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IMPLEMENTATION OF ARTICLE 4, PARAGRAPHS 8 AND 9, OF THE CONVENTION

MATTERS RELATING TO THE LEAST DEVELOPED COUNTRIES

Input of the Least Developed Countries Expert Group on the improvement of the Guidelines for the preparation of National Adaptation Programmes of Action

1. By its decision 29/CP.7, the Conference of the Parties (COP), at its seventh session, decided to establish the Least Developed Countries Expert Group (LEG). The terms of reference of the LEG, set out in the annex to the same decision, mandated the LEG to provide input into the review, and if necessary revision, of guidelines for the preparation of national adaptation programmes of action (NAPAs) at the eighth session of the COP. By its decision 28/CP.7, the COP decided to review, and if necessary revise, the guidelines at its eighth session, taking into account the views submitted by Parties and the LEG.

2. The attached submission contains the input of the LEG on the improvement of the guidelines for the preparation of national adaptation programmes of action.*

* The information attached to this note is reproduced as received, without editing.

INPUT OF THE LEAST DEVELOPED COUNTRIES EXPERT GROUP ON THE IMPROVEMENT OF THE GUIDELINES FOR THE PREPARATION OF NATIONAL ADAPTATION PROGRAMMES OF ACTION

Submission by
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The Guidelines for the Preparation of National Adaptation Programmes of Action (NAPAs) have gone through an iterative process of improvement from SB 13 to SB 15/COP 7. The LDC Expert Group (LEG) has gone through a process of annotating the guidelines; these annotations are included in italics in the annex to this submission. These annotated guidelines will be made available to Parties, GEF and GEF Implementing Agencies, and will also be presented to participants at an LDC Workshop to launch NAPAs in September 2002. Many Parties have already applied for funding from Implementing Agencies and will use the NAPA Guidelines for the preparation of NAPAs.

At the second meeting of the LEG held in June 2002, the group noted that the most plausible option would probably be to advise against amending the guidelines at this early stage and deem the attached annotations to be sufficient as an intermediate step towards further consideration at SBI 18 for a revision of the guidelines at COP 9.

The structure of the annotated guidelines is as follows:

A. Introduction
B. Objective of NAPAs
C. Characteristics of NAPAs
D. Guiding elements
E. Process
F. Structure of NAPA document

Appendixes:

A. NAPAs: Seeking Synergies Among Multilateral Environmental Agreements
B. Mainstreaming NAPAs: Integrating Adaptation to Climate Change into National Development Plans
C. Flowchart of main steps in developing a NAPA
D. Selection and Prioritisation of Options

Annex

ANNOTATED GUIDELINES FOR THE PREPARATION OF NATIONAL ADAPTATION PROGRAMMES OF ACTION

A. Introduction

1. National adaptation programmes of action (NAPAs) will communicate priority activities[1] addressing the urgent and immediate needs and concerns of the least developed countries (LDCs), relating to adaptation to the adverse effects of climate change.

Identification of priority activities will be the main goal of the NAPA. The annotated guidelines address methodological approaches to identifying these priority activities.

It is currently not possible to accurately predict climate change and its adverse effects, particularly at the local and regional levels. The IPCC maintains very strongly that learning to deal with climate variability and extremes is an excellent way of building adaptive capacity in the long run.

Strategies to cope with current climate variability and extremes exist at the community level. Hence one of the functions of the NAPA is to identify urgent action needed to expand the current coping range and enhance resilience in a way that would promote the capacity to adapt to current climate variability and extremes, and consequently to future climate change

2. The rationale for developing NAPAs rests on the low adaptive capacity of LDCs, which renders them in need of immediate and urgent support to start adapting to current and projected adverse effects of climate change. Activities proposed through NAPAs would be those whose further delay could increase vulnerability, or lead to increased costs at a later stage.

All LDCs share a low adaptive capacity arising from their poor socio-economic conditions. More importantly, the poor amongst those living in the LDCs would be the most vulnerable and in need of extra protection. The idea for NAPAs is to enable LDCs to treat some of the underlying causes of their vulnerability, and enable them to address those needs; for example, taking actions to reduce the impact of the next hazardous season, or putting in place policies (e.g. land-use zoning) that would facilitate future disaster response.

3. The NAPA will be presented in the form of a document specifying a list of priority activities, with a concise justification based on a tight set of criteria.

NAPA documents are intended to be concise communications and brief documents (5-10 pages long plus about 2 pages for each activity profile).

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[1] For the purposes of this annex, activities should include, *inter alia*, projects, integration into other activities, capacity building and policy reform.

4. The NAPA document will not be an end in itself, but rather a means for the dissemination, by an LDC Party, of its proposed programme of action to address its urgent needsfor adaptation. The priority activities identified through the NAPA process will be made available to the entity that will operate the LDC fund referred to in decision 7/CP.7, paragraph 6, and other sources of funding, for the provision of financial resources to implement these activities.

NAPAs are not obligations, but opportunities. They are a step towards addressing a country's urgent and immediate needs in regards to climate change adaptation. Countries should not see the completion of the NAPA document as the goal line, but a step towards addressing the needs identified in the NAPA.

B. Objective of NAPAs

5. National adaptation programmes of action will serve as simplified and direct channels of communication for information relating to the urgent and immediate adaptation needs of the LDCs.

C. Characteristics of NAPAs

6. National adaptation programmes of action should:

(a) Be easy to understand;

(b) Be action-oriented and country-driven;

(c) Set clear priorities for urgent and immediate adaptation activities as identified by the countries.

D. Guiding elements

7. The preparation of NAPAs will be guided by the following:

(a) A participatory process involving stakeholders, particularly local communities;

The participation of men and women at the grassroots-level is essential for two reasons. First, they are able to provide information on current coping strategies that the NAPA seeks to enhance. Second, they will be affected the most by climatic impacts and hence will benefit the most from the actions prioritized in the NAPA. Opportunities for the involvement of the private sector, NGOs and civil-society organizations should be sought. Early engagement of people at the grassroots level will be important in ensuring successful implementation of NAPA activities.

(b) A multidisciplinary approach;

By drawing on many disciplines, the resulting NAPA will be more integrated and cross-cutting, capturing all the components of sustainable development (social, environmental and economic).

(c) A complementary approach, building upon existing plans and programmes, including national action plans under the United Nations Convention to Combat Desertification, national biodiversity strategies and action plans under the Convention on Biological Diversity, and national sectoral policies;

UNCCD NAPs and CBD NBSAPs are products of bottom-up participatory processes that have crafted their priorities for action based on thorough and comprehensive knowledge and stakeholder involvement. In many cases, much of the groundwork for NAPAs will already have been developed in these documents. LDC Parties are encouraged to make use of the paper by the LDC Expert Group (LEG) on synergies among Multilateral Environmental Agreements, which is attached in Appendix A.

(d) Sustainable development;

Countries are encouraged to make use of the LDC Expert Group paper on mainstreaming NAPAs into development planning, included in Appendix B, and to build links between NAPAs and their Poverty Reduction Strategy Papers (PRSPs) and the national development planning process.

(e) Gender equality;

Climate change will have different impacts on men and women, and in most cases, the adverse effects of climate change disproportionately affect women. For example, with increasing drought it is women who have to walk longer distances to collect water. Women are often the main repositories of vital local and traditional knowledge, and they need to be recognized as key stakeholders in the consultations and in decision-making.

(f) A country-driven approach;

The guidelines have chosen a non-prescriptive approach to honor the country-driven principle. This national focus does not preclude investigating opportunities for regional synergies.

(g) Sound environmental management;

Sound environmental management comprises many tools (environmental impact assessment, strategic environmental assessment, environmental management systems). A measure beneficial to only one aspect of development (social, economic) should not come at the

expense of sound environmental management. This principle should be applied whenever possible.

(h) Cost-effectiveness;

Cost effectiveness should be interpreted in the wider context of sustainable development, rather than least-cost alone.

(i) Simplicity;

(j) Flexibility of procedures based on individual country circumstances.

The guidelines are not intended to be prescriptive. Depending on country circumstances, some LDCs may wish to address more elements.

E. Process

Please see Appendix C, which shows a flowchart describing the process for preparing a NAPA.

8. The preparation of the NAPA may proceed as follows:

(a) The setting up of a national NAPA team: the national climate change focal point will set up a NAPA team composed of a lead agency and representatives of stakeholders including government agencies and civil society. This group would be constituted using an open and flexible process that will be inclusive and transparent. The NAPA team will be responsible for preparing the NAPA and coordinating the implementation of NAPA activities;

The climate change focal point is asked to establish the NAPA team, but this does not necessarily mean that the focal point should lead the team. It may be more strategic to have the lead come from a central development planning ministry in order to mainstream the NAPA more effectively into development/poverty reduction plans. The selection of civil-society representatives will require careful consideration to identify the most appropriate participants, as civil-society participation will be a key factor in determining the NAPA. For example, a country with chronic food problems may consider engaging an NGO representative working at the local level on food and famine issues. The NAPA team will work with a broader multidisciplinary team to conduct the tasks in the preparation of the NAPA.

(b) The NAPA team will assemble a multidisciplinary team:

This will be the broader team entrusted with undertaking most of the tasks associated with preparing the NAPA. It will span all relevant disciplines such as agriculture, forestry, health, urban planning and women's issues, and will work under the guidance of the NAPA team. This team should include a social scientist familiar with participatory methods.

The following work is intended to be drawn from existing studies:

(i) To synthesize available information on adverse effects of climate change and coping strategies, which would be collated and reviewed, including the national strategies for sustainable development, the Programme of Action for the Least Developed Countries, the United Nations development assistance frameworks, and poverty reduction strategy papers, if available in the countries;

The information and knowledge on coping strategies that exist at the grassroots level would be reviewed here, including results from assessments of adverse impacts of climate change including any results from National Communications where they have been completed. A succinct review of main national development goals and strategies would be given (see the mainstreaming paper in Appendix B for further details).

(ii) To conduct a participatory assessment of vulnerability to current climate variability and extreme weather events, and to assess where climate change is causing increases in associated risks;

(iii) To identify key climate-change adaptation measures, based, to the extent possible, on vulnerability and adaptation assessment; such measures would also be responsive to needs identified under other relevant processes, such as the preparation of national action plans under the United Nations Convention to Combat Desertification and national biodiversity strategies and action plans under the Convention on Biological Diversity;

See the paper on synergies among Multilateral Environmental Agreements, which is attached in Appendix A.

(iv) To identify and prioritize country-driven criteria for selecting priority activities to address needs arising from the adverse effects of climate change, drawing on the criteria referred to in section F.4 below.

(c) Development of proposals for priority activities to address needs arising from the adverse effects of climate change: the national team will:

(i) Organize a national and/or subnational consultative process to solicit inputs and proposal ideas in order to help develop a short list of potential NAPA activities. The national team would facilitate this consultative process, and would help in translating ideas into activities. This process will allow adequate dialogue between the national team and the public, with time allowed for public comment and revisions;

The adequate dialogue with the public on the priority activities means that they need to be widely disseminated, ensuring that all Parties affected are informed and consulted. Use of the most relevant media in communicating with stakeholders is encouraged, including innovative ways of ensuring feedback from those that would be impacted the most.

(ii) Identify potential activities, which may include capacity building and policy reform, and which may be integrated into sectoral and other policies;

(iii) Select and identify priority activities, based on the agreed criteria;

(iv) Propose profiles of priority activities using the following format:

- Title
- Rationale/justification in relation to climate change, including sectors concerned
- Description
  - Objectives and activities
  - Inputs
  - Short-term outputs
  - Potential long-term outcomes
- Implementation
  - Institutional arrangement
  - Risks and barriers
  - Evaluation and monitoring
  - Financial resources

(d) The development of the NAPA document: the document will be prepared following the structure set out in section F below;

(e) Public review and revision: the NAPA document will undergo public review and be revised accordingly;

The public review process could include an open consultation on the document at the national, regional and local level, as well as a sectoral/thematic review.

(f) The final review process: the NAPA document, including the profiles, will be reviewed by a team of government and civil society representatives, including the private sector, who may take into consideration any advice solicited from the Least Developed Countries Expert Group;

During the final review process, the revision referred to in (e) above is anticipated to be completed by the NAPA team.

(g) National government endorsement of the NAPA: after the NAPA has been prepared, it will be submitted to the national government for endorsement.

(h) Public dissemination: the endorsed NAPA document will be made available to the public and to the UNFCCC secretariat.

It is expected that the UNFCCC secretariat will supply a copy of the completed NAPA to the LEG.

F. Structure of NAPA document

Information already included in the proposal for funding the NAPA preparation process need not be repeated in the NAPA document itself. The GEF proposal-preparation process requires specific information and linkages to other enabling activities. Only essential points should be repeated here.

1. Introduction and setting

9. This introductory section will include background information about the country that is relevant to the NAPA process. It will cover current characteristics, key environmental stresses, and how climate change and climate variability adversely affect biophysical processes and key sectors.

Given the need for conciseness in the NAPA document, only information that is directly relevant to the content of the NAPA document should be included in this section.

2. Framework for adaptation programme

10. This section will also provide an overview of climate variability and observed and projected climate change and associated actual and potential adverse effects of climate change. This overview will be based on existing and ongoing studies and research, and/or empirical and historical information as well as traditional knowledge.

This section should clearly summarize hazards posed by climate and climate change, and some summary of vulnerability, based on past studies and/or from stakeholder knowledge of their situation. This section will set the context for the whole NAPA by clearly demonstrating what aspects of climate change are important for the country, based on the experience of its stakeholders. Such an approach cannot rely exclusively on academic literature, or Vulnerability and Adaptation reports, but mainly on the knowledge of practitioners at the community level who have developed coping strategies over generations.

The reference above to "projected climate change" implies drawing on existing national projections, if available.

11. This section will describe the NAPA framework and its relationship to the country's development goals, as described in subparagraph 8(b)(i) above, to make the framework consistent with socio-economic and development needs. In addition, it would also describe the goals, objectives and strategies of the NAPA, taking into account other plans and multilateral environmental agreements.

While the NAPA identifies urgent and immediate action, it still needs to fit within development goals, plans and frameworks, especially in relation to rural citizens and economic development plans for the country. NAPAs will not attempt to implement broad national development goals; rather, NAPAs would build upon national goals and integrate into national plans. They should also promote synergies with other plans of action, and action in the context of other MEAs.

Most if not all countries have elaborated their development goals, and have systems in place to implement the associated plans through economic planning, etc. It is important that the NAPA team be aware of these, because NAPAs may be expected to safeguard important systems, including infrastructure that would be critical in achieving economic goals for the country. For example, a NAPA may wish to flood-proof a single bridge that connects a major cash-crop producing area of a region.

12. Where possible, a description of the potential barriers to implementation should also be included.

There may be potentially serious barriers to implementing NAPAs, such as a lack of policies to facilitate the implementation of the NAPA. These barriers should be identified and possibly considered as areas for intervention in the immediate term or in future. Examples of such barriers could include legal and policy-level inadequacies or inconsistencies, institutional, social, economic and cultural barriers, lack of awareness of climate change issues etc.

3. Identification of key adaptation needs

13. Based on this overview and framework, past and current practices for adaptation to climate change and climate variability will be identified as related to existing information regarding the country's vulnerability to the adverse effects of climate change, climate variability and extreme weather events, as well as long-term climate change. This section will explain how and to what extent activities may address specific vulnerabilities.

This will be the synthesis of the core of the NAPA preparation process, and should clearly articulate suggested courses of action based on specific vulnerabilities. This long list of activities should be based on the assessments carried out by the NAPA team, including very substantive involvement by stakeholders.

In some cases, countries may have adequate information from past studies to suggest urgent actions to address previously identified priorities. In such a case, the multi-stakeholder dialogue would emphasize the discussion of actions and selection of priority activities.

14. Given the actual and potential adverse effects of climate change described in section F.2 above, this section will identify relevant adaptation options including capacity building, policy reform, integration into sectoral policies and project-level activities.

4. Criteria for selecting priority activities

A country should be free to choose from these criteria as best suits their case. NAPA activities must address convincing threats of climate and climate change, and information should be provided that shows potential damages and how this damage would be avoided or reduced. NAPA activities should demonstrate fiscal responsibility (cost-effectiveness), they must be related to level of risk, and should complement important country goals, such as overcoming poverty to enhance adaptive capacity, and other environmental agreements.

The prioritization process is a two-tiered approach. Under paragraph 15 below, four general criteria will be used to select priority adaptation activities from a long list of potential activities. The criteria under paragraph 16 below will be prioritized and will subsequently be used to rank the selected NAPA activities.

The criteria under paragraph 15 could be seen as of a first order; those under paragraph 16 as further detailing. It is possible to take all of these criteria into account by employing multi-criteria analysis, as set out in Appendix D, where an example of a possible way to structure the criteria is given. Countries are encouraged to limit the number of criteria to a manageable number.

15. A set of locally-driven criteria will be used to select priority adaptation activities. These criteria should include, *inter alia*:

(a) Level or degree of adverse effects of climate change;

(b) Poverty reduction to enhance adaptive capacity;

(c) Synergy with other multilateral environmental agreements;

(d) Cost-effectiveness.

16. These criteria for prioritization will be applied to, *inter alia*:

(a) Loss of life and livelihood;

Countries are encouraged to treat "loss of life" and "loss of livelihood" as two distinct criteria.

(b) Human health;

(c) Food security and agriculture;

(d) Water availability, quality and accessibility;

(e) Essential infrastructure;

(f) Cultural heritage;

(g) Biological diversity;

(h) Land-use management and forestry;

(i) Other environmental amenities;

This could include wetlands, natural attractions, etc.

(j) Coastal zones, and associated loss of land.

Countries should use all or any of the above, as well as other relevant criteria for their situation.

5. List of priority activities

17. This section will list priority climate-change adaptation activities that have been selected based on the criteria listed in section F.4 above.

This is the outcome of the NAPA preparation process – a list of priority activities, which fit in well with the country's development goals and poverty reduction strategies, while at the same time enhancing the adaptive capacity of its vulnerable communities.

18. For each of the selected priority activities a set of profiles will be developed for inclusion in the NAPA document. This could follow the format set out in subparagraph 8(c)(iv) above.

The format of a project profile is as follows, and each should be about 2-3 pages only:

- *Title*
- *Rationale/justification, in relation to climate change, including sectors concerned*
- *Description*
  - Objectives and activities
  - Inputs
  - Short-term outputs
  - Potential long-term outcomes

- *Implementation*
  - *Institutional arrangement*
  - *Risks and barriers*
  - *Evaluation and monitoring*
  - *Financial resources*

6. NAPA preparation process

19. This section will describe the NAPA development process, including the process of consultation, the methods for evaluation and monitoring, the institutional arrangements, and the mechanism of endorsement by the national government.

This final section would document, briefly, the processes and major steps in developing the NAPA, paying particular attention to the important guiding principles of NAPAs, namely:

- *Use of a participatory process involving stakeholders, especially local communities;*
- *Inclusion of multiple disciplines and inclusion of agencies responsible for implementing development plans;*
- *Country-drivenness;*
- *Contribution to overall sustainable development goals;*
- *Government endorsement and commitment to implementing the outcomes, and some system for accountability;*
- *Transparency.*

Appendix A

NAPAs: Seeking Synergies Among Multilateral Environmental Agreements

Synergy: "a combined effect… that exceeds the sum of individual effects"
– Concise Oxford Dictionary, 7th edition

A. Context

Climate change is predicted to significantly impact the least developed countries (LDCs) due to their lower adaptive capacity and greater vulnerability to change. In response to this situation, at the November 2001 meeting of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC), guidelines for the preparation of National Adaptation Programmes of Action (NAPAs) were established (Decision 28/CP.7). NAPAs will communicate the immediate and urgent needs of LDCs as they prepare for the predicted impacts of climate change.

The UNFCCC guidelines for preparing NAPAs state that this process is to be guided by "[a] complementary approach, building on existing plans and programmes, including national action plans [NAPs] under the United Nations Convention to Combat Desertification [UNCCD], national biodiversity strategies and action plans [NBSAPs] under the United Nations Convention on Biological Diversity [CBD], and national sectoral policies". The purpose of this background paper is to examine the rationale for taking a "complementary approach" and to provide some guidance on how synergies between NAPAs, NAPs and NBSAPs can be achieved.

Although this paper focuses on synergies between the mandate, objectives, plans and activities of the UNFCCC, UNCCD and CBD, it is important to recognize that the preparation of NAPAs should be done in a manner consistent with each country's other international obligations, wider planning processes and overarching development goals. During the preparation of NAPAs, consideration may be given to obligations under other relevant multilateral agreements that a country has signed, such as the Ramsar Convention on Wetlands, the Bonn Convention on Migratory Species, the Convention on International Trade in Endangered Species, the Law of the Sea and the Forest Principles[1]. National strategies such as Sustainable Development Strategies, National Environmental Action Plans, national or local "Agenda 21 Plans", national conservation strategies, sectoral strategies, disaster preparedness plans and poverty reduction strategies such as Poverty Reduction Strategy Papers (PRSPs) should be examined as well.[2]

[1] Formally called the "Non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests".
[2] A complementary background paper on mainstreaming NAPAs into regular national sustainable development planning activities has been prepared by the LDC Expert Group and is included as Annex B of this document.

B. Why Seek Synergies between Multilateral Environmental Agreements (MEAs)?

A country's climate directly influences the ecological characteristics of its lands and waters, and, in turn, how people earn a living and organize themselves. The global process of climate change will, therefore, influence ecological, economic and social activities and development at the regional and local level in all countries, making it one of the more profound challenges to sustainable development and poverty eradication. This challenge is of particular concern to LDCs, and led to recognition of the need to immediately prepare NAPAs.

In putting forth the concept of NAPAs, LDC representatives also recognized that their countries have already initiated efforts to address climate change and other important environmental issues. Some countries have developed National Communications under the UNFCCC, action plans to combat desertification through the UNCCD and strategies to preserve biodiversity through the CBD. By taking a "complementary approach" and working cooperatively to address climate change, desertification and biological diversity loss, it is hoped that synergy – the achievement of results greater than what would occur if efforts to address a common problem were undertaken independently – can be promoted.

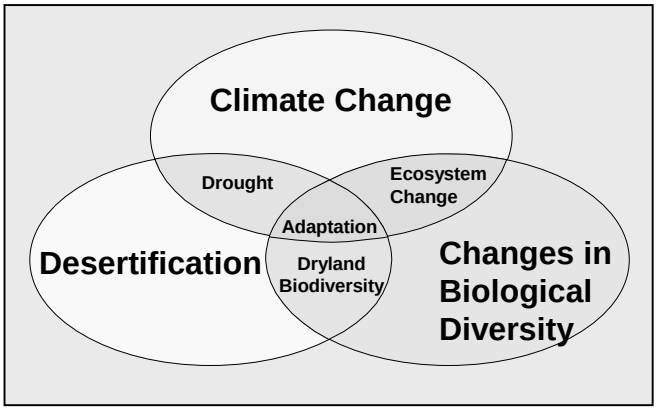


Fig.1: Interconnections between climate change, desertification and changes in biological diversity. Opportunities for achieving synergies in adaptation measures may be found where two or more of these processes overlap. For instance, measures supporting adaptation to drought conditions can simultaneously address concerns related to climate change and desertification.

As seen in Figure 1, climate change, desertification and loss of biological diversity are intimately connected to one another – they overlap and affect, and are affected by, each other. This interconnectedness means that opportunities exist to build on areas of mutual interest and to implement adaptation measures in a manner that promotes synergies between MEAs. As NAPAs are being designed, it is these opportunities that need to be identified by preparation teams. By seeking synergies between MEAs, NAPAs can effectively help achieve national development objectives while also supporting the achievement of their country's climate change, desertification and biological diversity objectives.

The preparation of NAPAs is the first step towards developing long-term plans for responding to climate change. The process is intended to effectively communicate LDCs' immediate climate change adaptation needs, and is to be undertaken in a short period of time and utilize existing information. In contrast, the preparation of NAPs under the UNCCD and NBSAPs under the CBD is a slower process involving more in-depth examination of particular issues (including new research) and extensive consultation with stakeholders. Given the time and resource constraints on the preparation of NAPAs, national teams can take advantage of the information gained and lessons learned through the development of NAPs and NBSAPs to, for instance, identify sources of vulnerability and key adaptation requirements. This knowledge can then be

incorporated into climate change adaptation plans. At the same time, NAPAs may be prepared in a manner that supports and reinforces the plans and activities of the UNCCD and CBD.

The Practical Benefits of Synergies

Better coordination between MEAs can provide a number of practical advantages, particularly in the area of capacity development. Although coordinating and integrating MEAs into national development plans is challenging for all countries, the significant potential benefits of this process means that efforts to promote synergy between MEA obligations needs to be encouraged. In relation to NAPAs, these benefits include:

- more efficient use of financial resources by avoiding unnecessary duplication of efforts. For instance, building upon existing knowledge bases and information sharing systems can lower the cost of developing a NAPA;
- better utilization of available human resources (and their time) within the government, the scientific/academic community and at the community level, helping to ensure efficient use of limited capacity and access to the best skills available;
- increased opportunity to implement identified measures and programs that have multiple objectives, thereby more efficiently using limited financial resources;
- better utilization of existing knowledge and expertise (scientific and indigenous) related to biodiversity and drylands management when identifying adaptation priorities;
- greater ownership of plans developed across sectors and jurisdictions, and from the local to the national level, which can lead to enhanced cooperation and more effective implementation of NAPA-related projects, programs and measures;
- greater opportunity to demonstrate the linkages between multilateral environmental agreements, poverty reduction efforts and sustainable development goals; and
- enhanced ability to engage in effective environmental management, thereby ensuring that benefits such as clean water, watershed protection, nutrient-rich soils, microclimate control and clean air are realized.

C. Common Objectives Among MEAs: The Basis for Achieving Synergies

As seen in Table 1, the UNFCCC, UNCCD and CBD share a common focus on promoting sustainability – either through the achievement of sustainable development in drought affected areas, the sustainable use of biological diversity or the assurance of sustainable economic development through the mitigation of climate change. As well, each convention aims to increase the robustness and resilience of ecosystems, which in turn promotes a reduction in the economic and social vulnerability of a country and its people. This objective is explicitly stated in the UNCCD, which seeks to ensure the rehabilitation, conservation and sustainable management of land and water resources in order to improve living conditions at the community level. Similarly, the UNFCCC seeks to address climate change so as to enable sustainable economic development and continuous food production. By decreasing their vulnerability, countries will be better able to withstand external shocks (ecological and economic) and adapt to climatic changes. This relationship is particularly critical in countries that derive a significant proportion of their

economic well-being from activities, such as agriculture, that are dependent on the health of local ecosystems.

The common environmental focus, application to shared landscapes and similar underlying objectives of the UNFCCC, UNCCD and CBD enables NAPA preparation teams to seek synergies in two different areas:

1. Through the ecological linkages and relationships between different ecosystems and their functions; and
2. In the socio-economic systems that countries have established to manage how they use, control and protect their natural resources. These systems include government administration, education and training, and economic activities. Achieving synergies in these areas can lead to a number of operational benefits.

D. The Ecological Basis for Synergy

Climate change, biological diversity, and desertification each affect and/or are affected by changes in the function and health of ecosystems. Climate change, for instance, could alter the functioning of an ecosystem (e.g. a coral reef or tropical forest), which in turn could lead to the extinction of a vulnerable species. Similarly, by removing plant biodiversity, reducing soil moisture and making more energy available to increase air temperatures, desertification can cause micro-climatic changes. These micro-climatic changes may increase the impact of global climate change at the local level.

The inter-connectedness of ecosystems means that actions taken in support of one MEA may affect the ability of a country to achieve its objectives under another MEA. This affect may be negative, neutral or positive, depending on the actions taken. For example, the use of intensive irrigation to cope with increased drought conditions caused by climate change may lead to the drainage of important aquifers and damage of biologically diverse river systems and wetlands. On the other hand, measures that conserve biological diversity can increase the ability of an

Table 1: Comparison of MEA Objectives

Convention to Combat Desertification
"The objective of this Convention is to combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa, through effective action at all levels… with a view to contributing to the achievement of sustainable development in affected areas. Achieving this objective will involve long-term integrated strategies that focus simultaneously, in affected areas, on improved productivity of land, and the rehabilitation, conservation and sustainable management of land and water resources, leading to improved living conditions, in particular at the local level." (Article 2, UNCCD)
Convention on Biological Diversity
"The objectives of this Convention… are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources…" (Article 1, CBD)
Framework Convention on Climate Change
"The ultimate objective of the Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve… stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner." (Article 2, UNFCCC)

ecosystem to cope with more frequent severe weather events brought about by climate change (see Box 1).
Efforts to address climate change, biological diversity and desertification should be undertaken in a manner supportive of achieving the wider objective of sustainable development. Healthy, functioning ecosystems are needed to ensure that the goods and services they provide, such as food, water, air purification and the control of pests and diseases, remain available to society. Enhancing the resilience and protective capacity of ecosystems will also help ensure the economic and social well-being of a country's people. This statement is particularly true for the rural poor who earn a living from the land and are highly vulnerable to ecosystem degradation and change.

Box 1: Synergies in Action

The coast of Vietnam experiences eight to ten typhoon storms per year. These typhoons often cause breaches in sea dykes that result in serious impacts on local aqua-culture economies. In Thai Binh province, the Vietnam Red Cross has sponsored a project in which 2,000 hectares of mangrove plantations have been planted in front of the local sea dyke system. The mangroves provide protection for the sea dyke, sequester carbon dioxide and support the production of valuable exports such as shrimps and crabs. When the project area was struck by the worst typhoon in a decade, the sea dyke experienced no significant damage and the economic livelihoods of local people were protected.

Source: IFRC (www.ifrc.org/what/dp/vietnam.asp)

E. The Socio-Economic Basis for Synergies

Opportunities for achieving collaboration and synergies also lie in the social, economic and bureaucratic structures that countries have established to protect, manage and use natural resources and address the issues of climate change, biological diversity and desertification. These opportunities may be in areas such as institutional structures, government administration, academic research, and economic development activities. For instance, a country's MEA focal points may reside in different government departments, yet rely on the same academic expertise or databases for advice and information, and be responsible for meeting similar reporting obligations. Similarly, civil society organizations and local community groups may on different occasions be approached by individuals from each national focal point on issues related to biological diversity, desertification and adaptation to climate change. As well, economic activities such as forestry can, if poorly managed, augment the effects of desertification, reduce biological diversity and enhance the process of global warming through the removal of a carbon sink. These situations may be avoided through better coordination of the structures that govern how MEA action plans are developed.

As NAPAs are being prepared, areas in which to simplify, better coordinate and streamline planning activities may be identified. These opportunities may already have been identified in previous research and reports developed in relation to the UNFCCC's National Communications, the CBD and/or the UNCCD. An examination of the socio-economic and institutional linkages between efforts to implement the UNFCCC, CBD and UNCCD provides a basis from which to determine where the opportunities for achieving operational synergies lie, and forms the basis from which to develop plans to maximize the potential of these opportunities.

F. Seeking Synergies in the Process of Developing NAPAs

Maximization of opportunities to achieve synergies between NAPAs, NAPs and NBSAPs requires careful planning prior to, during and following the development of a NAPA. Reaching this goal requires identifying potential areas of mutual interest and opportunities for synergy. One of the first steps to be taken during the formation of a NAPA therefore should be the identification of a country's existing commitments under international and regional environmental agreements, national legislation, and related programs and policies, such as poverty reduction strategies. A listing of the objectives of these agreements, priority areas of action and key contributors will assist the NAPA preparation team in identifying individuals with whom to consult during the preparation of their NAPA, or to include as part of the broader NAPA multidisciplinary team. Complementarities between programs of action may be identified and encouraged, overlap between actions reduced, and potential inconsistencies in planning initiatives addressed.

When examining NBSAPs and NAPs and reviewing how they were developed, three key areas may be examined:

- How stakeholders were consulted, the input provided and the outcomes of these consultation processes. The preparation of NAPAs is to be guided by a participatory and multidisciplinary approach (Decision 28/CP.7). By reviewing how stakeholder participation was undertaken across sectors, levels of government, and from the community to the national level during the development of NAPs and other locally driven planning exercises, insight may be gained into the success of these initiatives and how their outcomes may be included (if appropriate) in a NAPA. Networks and stakeholder groups established to support the development and implementation of previous regional and national planning processes might also be suitable for use in the preparation of NAPAs.
- To the extent that an ecosystem approach is appropriate, how this approach has been integrated into the planning processes used by other MEAs. An ecosystem approach integrates the inevitability of change into planning processes (adaptive management) and is a useful framework for integrating conservation efforts into multipurpose ecosystem management plans. The implementation of an ecosystem approach may be undertaken at the local and national level and across sectors. An examination of how the ecosystem approach has been integrated into, for instance, NBSAPs and its planning process may provide national teams with valuable insights and guidance on how to develop NAPAs.
- How priorities for action were determined. When preparing NAPs and NBSAPs, criteria for determining which issues and measures most urgently need to be addressed will have been developed. The process by which these criteria were determined, and the final criteria used, may provide NAPA preparation teams with useful insights as they establish their own processes for determining priority measures and areas for action. As well, the urgent needs identified in NAPs and NBSAPs may help preparation teams identify sources of vulnerability and key adaptation requirements that could be included in NAPAs.

G. Achieving Synergies in Implementation Activities

It is through the implementation of collaborative activities, such as those presented in Table 2, that the benefits of synergies between MEAs are most likely to be realized. As NAPA teams prepare their plans, there are some key areas in which collaborative measures and initiatives may be identified and synergies achieved. Activities in these areas could either be identified as NAPA priority activities or the collaborative means for implementing identified NAPA priorities. In the latter case, these initiatives may in some cases be deemed to be more appropriate as part of generic national development efforts rather than actual priorities captured in a NAPA.

It is recommended that NAPA preparation teams consider the following key areas:

- Institutional and Technical Capacity Development – key target audiences for education and training that build adaptive capacity include:
    - scientists, who may require training in forecasting, ecological and social assessment and monitoring, and specific areas of scientific research;
    - decision-makers and financial planners, who may require training in cross-sectoral policy making, planning and programming and conflict resolution;
    - civil servants who may need greater understanding of data and information management, public education, communications, institutional development and resource management;
    - civil society, who may require knowledge of advocacy and how to influence public policy; and
    - the media, which may need environmental literacy training so as to better raise public awareness of issues related to the UNCCD, UNFCCC and CBD.

  Efforts should be made to ensure that capacity development activities initiated to meet the needs of NAPAs (as well as NBSAPs and NAPs) fit within a country's broader capacity development needs and are not undertaken in isolation of other processes.
- Data Gathering and Inventories – consideration may be given to the collation of existing data and harmonization of data gathering systems. The information gathered through these processes will assist countries in meeting their reporting obligations under the UNFCCC (e.g., national communications), UNCCD and CBD. It will also enhance a country's ability to define, implement and assess efforts to achieve its sustainable development objectives.
- Natural Resource Management Practices – as demonstrated through the mangrove plantation project described in Box 1, integrated resource management practices can help fulfill the objectives of two or more MEAs. Careful planning can enable the development of measures able to take advantage of potential synergies, while also promoting sustainable livelihoods.
- Reporting and Assessment – opportunities for harmonizing and streamlining common aspects of reporting obligations under different MEAs and national processes can be sought.
- Research Needs – key scientific and socio-economic information requirements that assist in the design and implementation of different national plans can be identified.

- Public Education – common strategies for raising awareness of sustainable development concerns (including climate change) and their links to day-to-day human needs may be listed. Partnerships with media, government agencies, research institutes, community-based organizations, private enterprises and others could be developed at the national and/or, if appropriate, regional level.
- Technology Transfer and Adoption – when identifying technology needs, tools and methods that complement and support the implementation of other MEAs may be given priority.
- Infrastructure Development – as plans for new infrastructure are being prepared through regular development processes, the implications of future climate change need to be considered. For instance, if a new (or replacement) bridge is being built, higher standards may be used to increase the probability that it will be able to withstand more intense and frequent extreme weather events and sea level rise.
- Institutional Structures – an MEA coordinating committee may be established or revitalized to increase communication and coordination between focal points located in different government departments. Through this committee, focal points could:
    - learn from the approach each takes to implement the MEA for which it is responsible;
    - undertake consultations with stakeholders jointly, so that community leaders and representatives of non-governmental organizations are approached once rather than on three (or more) separate occasions;

Table 2: Possible adaptation strategies and the benefits they bring to each MEA.

	UNCCD	CBD	UNFCCC
Disaster planning framework: early warning systems; emergency measures to respond to floods, droughts, etc.	Help ensure protection of vulnerable communities (e.g., creating food and water reserves, cattle protection schemes).	Identification of fragile ecosystems and species prior to a crisis, to maximize protection during and following a disaster.	Determine priority measures to minimize loss of life and damage to livelihoods as a result of extreme weather events.
Integrated watershed management: agroforestry (firewood, fodder, annual crops), run-off harvesting for trees and range	No over-exploitation of local water hence low salinization risk; run-off harvesting, terraces and trees conserve soil.	Conserves much of the watershed's biological diversity, utilizes parts of it thus contributing to overall sustainability.	Increases water retention and hence its availability in times of drought. Slows water movement, reducing the risk of flash floods. Maintains vegetation as carbon sink and reservoir.
Intensive greenhouse agriculture and aquaculture (cash crops, fish, industrial materials from algae)	High income per unit soil and water used, thus economizing on land and water resources.	Reduced pressure on land leaves habitats for in-situ biodiversity conservation, thus promoting its utilization.	Reduced pressure on land (a) allows conservation of biodiversity resistant to climate change; (b) maintains carbon sink and reservoir.
In-situ conservation of biological resources, wildlife conservation	Potential for economic exploitation as an alternative livelihood; promotion of ecotourism.	Global benefits from dryland biodiversity assets.	Conservation of genetic diversity instrumental in restoring climate change damaged ecosystems.

Adapted from: "Review of Activities for the Promotion and Strengthening of Relationships with other Relevant Conventions and Relevant International Organizations, Institutions and Agencies." ICCD/COP3/9. 1999.

- explore potential changes to existing legal structures that would support the achievement of their objectives; or
- work with public servants in other departments at the local, regional and national level to promote mainstreaming of MEA activities.

Alternatively, all focal points may be brought together in a single body responsible for implementing MEA related measures. This "secretariat" could be located, for example, in the central planning authority.

- National Funding Processes – criteria for funding adaptation measures may include inter-departmental cooperation, the involvement of community-based organizations and other requirements that help ensure the establishment of grounded multi-sectoral, multi-disciplinary, initiatives.

Throughout the process of preparing a NAPA, efforts should be made to ensure open, effective and frequently used lines of communication between MEA focal points and associated committees. The systems of information sharing established while developing a NAPA can become the basis for future collaboration and will assist in the development of a comprehensive NAPA that builds on existing opportunities for achieving synergies between MEAs.

H. Overcoming the Barriers to Achieving Synergies

Achieving synergies between MEAs is challenging for all countries due to a variety of reasons and circumstances. In part barriers to achieving synergies at the national level are a legacy of how global environmental issues are addressed at the international level. Issues such as climate change, desertification and biodiversity have been addressed in a targeted, narrowly focused manner. The conventions developed in response to these issue have not been designed to promote synergies with other agreements, perhaps reflecting the complexity of the issues each addresses in and of themselves. Often individuals responsible for negotiating one agreement do not have substantial knowledge of the objectives, content and programs of action associated with other agreements, and are therefore limited in their ability to see the value of promoting linkages between them. Communication between secretariats has often been limited, reflecting a tendency to not recognize the shared objectives of MEAs and to undervalue the importance of coordinated implementation of agreements at the international and local level. Compounding this situation is the absence of a policy framework for achieving synergies between MEAs.

In recent years, as described in Box 2, the Secretariats of the UNCCD, CBD and UNFCCC have begun to address this situation through initiatives such as the Joint Liaison Group. As well, efforts to develop a policy framework for promoting MEA synergies are being undertaken through the United Nations University's Inter-Linkages program and by organizations such as UNDP, UNEP and the OECD. The Global Environment Facility and UNDP's Capacity Development Initiative provides an example of holistic work undertaken at the international level that demonstrates the existence of synergies across conventions.

The inefficiencies and parcelling of responsibilities and activities experienced at the international level are often reflected at the national level. Focal points established to implement measures under the UNCCD, for instance, may be located in a different department and have little

interaction with their country's CBD or UNFCCC focal points. Poor communication between focal points can result in a general lack of awareness of the potential opportunities for achieving synergies and the benefits that these might bring. This situation can be compounded by concerns about continued access to resources and loss of control over an issue.

It may be possible to overcome these barriers through many of the ideas presented in the previous section. For instance:

- existing institutional structures may be examined and altered to facilitate greater communication and cooperation between MEA focal points;
- capacity development may be undertaken to strengthen the ability of MEAs implementers to resolve conflicts and engage in integrated planning processes; and
- education and awareness raising regarding the objectives and activities of the various MEAs may be undertaken with focal point members to highlight their mutual interests.

While some countries have well established MEA focal points and implementation structures, in others only a few individuals may be responsible for all activities related to the UNCCD, CBD and UNFCCC. In such a situation, lack of time and resources seriously impede the possibilities for effective implementation of these agreements. As well, some countries may be Parties to the UNCCD, CBD and UNFCCC but may not have completed an action plan under each of these conventions. While these situations pose difficulties, they also create opportunities. LDCs may be in a better position to achieve synergies between MEAs as there are fewer people with whom to coordinate activities, and departmental structures and inflexible affiliations may not yet be firmly established as has occurred in other countries. LDCs that have not yet developed their NAPs or NBSAPs have an opportunity to build these (along with their NAPAs) in a manner that promotes synergies between MEAs. Establishing integrated systems and coordinated activities

Box 2: International Initiatives seeking Synergy between MEAs

In recent years, the Secretariats of the UNFCCC, CBD and UNCCD have made several recommendations, conclusions and decisions to increase mutual understanding and coordination. In March 2001, the CBD's Scientific Body requested that its Executive Secretary explore the formation of a Joint Liaison Group (JLG) responsible for enhancing coordination between the CBD and the UNFCCC. The establishment of a JLG was endorsed by the Parties to the UNFCCC in July 2001, and agreed to by the UNCCD in August 2001. The JLG held its first meeting in December 2001, with subsequent meetings taking place in January and April 2002. The JLG has established a common web-based calendar of events related to the three conventions, and is exploring the possibility of holding a joint workshop on cross-cutting thematic areas and activities.

In addition, the CBD has established the Ad Hoc Technical Expert Group (AHTEG) to prepare scientific advice on the interlinkages between biological diversity and climate change, and identify existing approaches and tools that may be used to simultaneously meet the goals of increasing biological diversity and responding to climate change. The first meeting of the AHTEG took place in January 2002; a follow-up meeting is planned for October 2002. The CBD is also developing a joint work program with the UNCCD to examine options for conservation and sustainable use of dry and sub-humid lands.

UNCCD's Secretariat examined how it may promote and strengthen its relationship with related conventions, international organizations and other institutions at its fifth Conference of the Parties held in October 2001. Prior to this, the Secretariat of the UNCCD participated in the April 2001 workshop in which draft guidelines for the preparation of NAPAs were developed.

Exploration of synergies is also taking place through a number of other initiatives at the international level. These include: an IPCC technical paper on the interlinkages between climate change, biodiversity and desertification; OECD DAC study on synergies between MEAs; UNDP's Sustainable Energy and Environment Division's work on synergies in the national implementation of the Rio Agreements; UNEP's work on synergies amongst conventions; and the United Nations University's Inter-linkages initiative.

from the beginning is often easier than trying to rework existing structures.

Regardless of how well developed national MEA implementation structures are though, overcoming the barriers to achieving synergies between MEAs requires demonstrable support from the highest political levels. Leaders must clearly understand and communicate the many positive linkages between achieving synergies between MEAs and the achievement of national development goals such as poverty reduction and the promotion of sustainable livelihoods.

Appendix B

Mainstreaming NAPAs: Integrating Adaptation to Climate Change into National Development Plans

1. The Context

> ***Adaptation:*** "those activities that people, individually or in groups such as households, villages, companies and various forms of government, carry out in order to accommodate, cope with, or reduce the adverse effects of climate change." (South Pacific Regional Environment Programme, 1999)

In November 2001, the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) approved the formation of National Adaptation Programmes of Action (NAPAs) for the least developed countries. In establishing NAPAs, the Conference of the Parties recognized that "many of the least developed country Parties do not have the capacity to… convey their urgent and immediate needs in respect of their vulnerability and adaptation to the adverse effects of climate change" (Decision 28/CP.7). The intention of NAPAs is to overcome this situation and enable the least developed countries (LDCs) to quickly and effectively communicate their "immediate and urgent" adaptation needs.

Decision 28/CP.7 provides guidelines for the preparation of NAPAs, and states that this process is to be guided by "[a] complementary approach, building on existing [development] plans and programmes, including … national sectoral policies." NAPAs are intended to build upon and be integrated with existing national development plans such as poverty reduction strategies (e.g. Poverty Reduction Strategy Papers), Sustainable Development Strategies, national conservation strategies, disaster preparedness/management plans and sectoral plans (e.g., agriculture, forestry, transportation). The purpose of this background paper is to develop recommendations on how this process of mainstreaming NAPAs into regular development planning may be undertaken. In this context, "mainstreaming" refers to the integration of the objectives, policies, strategies or measures outlined within a NAPA such that they become part and parcel of national and regional development policies, processes and budgets at all levels and at all stages in such a way that they complement or advance the broader objectives of poverty reduction and sustainable development.

2. Why Consider Adaptation to Climate Change in Development Planning?

Predicted Impacts of Climate Change

It is widely accepted within the international scientific community that human-induced climate change will cause an average global increase in the Earth's temperature of 1.4 to 5.8 degrees Celsius by 2100. In its Third Assessment Report, the Intergovernmental Panel on Climate Change[1] (IPCC) states that the "effects of climate change are expected to be greatest in

[1] The Intergovernmental Panel on Climate Change was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme. It is a body of several hundred of the world's top climate change scientists and experts, and is now considered to be the leading scientific authority on climate change.

developing countries… in terms of loss of life, effects on investment, and effects on the economy." The IPCC concludes that LDCs will experience:

- diminished access to water resources as precipitation decreases;
- greater food insecurity due to changing weather patterns;
- irreversible loss of biodiversity;
- increased incidence of water-borne and vector diseases as climatic zones shift;
- sea-level rise leading to coastal erosion and saltwater intrusion;
- greater incidence of flooding; and
- exacerbated desertification.

In some areas of the world, climate change is already having an impact on the economic, social and ecological well-being of communities (see Box 1). In the years to come, these effects are expected to become more pronounced and more widespread, and in some cases will affect the very survival of nations.

Box 1: Glacial Melt in the Himalayas

"If the glaciers continue to retreat at the rates being seen in places like the Himalayas, then many rivers and freshwater systems could run dry, threatening drinking water supplies as well as fisheries and wildlife."
– Klaus Toepfer, Executive Director, UNEP

The United Nations Environment Programme (UNEP) and the International Centre for Integrated Mountain Development recently released the findings of a study that documents how rising temperatures are accelerating the melting of glaciers and the snowfields in Nepal and Bhutan. Air temperatures in the region are rising at a rate of 0.06 degrees Celsius per year, and are now one degree higher than they were in the 1970s. As a result, glaciers in Bhutan are retreating at a rate of 30 to 40 metres a year and icy waters are rapidly filling glacial lakes. The study identified at least 20 lakes in Nepal and 24 in Bhutan could burst their banks in five to ten years time. Nepal's Tsho Rolpa Lake, for instance, has grown from an area of 0.23 square kilometres in the late 1950s to 1.4 square kilometres now. It provides water to the Rolwaling and Tama Koshi valleys in the Dolakha District of Nepal, and now threatens about 10,000 lives, thousands of livestock, agricultural land, bridges and other infrastructure. If Tsho Rolpa Lake was to burst its banks, the impact could be similar to the 1985 outburst of Nepal's Dig Tsho glacial lake, which destroyed 14 bridges and caused $1.5 million in damage to a nearly completed small hydroelectric power plant.

Source: http://www.unep.org/documents/default.asp?documented=245&articleid=3042

Implications of Climate Change for Development

> *"…we can confidently conclude that climate change will indeed worsen poverty (or at least slow rates of improving wellbeing) in particular localities for a period of time, unless adaptation occurs."*[2]

The least developed countries are highly vulnerable to shocks (fiscal, social and environmental) due to their unstable and weak economies, greater dependence on the use of natural resources, and the limited extent of their social services. Within LDCs, the poor are likely to be the most vulnerable to shocks. Climate change has the potential to shock the economic, social and ecological fabric of a country, and therefore to limit the ability of LDCs to reduce poverty and achieve their development objectives.

[2] U.K. Department for International Development. *Predicted impact of global climate change on poverty and the sustainable achievement of the Millennium Development Goals: Phase 1 Report: Volume 1*. Draft. May 2002. p. vii.

One of the earliest manifestations of climate change is expected to be an increase in climate variability. As the Earth warms, events such as the arrival of the rains will become less predictable, and severe weather like floods, tropical cyclones and droughts will become more frequent and intense. Climatic uncertainty already threatens the economic and social development efforts of LDCs, as demonstrated in recent years by events such as Hurricane Mitch and the Mozambican floods (see Box 2). The limited resources of LDCs means that severe climatic events tax their ability to immediately limit damage, prevent the outbreak of disease and meet the needs of refugees, and to rebuild infrastructure, economies and communities over the long-term.

Climate change could alter the rate and path of economic growth such that inequality becomes exacerbated and pro-poor growth policies are undermined. For instance, changes in rainfall and temperature patterns may cause current cropping patterns to become unsuitable to emerging climate conditions, livestock to experience greater stress, and pest and disease outbreaks to become more pronounced. These changes will have a direct impact on the ability of the rural poor to maintain their existing livelihoods, and could limit the ability of a country to maintain export earnings and pay for food imports.

Climate change will also bring about significant impacts on the health of a country's citizens,

Box 2: Impact of the 2000 and 2001 Floods in Mozambique

In the winters of 2000 and 2001, Mozambique experienced severe floods that threatened its successful economic growth. Mozambique and its neighbours experienced heavy rainfall in December 1999 and February 2000 that raised water levels in rivers to unprecedented levels. When Cyclone Eline hit the region in late February, the most severe flooding in 50 years was experienced in three of Mozambique's river basins. In April 2000, Cyclone Hudah also hit Mozambique's coastal areas of Nampula and Zambesia.

The 2000 floods caused significant damage to the southern and central regions of Mozambique. Two million Mozambicans (about 12% of the population) were affected by the storm, including about 700 who lost their lives and almost 250,000 who lost their homes. Over 20,000 cattle disappeared and about 11% of the country's cultivated and grazing lands were destroyed, causing over 113,000 small farm households to lose their livelihoods. Ninety per cent of Mozambique's functioning infrastructure and irrigation systems were damaged. Many bridges and secondary and tertiary roads were washed away, and all of the railroads in southern Mozambique were badly damaged.

Heavy seasonal rains again caused widespread flooding in central and northern Mozambique in mid-February 2001. The resulting floodwaters covered twice the land surface of the 2000 floods, affected more than 540,000 people, and caused over 50 deaths.

The 2000 floods significantly reduced Mozambique's real GDP growth – to 2.1% in 2000 compared to 7.5% in 1999 and 12.1% in 1998. International financial assistance of $471 million combined with the limited impact of the floods on the country's business sector and on investor confidence enabled Mozambique to recover in 2001 and experience economic growth rates of about 10%.

Although Mozambique's economy has recovered from the floods of 2000 and 2001, hundreds of thousands of people, particularly in the rural areas, continue to rebuild their livelihoods and communities. This task is being made even more difficult by the drought currently affecting southern Africa.

Sources: Australian Department of Foreign Affairs and Trade. www.dfat.gov.au/geo/fs/moza.pdf
United Nations Development Programme. www.undp.org/upa/frontpagearchive/2001/july/20july01/
AFROL.com. http://www.afrol.com/News/moz003_flood_economy.htm
KPMG. www.kpmg.co.mz/articles-engl/floods.htm
United Nations Children's Fund. http://www.unicef.org/emerg/Mozambique22Jun01.PDF

affecting their ability to participate in economic development opportunities. Movement of climate zones may lead to the introduction of vector-borne diseases into new areas (such as malaria to high altitudes), facilitate the growth of existing diseases (such as cholera due to greater numbers of floods) and increase heat mortality (particularly when combined with higher humidity and urban air pollution). The health implications of climate change are significant[3] and threaten to increase stress on systems already stretched by catastrophes such as HIV/AIDS.

As in dealing with all shocks, a key factor in addressing the impacts of climate change is to reduce the vulnerability and increase the resilience of a country and its people. Many actions taken by local people and national governments today to prepare for and cope with existing vulnerabilities to events such as droughts and floods could form the basis for initiating climate change adaptation efforts.

The Value of Immediate Adaptation Efforts

Climate change is already happening, and its implications will be felt more strongly in the years to come. The extent to which this process hinders the development of a country depends in part on how countries respond to this situation now. Countries may choose to adapt to climate change in a reactive or an anticipatory manner. Reactive adaptation takes place only when climate change impacts are experienced, at a time when the range of possible options may be narrower and responses more expensive, socially disruptive and environmentally unsustainable. When the impacts of climate change are anticipated, actions taken in response may be planned more carefully, effectively and efficiently – reducing long-term costs and helping to ensure that response measures support the achievement of other social and economic development goals. For example, a bridge built today may be constructed to standards higher than those in current use in anticipation that climate change will result in more severe flooding. This response will reduce the likelihood that the bridge will be washed away and need replacement in the future. As opportunities to engage in anticipatory adaptation will decrease as the process of climate change accelerates, timely analysis and planning is prudent.

As demonstrated in Box 3, climate change adaptation efforts generally build on existing activities. They are consistent with efforts to reduce the vulnerability of a country to existing climate variability, and can complement national development goals and poverty reduction efforts. Immediate actions to address adaptation concerns can therefore have co-benefits in terms of improving resource management, enhancing capacity development and reducing vulnerability to a variety of current stresses.

[3] The IPCC has concluded that: “the adverse health impacts of climate change will be greatest in vulnerable lower income populations, predominately within tropical/subtropical countries. Adaptive policies would, in general, reduce these impacts.” (IPCC. Summary for Policymakers: Climate Change 2001: Impacts, Adaptation, and Vulnerability. 2001. p.12).

Box 3: Reducing Vulnerability to Current Climate Variability and Long-term Climate Change

A variety of climate change adaptation efforts may be undertaken by LDCs that link immediate concerns to long-term development goals. These include:

- implementing land use planning initiatives that guide the expansion of human settlements away from high hazard zones;
- establishing and enforcing standards of design and construction of all kinds of infrastructure to ensure that they are able to withstand extreme climate events;
- improving water management and water use efficiency to reduce vulnerability to water shortages;
- encouraging agricultural and land management practices that improve productivity and protect soil and water resources;
- engaging in forest management and watershed protection to improve yields, provide habitat and reduce flood hazard; and
- strengthening health services to improve the quality of life and the productivity and learning capacity of the population.

Source: Ian Burton, personal communication.

3. Integrating NAPAs into National Development Plans

NAPAs are intended to outline a country's priorities regarding its most immediate and urgent adaptation needs. They are a first but far-sighted step toward addressing long-term adaptation initiatives and therefore need to be done carefully in a planned manner. To be effective, NAPAs need to be integrated into current plans, policies and programs, and designed such that they have a high likelihood of being implemented, lay the groundwork for future adaptation efforts and are consistent with and support the overarching development objectives of a country. If a NAPA is not relevant to a country's immediate development priorities, there is a higher probability that it will remain a peripheral exercise and that its results will not be given serious consideration during national development planning processes.

Mainstreaming environmental concerns like adaptation to climate change into regular development planning is challenging for all countries. It requires cross-sectoral cooperation, an interdisciplinary approach and considerable political will. This challenge is most likely to be met if efforts are made to:[4]

- engage other development sectors, particularly ministries and agencies responsible for national development, from the beginning throughout the preparation and implementation process. These efforts will increase the probability that the outcomes of the NAPA preparation process will be meaningfully endorsed;
- raise awareness from a scientific and socio-economic perspective of the implications of climate change for various sectors and groups within a country, to engage key stakeholders on this issue;
- link adaptation efforts to established policy-making processes. Achieving this goal requires the establishment or use of institutional mechanisms able to mobilize

[4] *Source:* OECD. DAC Guidelines on Integrating the "Rio Conventions" in Development Cooperation. 2002.

stakeholders and to address climate change from a cross-sectoral perspective within broader national development policies; and

- promote cross-sectoral and interdepartmental coordination, accountability and transparency in implementing NAPAs.

4. Supporting Mainstreaming During the Preparation of NAPAs

NAPAs can be used to facilitate mainstreaming of climate change adaptation efforts into national development planning processes. In particular, the process by which a NAPA team chooses to undertake its activities and consultations can be highly supportive of future mainstreaming of NAPA-related concerns and activities. The following three ways illustrate how this may be accomplished:

A. Selection of the NAPA Preparation Team

As required by the NAPA preparation guidelines, NAPA preparation teams are to be multi-disciplinary, composed of individuals from a variety of sectors and ministries. This requirement helps ensure that the final NAPA document will be more comprehensive and capture the social, economic and environmental aspects of sustainable development. In addition to this requirement, an effort should be made to:

- ensure that the preparation team has sufficiently high profile to be able to work closely with policy makers in relevant sectors and in central planning agencies; and
- ensure that at least one senior-level member in the team comes from a central planning ministry (as suggested in annotated NAPA guidelines, it may be strategic to select this member as the NAPA team leader).

By engaging a key player from the planning and/or finance ministries from the very beginning, greater understanding of the relationship between national planning processes and NAPAs can be achieved. At the same time, their inclusion enhances awareness and “buy in” of the central planning agencies regarding the broad implications of climate change for development.

Engaging individuals of high profile and from key ministries in the process of preparing NAPAs may be challenging. Key to this process will be making these individuals not only aware of NAPAs and their purpose, but also of the opportunity that they represent. For members of the finance ministry, for instance, NAPAs may be seen as an opportunity to avoid costly expenses in the future (e.g., collapsing infrastructure) while engaging in practical activities that support current development objectives (e.g., provision of renewable energy sources).

B. Stakeholder Consultations

Consultations with key stakeholders provide NAPA teams with an opportunity to meet with individuals from a variety of sectors and agencies – to not only learn about their objectives and concerns, but to also inform them about climate change and its implications for their activities. The relationships established during this process may be critical in ensuring the future success of adaptation efforts. NAPA projects and policies will likely be implemented by a variety of

individuals across sectors, departments and government levels. If these individuals do not understand the rationale for adapting to climate change, or if the central agencies do not view adaptation to climate change as being an important issue, then it is less likely that NAPAs will be successfully implemented.

While governments will set the broader policy framework in which immediate and urgent adaptation needs to take place, much of the practical, day-to-day response activities will take place at the local level. For this reason, particular attention should be given to including the voices of the poor (women and men) during stakeholder consultations (see Box 4). These groups are among the most vulnerable to the impacts of climate change due to their heavier reliance on a country's natural resource base. As recognized in the NAPA preparation guidelines, the poor often have considerable knowledge of adaptation strategies used in the past that may be incorporated into a NAPA. Effectively facilitating the participation of the poor into NAPA consultations can also support the broader development objective of empowering these groups.

C. Review of National Plans and Processes

The guidelines for the preparation of NAPAs encourage preparation teams to review the objectives, goals and strategies of existing national development plans. These plans may include

Box 4: Stakeholder Consultations for the Preparation of Environment Action Plans in The Gambia

In 1996 the Government of The Gambia used stakeholder consultations to develop Local Environment Action Plans (LEAPs) and National Action Plans (NAPs) for the multilateral environmental agreements (MEAs) on biodiversity, desertification and climate change. A small working group was charged with the planning and implementation of the consultations, which were conducted at the district, divisional and national level.

The District Level consultations were conducted at 16 locations and involved 150 to 200 participants per location. Participants were selected from women's groups, government extension workers, youth leaders, non-governmental organizations, community-based organizations, cultural and drama groups, etc., as well as trades people such as herders, fishermen, wood-carvers, carpenters, blacksmiths and crop cultivators. These meetings consisted of oral presentations followed by working group sessions. Members of the communities were requested to describe actions they have taken to cope with any abnormal climate or weather and to suggest any measures that could be undertaken in response to future climatic changes.

The 16 District level consultation reports were presented at the Divisional Level consultations. These consultations involved new stakeholders as well as active participants from the district level consultations. The new and reviewed information from these consultations was used to compile six Divisional Reports. These reports were considered at the National Level consultations, and combined with new information into a National Report. The National Climate Committee then supplemented the stakeholder consultations with additional consultations at the policy- and decision-making level. A five-day Policy Makers Workshop was organised at which high-level government officers presented sectoral policy and legal documents, and development programs. This workshop initiated efforts to mainstream climate change issues into development policies and programs.

Information relevant to each MEA was filtered from the District, Divisional and National Reports and used to form part of the National Biodiversity Strategy and Action Plans (NBSAP) for the Convention on Biological Diversity and the National Action Programme (NAP) for the Convention to Combat Desertification. The consultations also provided traditional and grassroots level knowledge related to climate change. Overall, the process indicated that people at the grassroots level have valuable knowledge of the environment they live in and, with time, have developed strategies to cope with negative effects. Connecting environmental effects to climate variability and change, though, was not always straightforward.

Sustainable Development Strategies, National Conservation Strategies and sectoral development plans. For most LDCs, Poverty Reduction Strategy Papers (PRSPs) or their equivalent will likely be the most important national plan for a country's development. (In fact, it could be argued that it is against the PRSP priorities that the impacts of adverse climate factors should be measured). All of these strategies and plans set the course of a country's development for years to come, and as such need to take into account the effects of climate change. A careful analysis of these documents will enable NAPA preparation teams to identify projects, programs and measures that support the achievement, or overcome any deficiencies, of current national development goals. It can also ensure that activities recommended within a NAPA complement and do not duplicate plans already initiated.

During this review, the NAPA preparation team may elect to first examine the specific projects, programs and measures contained in these documents, especially those that have been given priority. Activities related to sectors such as agriculture, forestry, water, health, transportation, industry and coastal zone management should be given particular attention due to their close links with adaptation efforts. These measures and projects (especially long-term projects) should be assessed in terms of whether they account for the impacts of climate change, their relationship to adaptation needs (especially urgent and immediate needs), the presence of initiatives that reduce the capacity of a country to respond to climate change and their potential for increasing vulnerability to climate change (e.g., building of new industrial infrastructure on a high risk floodplain). Following this assessment, the preparation team may then question whether new tools are required to ensure that climate change is incorporated into these documents. Do existing policy making frameworks adequately account for the implications of climate change? Finally, the team may assess whether new policies are needed to support climate change adaptation efforts.

While reviewing current national development plans and strategies, special attention should be given to any documentation of lessons learned through their preparation and implementation. For instance, how successful has been the implementation of sustainable development strategies? What were the reasons for the successes and failures? NAPA preparation teams may then work to include elements in their plans that are likely to lead to success, and avoid past mistakes.

Particular attention should also be given to the raw data and information gathered through past participatory or stakeholder consultations related to environment or sustainable development. Such information could benefit NAPA preparation and enhance the efficiency of the NAPA process.

5. Overcoming Barriers to Mainstreaming NAPAs

Mainstreaming NAPAs into national development processes will require overcoming a variety of barriers, many of which also challenge efforts to engage in sustainable development. As part of a country's development efforts, an enabling environment can be created to facilitate the integration of NAPAs and long-term climate change adaptation activities into national planning processes. Areas in which activities may be undertaken to facilitate the creation of this enabling environment are described in detail below and include:

- Education and Awareness Raising – civil servants and the public's knowledge of climate change and its impacts is often low. Individuals and central agencies need to understand the developmental impacts of climate change, and how it will influence their own work. In the absence of this understanding, it is less likely that key stakeholders will be supportive of, and implement, priority activities identified in NAPAs.
- Capacity Development – implementing climate change adaptation strategies may require skills and knowledge that do not exist at present. In the absence of these skills, it may not be possible to implement the recommendations put forth in a NAPA;
- Institutional Structures – adaptation to climate change requires a coordinated, integrated approach. Some countries may not have institutional structures in place that are capable of approaching climate change adaptation from a cross-sectoral perspective and mobilizing coordinated action by different departments, outside agencies and local people. In the absence of a supportive institutional structure, countries will be less able to achieve a coherent response to urgent and immediate climate change adaptation needs that support broader national development policies.
- Policy and Planning Frameworks – well-defined planning structures and procedures are required to ensure mainstreaming of adaptation into national planning processes. The frameworks and processes use to develop existing and new policies, programs and projects may need to be altered so as to ensure adequate attention to climate change concerns.

Typically, activities in these areas will be undertaken as part of regular national development processes. However, certain aspects of activities in these areas may be identified by NAPA preparation teams as key priority recommendations.

A. Education and Awareness Raising

It may be determined by the NAPA team that one of their country's immediate adaptation needs is to enhance civil servants' and other stakeholders' understanding of climate change. Education and awareness about climate change lays the groundwork for adopting adaptation considerations into regular policy development activities. By informing public servants of the importance of climate change and its immediate and long-term implications for their work, there is greater likelihood that the need to adapt to this process will become part of the consciousness of all individuals within the public service. Policy planners and activity implementers will therefore be more likely to take climate change into consideration as they draft their budgets, establish their plans, and determine their development objectives.

Awareness raising efforts need to be targeted to the needs and interests of the intended audience (e.g., focusing on the implications for crop development and potential solutions such as maintaining gene banks with the Agriculture Department). Central planning ministries likely should be the initial recipients of this type of training and awareness building, to help facilitate the inclusion of adaptation efforts in national budgets and planning processes.

Awareness raising exercises should also be undertaken with key stakeholders outside of the government, such as the private sector, media and civil society. This will help members of these

groups become more aware of the expected impacts of climate change, and the reasoning behind adaptation strategies adopted by local and national governments. (For instance, shipping companies may be approached to discuss the implications of sea-level rise, and hence the rationale for any planned changes in the functioning of a harbour).

B. Capacity Development

The capacity of government agencies and civil society organizations to implement adaptation efforts may need to be assessed and strengthened. In the absence of particular skills, it may not be possible for countries to implement the priority activities identified in their NAPAs, nor to mainstream these programmes of action into national planning processes. Specific activities that could support implementing and mainstreaming NAPAs may be undertaken in the following areas:

- enhancing the ability of policy makers to develop and use different types of integrated planning tools, engage in policy development and reform legal frameworks;
- improving the capacity of planning agencies to undertake inventories, monitoring and systemic observation;
- increasing stakeholders' ability to undertake impact assessment and research, including participatory assessment;
- increasing the ability of planners to develop conducive policy and institutional frameworks, including development planning and policy-making processes, as well as capacity for cross-sectoral policy-making and programming dialogue, multi-stakeholder planning processes, negotiations, mediation, conflict resolution, education and awareness raising;
- strengthening the capacity of climate change and policy research institutions; and
- enhancing the ability of civil society and media to raise public awareness of climate change issues and influence public policy decisions.

LDCs will have to assess which of these capacity development efforts are appropriate to their national circumstances, and how they could complement and fit within their broader national capacity development framework.

C. Institutional Structures

Climate change is not just an environmental issue. As noted earlier, the impacts of this process have ramifications for all sectors of society – health, business, agriculture, land use and forestry, transportation, urban development and even culture (which is often deeply connected to the land and the change of the seasons). Given the pervasive, cross-sectoral nature of climate change and its implications, making one agency responsible for dealing with this issue is impractical (see Box 5). A coordinated response is required to ensure the most efficient use of financial and human resources and that adaptation measures taken by one group do not negate or conflict with efforts undertaken by another. Cross-sectoral policy-making also effectively supports poor people's livelihood strategies. These strategies are often highly integrated, involving the use of a

variety of resources and a diverse set of activities that cross sectors and ministerial responsibilities.

Horizontal structures for inter-ministerial consultation and cooperation are required to ensure that adaptation responses are interlinked and complementary. A NAPA may set forth ideas regarding the establishment of new institutional linkages and relationships, or for the improvement of existing structures so as to enhance communication and coordination between different implementing agencies. Such institutional arrangements could, for example, include:

Box 5: The Need for Coordinated Institutional Initiatives

Lessons may be learned from the implementation of action plans associated with other multilateral environmental agreements. Often, planning initiatives that address global environmental issues have been viewed as "stand alone" activities that have limited relevance to national development priorities. Convention focal points are often isolated from mainstream policy-making and sectoral planning processes, and from each other. Ministries (such as Environment) responsible for the implementation of the action plans of the United Nations Convention to Combat Desertification (UNCCD) and the Convention on Biological Diversity (CBD) have not been able to achieve the government-wide coordination needed to implement key activities. In developing plans for implementation associated with the UNFCCC, the lessons from these processes need to be considered.

- *A Cross-Cutting National Committee*: This committee would bring together appointed representatives from various government departments and ministries into a decision-making body responsible for strategic planning and ensuring implementation of climate change adaptation measures.[5] The team could report annually on adaptation needs, the state of climate change science and predictions of the impact of these changes. The technical committee established by Burkina Faso to increase coordination between its activities related to the UNCCD, UNCBD and UNFCCC provides a model for this type of institutional arrangement.
- *Enhanced Existing Coordinating Structures*: This approach is appropriate when structures or committees developed to coordinate cross-sectoral activities already exist. These established institutions may not be functioning to their full potential and require additional financial or political support to undertake joint planning and implementation initiatives. Some countries may have effective institutions able to coordinate cross-sectoral activities. These institutions, though, may not be taking concerns related to climate change into consideration as they perform their role.
- *A Policy Research and Planning Unit*: This unit would have a multidisciplinary core staff dedicated to synthesizing research and findings from sectoral technical institutes. It would provide continuous feedback to decision-makers on how to integrate sectoral policies and responses in a coherent manner. In many LDCs, sectoral ministries have technical bodies doing research and monitoring, but this knowledge may not be shared sufficiently with other ministries nor integrated into policy-making. A unit of this nature would be potentially most effective if it resided centrally within an LDC bureaucracy, where it can have sufficient scope and influence to have a positive impact on national policy.

[5] *Source:* Synergy in National Implementation: The Rio Agreements. United Nations Development Programme. July 1999.

Regardless of the structure selected, to effectively facilitate the mainstreaming of climate change adaptation in national development plans, the institutional framework needs:

- to have sufficiently high influence in the national government to affect policy formation and, if appropriate, make its decisions hold;
- to be able to respond to national priorities;
- to have built-in incentives for coordination and participation, and;
- to be able to serve as a clearinghouse for information.[6]

The institutional structure should also consider coordination between the local and national level and perhaps decentralization of planning, particularly given that many of the responses to climate change will take place at the local level. A decentralized approach: helps develop integrated, cross-sectoral adaptation strategies; facilitates participation by the poor in the development of strategies; and maximizes resource mobilization while ensuring that resource allocation decisions are responsive to the needs of communities and households. The effectiveness of a decentralized approach, though, is highly dependent on the capacity of local level institutions to undertake new responsibilities.

D. Policy and Planning Frameworks

Based on its review of national plans and policies, the NAPA preparation team may choose to recommend that a country's policy-making frameworks be altered to ensure that climate change considerations are incorporated into specific plans and strategies. Climate change is a long-term process that will affect all countries for decades to come. It therefore will be an ever-present issue for national development planners, and ideally should become a regular consideration in planning cycles and policy development processes. Box 6 provides an example of how climate change adaptation may be mainstreamed into national planning processes.

Key policy planning frameworks into which climate change considerations may be incorporated include:

- *Land and Resource Use Planning*: A system for integrated land and resource planning and management is critical to translating synergies between adaptation needs and national development planning goals into practice. Often resource use activities take place in an independent, uncoordinated manner, leading to the unsustainable development practices that are at the root of much of a country's present vulnerability to climatic variability (e.g., migration of poor farmers onto marginal agricultural lands, increasing their vulnerability to droughts and, particularly when accompanied by deforestation, to floods). A revised land and resource use planning framework may prioritize making appropriate investments in fragile and marginal areas sensitive to climate change (e.g., strengthening the capacity of local communities to sustainably manage key watersheds). Investments in such areas are also fundamental to poverty reduction efforts, as they can help reduce natural resource degradation, rural to urban migration and have positive impact on national economic development. An effort may be made to institute a system of resource and environmental

[6] *Source*: UNDP. Synergy in national implementation: The Rio Agreements. Presented to Inter-linkages: International Conference on Synergies and Coordination between Multilateral Environmental Agreements. 1999.

Box 6: A Model for Mainstreaming Adaptation into National Planning Processes

The South Pacific Regional Environment Programme had produced a set of guidelines for policy makers and development planners that outline how climate change adaptation may be incorporated into the development activities of Pacific Island countries. The guidelines present a process that may be integrated into existing planning, public participation and decision-making processes. Steps within this process include:

1. For each development proposal, determine if modifications are necessary following an analysis of:
   a. the effects of climate change on the proposal itself;
   b. the effects of the proposal on key ecosystems, resources and environments that are sensitive to climate change; and
   c. the effects of the proposal on the ability to communities to cope with climate change impacts.
2. Develop options for how the proposal may be modified in light of this analysis.
3. Evaluate the modification options.
4. Integrate approved modifications into a revised development proposal.

Source: John Campbell and Neil de Wet. "Adapting to Climate Change: Incorporating climate change adaptation into development activities in Pacific Island countries." South Pacific Regional Environment Programme. 1999.

accounting (a new area), which considers resource use, its degradation over time and the effects of poor management practices on a country's future well-being.

- *Poverty Reduction Strategy Papers (PRSPs) or Equivalents*: A key component of today's poverty reduction agenda are PRSPs. These country-driven documents state the development priorities of a country, and are intended to incorporate the key principles of sustainable development. They represent a major opportunity for addressing the linkages between poverty and climate change impacts, and for many countries will be a key means through which to mainstream the recommendations contained in NAPAs (see Box 7). Concerns related to the need to reduce vulnerability to climate changes could be included

Box 7: Reducing Vulnerability to Climatic Changes through PRSPs

To encourage the incorporation of environmental issues into PRSPs, the World Bank has developed a suggested process that LDCs may use. This process involves: A participatory analysis of the linkages between poverty and environment; setting desirable but realistic targets to focus on priority problems; evaluating possible public actions for reaching these targets given their expected cost-effectiveness, institutional capacities and lessons from past experience; and establishing a system of monitoring the outcomes of interventions and feeding them into the next stage of analysis. In undertaking this assessment, climatic variability and change could be one of the environmental factors examined. More specifically, adaptation to climate change and the implementation of NAPAs may be examined in relation to water and coastal zone management, waste management, agriculture, forestry, energy production, etc.

One country that has successfully integrated issues related to the environment and the need to reduce vulnerability to climatic variability in its PRSP is **Mozambique**. Key activities laid out in this country's PRSP include: capacity-building in environmental management at the local level; improving and expanding environmental protection measures; undertaking environmental inspections; and promoting planned land occupation. Mozambique views measures to manage its vulnerability to natural disasters to be of "the utmost importance includes strengthening its capacity to respond to natural disasters" as noted in its PRSP.

Mozambique undertook extensive stakeholder consultations in developing its PRSP. This process included consultations at the sectoral level (e.g. health) involving technicians, donors and civil society. Consultation then took place at the central and provincial level and included representatives of civil society, the private sector, the media and international partners. In its recent review of PRSPs, the World Bank found that the countries that demonstrated good practice in the area of stakeholder consultations also scored high on mainstreaming environmental issues into their plans.

Sources: World Bank. "Environment." Poverty Reduction Strategy Sourcebook.
Mozambique. "Action Plan for the Reduction of Absolute Poverty (2001-2005). http://poverty.worldbank.org/files/Mozambique_PRSP.pdf.

in any poverty analysis undertaken to inform the development of a PRSP, and could be made a criterion for monitoring poverty reduction outcomes. The priorities identified in existing PRSPs may be assessed with respect to their vulnerability to climate impacts as part of the NAPA team's review of national development plans and processes.

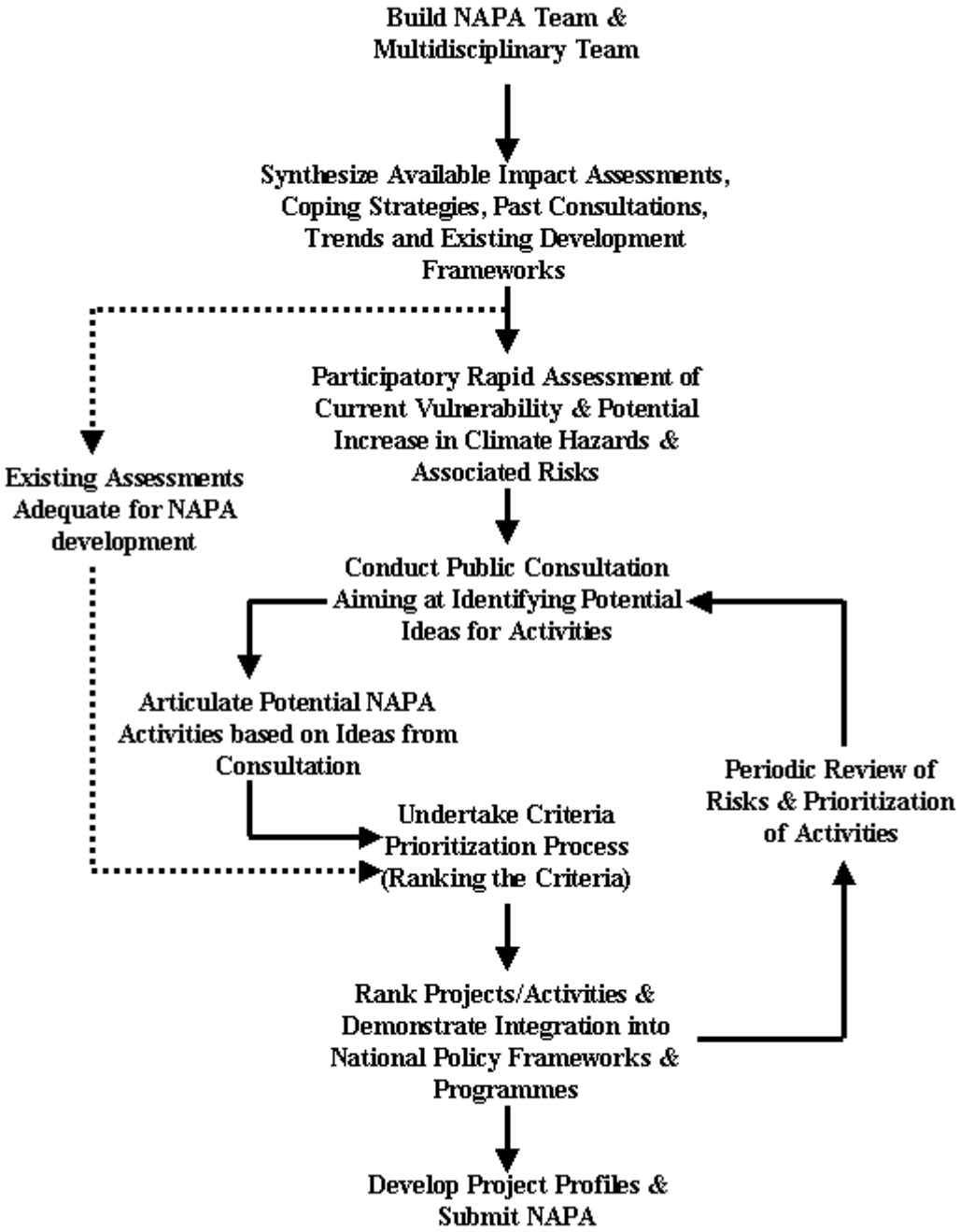
- *National Budgeting*: Budget-planning processes should consider the mobilization and allocation of funds in support of climate change adaptation efforts. In the absence of assured and dedicated financial resources for the implementation of climate change activities, it is less likely that the priority activities identified in NAPAs will be undertaken. National governments should realistically estimate the level of 'additional' funding likely to come from external sources for undertaking climate change-related adaptation activities. By setting aside, to the extent possible, financial resources from domestic sources for adaptation activities, governments will demonstrate that they are serious about adaptation and view these activities as priorities. In doing so, they will increase the likelihood that additional financial support will be received from international donors.
- *Strategic Environmental Assessment (SEA)*: SEA is a tool for ensuring that environmental, social and economic considerations are taken into account during the development of policies, plans and programs (as opposed to Environmental and Social Impact Assessments at the detailed project level). The main benefit to using SEA is that its proper use can achieve national sustainable development objectives. For this reason, an increasing number of countries are mandating its use. By including climate change as a factor in an SEA, a decision-maker will be able to determine whether an initiative contributes positively or negatively to adaptation, or whether adaptation considerations can enhance the expected results of an initiative. Moreover, the SEA would identify options for lessening negative impacts.

6. Final Thoughts

Mainstreaming climate change adaptation into national development policies will be a challenging process, yet is critical to reducing a country's vulnerability to existing climate variability and to addressing long-term climate change impacts. It will require overcoming disincentives to collaboration, such as "stovepiping" among departments and concerns over control of issues and resources. Strategic, interdisciplinary and cross-sectoral thinking is required among the individuals involved in planning and decision-making, and this may be lacking in part due to the traditional discipline-based educational systems and existing structure of bureaucracies. The success of mainstreaming efforts, though will be most dependent on gaining commitment at the highest level to this process.

Appendix C

Flowchart of main steps in developing a NAPA



Appendix D

Selection and Prioritisation of Options

1. Introduction

After the vulnerability of the country to climate change has been analysed and potential measures (options) been formulated, activities have to be selected and prioritised for inclusion in the NAPA. For the selection and prioritisation various techniques are available. In view of the diversity of CC impacts and thus the measures to avoid or mitigate these impacts, it is unlikely that one single method can handle all cases. Seen from a methodological point of view, the threats caused by climate change are not essentially different from what people have been experiencing in the past. Also the adaptation measures, proposed in the NAPA, will not be very different from those being introduced so far to fight poverty or to foster economic development. That is why evaluation methods used in the selection and prioritisation exercise will not differ much either. What is setting adaptation apart from the usual development project would seem to be the increase in frequency and intensity of extreme events and the uncertainty that goes with it, and the fact that adaptation projects normally try to achieve multiple objectives. That puts more emphasis on the treatment of uncertainty and risk.

In the following different techniques are briefly described, indicating in which cases what method is most suitable. The three main techniques are:

- Cost Benefit Analysis (CBA)
- Cost Effectiveness Analysis (CEA), and
- Multi-criteria Analysis (MCA)

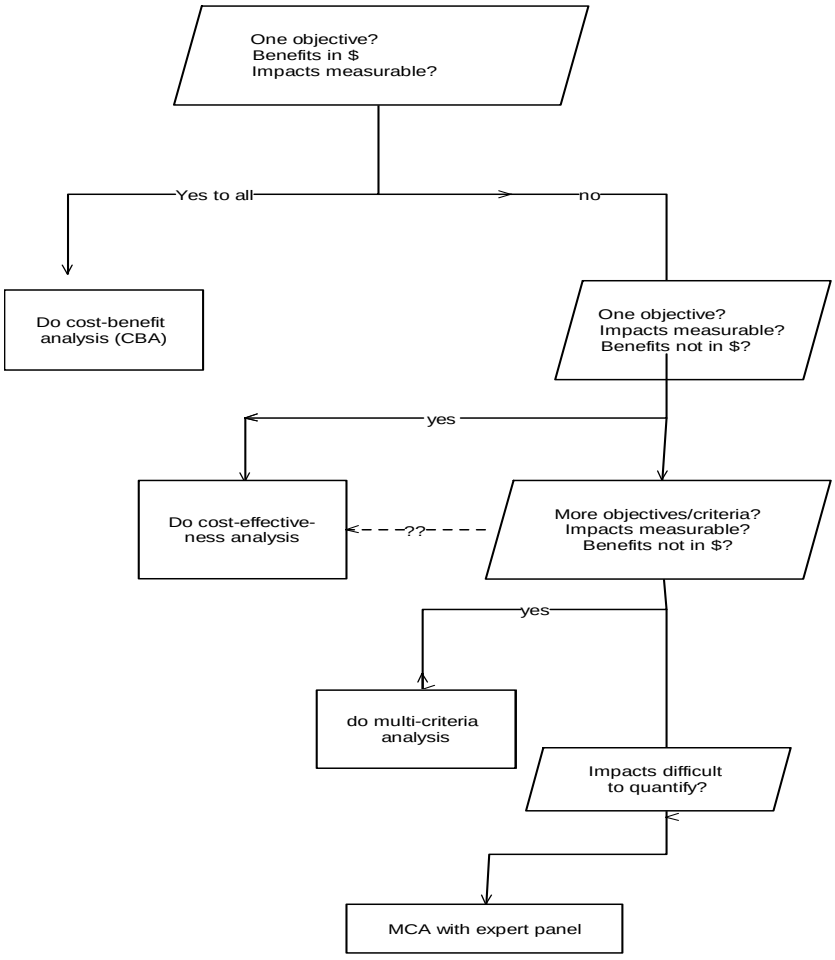
Of the three techniques CBA can handle optimisation, prioritisation and even provides an absolute yardstick, allowing a decision on whether or not to implement the measure, independent of its ranking. The limitation is that both costs and benefits must be expressed in monetary values and that the chief objective is economic efficiency. The yardstick (internal rate of return or net present value) allows the comparison of adaptation measures across sectors and can be used to optimise a measure. In contrast, MCA only allows the ranking of alternative options, but can – on the other hand - evaluate measures or interventions for which more criteria are deemed relevant and when quantification and valuation in money terms of costs and/or benefits is not well possible. Subjective judgement plays an important role in this technique, making outcomes more arbitrary than that of CBA. CEA is a method somewhat in between CBA and MCA. Its main use is costing of different options, that achieve the same objective. As is the case with MCA, CEA only produces a ranking in terms of cost. CEA can also handle cases with multiple objectives or criteria, but only if it is possible to weigh these objectives against each other. CEA then becomes a kind of MCA.

Given the fact that CBA is the more objective method and goes beyond mere ranking of activities, that technique is superior to MCA and it should be applied whenever possible. If criteria, which cannot (easily) be accommodated in CBA (such as institutional, sociological or cultural barriers), are important or when benefits cannot be quantified and valued (such as of

preserving bio-diversity), one has to resort to MCA. In MCA the outcomes of BCA can be taken on board, making the overall analysis a hybrid one. In the following the various methods will be briefly described. Before a measure can be included in planning, some description of resource cost and of effects will be needed. A minimum requirement is an estimate of financial and other cost involved. With these data available, carrying out a CEA is a small step and therefore a good way to start the analysis.

Figure.1 below schematises the preferred order of using methodologies. Reference is made also to 9], the Compendium of Decision Tools, which lists more methods than dealt with here, including sector-specific tools. Data availability will appear to be a major determinant of the method to be used. In cases when quantification/valuation is impossible, only qualitative methods are available, such as the Delphi method. In practice, political decisions will probably determine selection and prioritisation.

Fig..1. What method to use?



Note: “Benefits in $” means: benefits can be quantified and expressed in monetary units.

The outcome of the priority analysis is twofold: 1) a priority list of measures (such as the introduction of a policy or an incentive scheme, the implementation of legislation, the starting of an information campaign, but also project-type interventions, such as the construction or heightening of dykes, irrigation works or reforestation) and 2) an identification of further data or research required to firm up the priority assessment.

Measures influence each other, on the cost side as well as with regard to results. For instance, a measure of getting rid of stagnant water to allow the farmer to start working may also reduces the incidence of waterborne diseases. Integrating measures in different sectors and areas of the country into an overall strategy may lead to important cost savings (compared to the simple sum of costs of individual measures). That phenomenon must be taken into account, which may necessitate redefining options and revising the plan. An iterative process may be called for.

The methods are well documented and for details of the application reference is made to the relevant textbooks (see references at the end of this Annex). Some important methodological issues and pitfalls, common to CEA and CBA, and partly of importance also for MCA, are highlighted first, before describing the main characteristics.

2. Some methodological issues

Alternatives. It is often not immediately clear if there are alternative measures to cope with a climate threat. For CEA, of which the essence is achieving a given objective with alternative means, it sometimes helps to redefine, or rather broaden, the objective. For instance: If the problem is increased water logging (as is expected for Bangladesh) with the effect that agricultural production will go down, the first objective which comes to mind is to maintain agricultural production at a certain level (total, or per capita, at present level, or the level achieved without adverse weather conditions). Appropriate measures to achieve the goal may be improved drainage, installing pumps, introducing other rice varieties or combinations of these measures. Suppose that these measures turn out to be very expensive (leading to a cost price rendering rice production uneconomic), a broader objective could be introduced: maintain the food security (in stead of production) of the effected population at a specified level. Then more alternatives come in sight, because food can also be bought. Introducing income-generating activities other than increasing agricultural production could be seen as an alternative measure. An extreme alternative is to do nothing and provide for food aid. That would not be an acceptable long-run solution, but it is worthwhile to estimate the cost as it does provide a boundary for cost estimating. As may be appreciated from the example the optimum measure will often be a combination of measures. It is also important to realise that different solutions may be appropriate at different places and times. Defining alternative options is essential in all methods described here. In all case an alternative is ‘doing nothing’, usually referred to as the ‘base case’. A common mistake in comparing alternatives is that a situation before and after the introduction of a measure is taken instead of with and without the measure.

Discounting. Discounted cash flow analysis (DCA) allows to compare interventions with different streams of cost and benefits over time by determining the present value. At the same time the procedure makes allowance for the fact that future costs and benefits are valued lower than these of today. The height of the discount rate depends on scarcity of capital and the time value of money. A relevant concept here is that of ‘opportunity costs of capital’. A quick way to

estimate the discount rate is the prevailing interest rate for capital in the sector (public works sector in most cases) and correct it for inflation. Because of time lags, special risks and – in general – mal-functioning of the capital market that estimate, however, may not be reliable. As discount rate in developing countries often 10% is used. There is a debate on the discount to use for investments with a very long time horizon (spanning more generations) and/or dealing with irreversible effects. Some argue for a lower rate in those cases in order to foster acceptance of such projects, often environmental projects (See also reference 2). This is a slippery road to take and at variance with the concept of opportunity costs. An alternative is to express these special concerns in the prices. For instance in case of irreversible effects (depletion of a resource, for instance) prices (costs) will in the future be extremely high or even infinite (the same goes for the benefits of avoiding that situation), making an action to avoid such a situation economically feasible at (almost) any discount rate. For instance, if shortage of drinking water is 'solved' by using groundwater in such a way that water tables go down or by using fossil water reserves (a clearly unsustainable practice, as is being done in Yemen), the way to deal with this in the analysis is to not take the cost price of winning water but a much higher price, which would include the cost of recharging groundwater or even of desalinating sea water.. Discounting is applied in CEA and CBA.

Inflation. In theory the best way to deal with inflation is to project the inflation rate for the different expenditure and benefit categories. However, this is very difficult to do for a longer period and a practical way out is to work in constant costs. This gives the correct results when the inflation rate is the same for the different cost (and benefit) items. If a clearly different price development for main inputs/outputs in the analysis is to be expected, corrections have to be made.

Prices. Costs and benefits in the analysis should represent the true scarcity of resources used or produced/saved. Prices of production factors (labour, capital, know-how) and of goods/services are often distorted. Main sources of distortion are indirect taxes/subsidies and other deliberate government policies and mal-functioning of markets. When correcting for these distortions the accuracy aimed at naturally should be in line with the rest of the analysis (such as the cost estimating of measures and of climate change impacts). Corrections are usually necessary for:

- taxation/subsidisation
- wages
- discount rate (interest, the price of capital)
- foreign currency (exchange rate)

A guiding concept here is that of 'opportunity costs'. When applied to labour in the project, the reasoning is that the true cost of labour is the value added forgone (f.i. in terms of rice produced). If there is (large) unemployment in a country the 'opportunity costs of labour' (also called 'shadow cost of labour') can be set at close to zero. Applying the opportunity costs reasoning to material inputs leads to the use of 'border prices' or long-run world market prices. Doing this is also a way to detect hidden subsidies. For instance, the use of gas as a fuel in Bangladesh should be valued at the price it would fetch when exported. This is the correct method of estimating the cost, and not building up the cost price from exploration through the

different stages of storing, transporting and distributing up to the ultimate customer. For most cost items the acceptable method will be to just remove indirect taxes (VAT and import duties) and known subsidies. In case of quantitative import restriction the best way is to work out a price based on the long-run world market price.

The 'shadow' exchange rate is the rate that would prevail in the absence of undue protection (more than of trading partners) and when the rate is left to fluctuate freely. The estimation is specialist work and the easiest way is to consult the planning agency in the country or a recent authoritative report. As said, the same applies to the discount rate.

Uncertainty and risk

A common method in project appraisal is sensitivity analysis. Main inputs in the analysis (such as certain cost and/or benefits) are varied to see how sensitive the outcome is to these changes. A practical approach is to determine 'switching values', i.e. those values of major inputs, either alone or in combination with others, that render an activity uneconomic. It is then up to the analyst or experts on the subject to judge whether such changes could indeed occur in the lifetime of the activity. A similar procedure can be used in (computerised) MCA analysis.

Risk analysis uses Monte Carlo simulation on key inputs in the analysis. The analyst has to determine the probability distribution (normal, skewed, etc.) of the occurrence (say of an increase in cost, or number or intensity of extreme events). The computer model, using a random number generator, makes a large number of runs to determine the outcome. If a probability (or combinations) is input into the analysis, the output, naturally, is also a probability distribution of the outcome (for instance, of the rate of return or the benefit-cost ratio). There are commercial computer packages that perform the work (see for instance 3) which integrates risk analysis in spreadsheet programmes. Also in MCA models a routine doing the risk analysis can be built in (ref. 4).

Another possibility to deal with uncertainty is scenario development. This method corresponds with climate change scenarios developed by IPCC. For a systematic analysis the likelihood of a situation occurring and its probability distribution could be used as input in risk analysis.

3. Cost Effectiveness Analysis

To be able to include a measure in the priority list a minimum requirement would seem to be that there is some idea about the costs (investment and recurring costs). Whilst benefits are not always quantifiable and/or cannot always be expressed in monetary values, the costing of measures is normally possible. The non-monetary use of scarce resources, such as utilising existing capacity in government, should also be taken into account. If and to the extent that this leads to lower output elsewhere in the economy, this is a true cost (opportunity cost principle). This reasoning of 'opportunity costs' may point the way to estimating the cost of this use of resources.

The best way is to start the cost estimation using financial costs (market costs), taking inflation expected in the future into account. The outcome can readily be used as an input in the

budget estimate for the adaptation strategy. For a proper comparison of alternatives, financial costs should be converted in economic costs. 'Shadow' prices should be used where needed, as indicated above.

If the benefits cannot be measured in a reliable manner (for instance, as is the case with maintaining biodiversity), CEA is the appropriate method to compare alternative measures in order to find out how a well-defined objective can be reached in the most cost-effective way. It is of importance that the objective is defined carefully, and that attainment can be measured. If CEA would be applied to the example of flooding in Bangladesh, it should be ascertained that the same quantity of water could be drained in the same time in each alternative. It could then transpire that scooping out water of such quantities in such a short time by manual labour is not feasible. The cost-effective option is the one with the lowest present value, determined by discounting the cash flows of costs.

If there are multiple objectives, CEA can only be applied if one objective can, quantitatively, be expressed in the other by assigning importance (weight) to the objectives to arrive at a single yardstick. In health projects various measures have been developed (such as 'disability adjusted life years', DALYs; see reference 1 for worked-out examples) to bring effects on morbidity and mortality under one denominator. In Western countries these measures are commonly used in decision-making. Since values people give to a healthy year of life and to a year of life may differ from country to country, it is not the analyst who should determine these weights. Stakeholder meetings seem appropriate to answer these difficult questions. A CEA, dealing with different objectives brought under one denominator, is called 'weighted cost-effectiveness'.

4. Cost Benefit Analysis

CBA can rank activities, determine the optimal use of scarce resources (in efficiency terms) and, because CBA weighs costs against benefits, it determines whether benefits outweigh costs, allowing to decide whether implementation is in the interest of the national economy. This clear 'yes' or 'no' answer, the fact that measures across sectors can be compared and that CBA can be used to optimise measures makes this technique superior to CEA and MCA (next section).

CBA involves quantifying both costs and benefits with regard to their amounts and timing, and giving them a monetary value. If discounting results in a positive net present value (NPV) the intervention is economically efficient. Alternatively, if the rate of return (the IRR) that produces a zero NPV is higher than the discount rate, the project is accepted. As in the case of CEA it is important that impacts of measures can be quantified and valued, and that costs and benefits represent real losses of or additions to scarce resources (see section 2 above). If alternative measures to reach the same goal exist, CBA is normally preceded by CEA to find the best alternative.

With regard to assessing costs and benefits it is essential to define a 'base case' (the situation without the measure being carried out) and the 'project case' (with the measure), determining costs and benefits by subtracting the two situations. Consequently defining and projecting a 'with' and 'without' situation avoids the rather common mistake of comparing 'before' and 'after'. It must be stressed that the 'base case' is not the same as the present situation. The 'socio-economic conditions and prospects' provide an input for the projection of the 'base case'.

A drawback of CBA is that it requires that benefits are measurable and can be expressed in monetary terms and that the emphasis is on economic efficiency alone. If there is no market for the goods or services provided by the activity, prices often can be estimated in indirect ways (contingency evaluation, willingness-to-pay analysis, etc. See reference 5 and 1). It is not impossible to introduce equity considerations, but the amount of additional work is considerable and also arbitrary elements are introduced (who should say what the desirable income distribution is?). It should also be realised that project selection is not the most direct or efficient method to change an existing income distribution. Therefore social CBA (SCBA) is rarely applied. Nevertheless, in cases where social considerations are important SCBA shall have to follow economic CBA (ECBA). That could well be the case in adaptation studies as the poor are usually the most vulnerable. The techniques to internalise social considerations are available (see reference 7 and many other older textbooks on BCA). An alternative to internalising equity considerations into the analysis is to make these an additional but separate objective, and treat this outside CBA, in a qualitative way or using MCA.

An important issue in the analysis is the preservation of the environment. Adaptation measures should be environmentally sustainable. The way this requirement is expressed in COP decision 28/CP.7 suggests that treating sustainable development as a constraint in the selection of measures does justice to its importance. Doing that requires an operational definition of sustainable development. An interesting approach is described in reference 8. Both equity and ecological sustainability are introduced as separate criteria next to economic efficiency and evaluated with the help of MCA. With regard to environment, CBA has in general been reasonably successful in incorporating environmental considerations by separately estimating 'external costs and benefits'. Also in the valuation of environmental benefits there has been much progress (see reference 5).

As said, CBA lends itself to optimise the impacts of a measure. When the growth of benefits decreases with increased intensity of a measure, there comes a situation when marginal costs (MC) exceed marginal returns (MR). At the optimum the well known condition that MC=MR applies, where the NPV is at its maximum[1]. In practice it seems best to work with levels of intervention and resulting benefits (incremental costs and benefits), rather than with MC and MR, which requires specifying functions. It is also possible to determine the optimum starting year of an intervention.

When benefits are not measurable and/or when important decision criteria cannot be incorporated in BCA one (of many) forms of MCA must be resorted to.

[1] At first sight it appears as if Samuel Frankhauser (ref. 8) uses a slightly different approach to optimisation. He minimises the sum of adaptation costs and residual damages. "Residual damages", when avoided by a measure, become "benefits" in CBA language and so the methods are the same.

5. Multi criteria analysis

MCA has become increasingly popular, not least in relation to environmental issues, including CC (Arrow et al. 1996, Bell et al. 2001). A proliferation of methods and software has been observed but without, so far, clear winners or losers. However, some authors have attempted to compare methods and identify advantages and disadvantages of different methods[2]. This has provided useful insights.

Provisional conclusions are:

- method uncertainty: different methods produce different results and it appears preferable to apply several MCDM methods (Bell et al., abstract, p.229)
- ease of manipulation coupled with subjectivity and lack of transparency has contributed to lack of confidence, distrust even, in results of MCDM methods. Simpler methods, preferably without use of computer software, are recommended.
- MCA/MCDM is very useful for structuring problems and decisions, not necessarily for solving problems ('holistic assessments' are preferred for ultimate decisions)

The ingredients of MCA are objectives, alternative measures/options/interventions, criteria (or attributes), scores that measure or value the performance of an option against the criteria, and weights (applied to criteria). Defining objectives and formulating different options is not different from CBA or CEA. The difference lies in the selection of criteria and their weights. As concluded above these are subjective elements, allowing manipulation of results. For the determination of weights procedures exist which more or less guarantee that the set of weights is consistent. "DEFINITE" (See reference 4) contains a separate routine (pair-wise comparison) to arrive at a consistent set of criteria. It further allows to use different ways of MCA, from simple to quite sophisticated, and includes a routine for (simple) CBA.

A major exercise is determining the scores, i.e. assessing the impact of alternative measures/options on the different criteria. Often the relationship between input and impact will not be linear. CEA, as explained above, will be helpful to choose between (technical/engineering) alternatives and CBA to optimise a measure. Assessing causal relationships between measures and effects seems a matter of research, rather than the subject of a stakeholders' meeting. Scores can be entered in various ways: monetary and non-monetary data, qualitative data (for instance ++, + or --, for respectively positive, very positive and very negative), various rating scales, and direct assignment of a percentage contribution to an objective or criterion. The scores have to be normalised or standardised to make them comparable. A usual way is to convert them into a preference scale from 0 (lowest) to 100 (best scoring option) or 0 – 1 (DEFINITE). In computer models the model performs this operation.

The selection of a set of criteria is subject to a number of pitfalls. 1) Probably the most serious danger is overlap (double counting) or interdependency. In the Bangladesh example

[2] Bell et al. distinguish three groups of MCDM methods: weighting methods, deterministic ranking methods and uncertainty ranking methods (Bell, M., B. Hobbs, E. Elliott, H. Ellis and Z. Robinson, 2001. An Evaluation of Multi-Criteria Methods in Integrated Assessment of Climate Policy, in: Journal of Multi-Criteria Decision Analysis, vol. 10, 229-256 (2001).

above, avoiding or getting rid of floods will have a positive impact on health. The impact may be expressed in a decrease of morbidity and mortality, two clearly interrelated criteria, and that fact should be taken into account when determining the weights in order to avoid double counting. Complete independence of criteria will in practice be unattainable. 2) Another danger is that only those criteria are selected to which effects can easily be attributed. Health and bio-diversity are criteria that may fall victim to the difficulties of estimating and attributing effects. That a contribution to a criterion cannot well be assessed must be taken for granted. Employing expert judgement seems preferable to leaving out the criterion. 3) Too many criteria may be taken into account, leading to a 'splitting bias'. According to Van Pelt (ref. 8) MCA is most reliable if the number of alternative options lies between 3 and 8, the number of criteria does not exceed 7, the impact can be quantified and if different MCA techniques give comparable outcomes.

It may be helpful to structure the criteria in a 'value tree'. Main criteria will usually be costs and benefits, each subdivided into constituent criteria of lower hierarchy. Costs could be divided up in monetary and in-kind costs, benefits into economy, safety, and health, with a further subdivision of economy. There are trade offs between criteria, notably between costs and benefits. The MCA model "HIVIEW" (see reference 11) generates and visualises this tree of criteria, which is very helpful for analysing the structure of the criteria set.

The Guidelines list a great number of criteria. It is stated further that the selected set should locally driven and "inter alia" is added both in section 15 and 16. The present interpretation of the LEG is that the list can be seen as a checklist of possibly relevant criteria (depending on the country and, especially, on the measures/interventions which are being evaluated). Further, when the criteria are put in matrix form with 15 a-d at the horizontal axis and 16 a-j at the vertical, it appears that in many cases the 'vertical criteria' are sub criteria of the horizontal ones. This is most clear for 'poverty' with health, food security, water constituting parts. Similarly, the degree of an adverse effect (15 a) can be measured in loss of life (16 a), health, loss of land, loss of biodiversity, etc. Regarding the criteria in this way helps in determining where criteria overlap or are correlated. The MCA Model signals where criteria are correlated. Grouping the criteria or expressing one into the other (making it one) seems the solution in these cases. It is stressed again that too many criteria makes it impossible to interpret the outcome of MCA.

6. A hypothetical example using MCA for selection/prioritisation

This illustration of MCA uses the same example as above. The steps normally taken in a MCA analysis are as follows:

1. Problem definition: Because of rising sea level, higher intensity of precipitation and increased run-off in upstream areas, rain and smelt water reaches Bangladesh in a shorter period than before and also drains less easily. Floods in some coastal areas, as Bangladesh has been experiencing for a long time, so are getting worse[3].
2. The objective of the intervention is to get rid of superfluous water in order to safeguard agricultural production, to avoid the spread of waterborne diseases, and to avoid damages to buildings, nature, infrastructure, etc. (called environment in the example)

[3] In many parts of the country salt intrusion seems to be a bigger problem.

3. The criteria used to measure effects are a) agricultural production, b) health c) expected damage of the environment and d) the cost of the intervention.
4. As alternative interventions the following is considered: a) installing pumps at strategic sites, b) improving the existing drainage infrastructure c) organising manual labour at a big scale (not unusual in Bangladesh). An alternative option always is to do nothing (bear the losses).
5. Estimating effects in a reliable manner naturally is of paramount importance. This is the area where risk analysis is especially valuable. It is here assumed that there is insufficient data at this stage to do CBA and CEA - very suitable of course to evaluate effects on 3.a) and 3.c)-. For the study area there are, however, rough estimates of the extent and duration of floods that could be avoided, from the DALYs (see reference 1) that could so be gained, from the damage done to the environment (in money terms) and of the costs of the different interventions (also in money terms).
6. The last step is to give weights to the different criteria.

All steps lend itself for stakeholder participation (in a facilitated workshop, for instance), but steps 3, 4 and 6 especially so. Under 4 traditional coping mechanisms would be brought in and under 6 the preferences of people affected by the floods (and the measures to avoid them). Table 1 gives the basic data and table 2) the results in terms of ranking after the effects (expressed in various units) have been 'standardised' by scaling them (0-1 scale) and weights have been assigned to the criteria.

Table 1. Scores on criteria (absolute)

	cost	effect	health	environment		
		(mln HA	(mln	cost		
	mln $	days)	DALYs)	(mln $)		
pump	-700	1000	10	-70		
infrastruct	-800	800	8	-10		
labour	-900	300	3	-10		
bear losses	0	0	0	-50		

Table 2. Scores standardised (0-1 scale), weighted summation and ranking

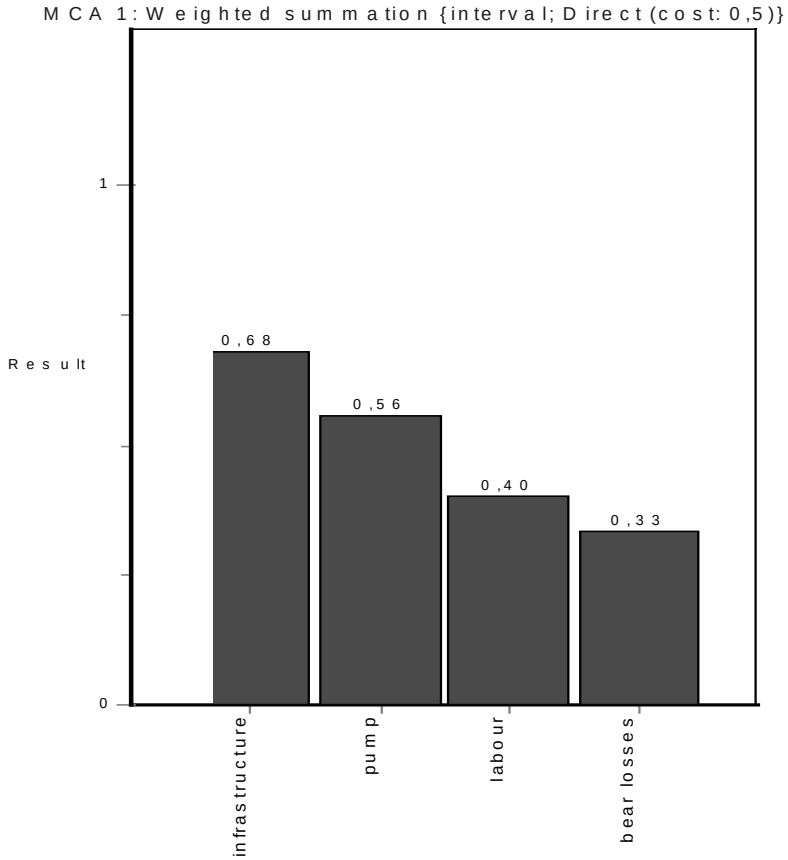
					weighted	ranking
	cost	effect	health	environment	summation	
pump	0,22	1	1	0	0,56	2
infrastructure	0,11	0,8	0,8	1	0,68	1
labour	0,00	0,3	0,3	1	0,40	4
bear losses	1,00	0	0	0,33	0,33	3
weight	0,25	0,25	0,25	0,25	1,00	

The data was input in a spreadsheet (table 1) and the calculations (standardisation and summation of contribution) are made in table 2. When the calculations are properly formulated in

the spreadsheet, performing sensitivity is possible[4]. It would be logical to investigate the sensitivity of the effects (scores in table 1) and of the weighting (table 2) on the outcome (ranking). If pumping would be less expensive (for instance only 400) and infrastructure more expensive (950) the two alternatives would get the same ranking. If cost would be given a weight of 0,45 and environment of 0,05 (so in proportion of the estimated costs), then pumping becomes the better alternative. Also risk analysis could be done on the scores (see reference 3), but much more useful would seem to improve the estimates of effects. As said, MCA can be done using computer models. Both HIVIEW (ref. 11) and DEFINITE (ref. 4) support weighted summation, as done above. Doing sensitivity using a MCA model becomes easy.

Both models are easy to apply. HIVIEW does sensitivity, allows relative and absolute scaling, and accepts inputs of scores in various forms (numbers, but also 'yes' and 'no'). Special is that it can present the structure of weighting graphically. DEFINITE is a full-fledged decision support programme. It includes four different MCA methods, (simple) CBA and graphical evaluation methods. It allows all formats for inputs, including +, ++, -, --. Unique is that DEFINITE leads the analyst through rounds of interactive assessments of options, weights, scores etc. and that there is a routine to check internal consistency of the weight set using pair-wise comparison. Reporting is in text and numbers, but also graphs can be produced, as in fig. 1 below:

Fig. 1. Reporting results by DEFINITE



[4] Care has to be taken that the scaling of scores is always done on the highest/lowest score in a column and that this order can change in the sensitivity analysis.

To make use of the many possibilities of the model some training seems advisable. The danger of the programme (as with all MCA) is that the emphasis comes on the method, rather than on the (hard) work to develop estimates of costs and benefits of options.

References

1. Economic Analysis of Investment Operations, Pedro Belli et al., World Bank, 2001
2. Climate Change 2001: Impacts, Adaptation and Vulnerability, IPCC (http://www.ipcc.ch/pub/tar/wg2/069.htm)
3. @RISK (http://www.palisade.com/html/risk)
4. "DEFINITE", Institute for Environmental Studies, Vrije Universiteit Amsterdam, The Netherlands.
5. Values for the Environment, A guide to Economic Appraisal, J.T. Winpenny, Overseas Development Institute 1991, London.
6. Handbook on Methods for Climate Change Impact Assessment and Adaptation Strategies, Jan F. Feenstra et al., UNEP/IVM, 1998
7. Guidelines for Project Appraisal, Arie Kuyvenhoven and L.B.M. Mennes, Erasmus University, 1985
8. Sustainability-oriented Project Appraisal for Developing Countries, Michiel J.F. van Pelt, Rotterdam, April 1992 (PhD Thesis)
9. The Costs of Adapting to Climate Change, Samuel Frankhauser, GEF Working Paper 16, 1998
10. DTLR, 2001. Multi-Criteria Analysis: A Manual, published on the web: http://www.dtlr.gov.uk/about/multicriteria
11. HIVIEW for Windows: http://www.enterprise-lse.co.uk (600 UK pounds).

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