 15 years);

(b) Difficulties associated with cost–benefit analysis include estimating the social rate of time discount (when costs are incurred at one point in time and the benefits occur at another, it is standard practice to discount the costs and benefits in future periods by applying an appropriate rate in order to estimate the present values of those future costs and benefits¹⁴). Also, potential opportunity costs must be determined, given what is understood about the rate of climate change and the sensitivities of the system in question. Cost–benefit analysis is unsuitable for capturing non-monetary aspects, and inter-sectoral linkages need to be recognized and taken into consideration while working at a sectoral level;¹⁵

(c) Cost–benefit analysis is useful for comparing different adaptation options;

(d) The following issues could be considered when assessing the costs and benefits of adaptation action:

(i) For the evaluation of the benefits of a measure it is useful to assess not only the prevented climate change damage but also the potential contribution to enhanced adaptive capacity, other potential positive side effects, such as innovation, increased employment or competitiveness, and synergies with other areas, such as mitigation, energy security or sustainable development;

(ii) For the evaluation of the costs of a measure it is useful to assess microeconomic costs (e.g. investment, maintenance) and macroeconomic costs (e.g. decrease of competitiveness, change of external costs);

(iii) When comparing the costs and benefits of adaptation measures in order to evaluate the net benefit, it is important to assess the costs and benefits over the expected lifespan of the measure. The New York State economic assessment team, for example, considered the expected lifetime of an infrastructure or investment, their amortization times and the discount rates. It is equally important to provide information about the level of reliability attached to the evaluation and to ensure comparability to the extent possible. It is also important to consider other criteria, such as the relevance of the measure, its effectiveness, its outreach (e.g. local, regional, national), the dynamics of its incentives, its acceptance, potential conflicts of interest, mutual influence with other measures, the role of the State and its flexibility (e.g. ‘no regrets’, stability under different scenarios);

(iv) The evaluation of costs and benefits of an adaptation measure is only useful when compared with a baseline or ‘business as usual’ scenario, which might be difficult to establish in certain cases.

¹⁴ FCCC/TP/2009/2/Rev.1, paragraph 68.

¹⁵ FCCC/TP/2009/2/Rev.1, paragraph 6.

24. Multicriteria analysis (MCA):

(a) MCA allows for the assessment of different adaptation options against a number of criteria whereby each criterion is provided with a weighting. With the help of this weighting, an overall score for each adaptation option is obtained. The adaptation options with the highest score could then be prioritized.¹⁶ This tool is especially useful when only partial data are available, when certain influencing factors are difficult to quantify and/or when the monetary benefit or effectiveness are only two of many criteria;

(b) Scores are usually assigned to each criterion, where the limits between the different scores are defined prior to the scoring or based on expert judgement;

(c) The example of the Netherlands' adaptation strategy shows that a ranking could be obtained through a two-step process. The adaptation options that score highest in the evaluation criteria listed in table 2 were selected as a first step. Thereafter, the evaluation criteria themselves were ordered according to their perceived weight, based on expert judgement. That weight is expressed as a percentage (e.g. 40 per cent weight for importance, 20 per cent weight for urgency). The adaptation options that score highest in the criteria result would be the prioritized adaptation options;

(d) Several other influencing factors, such as political culture, national objectives and principles, or existing national strategies and stakeholders, play an important role when countries rank the measures required to confront climate change.

C. Approaches for implementation

25. Most national adaptation strategies are still at early stages of implementation. Some general steps exist to enable countries to start the implementation of their adaptation plans. Usually, the first step after the development of the strategy is its conversion into a more detailed and concrete plan, in some cases including a timeline. The prioritization of adaptation options can be part of the development of this more concrete plan. It is followed by the assignment of appropriate responsibilities for each of the adaptation activities, particularly those of the national government. That step could be accompanied by awareness-raising and capacity-building. Planning for implementation also includes the identification of potential conflicts or synergies among the different adaptation and/or mitigation activities or other national strategies and plans. That also involves the assessment of synergies between the available human resources and of the potential for regional or global cooperation. Finally, the shift into the implementation phase requires the securing of financial resources.

1. Development of concrete plan

26. As adaptation strategies only provide the broader framework for adaptation in a country, the next step usually is to develop a more detailed and concrete plan that guides the implementation of activities. The plan usually contains a more detailed outline of the steps to be taken, the assigned responsibilities and the estimated timeline. For example, the Bangladesh climate change strategy and action plan outlines concrete programmes to be carried out in different sectors, the kinds of activities to be undertaken and the responsible ministries and agencies. Those programmes may be refined and elaborated in consultation with the principal stakeholders at the time of implementation.

2. Distribution of responsibilities

27. The implementation of prioritized adaptation activities starts in most cases with the distribution of adequate responsibilities to those who are best and most efficiently able to

¹⁶ FCCC/TP/2009/2/Rev.1, paragraph 66.

deal with the risks. It is useful to distribute responsibilities in accordance with the prevailing political system of a country and with regard to the administrative level that possesses the best knowledge on local vulnerabilities and adaptive capacity and is thus best able to take effective decisions.

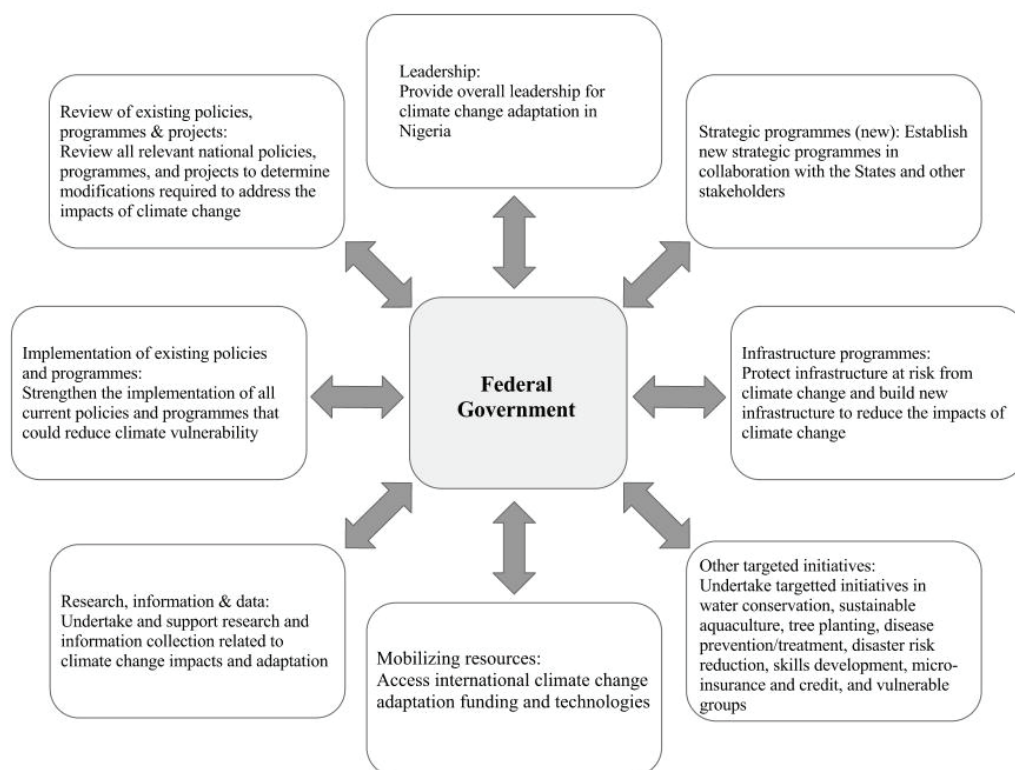
28. In political systems in which responsibilities are decentralized, such as in Australia, Germany or United States of America, the government's responsibility would be limited to developing the right political and legal framework, raising awareness and providing capacity-building and knowledge, creating incentives for adaptation, supporting individual responsibility, and providing general guidance and sometimes financial resources, whereas lower administrative levels would be in charge of prioritization and implementation.

29. The Australian Government applies the following criteria to define whether or not national government action is needed:

- (a) When the adaptation response involves multiple sectors (e.g. water, emergency management);
- (b) When there is a policy overlap (e.g. when there are inconsistent approaches between jurisdictions that produce inefficiencies or higher costs);
- (c) When the magnitude of risk to national well-being warrants all governments to work together (e.g. when failure in one jurisdiction threatens an entire nation, for example critical infrastructure such as electricity supply).

30. Nigeria's adaptation strategy allocates responsibilities to the following key stakeholder groups: the federal government, the state and local governments, civil society organizations and the organized private sector (see figure 1). For each of the identified priority sectors, the Nigerian strategy assigns concrete responsibilities for each of the above-mentioned actors to implement the planned adaptation activities.

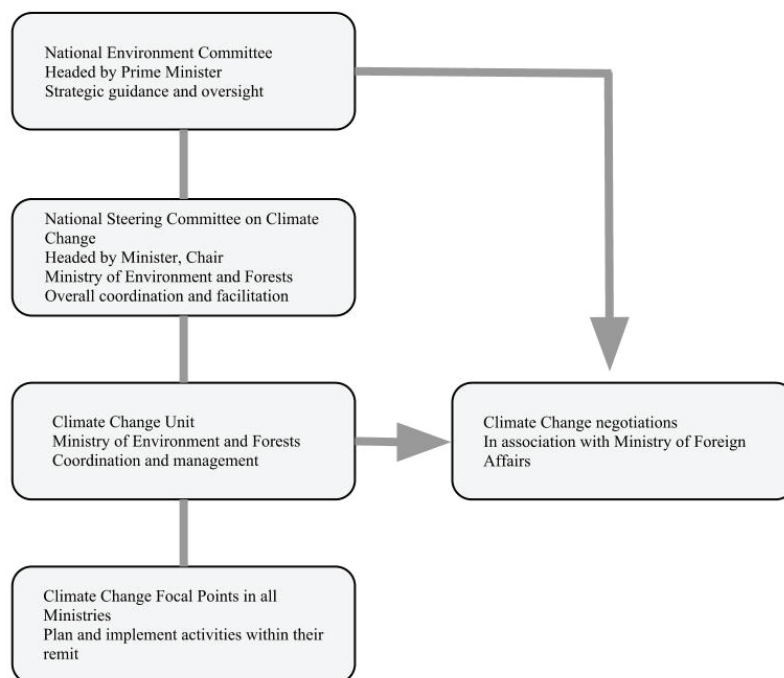
Figure 1
Implementation of national adaptation strategy and plan of action on climate change for Nigeria: recommended role of the federal government



Source: Adapted from Building Nigeria’s Response to Climate Change. 2011. *National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA – CCN)*. Nigeria. Available at <<http://nigeriaclimatechange.org/naspa.pdf>>.

31. In Bangladesh, the action plan is coordinated by a special body, such as a climate change unit, specifically created by the Ministry of Environment and Forests. That unit will operate under the guidance of the National Environment Committee, chaired by the Prime Minister, and the National Steering Committee on Climate Change, headed by the Minister of Environment and Forestry. All relevant sectoral ministries will have climate change focal points responsible for the implementation and monitoring of sectoral policies, programmes and projects involving other stakeholders, such as civil society and the private sector (see figure 2).

Figure 2
Bangladesh climate change action plan organization chart



Source: Adapted from the Ministry of Environment and Forests. 2009. *Bangladesh Climate Change Strategy and Action Plan 2009*. Dhaka: Ministry of Environment and Forests.

32. The Regional Framework to Achieve Development Resilient to Climate Change and the implementation plan of the CARICOM States provide a useful example of how to distribute responsibilities within a regional climate adaptation strategy. The CARICOM States have decided to adopt the ‘Three ones’ approach for the implementation of their regional framework. The approach is based on the principle of establishing a sustainable resource mobilization plan with three core elements. The first element suggests one coordinating mechanism to manage the process, recommending regional coordinating mechanisms and a separate national coordinating mechanism in each country. Considering the different challenges, organizational processes and governance of each member country and regional organization, the States are asked to work within, and build upon, the already existing governance and institutional arrangements. The coordination of the execution of the implementation plan of the framework will be managed by a new body, the Liliendaal Bureau on Climate Change, which will report to the Heads of Government and will be supported technically and secretariat-wise by the Caribbean Community Climate Change Centre (CCCCC). The coordinated action among all partners will be ensured through one plan, which will include a set of shared and common goals and objectives that can be contained within various individual documents.

3. Definition of a timeline

33. Most countries define a timeline during which the developed plan is to be reviewed and updated, during which the effectiveness of implemented activities will be reviewed. For example, the Nigerian adaptation strategy and plan is reviewed every five years and is updated in the light of new knowledge and experience. It has placed particular emphasis on coordinating this review period with the timelines of other important processes within the country, including the review of the Millennium Development Goals. The climate change

risk assessment in the United Kingdom is to be reviewed every five years, whereas the CARICOM regional framework is to be reviewed biannually.

34. In addition to the review of the plans, some countries assign specific timelines to the implementation of planned measures. For example, Nigeria's implementation plan defines three different timelines for different categories of action: short term (within a budget year), medium term (within two to three years) and long term (within three or more years). It should be recognized that measures taken in the short term can, or in many cases should, be continued in the medium and long term. Bangladesh's climate change action plan has a timeline of 10 years (2009–2018), with initial activities to be implemented during the first five years.

4. Assessment of conflicts and synergies and potential cooperation

35. Part of the implementation of adaptation activities is the assessment of potential conflicts or synergies of the planned activities with other plans or strategies. Mainstreaming of adaptation activities into other national plans and strategies forms an important part of the exercise.

36. In Nigeria, for example, adaptation activities should be consistent with and mainstreamed into the Vision 20:2020 plan, Nigeria's programme to address the Millennium Development Goals and Nigeria's national development agenda. In Bangladesh, adaptation activities will be mainstreamed into the Vision 2021 plan of the government as well as into its poverty reduction strategy.

37. In order to assess the potential for synergies and the effectiveness of planned activities, it is useful to ensure international cooperation. This is not only helpful in terms of securing financial and technical resources, but also in terms of coordinating activities to avoid conflicts and ensure effective results across national borders, for example related to transnational river basin management. For example, Bangladesh is cooperating with its neighbouring countries through regional action plans, as demonstrated in the 2008 South Asian Association for Regional Cooperation Ministers of Environment meeting, held in Dhaka, Bangladesh.¹⁷ In addition, Bangladesh also seeks to enhance cooperation on key adaptation-relevant issues, including water security.

5. Securing financial resources

38. Some adaptation plans already include the source of funding to cover the costs of planned adaptation activities. Under the German adaptation plan, for example, ministries are required to cover the costs of the activities that will be carried out under their responsibility from their own budgets.

39. The Nigerian adaptation plan recommends specific steps to mobilize the additional financial resources required for its implementation:

- (a) Situate climate change adaptation financing within the broader context of national development financing and the development goals of Vision 20:2020;
- (b) Undertake a detailed financial needs assessment to properly determine the economic costs of climate change adaptation in Nigeria;
- (c) Review all multilateral mechanisms to finance climate change adaptation, and determine what capacities must be put in place to access and manage those funds;
- (d) Revise the National Fiscal Policy to incorporate the cost of climate change adaptation;

¹⁷ Further information on this regional cooperation is available at http://www.saarc-sec.org/areaofcooperation/cat-detail.php?cat_id=54.

(e) Develop an innovative, non-debt creating national financing mechanism to support adaptation, raise the necessary funds and manage those funds well;

(f) Ensure that climate financing policies and resource allocations are responsive to real needs.

40. A detailed funding plan is to be developed by the ministries, departments and agencies of the government, which will incorporate domestic as well as international funding sources in Nigeria. The adaptation plan sets out preliminary guidelines for this funding plan.

41. The Government of Bangladesh has established a National Climate Change Fund with an initial capitalization of USD 45 million, raised to USD 100 million, which will focus mainly on adaptation. It estimates that an estimated amount of USD 500 million is needed to implement the planned adaptation activities during the first two years of the action plan and a total of USD 5 billion during the first five years. It encourages all development partners to contribute to this fund, which will be used exclusively to finance activities under the action plan.

6. Application of monitoring and evaluation system

42. The design of a monitoring and evaluation system forms an important part of any adaptation strategy and plan and its application should be integrated into the implementation process. The early integration of monitoring and evaluation helps to correct measures if required and supports the learning process. Indicators to monitor the implementation process and the effectiveness of measures should be communicated to and developed together with all relevant stakeholders.

43. The national adaptation strategy and plan of action on climate change for Nigeria includes priority actions with the responsible stakeholder, the expected timeline and draft implementation indicators, which need to be refined at the start of and during implementation. In addition, Nigeria has produced preliminary guidelines for measurement, verification and reporting of its adaptation strategy and plan. The plan also stipulates that the government authority responsible for climate change will also be responsible for the coordination of the monitoring process.

44. The Bangladesh climate change strategy and action plan stipulates that the individual sectors should develop internal mechanisms for monitoring progress and the continuous evaluation of impacts. In addition, an ad hoc committee is to be set up from time to time to assess overall progress, consisting of sectoral technical experts and community representatives. That committee should also periodically verify the defined indicators.

45. Although still preliminary, the following principles are going to be applied to the CARICOM monitoring and evaluation framework:

(a) Transparency: the CCCCC will, through its clearing house, monitor the progress of actions and share information and data with all partners;

(b) Simplicity: the reporting burden should be kept to a minimum, with the application of a self-reporting system in which organizations will inform the centre about progress against certain targets;

(c) Integration with sustainable development indicators: the integration would ensure that adaptation indicators are not a goal in themselves but should be selected according to their ability to effectively provide information about increased resilience or adaptive capacity;

(d) Relevance to the region- and nation-specific challenges: guidance for the monitoring and evaluation system will be provided at the regional level, but indicators should be adapted to the needs of each member State.

46. Based on the four principles above, CARICOM will apply a twin-track approach to measuring adaptation outcomes. It will measure development performance under climate challenges by tracking changes in real-life outcomes of climate-vulnerable communities. In that regard, the adaptation outcomes of CARICOM States can be compared with other countries with similar conditions using a range of social, economic and environmental indicators. On the other hand, it will measure how climate risk management is being applied in the development processes, actions and institutions.

III. Synthesis of knowledge and experience on relevant adaptation planning activities under the Nairobi work programme

47. Several activities mandated under the Nairobi work programme focused on advancing the knowledge base and sharing information on adaptation planning and practices and catalysing action. Relevant activities undertaken under the Nairobi work programme include the following:

(a) A workshop on adaptation planning and practices held to exchange information and views on existing adaptation practices, experiences, needs, gaps, opportunities, barriers and constraints, and on the contribution of traditional knowledge to the work on adaptation planning and practices;¹⁸

(b) A workshop on integrating practices, tools and systems for climate risk assessment and management and disaster risk reduction strategies into national policies and programmes to identify best practices of using tools and integrating practices for climate risk assessment and management and disaster risk reduction strategies into national policies and programmes;¹⁹

(c) A technical workshop on advancing the integration of approaches to adaptation planning to share information on approaches to and experiences in integrating and expanding adaptation planning and action at the national, subnational, community and local levels and views on lessons learned, good practices, gaps, needs, barriers and constraints to adaptation to enable informed decision-making on integrated practical adaptation actions and approaches, at various levels and within different sectors of society;²⁰

(d) Submissions by Parties and relevant organizations on efforts undertaken to monitor and evaluate the implementation of adaptation projects, policies and programmes and the cost and effectiveness of completed projects, policies and programmes as well as views on lessons learned, good practices, gaps and needs. Submissions from 31 Parties showed that 15 countries were considering or were in the process of developing national adaptation plans or frameworks;²¹

(e) An enhanced interface on adaptation practices;²²

¹⁸ The report on the workshop is available in document FCCC/SBSTA/2007/15.

¹⁹ FCCC/SBSTA/2009/5.

²⁰ FCCC/SBSTA/2010/2.

²¹ FCCC/SBSTA/2007/9, paragraph 16.

²² Further information on the adaptation practices interface is available at <<http://unfccc.int/4555>>.

(f) A synthesis report on approaches to and experiences in integrating and expanding adaptation planning and action, and lessons learned, good practices, gaps, needs, and barriers and constraints to adaptation;²³

(g) A technical paper on integrating practices, tools and systems for climate risk assessment and management and disaster risk reduction strategies into national policies and programmes;²⁴

(h) A technical paper on potential costs and benefits of adaptation options.²⁵

48. Some additional examples of national adaptation planning and practices disseminated through several activities undertaken under the Nairobi work programme other than the case studies described in chapter II are included in annex II.

IV. Potential role of and relevant contributions made by organizations, including Nairobi work programme partner organizations that could support the national adaptation planning processes

49. The case studies described in chapter II provide various examples of the utility of involving different stakeholders, including civil society organizations, private-sector actors and others, in national adaptation planning processes. This chapter provides an overview of relevant contributions by organizations, including Nairobi work programme partner organizations, that were shared and reported in the implementation of various activities under the Nairobi work programme and that could assist countries in their national adaptation planning processes.

50. Stakeholder participation and sharing of experiences are needed to enhance the decision-making process on adaptation at the national level. The potential role of non-governmental organizations to act as catalysts in facilitating integrated adaptation planning was highlighted in a workshop conducted under the Nairobi work programme.²⁶ On-the-ground experience and examples of tested methods of working within different socioeconomic and ecological contexts implemented by non-governmental organizations could be useful for supporting national adaptation planning processes. Practical Action shared information on its experiences of providing technical guidance and information to vulnerable communities and local governments, as an example of how a non-governmental organization can act as a broker to promote the national adaptation planning process.

51. Engagement and collaboration among stakeholders, ranging from local communities to national governments, has occurred in many Pacific small island developing States in adaptation planning and when implementing adaptation measures. The process of public consultation and participation has ensured that local interests have been considered in national policies and plans for climate change adaptation. That approach aims to prioritize vulnerable groups and their adaptation needs.²⁷

52. Romania has used a participatory approach, working with non-governmental organizations on adaptation planning in an intersectoral working group. The working group was organized in 2007 and in 2009 and consisted of 25 experts representing authorities and institutions responsible for environmental protection, the economy, development and

²³ FCCC/SBSTA/2009/6.

²⁴ FCCC/TP/2008/4.

²⁵ FCCC/TP/2009/2/Rev.1.

²⁶ FCCC/SBSTA/2010/2.

²⁷ FCCC/SBSTA/2010/2.

finance, agriculture, forests and rural development, transport, public works and housing, education, health, tourism, meteorology and hydrology, research institutions and non-governmental organizations.²⁸

53. Parties have also considered the potential contribution of regional initiatives and aspects to the national adaptation planning processes. For example, regional scientific networks, such as the Asia-Pacific Network for Global Change Research, could contribute to the risk assessment phase of national adaptation planning by supporting capacity-building for vulnerability and impact assessment through knowledge dissemination.

54. Annex III provides an overview of some relevant contributions made by organizations to national adaptation planning and processes, including results, outcomes and lessons learned as well as gaps and challenges.

V. Lessons learned

55. A number of lessons learned and good practices on adaptation planning processes emerging from the case studies and the review of knowledge and experiences shared through activities under the Nairobi work programme, including relevant contributions made by organizations, have been identified. They are described below.

56. **Stakeholder engagement and the distribution of responsibilities:** engagement and collaboration among stakeholders, including local communities, civil society, non-governmental organizations and the private sector, facilitates the prioritization and implementation of national adaptation planning processes. For example, experiences shared by organizations have indicated that collaboration with national governments and research institutions helps in bridging gaps between policy and research, and facilitates better integration of science- or evidence-based risk adaptation planning and implementation. More involvement of local stakeholder groups is required to catalyse the inclusion of local needs, including the needs of vulnerable groups, into national plans and policies.

57. Furthermore, coordination across federal, national, regional, state and local levels facilitates informed decision-making at the national level.

58. Early experiences demonstrated through the case studies show that it is important for governments to find the most effective balance between acting on their own and providing the right conditions and incentives for other stakeholders to act. The distribution of responsibilities emphasizes the importance of allocating accountability for delivering, monitoring and reporting on activities, for example according to sectors of expertise and responsibility.

59. **Mainstreaming:** the first experiences with the implementation of adaptation actions in Germany identify mainstreaming as the most effective approach to adaptation. It is seen as a long-term process that requires early information and communication with the relevant stakeholders. In addition, a lesson learned from the implementation of the early adaptation projects in Germany is to look for existing gaps and weaknesses in systems when confronted with weather extremes and other types of climate change. Those gaps and weaknesses should be addressed first when prioritizing adaptation actions. The Australian Government also closely follows the mainstreaming approach and states that new institutional or policy structures will only be considered where a demonstrated case has been made and existing frameworks cannot manage the risks effectively.

60. **Dealing with uncertainty:** in general, examples from the case studies lead to the understanding that uncertainty should not lead to inaction, since a lot of information already

²⁸ FCCC/SBSTA/2009/MISC.4.

exists and regular risk management strategies are useful for dealing with climate change impacts whose direction is not yet fully known. In addition, an important recommendation from the Australian Government reiterates that there is no need for adaptation to try to prevent all adverse impacts from climate change. In fact, such an attempt would be considered inefficient and not cost-effective. Instead, a sustainable balance needs to be made between acting too early or too late and between the potential benefits of action and the likely magnitude of climate change impacts. It is recommended to draw on the experience of sectoral experts who are already familiar with dealing with climate effects (e.g. urban water supply managers) and to pay careful attention to lessons learned from successful and failed adaptation activities.

61. **Responding to financial constraints:** the New York State adaptation assessment provides a good example of ways to respond to financial constraints. It proposes reviewing capital budgets and the time periods of adaptation strategies in order to determine which adaptation strategies can be undertaken within existing funding constraints and what additional resources need to be identified. In addition, it recommends linking adaptation strategies to planned projects or other non-adaptation efforts, which could result in significant cost savings, and that in times of fiscal austerity priority should be put on exploring low-cost and ‘no regrets’ adaptation strategies. Among other lessons learned is that even in countries where a concrete funding plan does not yet exist, potential funding sources and approaches to access them should be outlined within the plan.

62. **Knowledge sharing and enhancing access to information:** sharing of lessons learned and relevant knowledge, as well as review of adaptation planning and practices, also including those undertaken in collaboration with organizations, is useful for countries when experience with national adaptation planning processes is limited. For example, adaptation action undertaken at the local level could be scaled up and used at the national or regional level. The review of planned and existing national adaptation actions helps in awareness-raising, identifies opportunities for scaling up and replicating actions, building on what is working, and enhances collaboration, where appropriate.

63. Improving access to information for practitioners and policymakers is also important in that context. Regional and scientific networks and organizations could play important roles as information disseminators, in order to build capacity for vulnerability and impact assessment, and also for planning and implementation of adaptation measures.

Annex I

Types of approaches and activities undertaken by countries to implement national adaptation strategies and plans

<i>Country</i>	<i>Responsible entity</i>	<i>Type of adaptation action</i>	<i>Description of approach/activity</i>
Germany	Federal government	Enabling activities	(a) Development of knowledge and information as well as the required infrastructure to enable decision-making and mainstreaming (b) Normative framework (legal instruments and incentives) (c) International responsibility under the Convention and the European Union and in research and development cooperation
		Mainstreaming	Environmental safeguards
		Mainstreaming/direct adaptation	Adaptation activities related to the federal government's own properties and infrastructure
		Support and financing of pilot projects	Development of concepts, pilot and model projects and programmes, and derivation of lessons learned
	State governments	Enabling activities	(a) Development of knowledge base (b) Extension of knowledge and building of networks (regional conferences, integration of community leaders) (c) Joint financial programmes with federal governments
		Direct adaptation	Joint concepts and measures with federal governments in specific sectors (health, biodiversity, water management, agriculture)
	Non-State actors	Direct adaptation	No specific methods identified: own initiatives
Local actors in cooperation with federal/state governments	Direct adaptation	Integrated risk assessments across regions and sectors to consider mutual effects: inter- and transdisciplinarity is key	
Australia	Federal government	Enabling activities	(a) Provision of information for business and communities to adapt through science programmes

<i>Country</i>	<i>Responsible entity</i>	<i>Type of adaptation action</i>	<i>Description of approach/activity</i>
			(b) Driving and coordination of national reform efforts and ensuring national standards
		Mainstreaming/direct adaptation	Factoring climate change considerations into government's management of public assets (e.g. flood protection, infrastructure, public health)
		Complementing action	Creation of safety nets to protect the vulnerable and those who have difficulties adapting by themselves
	Commonwealth	International activities	Positioning of Australia in the international context
	Local governments	Direct adaptation	Coordination and encouragement of adaptation to local impacts
	Commonwealth, state and local governments	Mainstreaming	(a) Emergency management planning (b) Land management (c) National focus to drive change
Caribbean/Caribbean Community (CARICOM)	Liliendaal Bureau on Climate Change (subcommittee of the Heads of Government)	Enabling activities	(a) Provision of guidance to Heads of Governments on required transformational changes (in relation to adaptation and mitigation policy, finance and investment, and foreign relations) (b) Receiving briefings from the scientific community at regular intervals and communication of policy imperatives to Heads of Government (c) Monitoring of regional implementation
	CARICOM Ministerial (Council for Trade and Economic Development, Council for Human and Social Development, Council for Foreign and Community Relations)	Mainstreaming	(a) Assurance that CARICOM initiatives are consistent with the strategic elements and goals of the Regional Framework to Achieve Development Resilient to Climate Change (b) Strengthening of the region's climate change negotiators
	CARICOM mandated regional institutions	Enabling activities	(a) Strengthen national capacities through training, programme support, technical assistance and resource mobilization

<i>Country</i>	<i>Responsible entity</i>	<i>Type of adaptation action</i>	<i>Description of approach/activity</i>
			<p>(b) Encouragement of information sharing, documentation and comparative analysis</p> <p>(c) Development of policy platforms and advocacy of regional policy initiatives in global forums</p> <p>(d) Coordination with the Alliance of Small Island States in developing negotiation strategies to reflect CARICOM's priorities and interests under the regional framework</p>
	Caribbean Development Bank	Enabling activities/mainstreaming	<p>(a) Mainstreaming of climate change in economic and policy work with member countries (e.g. country strategies)</p> <p>(b) Mobilization and channelling of resources from the international development community</p> <p>(c) Provision of financing for capacity-building/institutional strengthening, specialized products and risk transfer</p>
	Caribbean Community Climate Change Centre	Enabling activities/mainstreaming	<p>(a) Coordination of the implementation of the framework</p> <p>(b) Provision of technical support and guidance</p> <p>(c) Maintenance of dialogue with stakeholders</p> <p>(d) Coordination of Caribbean positions under the Convention</p> <p>(e) Assistance to countries for assessing financial resources</p>
	National government	Enabling activities/mainstreaming	Establishment and servicing of national coordinating mechanism (considering the long-term coordinating role and the need to manage scarce resources and external funding, it is recommended to be a role of the national strategic planning and/or finance ministry)

Annex II

Additional examples of adaptation planning activities reported under the Nairobi work programme^{1,2,3,4}

<i>Country</i>	<i>Responsible entity</i>	<i>Type of adaptation action</i>	<i>Description of approach/activity</i>
Argentina	National and local governments, scientific and technical working groups, non-State local actors	Approaches for implementation	The Argentine experience on implementing adaptation action is that softer measures, such as knowledge dissemination, and regulations and practices, can be more important than structural, technological and equipment-related investments. Besides accessing financial resources, it was also found to be crucial that the scientific and technical teams maintained stability, in order to protect and pass on accumulated knowledge. Another finding shared by the Argentinian Government was that adaptation actions undertaken at the local level could be scaled up and used at the regional level. Replicating actions on another level was found to be conditioned by the sharing of knowledge and communication on concerns, impacts and lessons learned
Australia	Federal government and territory governments	Approaches and tools for prioritization	The Australian experience on climate change risk assessment shows that for climate change risks to be integrated into strategic planning and decision-making, it is necessary to go through a period of awareness-raising, development of the necessary science and practical response techniques, and identification of priorities
	Federal government and non-State actors	Approaches and tools for prioritization	The prioritization of adaptation measures in the Australian national risk and vulnerability assessment, completed in 2005, was based upon a literature review and meetings with key stakeholders in all capital cities. The selection process included considerations of climate vulnerability, the significance of systems at risk and the need for government intervention to ensure the implementation of well-timed and efficient adaptation actions

¹ FCCC/SBSTA/2007/MISC.10.

² FCCC/SBSTA/2009/MISC.4.

³ FCCC/SBSTA/2009/MISC.10.

⁴ FCCC/SBSTA/2006/11.

<i>Country</i>	<i>Responsible entity</i>	<i>Type of adaptation action</i>	<i>Description of approach/activity</i>
	Non-State actors	Approaches for implementation	The Australian Coral Bleaching Response Plan incorporated a community monitoring system to evaluate the implementation of the plan. The basis of the so-called Bleach Watch is a partnership including research stations, reef tourism operators and local communities. Together, the involved actors report detections and monitor coral bleaching. The experiences from the project have highlighted the importance of broader community involvement in the monitoring and evaluation of the adaptation plan
Austria	Ministry of Agriculture, Forestry, Environment and Water Management	Approaches and tools for prioritization	In 2007 initiated projects, including workshops for stakeholder dialogue, to prepare the development of a national adaptation strategy. The first measure was to conduct a survey on ongoing adaptation actions and research projects to provide a comprehensive picture of the current climate change adaptation situation in Austria. The sectors included in this study were agriculture, forestry, water management, tourism and the electricity industry. Thirteen areas of activity were screened for the survey and gathered in a database. The result was used as the basis for a comprehensive paper, providing knowledge on climate projections, vulnerability assessments and a set of recommendations for additional adaptation actions
	Government	Approaches for implementation	Stakeholder engagement in the implementing phase of adaptation planning. For example, in 2009 Austria started a stakeholder dialogue to define research needs, identify adaptation measures and discuss allocation of responsibility for implementing the chosen measures
Bangladesh	State government	Approaches for implementation	In Bangladesh, the Department of Environments' Climate Change Cell worked on a road map to develop and implement a standard tool to operationalize mainstreaming and the integration of climate risk management and adaptation. The objective was to establish a mechanism that supports national development planning and integrative implementation of adaptation measures and climate risk management in a systematic

<i>Country</i>	<i>Responsible entity</i>	<i>Type of adaptation action</i>	<i>Description of approach/activity</i>
			manner over a long period of time
Colombia	Non-State local actors, national and local governments	Approaches for implementation	Involving local stakeholders was also highlighted as an important lesson from implementing adaptation projects in Colombia. The Colombian recommendation on how to choose adaptation measures was to build on what is already working, is successfully practised and which also takes the role of local communities into account
Costa Rica	Ministry of Environment	Approaches for implementation	In 2009, the Ministry of Environment of Costa Rica began to develop a national adaptation programme for biodiversity and coastal marine areas. The programme aimed to integrate climate risk assessments and management reduction strategies into current and new national policy frameworks for those sectors
Denmark	Multiple governmental departments	Approaches for implementation	The 2008 Danish Strategy for Adaptation to a Changing Climate included three key initiatives to ensure that planning and development were considering future climate change, including a monitoring and evaluation approach. A Coordination Unit for Research on Climate Change Adaptation was organized under the strategy to evaluate the progress in implementation of the strategy and to report to the government. The cross-ministerial unit was also assigned the task of sharing lessons learned between sectors and authorities at all levels
El Salvador	Non-State actors	Approaches and tools for prioritization	El Salvador took part in the Global Environment Facility regional project on strengthening capacities for stage II adaptation to climate change in Central America, Mexico, Cuba and El Salvador and developed a coastal plain adaptation strategy. The identification and prioritization of adaptation measures for the strategy was based upon an integrated assessment of future climate vulnerability, including local projected socioeconomic dynamics, and climate change. To prevent or minimize impacts related to climate variability and change, the assessment incorporated natural and social features that create or increase present and future climate vulnerability. The adaptation measures were identified,

<i>Country</i>	<i>Responsible entity</i>	<i>Type of adaptation action</i>	<i>Description of approach/activity</i>
			prioritized, structured and validated by a research team, together with local actors
	Non-State local actors, local and national governments	Approaches for implementation	The local floodplain adaptation strategy adopted by El Salvador contains an implementation methodology. The scope of the adaptation measures were identified, including specific actions, the geographic location and the actor responsible for implementation. The responsibilities for some certain actions were allocated to rural families and their local organizations; other actions and measures were assigned to municipalities or to national public entities, depending on their legal mandates. The implementation plan thus supported the participation of local rural people and encouraged this group to actively influence and participate in the policy or decision-making process, to incorporate adaptation into the development agenda
	Non-State local actors	Approaches for implementation	The system for monitoring and evaluating the implementation of the local climate change adaptation strategy on vulnerability and adaptation to climate change of rural people living in the central coastal plain of El Salvador was based upon engaging the immediate beneficiaries and their social organizations at the local level to follow up on implementation actions and to replicate successful measures
Finland	Multiple governmental departments	Approaches for implementation	An evaluation of the Finnish national adaptation strategy was completed in 2008–2009. The evaluation was conducted by the Coordination Group for Adaptation to Climate Change, consisting of representatives of ministries, research institutes, research funding agencies and regional actors, which compared the adaptation measures identified in the strategy to adaptation action in the different sectors. A survey was used to answer whether and how actions defined in the strategy had been executed. The follow up of the evaluation included seminar discussions on the possibility to use indicators to show the level of adaptation achieved by different measures and actions. The preliminary indicator that was launched placed Finland's adaptation level on step 2, on a scale from 1 to 5. In Finland, the administrative sectors, municipalities and industries also launched their own review processes of the work on

<i>Country</i>	<i>Responsible entity</i>	<i>Type of adaptation action</i>	<i>Description of approach/activity</i>
			implementing adaptation measures ^a
France	Multiple governmental departments	Approaches and tools for prioritization	In 2007, interministerial work lead by the National Observatory on the Effects of Climate Warming and the Department of Ecology, Energy, Sustainable Development and the Sea was initiated, which focused on assessing the main impacts of climate change and the cost of, and which adaptation measures to pursue within, a national adaptation plan. The results of the work were used to define priorities for the national adaptation plan ^b
Germany	Cooperation between the federal government, the federal Länder and non-State actors from civil society	Approaches and tools for prioritization	The German Strategy for Adaptation to Climate Change was adopted in 2008. The underlying principles of this national framework are the following: openness and cooperation; knowledge, flexibility and precaution; subsidiarity and proportionality; integrated approach; international responsibility; and sustainability. Based on those principles, the framework brings about a medium-term, step-by-step process aimed at assessing the risks of climate change. This process provided a basis for stakeholder involvement
	Federal government	Approaches and tools for prioritization	When goals are to be defined and adaptation measures developed and implemented under the German strategy for adaptation to climate change, the frameworks underlying the principles might contribute to the definition of the goals and the development and implementation of adaptation measurement
	Federal Environment Agency	Approaches for implementation	As a means to implement and improve the German adaptation strategy, the federal government extended the area of responsibility of the Competence Centre on Global Warming and Adaptation at the Federal Environment Agency. Through the KomPass web service, information from various topic areas, sectors and ministerial departments is assembled, assessed and disseminated to the public
	Federal government	Approaches for implementation	To monitor and evaluate adaptation action, the German Government has developed adaptation indicators in accordance with the indicator system of the European Union. From 2011, the indicator system is used to

<i>Country</i>	<i>Responsible entity</i>	<i>Type of adaptation action</i>	<i>Description of approach/activity</i>
			produce a progress report of the German adaptation strategy, covering 14 sectors of the German strategy. The indicators are based on existing data and are to be improved gradually to be a more complete approach
Ireland	Environmental Protection Agency in cooperation with additional State agencies and departments	Approaches and tools for prioritization	The Irish Climate Change Research Programme was established in 2007. Climate change impacts and adaptation were included in the thematic areas on which the programme was structured. The development of the structure took place under the lead of the Environmental Protection Agency, together with other State agencies and departments. The work on climate change impacts and adaptation led to the development of the national climate change strategy in the same year. A national climate change impacts and adaptation database was then developed to support the national adaptation strategy and planning by providing information from experts, sectors and international practices. The aim for the future is to use the database to successfully integrate scientific data and adaptation measures into planning and development practices
Latvia	Government	Approaches and tools for prioritization	Submissions made by Latvia show that prioritization of adaptation measures has been handled as an issue of national security. The national security concept note approved in 2008, based upon an analysis of danger to the State, considers climate change risks. The security analysis is decisive for the process of making priorities for, and choosing measures to prevent, climate change risks ^c
Romania	Government	Approaches and tools for prioritization	The Romanian national guide on adaptation to climate change effects was finalized and approved in 2008. One of the main objectives of the guide was to identify the most important and cost-effective adaptation measures in the most vulnerable sectors. Adaptation measures that could be implemented at the local level, taking into account the limited available resources and the latest climate scenario for Romania, were targeted by the national guide

<i>Country</i>	<i>Responsible entity</i>	<i>Type of adaptation action</i>	<i>Description of approach/activity</i>
South Africa	Government, multiple sectors	Approaches and tools for prioritization	As shared under the adaptation practices interface, mandated by the Subsidiary Body for Scientific and Technological Advice, the South African Government has started pilot adaptation programmes and projects and promoted capacity-building and education in different sectors. Action targeting water resources, food security, agriculture, forestry and fisheries, oceans and coastal areas and education has been undertaken. Among the measures was the adjustment of national spatial planning to enhance the protection of coastlines
Spain	Government	Approaches and tools for prioritization	To mainstream adaptation into national policies and to identify adaptation options, the Spanish national climate change adaptation plan (PNACC), adopted in 2006, ^d pointed out 15 priority key sectors and systems for undertaking specific impact and vulnerability assessments
	Government	Approaches and tools for prioritization	Stakeholder participation has been used to prioritize adaptation action in Spain. Before implementing actual adaptation measures under the PNACC, key stakeholders in the targeted sector are encouraged to contribute to the definition of adaptation options
Sweden	Local governments and regional administrations	Approaches for implementation	Another approach to implementation, targeting the subnational levels of government, has been submitted by Sweden. To support the implementation of adaptation measures in Sweden, the Commission on Climate and Vulnerability emphasized in its report the responsibility of local and regional administrations to implement adaptation measures ^e
United States	Government, multiple departments and agencies, federal, state, regional and local agencies in cooperation with users	Approaches and tools for prioritization	The National Integrated Drought Information System (NIDIS): creation of a subsystem for risk assessment. Regional pilot projects were being developed, creating regional subsystems for monitoring and forecasting, risk assessment, preparedness, communication, key clearing house functions and evaluation and feedback systems. Among the keys identified for successful implementation were the criteria used for selecting, designing and implementing projects. Priorities for the near-term needs at

Country	Responsible entity	Type of adaptation action	Description of approach/activity
			different scales were also considered as crucial for the project to be successful. The lessons learned from this action included gained knowledge on how to scale up to a unified national approach from singular regional activities ^f
	Government at the federal, regional, state and local levels, multiple departments and agencies	Approaches for implementation	To implement NIDIS an implementation plan was created to describe how the system would be developed, set up and operated to facilitate informed decision-making. ^g NIDIS included subsystems for evaluation and feedback as part of the implementation strategy, both at the national and regional scale. Coordination across the federal, regional, state and local levels was a learning experience at the national level, shared through a submission under the Nairobi work programme. The project also accumulated knowledge on interaction between federal agencies and on liability matters

^a Further information is available at <<http://www.mmm.fi/en/index/frontpage/ymparisto/ilmastopolitiikka/ilmastomuutos.html>>.

^b More information on the National Observatory on the Effects of Climate Warming report is available at <<http://www.developpement-durable.gouv.fr/ONERC-Report-to-the-Prime-Minister.html>>.

^c The Latvian Government's web page contains the national security concept note from 2002, while an English summary of the concept note from 2008 is available at <http://www.mod.gov.lv/en/Par_aizsardzibas_nozari/Politikas_planosana/Koncepcijas/~media/AM/Par_aizsardzibas_nozari/Plani,%20koncepcijas/2008_nd_en.ashx>.

^d For more information, in Spanish, on the PNACC, see the web page of the Ministry of the Environment and Rural and Marine Affairs, available at <http://www.magrama.gob.es/es/cambio-climatico/temas/impactos-vulnerabilidad-y-adaptacion/plan-nacional-adaptacion-cambio-climatico/planificacion_seguimiento.aspx>.

^e Available at <<http://www.sweden.gov.se/sb/d/574/a/96002/>>.

^f *National Integrated Drought Information System Implementation Plan*, available at <<http://www.drought.gov/imageserver/NIDIS/content/whatisnidis/NIDIS-IPFinal-June07.pdf>>.

^g See also the *National Integrated Drought Information System Implementation Plan*, available at <<http://www.drought.gov/imageserver/NIDIS/content/whatisnidis/NIDIS-IPFinal-June07.pdf>>.

Annex III

Examples of relevant actions involving Nairobi work programme partner organizations and relevant stakeholders that could support national adaptation planning processes^{1,2,3,4,5}

<i>Organization</i>	<i>Type/name of action</i>	<i>Activities</i>	<i>Countries/regions covered</i>	<i>Sector</i>	<i>Results, outcomes and lessons learned</i>	<i>Gaps and challenges</i>
<i>Risk assessment</i>						
Institute for Social and Environmental Transition (ISET), United Kingdom	Adapting to Climate Change in China (ACCC)	ACCC aims to improve the understanding and assessment of impacts, vulnerability and risk in key sectors in China to reduce exposure to loss and damage by integrating policy and research, national and subnational planning, and social and physical science	China	Development planning	The project has supported evidence-based adaptation planning, which takes into account current and future climate change and variability through access to relevant data, tools and information on climate impacts and risks for decision makers	Conducting vulnerability and risk assessments across diverse cultural and geographic areas has been identified as a significant challenge
Climate Impacts Programme (UKCIP), World Resources Institute (WRI) and Chinese Academy of Social Sciences (CASS) ⁶			ISET, UKCIP and WRI are supporting CASS to identify potential climate change impacts and risks in three provinces: Ningxia Autonomous Region, Guangdong and Inner Mongolia		Lack of relevant data or data of low quality may cause difficulties to the development of models	Integration of research ideas and practices is a time-consuming exercise
		Actions so far include the following: training,			There are at this point no standardized methods for conducting vulnerability and risk assessments and there	

¹ The Nairobi work programme on impacts, partners, action pledges and experts database. Available at <<http://unfccc.int/5005>>.

² UNFCCC. 2009. *Action Pledges: Making a Difference on the Ground – A Synthesis of Outcomes, Good Practices, Lessons Learned, and Future Challenges and Opportunities*. Available at <<http://unfccc.int/4628>>.

³ FCCC/SBSTA/2010/9.

⁴ FCCC/SBI/2012/MISC.2.

⁵ UNFCCC. 2010. *Action on the Ground – A Synthesis of Activities in the Areas of Education, Training and Awareness-raising for Adaptation*. Available at <<http://unfccc.int/4628>>.

<p>participation in research and other learning platforms, working directly with the national government and key academic institutions in China to bridge gaps between policy and research, developing a methodology to integrate risk assessments into national-level planning processes, developing a common definition of vulnerability and risk for all partners and producing a series of key research highlights and case studies</p>	<p>is a need to develop appropriate methods at the local level. It has also become visible that there is a need to integrate qualitative and quantitative methodologies. The assessments become more meaningful and are more likely to catalyse change if linked to real life governance and policy processes. The experience is that multimodel climate scenario approaches are less resource intensive and facilitate planning for a variety of outcomes</p>
<p>World Meteorological Organization in collaboration with the Ibero-American Network of Climate Change Offices (RIOCC)</p>	<p>Global climate observing systems (GCOS) cooperation action plans</p>
<p>The implementation of GCOS cooperation action plans in the Ibero-American region aims to improve the collection, management, exchange, access to and use of observational data and to promote improvement of observations</p>	<p>Various sectors</p>
<p>RIOCC: Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, El Salvador, Spain, Guatemala, Honduras, Mexico, Nicaragua, Panama,</p>	<p>Different projects in the global upper network and in the global surface network have been developed and financial support has been provided. Lessons learned show that endorsement by regional organizations and effective collaboration with meteorological services is very important for</p>
<p>Funding has been considered as a main concern for the implementation of GCOS plans. There is also a need for better observations, especially in developing countries, to enhance forecasting and climate services</p>	<p></p>
<p></p>	<p></p>

making implementation successful. Also, assistance from the international donor community is essential. To obtain more and relevant data, the involvement of local stakeholders is required

Paraguay, Peru, Portugal, Dominican Republic, Uruguay and Venezuela (Bolivarian Republic of)

Prioritization

<p>Inter-American Development Bank (IDB)^b</p>	<p>Response to climate change strategy. Sector priority of the bank's objectives: protection of the environment, response to climate change, promotion of renewable energy and ensuring food security</p>	<p>Development of institutional and regulatory frameworks enabling investment in sustainable transport, alternative fuels, renewable energy, energy efficiency, agricultural development and land tenure to enhance food security</p>	<p>South America, Central America and the Caribbean</p>	<p>Water, agriculture, energy, development technology, finance</p>	<p>IDB country strategies supporting governments to address climate change adaptation in Argentina, Bahamas, Barbados, Belize, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, Venezuela (Bolivarian Republic of)</p>	<p>Challenges and gaps have been identified within each country strategy. Among the identified issues are the following: vulnerability to external conditions, institutional capacity deficiencies and coordination of multiple actors and agendas within the governments but also within the IDB itself</p>
<p>World Health Organization (WHO)</p>	<p>Support to national adaptation planning within the health sector</p>	<p>Awareness-raising and guidance to support greater health-sector engagement in climate change</p>	<p>Africa, the Americas, Europe, Eastern Mediterranean region, South-East Asia,</p>	<p>Health</p>	<p>A collection of tools and experience, creating a comprehensive programmatic approach to support health</p>	<p>International funding is required. Over 95 per cent of the least developed countries want to prioritize adaptation in the health</p>

<p>and health adaptation to climate change</p>	<p>adaptation programming at the national, regional and global level</p> <p>Technical and policy support for vulnerability and adaptation assessment based on newly revised guidance produced by WHO and the Pan-American Health Organization, following consultation with health and environment practitioners</p> <p>Integration of adaptation measures within a comprehensive approach to strengthening health systems to protect populations from the impacts of climate change</p> <p>Sharing of lessons learned and technical resources from the range of WHO pilot projects on health adaptation to climate change, through the Nairobi work programme and other</p>	<p>Western Pacific region</p>	<p>adaptation, for example the Plan of Action for Public Health</p> <p>Adaptation to Climate Change, to minimize adverse public health effects of climate change in Africa, developed by WHO and the United Nations Environment Programme. The plan responded to the calls of the Convention, ministers, the African Union Commission and the African Development Bank to provide technical assistance for implementation and to provide access to climate funds</p>	<p>sector, but only 30 per cent of the least developed countries have conducted appropriate assessments or developed response plans. International funding for health adaptation is less than 1 per cent of the projected rise in health-sector costs, USD 2–4 billion annually by 2030. In addition, since the 1970s over 140 000 excess deaths have occurred each year due to climate change</p>
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Convention mechanisms
 Technical and policy support for new projects and programmes on health adaptation to climate change
 Technical support in developing national strategies and action plans

Implementation

Fundação Getúlio Vargas (FGV) ^c	Policies for the climate	Brazil	Various	Improving initiatives at the national level, especially for the national policy for climate change. Articulating institutions for the elaboration of public policies that address climate change
Developing sustainability strategies, policies and management tools for public and private organizations at the local, national and international level. This includes support offered by the Climate	Observatory, which coordinates multiple institutions at the national level, representing different parts of the country. The programmes follow four strategic lines: (a) education; (b) research and knowledge production; (c) articulation and			

<p>exchange; and (d) mobilization and communication</p>	<p>World Wildlife Fund (WWF) in collaboration with Mexico^d</p>	<p>Project Rio Conchos: adaptation in river management</p>	<p>Mexico</p>	<p>The programme was established in 2002. It contains four main interventions: (a) reform of the irrigation industry; (b) improved management of headwaters; (c) strengthening institutions; and (d) environmental flow determination</p>	<p>Water resources, river basin management and freshwater conservation</p>	<p>An institution for adaptive basin management has been established. Vulnerability to drought has been reduced and access to water is more secure. Agriculture has as a result become more economically efficient and livelihoods enhanced. Payment for ecological services and environmental flows and for conservation of endemic species has been developed. Campaigning to close illegal wells and to enforce water laws took place in 2008</p>	<p>A relatively complex method to determine environmental flows was used, which could have been substituted by a quicker, cruder interim method to determine flows sooner. The illegal extraction of water is high, 40–60 per cent of sustainable yield, and needs to be reduced</p>
					<p>The case study highlighted the need for the sustainable management of surface water and groundwater in adaptation measures. Enforcement of the water law was also found to be crucial for the success of the project. The importance of stakeholder</p>		

engagement was highlighted. The evaluation of the project includes a recommendation to use multi-stakeholder processes in similar processes even if not legally mandated

Monitoring and evaluation

BirdLife International ^{6,7}	BirdLife partners advocating recognition of ecosystem-based approaches in national adaptation planning	Building capacity among BirdLife partners to engage in national adaptation plan processes and adaptation-proofing policy (energy, agriculture, forestry, water management)	Africa, the Americas, Asia, Europe and Central Asia, the Middle East, the Pacific (e.g. Palau)	Ecosystems and natural resources, energy, agriculture, forestry, water management	Identification of national adaptation plans that do not include environmental considerations in partner countries and those that do. Evaluated if the adaptation recommendations are the right ones from a broad environmental perspective
	One country example, BirdLife's partner in Palau, the Palau Conservation Society, working with communities and the government to ensure that adequate forested coastal buffer zones are in place, is helping to mitigate coastal erosion and to minimize the impact of saltwater inundation on water quality. It will also improve the				Development of the new Integrated Biodiversity Assessment Tool, which allows integration of biodiversity considerations at the earliest stages of adaptation and other project planning, helping governments, private business and funders to avoid

<p>conservation of coastal biodiversity</p>	<p>damaging natural resources during development</p>
<p>International Institute for Sustainable Development in cooperation with Costa Rica, Spain and the United States⁶</p>	<p>Adaptation Partnership</p>
<p>Review of planned and existing adaptation activities in 12 subregions across Asia and the Pacific, Africa, and Latin America and the Caribbean to catalyse effective adaptation. These reviews provide an inventory of regional and country-level adaptation activities and summarize adaptation priorities. They also identify gaps and opportunities for scaling up and enhancing collaboration</p>	<p>Africa, Asia and the Pacific, Latin America and the Caribbean</p>
<p>Promotion of more efficient adaptation processes in parallel with scaling up adaptation finance. Bringing countries together to share experiences and discuss work on adaptation. Taking stock and creating an inventory of ongoing adaptation activities in Africa, Asia and the Pacific, and Latin America and the Caribbean, extracting lessons learned to be shared within the Nairobi work programme. Partners to the Nairobi work programme were invited to contribute to the exercise</p>	<p>Various sectors, cross-sectoral</p>
<p>Precise definition of objectives and a hypothesis about the change process (i.e. a sound national adaptation process) are needed before designing the monitoring and evaluation method</p> <p>Access to local knowledge and experience within monitoring and evaluation systems and making sure all relevant stakeholders participate</p> <p>Need to build capacity to do adaptation monitoring and evaluation. This must be based on national systems, not donor systems</p>	<p>Focusing on evaluation through questions such as “Are we doing the right things?”, not just “Have we done what we set out to do?”</p> <p>Use existing information, data and monitoring and evaluation systems in</p>

relevant sectors. Look out for complementarities and opportunities for harmonization

^a ISET web page, available at <<http://www.i-s-e-t.org/projects-and-programs/resilience-to-climate-change>>.

^b More information is available at <<http://www.iadb.org/en/about-us/our-objectives-goals-and-sector-priorities,7914.html?#anchor5>>; country strategies are available at <<http://www.iadb.org/en/projects/country-strategies,6831.html>>.

^c FGV web page, available at <<http://ces.fgvsp.br/index.php?r=site/contendo&id=225>>.

^d World Wildlife Fund. 2008. *Water for Life: Lessons for Climate Change Adaptation from Better Management of Rivers for People and Nature*. Available at <http://awsassets.panda.org/downloads/50_12_wwf_climate_change_v2_full_report.pdf>.

^e <http://www.birdlife.org/climate_change/UNFCCC/copenhagen_2009.html>.

^f BirdLife International. *Partners with Nature: How Healthy Ecosystems are Helping the World's Most Vulnerable Adapt to Climate Change*. Available at <http://www.birdlife.org/climate_change/pdfs/Ecosystemsandadaptation.pdf>.

^g Adaptation Partnership web page, available at <<http://www.adaptationpartnership.org/blog/about-us>>.