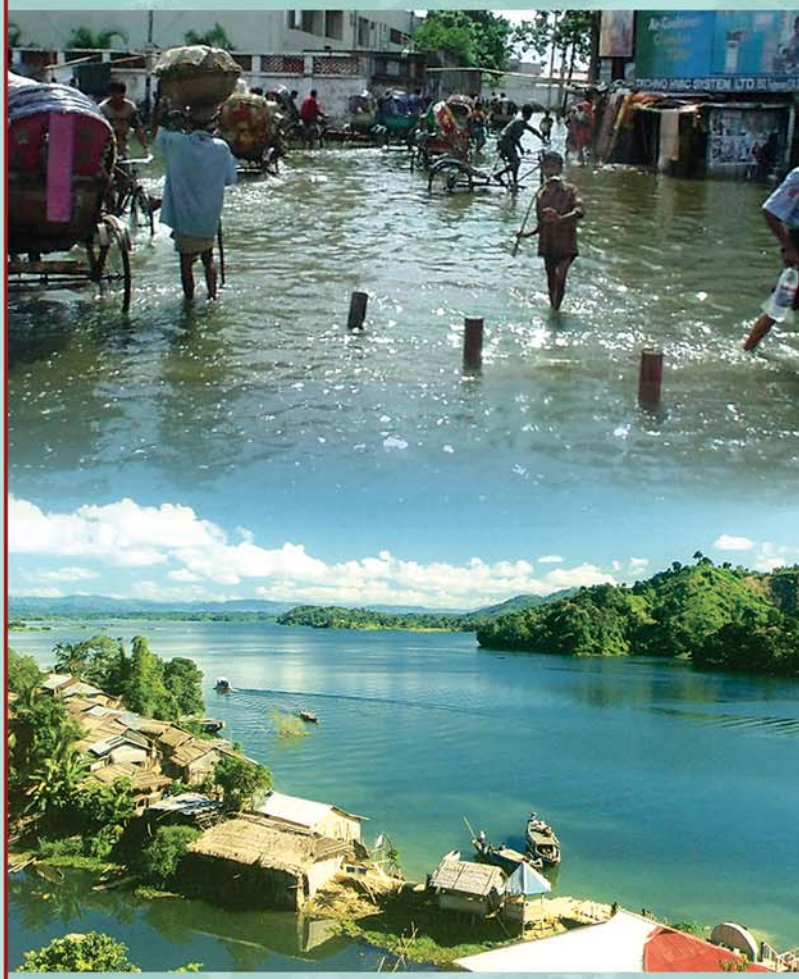
UNFCCC

Least Developed Countries Expert Group

NATIONAL ADAPTATION PROGRAMMES of ACTION

NAPA

Selection of examples and exercises drawn from the regional NAPA preparation workshops



UNDP

UNEP

UNITAR

Cover pictures: Flooding in Dhaka, Bangladesh, July 2004. Images courtesy of Golam Rabbani, Bangladesh Center for Advanced Studies (BCAS) and the Sustainable Development Network Programme (SDNP), Dhaka.

This publication (available in English and French) received the financial support of the GEF through UNDP (Project GLO/03/G37) and the Norwegian Government through UNEP's Regional Office for Africa. The coordination of its final production was the responsibility of UNITAR. French translation by Frederic Palmer and Djamila Robinet-Kaloya, ENDA-TM.

PREFACE

The primary objective of this publication is to share the results of the experience gathered during the four regional workshops dedicated to the National Adaptation Programmes of Action (NAPAs). These workshops were organized under the leadership of the Least Developed Country Expert Group (LEG), with the support of UNDP/GEF funded projects, UNEP and the Swiss Federal Agency for Environment and Landscape (SAEFL). UNITAR was the executing agency.

They were held:

- In Apia (Samoa), in March 2003, for the following SIDS LDC countries: Kiribati, Solomon Islands, Tuvalu, Vanuatu and Samoa;
- In Addis Ababa (Ethiopia), in June 2003, for the following Anglophone LDC countries: Eritrea, The Gambia, Lesotho, Liberia, Malawi, Mozambique, Sierra Leone, Uganda, United Republic of Tanzania, Zambia, Yemen and Ethiopia;
- In Thimphu (Bhutan), in September 2003, for the following Asian LDC countries: Afghanistan, Bangladesh, Cambodia, Lao People's Democratic Republic, Maldives, Myanmar, Nepal and Bhutan; and
- In Ouagadougou (Burkina Faso), in October 2003, for the following Francophone LDC countries: Angola, Benin, Burundi, Cape Verde, Central African Republic, Chad, Comoros, Congo (Republic Democratic), Central African Republic, Djibouti, Guinea, Guinea Bissau, Equatorial Guinea, Haiti, Mali, Madagascar, Mauritania, Niger, Sao Tome-and-Principe, Senegal, Sudan, Togo and Burkina Faso.

The LEG, local and regional institutions, the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat, UNFCCC Focal Points, the above mentioned UN agencies and Governments representatives of the four host countries were all actively involved in these events.

The work and recommendations produced by the LEG and the national facilitators concerning the implementation of the NAPAs, further reinforced over the course of the regional workshops, is summarized in this publication. The LEG, together with the GEF Implementing agencies, hopes that the production of high quality NAPAs is facilitated through the sharing of this document with a wider audience, in particular the NAPA teams that are already or will soon be established in each LDC.

La'avasa Malua, Chair of the LEG, in Addis Ababa, June 2003

ACKNOWLEDGEMENTS

This publication was prepared by three lead authors, **Dr. Klaus Broersma**, **Dr. Thomas Downing** and **Dr. Jean-Philippe Thomas**, who actively contributed to the NAPA workshops held in 2003. It was developed under the leadership of the Least Developed Country Expert Group, taking into account the valuable inputs gathered during these workshops. The authors extend their thanks and appreciation to the national and regional experts as well as to all the country teams who worked hard during these long sessions where the ideas and tools, herein described, were tested.

2003 Least Developed Country Expert Group:

La'avasa MALUA, LEG Chair, Samoa
Mohammed ALI, the Maldives
Lubinda AONGOLA, Zambia
Philip BAKER, Canada
Henk BOSCH, the Netherlands
Klaus BROERSMA, the Netherlands
Paul DESANKER, Malawi
Madeleine DIOUF, Senegal
Bubu Pateh JALLOW, the Gambia
Mizanur KHAN, Bangladesh
Liza LECLERC, Canada
Abebe TADEGE, Ethiopia
Dechen TSERING, Bhutan
Jos WHEATLEY, United Kingdom

Facilitators

Mozaharul ALAM, BCAS
Admasse ASSEFA, Ethiopia
Luke BRANDER, IVM the Netherlands
John Mac CALLAYWAY, UNEP Risø Center
Moussa CISSE, ENDA -TM
Bismarck CRAWLEY, SOPAC
Bhujangarao DHARMAJI, IUCN Regional Office Asia
Moussa DIAKHITE, UNFCCC Secretariat
Adama DIALLO, AGRHYMET
Thomas DOWNING, SEI
Wondwosen FELEKE, Ethiopia
Abate GETACHEW, Ethiopia
Mounkaila GOUMANDAKOYE, DDC
Thanavat JUNCHAYA, UNEP Bangkok
Daniel KABORE, Burkina-Faso
Atu KALOUMAIRA, SOPAC/IDRC
Kamal KISHORE, BCPR/UNDP India
Mathieu KOUMOIN, UNDP Dakar
Martin KRAUSE, UNDP Pretoria
Olav LUNDSTOL, UNDP Kuala Lumpur
Raymond MALOU, Senegal
Youssef NASSEF, UNFCCC Secretariat
Hubert N'DJAFA OUAGA, AGRHYMET
Madiodio NIASSE, IUCN Regional Office West Africa
Victor OGBUNELCE, Drought and Desertification Center
Janos PASZTOR, UNFCCC Secretariat
Leoo POLLUTEA, Samoa
Vivian RAKSAKULTHAI, Thailand
Annie RONCEREL, UNITAR
Emilie ROUSSELOU, UNITAR
Ademola SALAU, UNDP New York
Ravi SHARMA, UNEP Nairobi
Youba SOKONA, ENDA
Léopold SOME, Burkina-Faso
Jean-Philippe THOMAS, ENDA -TM
Jigme TOBGAY, UNDP Thimphu
Tom TWINING-WARD, UNDP Samoa
Marjan VAN HERWIJNEN, IVM The Netherlands
Leo ZULU, Malawi

Country teams

Abdul Wali MODAQIQ, Afghanistan
Abdul Wahed NABIZADA, Afghanistan
Ghulam RASOOL AHMAD ZADA, Afghanistan

Syed Nazmul AHSAN, Bangladesh
Mozaharul ALAM, Bangladesh
Mosharaf HOSSAIN, Bangladesh

Justin AGBO, Benin
Lambert DAH KINDJI, Benin
Ibila DJIBRIL, Benin

Meghraj ADHIKARI, Bhutan
Tshoki CHODEN, Bhutan
Kunzang DORJI, Bhutan
Lobzang DORJI, Bhutan
Singye DORJI, Bhutan
Sonam DORJI, Bhutan
Mahesh GHIMIRAY, Bhutan
Austin HUTCHOEN, Bhutan

Kezang JAMTSHO, Bhutan
JIGME, Bhutan
Helene JORDANS, Bhutan
Tatsuko KONDO, Bhutan
Thinley NAMGYELV, Bhutan
Kunzang NORBU, Bhutan
Yeshey PENJOR, Bhutan
Miraj PRADHAN, Bhutan
Karma L. RAPTEN, Bhutan
Ugen SONAM, Bhutan
Karma TSHERING, Bhutan
Jigme WANGDI, Bhutan
Tashi WANGYAL, Bhutan

A. Laurent AOUYA, Burkina-Faso
Soumayila Boniface BANCE, Burkina-Faso
Mamounata BELEM, Burkina-Faso
Koncourou COULIBALY, Burkina-Faso
Sambou COULIBALY, Burkina-Faso
Adama DIALLO, Burkina-Faso
Mamadou HONADIA, Burkina-Faso
Harouna KARAMBIRI, Burkina-Faso
B. Dieudonné KINI, Burkina-Faso
Elhadji M. Lawali MAHAMANE, Burkina-Faso
Marie Eugenie MALGOUBRI, Burkina-Faso
G. Bernard NONGUIERMA, Burkina-Faso
Frédéric OUATTARA, Burkina-Faso
Delphine B. OUEDRAOGO, Burkina-Faso
Kimsé OUEDRAGO, Burkina-Faso
Michel Jérôme TANKOANA, Burkina-Faso
D. Honoré TOE, Burkina-Faso
Louis Blanc TRAORE, Burkina-Faso
Goudouma ZIGANI, Burkina-Faso

Venant MYANDWI, Burundi
Ferdinand NDERAGAKURA, Burundi
Arthur RUSHEMEZA, Burundi

Siphannara KANG, Cambodia
Soben KIM, Cambodia
Kamal UY, Cambodia

Ester Araujo DE BRITO, Cape Verde
Arlinda NEVES, Cape Verde

Léon BAIKOUA, Central African Republic
Thiérry Cyprien M' PONDO, Central African Republic
Aline Gisèle PANA, Central African Republic

Prosper AKINGAR NANDIDAYE, Chad
Anoueye LANGARSOU, Chad
Yemangar LANGTANGAR, Chad

Ahmada MSAÏDIE, Comoros

Djunsanumbe ETUMEGAKU, Democratic Republic of Congo

Annie MWANA KALUNGA KOMPANYI, Democratic Republic of Congo
Jacques TUNGUNI DIA MANSONI, Democratic Republic of Congo

Moussa AHMED HASSAN, Djibouti
Saleban Ahmed AIBO, Djibouti
Darar Houffaneh HASSAN, Djibouti

Nure ABDELA, Ethiopia
Mekuriaw ABEBE, Ethiopia
Shiferaw ALMAZ, Ethiopia
Taye ASHENAFI, Ethiopia
Asfaw BERIHUN, Ethiopia
Agonafir DEREJE, Ethiopia
Assefa DESIE, Ethiopia
Bekele ENDAKACHEW, Ethiopia
Mersha ENGIDA, Ethiopia
Eskzeya GENETU, Ethiopia
Shikure HABIB, Ethiopia
G/Yohannes HABTU, Ethiopia
Hailu HAILMARIAM, Ethiopia
Berhanu LAKEW, Ethiopia
Berhanu MESFIN, Ethiopia
Abebe MITIKU, Ethiopia
Mamo NEGASH, Ethiopia
Yusuf NESRIA, Ethiopia
Tesfaye RAHEL, Ethiopia
Abdulwasie SEADA, Ethiopia
Derbie SHEWAYE, Ethiopia
Bekeli SIRAJE, Ethiopia
Abza TARIKU, Ethiopia
G/Eyesus YOHANNES, Ethiopia
G/Hiywot YOHANNES, Ethiopia

Pa Abdoulie MANNEH, the Gambia
Baboucarr MBYE, the Gambia
Momodou NJIE, the Gambia

Mohamed DIALLO, Guinea
Joseph SYLLA, Guinea
Ahmed Faya TRAORE, Guinea

Malam DA SILVA, Guinea Bissau
Bernardo QUADE, Guinea Bissau
Joâo Lona TCHEDNA, Guinea Bissau

Antoine Marie Georges GONEL, Haïti
Régine LOUIS, Haïti
Moïse Fils JEAN-PIERRE, Haïti

Kireua BUREIMOA, Kiribati
James UAAN, Kiribati

Phonedavanh PHINSAVANH, Lao PDR
Sombounmy PHOMTAVONG, Lao PDR
Xayayeth VIXAY, Lao PDR

Malintle KHELELI, Lesotho
Mothae NONYANA, Lesotho
Bruno SEKOLI, Lesotho

Samuel BOAKAI, Liberia
Benjamin S Jr. KARMORH, Liberia
Fodee KROMAH, Liberia

Norbert RAKOTONDRASOA, Madagascar
Germain RANDRIASANDRATANA, Madagascar
Hubert RANZANAKOTO, Madagascar

William CHADZA, Malawi
Evans Davie NJEWA, Malawi

Ahmed JAMEEL, Maldives
Ahmed MAZIN, Maldives
Aslam RASHEED, Maldives

Birama DIARRA, Mali
Mori Moussa KONATE, Mali
Alassane TOURE, Mali

Baye FALL, Mauritania
Oumar FALL, Mauritania

Dambuza CHISSANO, Mozambique
Alberto MOISES, Mozambique
Manuel SOUSA, Mozambique

Htwe Nyo NYO, Myanmar
Khin Myint WAI, Myanmar
Ne WINN, Myanmar

Sagar Man Singh DANGOLE, Nepal
Purushottam KUNWAR, Nepal
Deependra B. THAPA, Nepal

Solange BAKO SAFI, Niger
Souley IRO, Niger
Abdoulaye ISSA, Niger

Sébastien DUSABEYEZU, Rwanda
Charles URAMUTSE, Rwanda
Maximilien USENGUMUREMYI, Rwanda

Sialaoa AMARAMO, Samoa
Faamau LAUINA, Samoa
Faatoia MALELE, Samoa
Fiu MATAESE, Samoa
Dean SOLOFA, Samoa
Silia UALESI, Samoa

Violet WULF, Samoa

Moniz Eugenio DE ALMEIDA, Sao Tomé & Principe
Manuel Fernandes DE CEITA VAZ DO ROSARIO, Sao Tomé & Principe
Carlos Alberto DE JESUS D'ALVA, Sao Tomé & Principe

Amadou Gnagna CISSE, Senegal
Yakham DIOP, Senegal
Michel SECK, Senegal

Tommy BRAIMA, Sierra Leone
Iyesah JOSIAH, Sierra Leone
Abie Elizabeth KAMARA, Sierra Leone

Nilton CHITE, Solomon Islands
Chanel IROI, Solomon Islands
Morgan WAIRIU, Solomon Islands

Ismail ELGIZOULI, Sudan
Hassan Ali Gadaa IBTISAM, Sudan
Sumaya ZAKI EL DEEN, Sudan

Savinus KESSY, Tanzania
Malago MALAGAHIMBA, Tanzania
Margareth MEELA, Tanzania
Richard MUYUNGI, Chairman of the Least Developed Country Group, Tanzania

Awadi Abi EGBARE, Togo
Akouavi Mana Sekpona GABA (AMAVI), Togo
Essowavana TCHAKEI, Togo

Semese ALEFAIO, Tuvalu
Talavai IONA, Tuvalu
Seluka SELUKA, Tuvalu

Gideons MAEL, Vanuatu

Paul ISABIRYE, Uganda
Javason J. KAMUGISHA, Uganda
Margaret SIRWANJA, Uganda

Fahmi Abdulhadi BINSHBRAK, Yemen
Anwar Abdulaziz NOMAN, Yemen

G.E. GONDWE, Zambia
Hudson MULUMBUMI, Zambia
Patricia MUPETA, Zambia

ACRONYMS

BCAS	Bangladesh Centre for Advanced Studies
CBA	Cost Benefit Analysis
CBD	Convention on Biodiversity
CEA	Cost Effectiveness Analysis
COP	Conference of Parties
DFID	Department for International Development (UK)
ENDA	Environmental Development Action in the Third World
GEF	Global Environment Fund
GIS	Geographical Information System
IFAD	International Fund for Agricultural Development
IPCC	Intergovernmental Panel on Climate Change
LDC	Least Developed Country
LEG	Least Developed Countries Expert Group
LPG	Liquefied Propane Gas
M&E	Monitoring and Evaluation
MCA	Multi Criteria Analysis
MEA	Multilateral Environmental Agreement
NAP	National Action Plan
NAPA	National Adaptation Programme of Action
NBSAP	National Biodiversity Strategy and Action Plan
NGO	Non-Governmental Organisation
SIDS	Small Island Developing States
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
UNEP	United Nations Environment Programme
UNITAR	United Nations Institute for Training and Research
UNFCCC	United Nations Framework Convention on Climate Change
PRSP	Poverty Reduction Strategy Paper
SAEFL	Swiss Agency for Environment, Forest and Landscape
SDNP	Sustainable Development Network Programme

TABLE OF CONTENTS

INTRODUCTION

THE LEAST DEVELOPED COUNTRIES (LDCs) are a group of 50 countries that have been identified by the United Nations as the poorest and weakest segment of the international community. The economic and social development of these countries represents a major challenge because of a series of vulnerabilities and constraints. Extreme poverty, the structural weakness of their economies and the lack of capacities related to growth and development - often compounded by geographical handicaps - hamper efforts by these countries to effectively improve the quality of life of their peoples. These countries are characterized by their acute susceptibility to external economic shocks, natural and man-made disasters, communicable diseases, limited access to education, health and other social services and to natural resources, poor infrastructure, and poor access to information and communication technologies.

THE UNFCCC PROCESS recognizes the specific situation of the LDCs in Paragraph 9 of Article 4 of the United Nations Framework Convention on Climate Change (UNFCCC). Moreover, Decision 5 of the 7th Conference of the Parties (5/CP.7) recognizes that LDCs do not have the necessary means to deal with problems associated with adaptation to climate change. Finally, Decision 28/CP.7 sets guidelines for the National Adaptation Programmes of Action (NAPAs). These NAPAs will allow LDCs to set priority activities to be undertaken to meet their immediate needs and respond to their most urgent concerns with regards to adaptation to the adverse effects of climate change. The rationale of this effort resides in the limited ability of LDCs to adapt, and in the urgent need for specific support that will allow them to deal with the adverse effects of climate changes that are taking place now and that will take place in the future. NAPAs are not an end in themselves, but a way for LDCs to present and negotiate a country-driven action programme. The most urgent activities identified during the NAPA process will be submitted to the Global Environment Facility (GEF) (cf. Paragraph 6, Decisions 7/CP.7 and 5/CP.7) and other funding sources, with the aim of obtaining financial resources to implement them.

THE LDC EXPERT GROUP (LEG). Within the framework of the UNFCCC, Decision 29/CP.7 provided for the establishment of an LDC Expert Group with the mission of providing guidance and advice on the preparation and implementation strategies for the NAPAs. The LEG, together with adaptation experts, is firmly convinced that the experience gained by LDCs in adapting to present climate change and extreme climatic events will also enable them to develop their long-term capacity to adapt to climate change. This experience is of primary importance since it is currently hard to foresee precisely what impact and negative effects climate change will have, particularly at the local and regional levels.

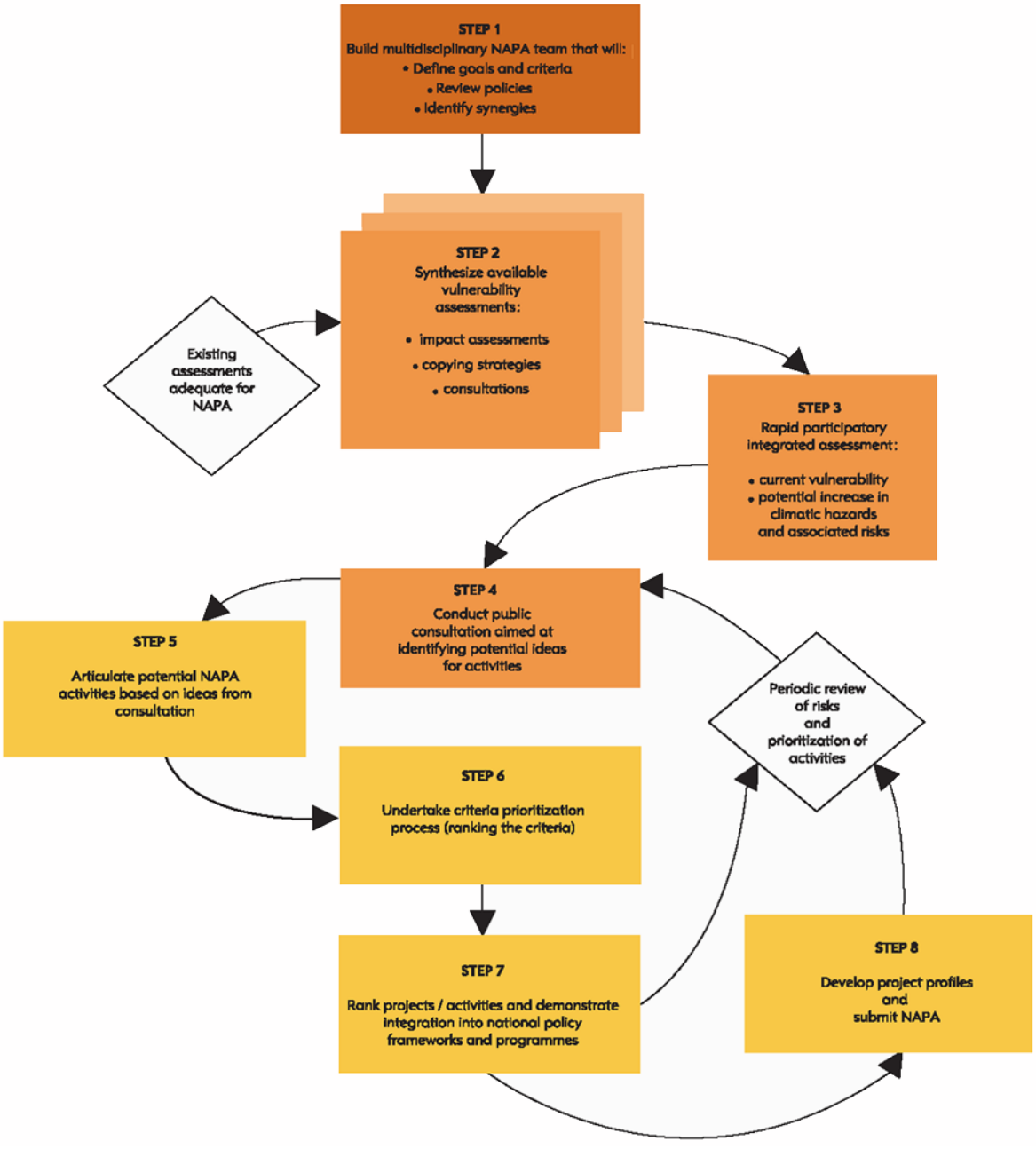
THE NAPA WORKSHOPS - the 8th Conference of Parties (COP8) decided that four workshops for LDCs should be held in 2003 in order to expedite the NAPA formulation process, two in Africa for Francophone and Anglophone LDCs, one in Asia, and another for Small Island Developing States (See: Guidance to an entity entrusted with the operation of the financial mechanisms of the Convention for the Least Developed Country Fund, Decision 8/CP.8). To help countries implement their NAPAs methodically and effectively, the LEG has defined various stages to be followed in this process. This approach was followed during the four NAPA workshops held in 2003 as requested by the Parties.

It is important to point out here that the NAPA process should be entirely country-driven and country-specific. In preparing their NAPA, LDCs should sort through the concepts and techniques on their own. It is also important to stress that the case studies and examples described in this publication are not 'LEG-approved' project templates. Rather, the spirit of this document is to create some familiarity with key vulnerabilities and to underpin the 'learning by example' approach that was used during the workshops. Practical methods for achieving the most significant and effective results were proposed for each stage. They allowed for a carefully targeted strengthening in the concepts of the eight NAPA steps, thus we are able to assume that workshop participants have acquired a general understanding of these implementation phases.

This process is commented in the three following sections of this publication:

- Section One provides an overview of the overall NAPA process, with a focus on the establishment of the National NAPA team and on participatory methods and tools;
- Section Two presents an overview of the Vulnerability Assessment in the NAPA process and the linkages to adaptation; and
- Section Three focuses on Prioritisation of Immediate Actions on the basis of criteria carefully selected through the NAPA process. The section finishes with the Development of Project Profiles.

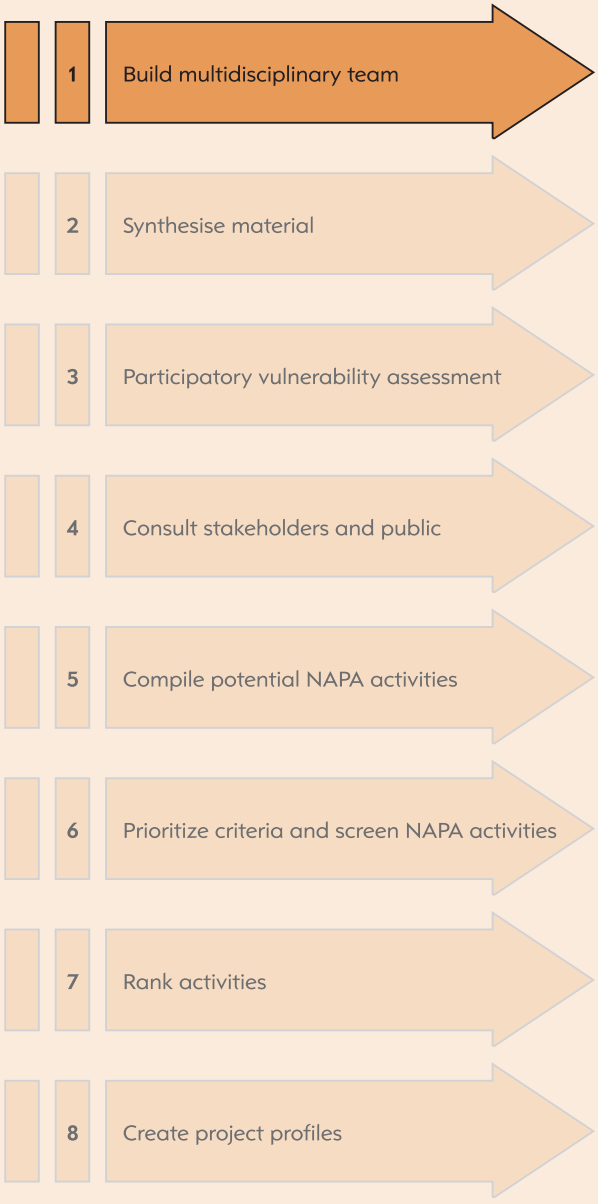
NAPA STEPS



OVERVIEW OF THE NAPA PROCESS WITH A FOCUS ON THE PARTICIPATORY APPROACH - STEP 1

Summary

The first step in the process of formulating a NAPA (Step 1) is to set up a multidisciplinary team, the National NAPA Team, that will be responsible for the coordination of the NAPA itself, in the spirit of the proposed guidance. The preparation of NAPAs should be guided by a participatory process involving stakeholders, particularly local communities, and a multidisciplinary and complementary approach akin to the broader context of sustainable development.



The NAPA guidelines, as defined by the COP Decision 28/CP.7, also specify that NAPAs are 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 (NBSAPs) under the United Nations Convention on Biological Diversity (CBD), and national sectoral policies." In addition, the NAPA guidelines specify that the design of the entire NAPA process should be country-driven and should use participatory methods throughout.

In order to comply with this guidance, two important elements should be taken into account from the very beginning of the process:

- The nature of the institutional setup to be established for the NAPA process (Step 1); and
- The tools and methods to be used during the NAPA process (Steps 2 to 8).

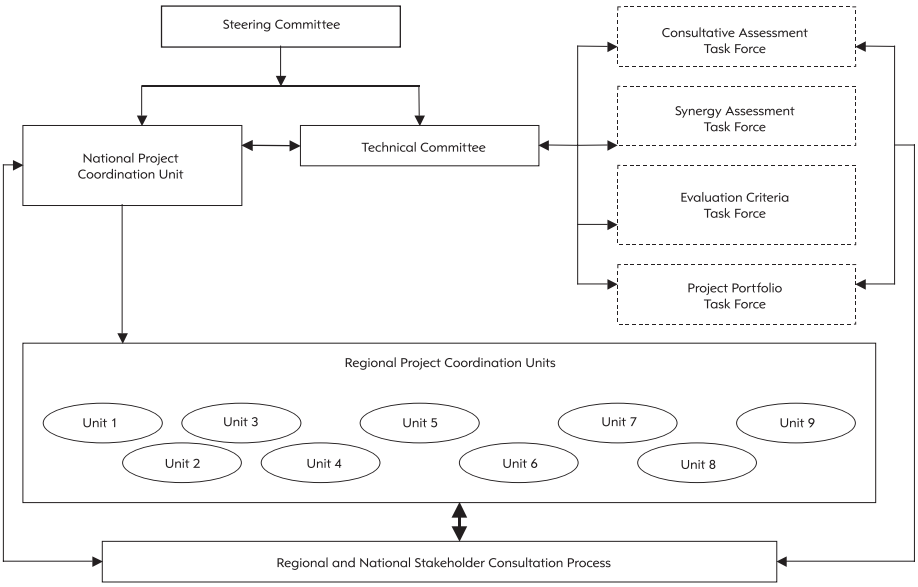
1.1 COORDINATION OF THE NAPA PROCESS

Quite often countries have already established institutional bodies at the national and sub-national levels to coordinate roles and inputs from various government agencies. These bodies may be sector specific or cross-sectoral in nature, such as the bodies overseeing the preparation of medium-term development plans or longer-term visions. Many countries have even created national coordination committees to oversee the implementation of multilateral environmental agreements (MEAs). National committees on climate change, for example, have been instrumental in sharing and disseminating information across government ministries, as well as to stakeholder groups in such mechanisms.

In the case of NAPAs, existing climate change committees or other structures may serve well as the basis for the NAPA process. It will be necessary to broaden these committees to include the local community and wider stakeholder participation and/or to examine ways to make use of the various participatory tools. Identifying possible synergies among multiple environmental conventions, for example, may likely be done effectively through active and consistent stakeholder involvement, since local communities and other major group actors frequently work on environmental issues that transcend specific sectors. This also applies to ensuring that NAPAs are consistent with development plans and longer-term visions, as well as other national policy statements and international obligations, such as various other entities who have already participated in the preparation of MEA commitments, such as national biodiversity strategies, and other documents.

The box below shows the example of Ethiopia as described in their UNDP/GEF NAPA project document. It illustrates an institutional structure built to carry out a thorough participatory process and crosscutting analysis as required by the guidelines. The multidisciplinary team approach (including four different specialized Task Forces) will provide the relevant framework to perform the participatory and integrated assessments, needed to complete the NAPA. This process relates to NAPA Steps 2 to 8, which are described in the following two sections.

Figure 1: Organizational Chart for the Ethiopian NAPA Process



Source: UNDP/GEF project document, 2003.

Example of Ethiopia

In the NAPA UNDP/GEF project document formulated by the Government of Ethiopia, the two activities associated with preparing the NAPA process are envisioned as follows:

- The establishment of an institutional structure, through a set of administrative and oversight Committees, to carry out the NAPA process; and
- The assembling of a multidisciplinary integrated assessment team, through a Technical Committee and Task Force units, to carry out technical assessments.

In order to carry out these activities, the Ethiopian NAPA Team, established by the national climate change focal point, consists of three distinct coordination units:

- *A Steering Committee* to provide strategic oversight and policy guidance to the NAPA Team;
- *A National Project Coordination Unit* to coordinate all of the NAPA activities with its secretariat in the National Meteorological Services Agency; and
- *A Regional Project Coordination Unit* to assist the National Project Coordination Unit in coordinating the stakeholder consultative process outside Addis and whose secretariat is located within the regional Desks for Agricultural Extension.

In addition, the assessment efforts that are required as inputs to the development of the NAPA document are conducted with a multidisciplinary approach, focusing on both substance and process issues. *A Multidisciplinary Assessment Team* is in charge of undertaking well-defined assessments and analyses on a commissioned basis. This team is the technical support unit of the project. It is formed by the *National Project Coordination Unit*, in coordination with the *Steering Committee*. Administratively, the *Multidisciplinary Assessment Team* will function as a technical committee with four distinct Task Force units:

- *The Consultative Assessment Task Force* will assess options for executing the consultative process for the identification of priorities for adaptation project activities;
- *The Synergy Assessment Task Force* will assess complementary climate change adaptation-relevant strategies, projects, policies, and other proposed initiatives that may be embedded in action plans for certain national sustainable development initiatives and multilateral environmental agreements or other initiatives as described in the previous section;
- *The Evaluation Criteria Assessment Task Force* will identify and apply pertinent evaluation criteria to a list of adaptation projects in order to produce a prioritized set; and
- *The Project Portfolio Task Force* will prepare an adaptation project portfolio of all the high-priority projects.

Each Task Force is composed of three national experts.

Source: UNDP, project document, Government of Ethiopia, 2003.

1.2 STAKEHOLDER PARTICIPATION IN THE NAPA PROCESS

Once a national set up is established, the first task of the managerial team is to review, and modify if needed, the schedule of planned activities and the budget allocations according to the actual situation. As recommended by the Guidelines, the NAPA process will benefit from early and broad-based involvement of the concerned stakeholders, particularly the local communities who are most directly affected by climate variability, who can identify their immediate and urgent needs for coping with these changes, and with whom they can discuss possible project ideas. Each country will choose and implement the methods that are the most adapted to their situation.

A few general concepts are briefly summarized here for easy reference.

Defining 'Participation', 'Stakeholders' and 'Public'

Participation means the "process through which the views of all interested parties (stakeholders) are integrated into project decision-making[1]". In the 1990s, public participation in decision-making gained momentum with the onset of the notion of sustainable development and, in particular, Agenda 21. In the area of development assistance, public/stakeholder involvement has become an important guiding principle, if not a requirement, for bilateral and multilateral donor agencies. Participatory approaches have now become an important tool for more effective and efficient decision-making and are applied extensively. An important and challenging task for decision-makers is delimiting where participation begins and ends and with whom it takes place. Although the terms 'public involvement' and 'stakeholder participation' are often used interchangeably, there are some important nuances worthy of distinction. The term public, for instance, generally refers to the public at large, and may potentially include any and all interested individuals. The term stakeholder, on the other hand, is understood as being more restrictive, and relates to any actor or group of actors who has a clear stake in the problem and who may play an active and contributing role in solving that problem. Stakeholders are usually represented interests and may include:

- Concerned public sector actors from government ministries/agencies;
- Private sector interests, represented by businesses and small and medium sized enterprises, traditional small commercial production;
- Non-government organizations, civil society organizations, community-based organizations, and people's organizations;
- Local communities; and
- Other actors, including service providers and research, training and academic institutes.

[1] Index of Tools and Techniques for Stakeholder Involvement in 3 Stages, Annex, UNESCAP 1999.

The challenges and opportunities of stakeholder involvement are described in more detail in the references identified at the end of this publication. They should be kept in mind when making decisions in the NAPA process. Different levels and tools for participatory approaches, along with their respective strengths and weaknesses, are summarized in Table 1. The NAPA team should be well aware that effective stakeholder involvement requires a high degree of flexibility. If anticipated results with regards to their involvement are not being generated, if participants are dissatisfied or sceptical, or if unforeseen developments have altered the dynamics, the NAPA process should be modified to take into account, *inter alia*, the concerns expressed. The following is an important set of requirements that should be met at the outset of the stakeholder involvement in every participatory process. A successful participatory process must ensure that:

- The participatory process is legitimate;
- Effective coordination, preferably through existing mechanisms of the consultation process, is established;
- A clear statement of purpose and intent are provided for stakeholder involvement;
- A reasonable deadline is set for completing the NAPA process and its various stages, allowing time for thorough stakeholder dialogue and cooperation;
- A clear explanation of what is expected of stakeholders and what they, themselves, can expect is given; and
- Knowledge of stakeholders issues and concerns should include a comprehensive understanding of who is affected by the thematic area, such as vulnerability to climate change, and the sectors, interests and/or regions that different stakeholders represent.

Stakeholders identification exercise during the NAPA Workshop in Addis Ababa, 2003.

Table 1: Stakeholder / Public Involvement Tools: A Summary

LEVEL OF INTERVENTION	METHODS	TOOLS	ADVANTAGES / STRENGTHS	DISADVANTAGES / WEAKNESSES
Stakeholder analysis	Project team's assessment of the major stakeholders, their relevance to climate adaptation, skills, mission, any critical decisions scheduled that should take climate or climate risks into account.	Interviews and expert knowledge to construct a checklist or profile of major stakeholders.	Awareness among project team of the decision environment. Will help target realistic stakeholder participation and support.	Stakeholders change, and thus this assessment should be updated, at least informally, as the NAPA process develops.
Information gathering and dissemination	Keeping the public and stakeholders informed; gathering information for informed decision-making.	Surveys, questionnaires, participatory rural appraisal, electronic discussion groups, websites, workshops and conference discussion and working papers, etc.	Opportunity to interact with stakeholders and to adapt the assessment to address specific concerns more directly.	Occasionally used as the first and only option for engaging stakeholders, rather than being the first in a series of interventions, such as public consultation etc.
Stakeholder consultation	Information exchanges based on the principle of two-way communication to solicit input from interested stakeholders.	Examples range from very informal contacts, to more structured events, such as constituency meetings, policy dialogues, public hearings, 'road-shows', etc.	Heightens awareness of issues under consideration without the time or financial burden associated with institutional structures; seeks to legitimize and democratize the process.	Criticized as sometimes being only post facto in nature by informing the public and stakeholders after decisions have been drafted with little insurance that modifications will be made. Sometimes one-way communication instead of a real dialogue between decision-makers and stakeholders/local communities.
Multi-stakeholder body	Multi-stakeholder bodies are mechanisms for coordinating and integrating stakeholder groups in the decision-making processes. Their specific form and function vary.	Forums, such as National Councils for Sustainable Development, round tables, commissions, collaborative policy forums, etc.	Semi-institutionalised structures; although the form and function generally vary, such bodies are broad-based with participants on 'equal-footing'; heterogeneous views are taken into consideration leading to integrated and more holisticdecision-making.	Although sometimes high profile, advisory bodies are usually ad hoc and lack consistent participation; bodies might also lack authority to implement decisions and thus be seen as talk shops; power struggles are not absent; wealthy vs. directly affected publics tend to participate disproportionately; some views are marginalised – particularly the poor and vulnerable groups.
Institutionalized mechanisms with stakeholder participation	Mechanisms created at national level within the regular administrative system but that also include representatives of variousstakeholders.	National committees for MEA implementation (climate change, biodiversity, etc.), development planning, etc.	A more formalized and permanent degree of involvement; stakeholder participants usually selected on the basis of personal prestige or eminent persons.	Possible lack of wide-spread public involvement on permanent basis, usually ad hoc, gaps and duplication in roles, institutional competition, inadequate skills and personnel needed for some of the complex technical issues; other constraints related to advisory bodies as described above.

Table 2 provides a quick overview of the various participatory requirements, as stated in the Guidelines, and some of the possible participatory methods and tools that can be used during this process.

Stakeholder analysis should be used on several occasions during the NAPA process, either for the institutional setup of the management process of the NAPA itself (Step 1) or later, during the vulnerability assessment (Steps 3 and 4), the compilation of potential NAPA activities (Step 5) or the final project formulation. Decision 28/CP.7 describes the rationale for developing NAPAs because of "the low adaptive capacity of LDCs, which renders them in need of immediate and urgent support". Consulting stakeholders in every step will improve the effectiveness of future responses. A group exercise is proposed on the next page.

Table 2: Participatory Requirements for the NAPAs and Possible Methods or Tools

PARTICIPATORY REQUIREMENTS FOUND IN THE NAPA GUIDELINES	POSSIBLE PARTICIPATORY METHODS TOOL OPTIONS
To establish a NAPA team with a public participatory dimension.	➔ Stakeholder analysis.
To carry out participatory Vulnerability Assessments.	➔ Stakeholders identification and consultation: surveys, interviews, questionnaires, participatory rural appraisal (a field–based research technique utilizing maximum involvement from local communities),
To solicit inputs and proposal ideas in a national and/or consultative process. To promote dialogue to reach public support/consensus.	➔ Consultation of stakeholders identified: surveys, interviews, questionnaires, participatory rural appraisal, electronic discussion groups, websites, workshops and conference discussion and working papers.
To organize a public review of the NAPA document.	➔ Soliciting the views of stakeholders and the public through a two-way exchange of communication and dialogue. Consultation may involve techniques, such as the organization of constituency meetings, 'road shows' (presenting project designs and draft policies to local communities), and public hearings. Stakeholders are consulted during Log frame formulation.
To review the final NAPA document in a participatory manner.	➔ Soliciting the views of stakeholders and the public through a two-way exchange of communication and dialogue (final document must be influenced by the comments received).
To describe the participatory process in the NAPA document.	➔ Narrative exercise reflecting the participatory process – Requires advanced planning to ensure that proper records are kept.
To disseminate to the public the endorsed NAPA.	➔ Establish a communication strategy and secure its funding (including translation, if needed).

Exercise 1: A Stakeholder Analysis

In order to determine who should possibly be involved in a stakeholder consultation - or might want to be involved - the following questions can be asked:

- Who is/might be interested in or affected by the thematic area?
- What are their interests and positions?
- Who has information and expertise that might be helpful?
- Who has been/is involved in similar initiatives or planning?
- Who has expressed interest in being involved in similar initiatives/efforts before?
- Who else might make a useful contribution to the NAPA?

A simplified table for categorising stakeholders who may assist with the stakeholder consultation is shown below. After identifying stakeholders, their interests, etc., it may be helpful to divide stakeholders into four categories:

1. Those who will likely want to participate fully or whose active involvement will determine the credibility of the process;
2. Those who will likely play a more limited role;
3. Those who will likely want only to be kept well informed; and
4. Those who will not want to be involved.

This categorisation may help with the organization of every stakeholder analysis that will be needed throughout the NAPA process.

Who?	***What?***	***Why?***	***How?***	
Name of Stakeholder	***Stakeholder Interests & Mandate***	***Reasons for Inclusion***	***Participatory Approach/Method***	***Specific Task***

CHECKLIST:

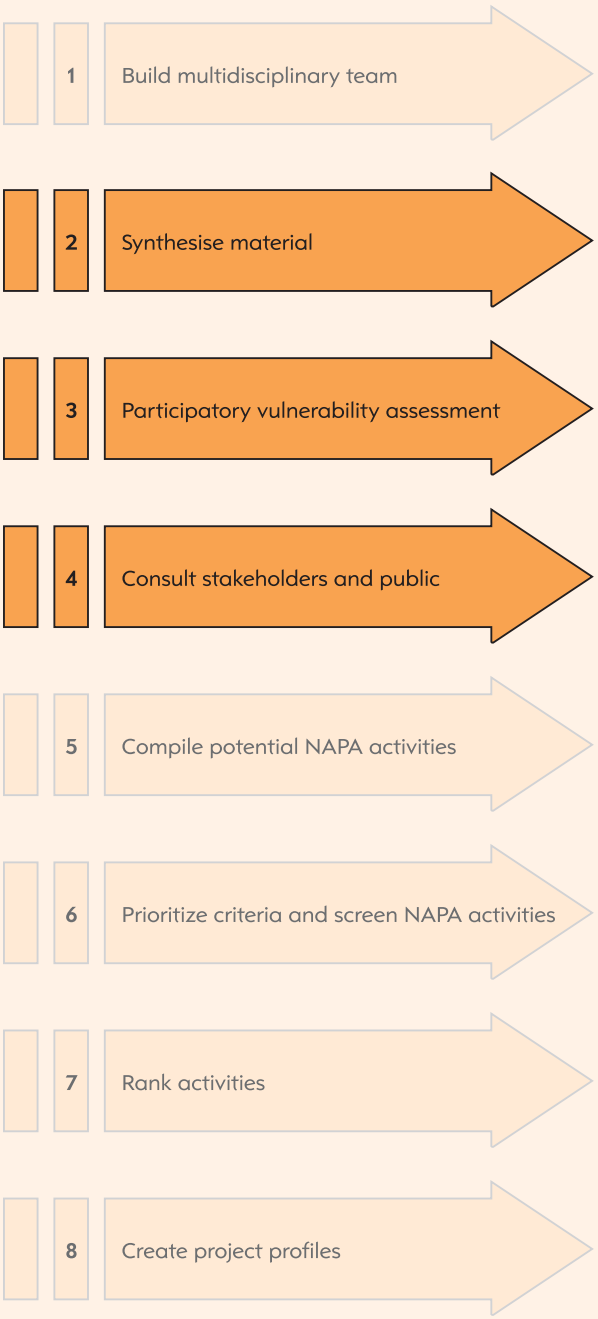
- ☑ Establish institutional structure
- ☑ Review Annotated NAPA Guidelines
- ☑ Identify potential stakeholders for the NAPA team
- ☑ Agree upon a schedule for project activities
- ☑ Review budget allocations according to approved Team(s) set up, milestones and project outputs
- ☑ Establish a strategy to monitor stakeholder consultation

VULNERABILITY IN THE NAPA PROCESS – STEPS 2 TO 4

Summary

National Adaptation Programmes of Action (NAPAs) will identify urgent adaptation needs in the least developed countries. Once the project team has been assembled, and relevant background information collected, a participatory vulnerability assessment is conducted that identifies the priority groups, sectors and regions. Measures of vulnerability can be used to screen adaptation ideas.

This section is intended to help NAPA teams achieve Steps 2 to 4, as well as initiate their work on Step 5. Step 5 is further elaborated on in the next section.



Section 2 covers the following topics:

Overview of vulnerability in the NAPA process. The vulnerability assessment draws upon existing material, expert knowledge, and stakeholder and public consultation. The synthesis of existing knowledge should identify high priority vulnerabilities.

- *Who are the vulnerable groups?*
  The first step is to identify vulnerable socio-economic groups. A livelihoods approach is proposed that is compatible with a poverty alleviation focus. Livelihoods are related to economic sectors, public infrastructure and ecosystem services.

- *What resources are exposed to climatic risks?*
  Vulnerable groups are exposed to a range of present climatic hazards, trends in climatic hazards that may become significant in the near future, and other environmental, economic, and socio-political stresses.

- *How sensitive are resources and groups to climatic risks?*
  The livelihoods and stresses/threats are evaluated in a sensitivity matrix that identifies the priority vulnerabilities or actions.

- *How are the high priority vulnerabilities carried forward in screening adaptation options?*
  The rapid participatory vulnerability assessment links to the next steps in the NAPA process by identifying potential adaptation strategies and measures for present, high priority risks and suggesting targeted indicators for evaluating adaptation options and monitoring.

2.1 OVERVIEW OF VULNERABILITY IN THE NAPA PROCESS

Each step of the NAPA process is driven by the need to plan activities that will reduce vulnerability to climate change. The main task is a rapid participatory assessment that targets the priority livelihoods, sectors and regions for designing adaptation activities in order to address the urgent and immediate needs and concerns. A conceptual framework of vulnerability assessment and the relevant terms are background material for the NAPA team. The NAPA annotated guidelines identify two critical concerns regarding vulnerability:

1. National Adaptation Programmes of Action (NAPAs) will communicate priority activities addressing the urgent and immediate needs and concerns of the least developed countries (LDCs), relating to adaptation to the adverse effects of climate change. The IPCC concluded that it is not possible at present to attribute changes in variability and extremes to climate change. Learning to deal with present climatic hazards is an excellent way of building adaptive capacity in the long run. However, NAPAs are not intended to be disaster management programmes, but to address win-win situations for both climate change and other climate related activities.

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. The poorest countries have little capacity to fund climate change adaptation activities, and the poor in LDCs are the most vulnerable and need extra protection. Escalating costs for dealing with climate impacts arise from responding to emergencies and disasters--symptoms rather than the underlying causes of their vulnerability. NAPAs are intended to enable LDCs to treat some of the underlying causes of their vulnerability. Each of the eight NAPA steps concerns vulnerability as summarized in Table 3.

Table 3: How Vulnerability is Reflected in the NAPA Steps

NAPA STEPS	VULNERABILITY
Step 1 Establish the NAPA team as well as a broader multi-disciplinary team to assist in the preparation of the NAPA.	At the design stage, several issues relate specifically to vulnerability: Should the assessment focus on specific sectors, vulnerable regions and livelihoods? How should vulnerable populations be represented in the team? What analytical skills are required?
Step 2 Synthesis of available vulnerability assessments, including: • Existing studies such as national communications • Coping strategies • Past consultations • Existing development frameworks such as national strategies for sustainable development, PRSPs, Programme of Action for the LDCs etc.	In addition to climate change material (national communications, country reports, etc.), the team should draw upon development, poverty and vulnerability documents, such as Poverty Reduction Strategy Papers, food security plans, disaster preparedness plans and reviews, desertification plans, local case studies of vulnerability reduction efforts, and assessments for environmental conventions (e.g., biodiversity, water) and international processes (e.g., water dialogues).
Step 3 Conduct a rapid participatory integrated assessment. Include: • Current vulnerability to climate variability and extreme weather events • Potential increase in climate hazards and associated risks due to climate change	This is the main concern of this guidance material, following a process of rapid screening in consultation with key stakeholders and experts, further elaboration of priority vulnerabilities and identification of indicators for evaluating adaptive options to address urgent and immediate needs.
Step 4 Identification of key climate change adaptation measures	Stakeholders that link poverty/vulnerability issues with climate and environment will be key in focussing on the high priority adaptations. These stakeholders span sectoral development agencies to local community groups, enterprises in the commercial sector to international programmes, and practitioners to planners. In reality, stakeholder processes underpin all of the NAPA steps (see Section 1).
Step 5 Articulation of potential NAPA activities during consultative process	Stakeholders will suggest a wide range of adaptation strategies and measures that could be implemented—sound strategies to reduce poverty should be a priority.
Step 6 Identification and prioritization of country driven criteria for selecting priority NAPA activities	A first-order screening of the potential adaptation activities should ensure that they are consistent with a focus on reducing present vulnerability (exposure to climate change and poverty) as well as appropriate for implementation through the NAPA process. Criteria addressing poverty and adaptive capacity should be identified.
Step 7 Ranking of priority NAPA activities	A simple multi-criteria approach should be sufficient to identify those activities that are urgent and that will have an immediate impact. Priority should be given to the reduction of vulnerability.
Step 8 Development of project profiles for priority NAPA activities	The most important activities will be summarised as project profiles. A narrative relating to vulnerability and the potential to reduce present as well as future risks should be described in the overall objective of the project profile.

From framing vulnerability to definitions

In a multi-disciplinary team with diverse stakeholders, it may be useful to discuss how vulnerability is framed in the development and climate change contexts. Such a discussion could be considered part of the background preparation for the first two NAPA Steps, and would allow for the development of a common understanding of the concepts and terms. Past experience shows that many teams that have jumped to work, later discover that they have conflicting and incompatible definitions or that they have no consensus on how the elements of the assessment should fit together. A dialogue on a) key terms and definitions (see box below) and b) how to frame issues of vulnerability will help clarify the approaches of experts and stakeholders.

Conceptual frameworks for vulnerability assessment

Quite a few frameworks have been developed by scientific groups over the past few years. An example of a conceptual framework is shown below. Socio-economic and ecosystem drivers of vulnerability are linked to exposure, sensitivity, coping responses and longer term adaptation. The processes work on a range of scales. A general framing of this sort needs to be further developed in light of the specific stressors, exposures and processes in the region of interest. Such a framework should map directly onto the project activities.

Defining 'Vulnerability'

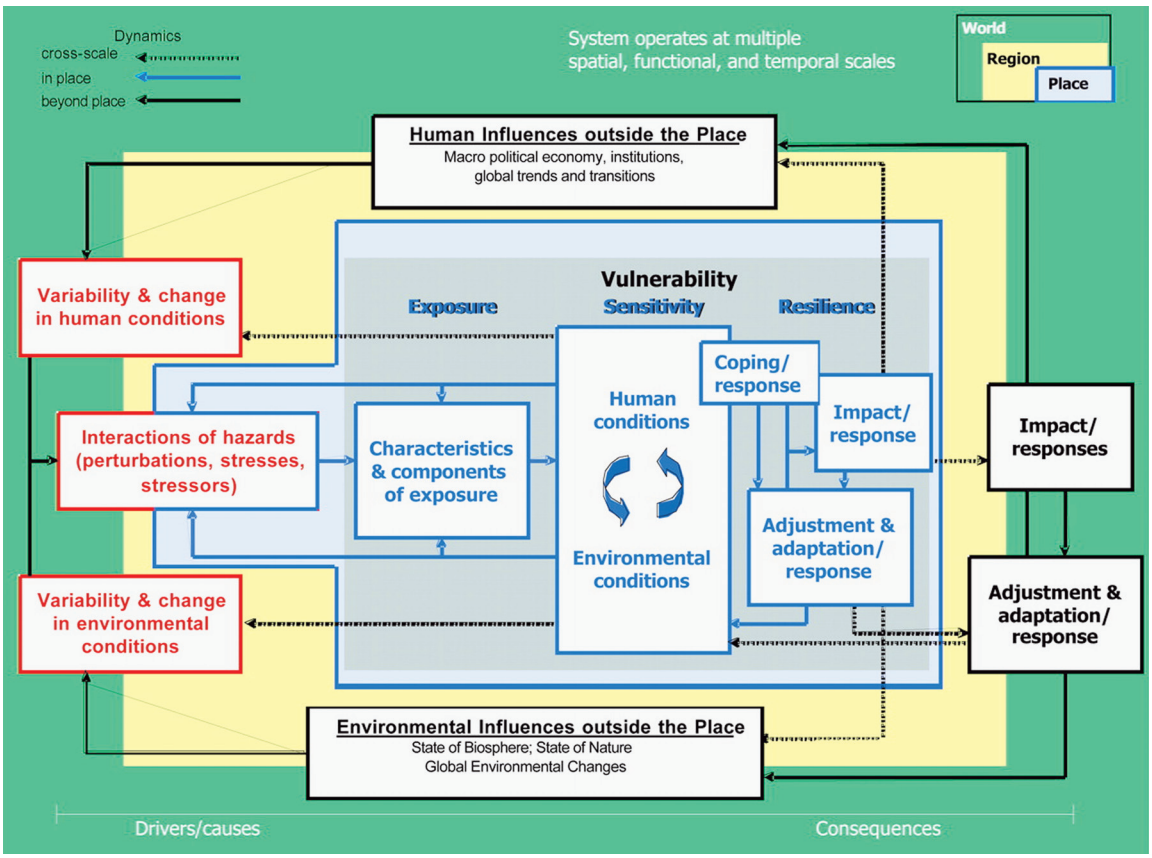
The word vulnerability has many meanings. A traditional definition in the natural hazards field is: "The degree to which an exposure unit is susceptible to harm due to exposure to a perturbation or stress, and the ability (or lack thereof) of the exposure unit to cope, recover, or fundamentally adapt (become a new system or become extinct)" (Kasperson *et al*. 2000). Technical literature on disasters uses the term to mean: "Degree of loss (from 0% to 100%) resulting from a potentially damaging phenomenon" (UNDHA, Glossary of Terms).

In contrast, the poverty and development literature focus on present social, economic and political conditions: see 'An aggregate measure of human welfare that integrates environmental, social, economic and political exposure to a range of harmful perturbations', Bohle *et al*. 1994.

The IPCC has prescribed a definition of vulnerability that relates almost entirely to climate change: "The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity." (www.ipcc.ch/pub/syrgloss.pdf, also see Adger *et al*. 2004 and Downing *et al*. 2002, 2004 for discussions on definitions of vulnerability, and adaptation).

Finally, it is essential for users to define vulnerability in their own context: NAPA activities are intended for implementation at the national level and we know that in many cases, stakeholders already have a working definition of vulnerability.

Figure 2: An Example of a Diagram for a Vulnerability Framework



Source: Turner *et al.* (2003).

Three activities are worth thinking about:

- **Canvass the experts and stakeholders.** Do they have an existing approach to vulnerability, poverty reduction, or climatic hazards that they use in their planning? Can these approaches be extended to understand climate change adaptation?

- **Construct a mental map** of the actors and processes in vulnerability to climate change. Exercise 2 shows how this is done. It is a useful device, and is often a very creative and stimulating way to visualize the issues.

- **Compile a poster of the project.** Put all of the elements of your NAPA project onto one poster for presentation to stakeholders and external audiences. The eight steps are already identified, but specific sources of information, methodologies and consultation processes will need to be added.

The following exercise shows one way for a team to develop an overall view of vulnerability.

Exercise 2: Building a Conceptual Framework for a Vulnerability Assessment

A simple tool for problem scoping is the interactive exercise called 'cognitive mapping'. The aim of the exercise is to work with a range of stakeholders and experts to construct a common understanding of a particular issue.

For the NAPA teams, the exercise could focus on an overall understanding of vulnerability, a mapping of the NAPA project itself, or a specific aspect of vulnerability, such as food security among semi-arid farmers for example. In each case, the generic process would need to be adapted accordingly.

The exercise can be adapted to suit specific cultural habits (such as using symbols made of basic material, etc.). Whenever possible, it works well with a large wipe board or 4-5 flip chart sheets tacked to a wall (using blue-tack or tape). Stakeholders, processes, and indicators are represented by paper cards (or Post-it notes) and are arranged (and rearranged) on the wipe board as need be. Marker pens can be used to draw and label connections. Finally, a digital camera can be used to record the work in progress and disseminate it to the participants.

The following questions can be used to guide an overall conceptual framework of vulnerability and adaptation.

1) Begin with a brainstorming exercise: ask each person to write onto the plain cards (or post-it notes):
   - What are the key processes defining/creating vulnerability?
   - Who are the actors that are themselves vulnerable, influence the vulnerability of others, or have major roles in adaptation?

2) Cluster these on one side of the wall board.

3) Look for common names to represent the clusters—for instance smallholder farmers covers subsistence farmers, rural agriculturalists, etc.

4) Position a card on the wall board to represent each cluster. Connect the cards, noting the nature of the relationship and any feedback loops. As the mental model grows, you may need to reorganise the cards to simplify the diagram.

5) Ask the participants if the model captures their understanding:
   - Are there crucial actors or relationships that are missing?
   - Does the diagram illustrate the particular circumstance of the most vulnerable populations?
   - Does the diagram help explain a significant vulnerability, such as a recent drought or storm?

2.2 WHO ARE THE VULNERABLE GROUPS?

After a consensus has been reached on the conceptual framework for the vulnerability assessment (see Section 2.1), the team should begin the concrete vulnerability assessment process. Methods available for vulnerability assessments range from interviews and rapid participatory appraisals to formal modelling of resource allocation under different scenarios. An important first step in this process is to identify those groups that are most vulnerable. The sustainable livelihoods approach is a good starting point from which to do this and is described below. Vulnerability is a relative measure of exposure to a range of stresses and shocks. The multiple attributes of vulnerability can be readily portrayed as a profile for representative livelihoods.

Step 3 in the NAPA process is a rapid vulnerability assessment. This entails identifying—who is vulnerable (Section 2.2), to what (Section 2.3) and to what extent (Section 2.4)? The three tasks are brought together in the livelihood matrix described below. A focus on vulnerable livelihoods has strong synergies with poverty reduction and development planning.

The word livelihood has various definitions. It is often referred to as the ensemble of capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (see www.livelihoods.org). A precise definition and typology of livelihoods are not required at this stage in the NAPA planning. A pragmatic approach based upon a sound understanding of the national situation is sufficient.

Background on sustainable livelihoods

A widely used approach to sustainable livelihoods was developed by the UK Department for International Development and the Institute for Development Studies (see www.livelihoods.org). The approach shows livelihoods as exposed to shocks and threats, with livelihood strategies linking institutions and outcomes. The characteristics of livelihoods are often called the five capitals—human resources, natural resources, finance, physical infrastructure and assets, and social networks and relationships.

The multiple aspects of vulnerability lead directly to multiple criteria assessment of adaptation (see Section 2.5).

The first step in developing a sustainable livelyhoods framework is to list the livelihoods in the region, such as farmers (smallholders and commercial), fishing communities, pastoralists and urban poor. Then work backwards to list the productive activities of these livelihoods, such as food cropping, cash cropping, small livestock and off-farm casual labour (for smallholder farmers).

In turn, those activities depend on a range of sectoral services (such as local and national markets), public infrastructure (roads and ports) and ecosystem services (watershed groundwater recharge). Thus, the rows of the livelihood matrix are a hierarchy of the ecosystem, public and economic services that are essential inproductive activities, which are elements of common livelihoods. For example, the relationship between climate and the soil water balance of a filed will affect a variety of crop and livestock production activities, which are the major components of some livelihoods.

More generally, this chain comprises the units of exposure—those elements in ecosystems, populations and economies that are subject to climatic hazards and trends. Feel free to organise the exposure units according to what makes most sense given the local priorities and conceptual framework. Avoid unnecessary complexity—just listing livelihoods may be sufficient to identify the top priorities.

Using the sustainable livelihoods approach, it is possible to chart vulnerability for different livelihoods. For this purpose a spider diagramme is used (see Figure 3).

In the diagram vulnerability increases as one proceeds further into the web (i.e. towards the centre). If scores were to be assigned to the various rings, with high scores equating to low vulnerability, the outer rings would have higher scores than the inner ones. The hypothetical example consists of four groups and is broadly consistent with the food security situation in southern Africa. Smallholder farmers are more vulnerable than emerging farmers, with lower scores on natural resources (land and livestock), finance (cash crops and off-farm employment), access to physical infrastructure (roads), human capital (skilled labour) and social networks (participation in community voluntary organisations). Agro-pastoralists are even more vulnerable on most of the indicators, but with significant livestock holdings that may compensate to some degree. Market traders have high scores on many indicators, although they do not produce food themselves. The spider diagram (Figure 3) illustrates several aspects of vulnerability.

- Everyone is vulnerable to some degree, but the attributes of vulnerability differ between groups. It is not always easy to say which group is more vulnerable overall.
- Livelihoods are vulnerable to different stresses and threats. For example, traders would suffer in an economic recession while traditional farmers bear the first impacts of a drought.
- A complete picture of vulnerability requires consideration of the range of relevant assets, as in the five capitals approach shown in figure 4 and not just impacts of climate change.

Figure 3: Spider Diagram

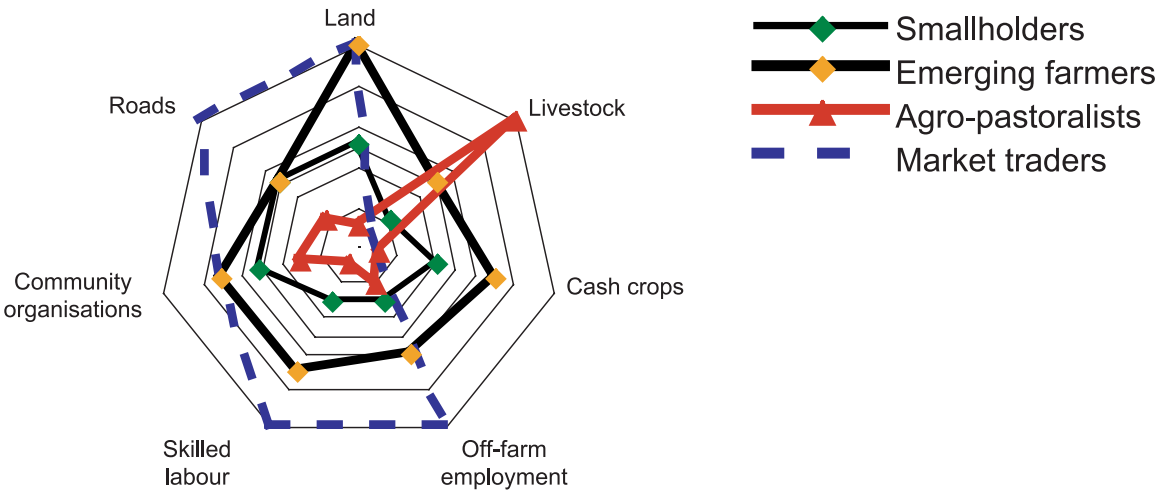
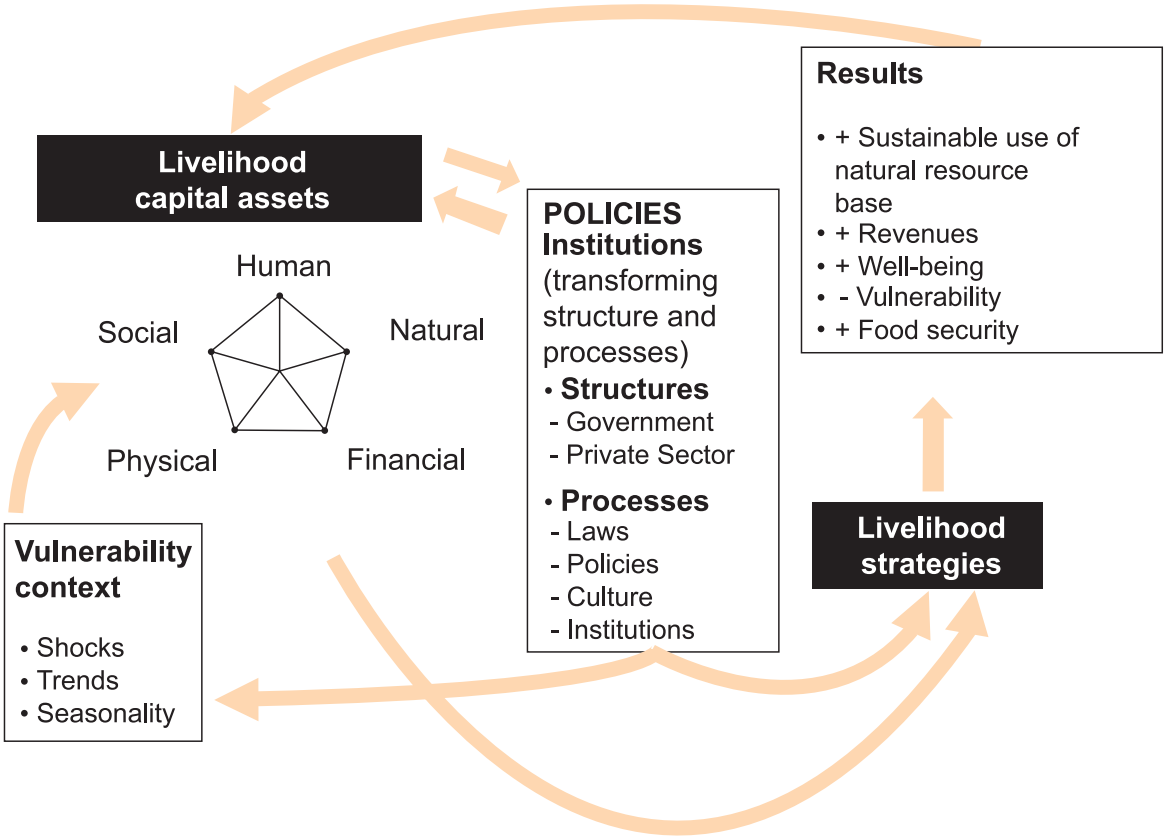


Figure 4: Sustainable Livelihood Framework



Source: Adapted from "Sustainable Livelihood Framework", DFID 1999.

The group exercise of the following page (Exercise 3) takes the analysis of who is vulnerable one step further, by linking the list of vulnerable groups to stakeholders who are concerned with climate adaptation.

The results of Exercise 3 (see page 30) could be reported in short (1-page) briefing notes on each vulnerable livelihood including:

- A short description of the livelihood;
- Its characteristics (e.g., according to the five capitals) and relative scores for key indicators;
- The geographic location;
- A narrative describing the exposure to climatic hazards; and
- The trend in livelihoods, and the role of other stresses.

Exercise 3: Identifying Stakeholders with the Chapatti Exercise

The aim of this exercise is to enable one to identify the relevant stakeholders, the nature of their interest in and support for climate change adaptation, and their links to the vulnerable livelihoods identified above. It is a good way to begin to link the NAPA planning with the key stakeholders who will implement the adaptation activities.

Participants begin by brainstorming a list of the most vulnerable actors as well as those who influence the level of vulnerability and the adaptive capacity of these actors. Using cards or post-it notes, participants should write down the various stakeholders (one per card). These are then grouped according to common types of stakeholders and rearranged on the wall board. A simple way of organizing them is according to their primary organisational scale—international, national, regional or local (say from left to right on the board). They might also be grouped according to their level of exposure—say from operational (including many NGOs and the vulnerable themselves) to policy (mostly governments), say from bottom to top. Physically note the relationships between stakeholders. This should produce an inventory of networks (or stakeholder regimes) that are likely to support various kinds of adaptation.

Based on the participants contributions:

- Which stakeholders are most powerful, in terms of development planning and implementation? Draw circles around each stakeholder proportional to their relative power or influence. The circles might be seen as chapattis (an Indian flat bread), hence the name of this exercise.
- What is the organisational structure of each stakeholder? Perhaps mark those that are informal (e.g., a village committee) or formally constituted (e.g., a ministry or firm).
- What is their role in climate adaptation? Mark (or group on the wall board) those that are concerned with strategic policy, translate plans into operational plans, and implement plans.
- What sort of climate adaptation is of primary concern for the stakeholders? The inventory might note key sectors (e.g., water), priority regions (e.g., semi-arid areas) or environmental synergies (e.g., desertification).

Draw links between stakeholders to indicate the nature of their relationship:

- Governance: Does one stakeholder own or control another? How do local actors influence national policy (e.g., consultation, democracy, demonstration)?
- Finance: Who controls budgets, fees, taxes?
- Information: Are there formal or informal monitoring and reporting systems that inform policy, planning and operations?

Finally, is it possible to identify networks of stakeholders that form a specific policy-applications regime? For instance, groups of stakeholders concerned with emergency disaster response, food security or human settlements often have different members, modes of finance and planning and climatic concerns. Are different regimes likely to have different interest in and influence over climate change adaptation? Which regimes are most relevant for reducing vulnerability in the priority livelihoods and regions?

CHECKLIST:

- ☑ List vulnerable livelihoods
- ☑ Chart stakeholder networks and interest in climate change adaptation
- ☑ Plan engagement with relevant stakeholders for reducing vulnerability

2.3 WHAT RESOURCES ARE EXPOSED TO CLIMATIC RISKS?

Present climatic hazards that threaten vulnerable livelihoods can be described by their duration, spatial extent, frequency of occurrence, and the range of their impacts. Trends in the incidence and severity of hazards should be noted. A narrative of each hazard will support the formulation of NAPA project profiles.

Present and future stresses and threats

The task now is to list the present climatic threats (or opportunities) and the trends in these hazards, if any, that are significant for the vulnerable livelihoods identified above. Some judgment is required to separate the continuum of weather and climate into distinct threats. For instance, drought is almost always a threat in some form or another for rural livelihoods. But drought is a continuum from a dry spell of a few days to a seasonal shortage of rainfall to episodes of drought over a year or more.

Further details of the climatic hazards should include:

- A narrative that describes the effects of the hazard. This can help support the NAPA project profiles by indicating what are the main concerns with the hazard.
- Estimates of the range of impacts, including economic losses, loss of life, and social stress. Where possible, quantitative values should be used for an expected recurrence of the hazard. Or at least show the range of impacts from recent events, even if only partial estimates.
- The duration and spatial extent of the hazard. Note if specific regions are at higher risk.
- The expected frequency of occurrence. The conventional notation is an annual expectation (e.g., a 5% chance of occurring in any one year) which can be converted into the equivalent return period (e.g., a 5% probability is often expressed as an event which occurs once in 20 years).
- Trends in the hazard. Time series of the hazard, such as a catalogue of past droughts for as long as data is available, is a useful way to look for trends in impacts. Scenarios of future climate change can be drawn upon to indicate whether the observed trend is consistent with our present knowledge of expected climate change.

It may be useful for the team to do a 'reality check' to see the extent to which the priority hazards reflect existing knowledge on regional climate change (for instance, regional expectations such as snow melt or warmer temperature as described by the IPCC).

At this stage in the NAPA development, the detail depicted in Table 4 may not be necessary. Further work on climatic hazards may be warranted later in a broader adaptation process, but one must remember that the focus of the NAPA is on present and urgent risks rather than the long term prospects.

It may be useful to add other stresses and shocks that exacerbate the effects of climatic hazards. For instance, AIDS/HIV infection, economic recession and civil strife would alter the range of coping strategies that different livelihoods might employ in order to cope with droughts or floods. These become important if they directly affect the adaptive capacity of livelihoods and the ability to implement proposed adaptation strategies for urgent and immediate needs.

Example: An inventory of hazards

Table 4 is a scheme of how one could describe both in narrative and quantitative format a specific hazard. A range of some of the most common hazards is shown. The quantitative factors are ranked using an exponential scale. In this example, long-term drought and coastal storms result in the greatest economic impacts, likely due to the large areas affected. However, the loss of life is greatest in coastal storms (assuming, as this example does, that vulnerable populations are not subject to widespread famine during drought). The frequency and intensity of all hazards is increasing, save for coastal storms, where the trend is unclear. Such storms are too infrequent to allow for the interpretation of the recent events as a significant trend.

Table 4: Inventory of Common Hazards

Hazard	Narrative	1 Impacts	2 Loss of life, no.	3 Duration, days	4 Spatial extent, km^2	5 Frequency	6 Trend
Warm spells	Heat stress affects crops at flowering, human health particularly among the elderly	2	1	2	3	3	↑
Dry spells	Critical for some stages of crop growth, increased water demand	3	1	3	4	3	↑
Seasonal drought	Reduced yields or crop failure, loss of assets	4	1	3	4	2	↑
Multi-year drought	Increased poverty, food imports, reduced water supplies and hydro-electric power	5	3	4	6	2	⇑
Intense rain	Local flooding, loss of young crops, damage to buildings and infrastructure	3	1	1	3	3	⇑
Riverine flood	Regional flooding, longer term health effects, loss of seasonal crop production and storage, damage to infrastructure	4	2	2	3	2	↑
Coastal storm	Intense wind and flood damage to buildings and infrastructure, salt water intrusion and erosion of productive	5	4	2	4	1	?

Key: The ratings are on an exponential scale:

1. Impacts: 1 = $1 per capita, 2 = $10, 3 = $100, 4 = $1000, 5 = $10,000
2. Loss of life: 1 = 1 person per event, 2 = 10 people, 3 = 100 people, 4 = 1000 people
3. Duration: 1 = 1 day, 2 = 10 days, 3 = 100 days (a season), 4 = 1000 days (more than a year)
4. Spatial extent: 1 = 1km^2, 2 = 10 km^2, 3 = 100 km^2, 4 = 1000 km^2, 5 = 10,000 km^2, 6 = 100,000 km^2
5. Frequency: 1 = 1% probability of occurance in any given year, 2 = 10%, 3 = 100% (occurs every year)
6. The markers for trends: ↑ = significant increase, ⇑ = moderate increase, **?** = uncertain trend

Table 5: Pacific Island Countries Estimated Level of Vulnerability to Specific Natural Hazards

Country	Population	Land Area km^2	Tropical Cyclone	Storm Surge	Coastal Flood	River Flood	Drought	Earthquake	Landslide	Tsunami	Volcanic Eruption
Cook Island	19.500	240	H	H	M	M	H	L	L	M	-
Federal States of Micronesia	114.800	701	M	M	H		H	L	L	M	-
Fiji	752.700	18.272	H	H	H	H	H	H	H	H	L
Kiribati	76.000	725	L	M	H	-	H	L	L	H	-
Marshall Island	50.000	181	H	H	H	-	H	L	L	H	-
Nauru			L	L	L	-	H	L	L	L	-
Niue	2.300	258	H	H	L	-	H	L	L	M	-
Palau	21.600	494	H	H	M	-	H	L	L	M	-
Papua New Guinea	4.056.000	462.243	H	H	H	H	H	H	H	H	H
Samoa	163.000	2.935	H	H	H	H	L	M	H	H	M
Solomon Islands	337.000	28.370	H	H	H	H	H	H	H	H	H
Tokelau	1.600	12	H	H	H	-	H	L	L	H	-
Tonga	97.400	720	H	H	H	M	H	H	L	H	H
Tuvalu	9.100	24	H	M	H	-	M	L	L	H	-
Vanuatu	156.500	12.200	H	H	H	H	H	H	H	H	H

Key: Risk Ranking: L=Low; M=Medium; H=High

LDCs

Sources: Final Report for International Decade for Natural Disaster Reduction, Dr. Jack Rynn. Carter et al. (1991); SPREP/UNDHA-SPPO (1994); Chung (1996); UNDHA-SPPO/SPDRP (Hamnett 1996); UNDHA-SPPO/SPDRP (Vroljks 1998); Burke (1999); Natural disasters experienced during the Decade 1990-2000 and potential for future per NDMOs. (UNDHA has now become UNOCHA).

Table 5 illustrates the vulnerability ranking of numerous natural hazards at the sub-regional level. The additional elements which should also be investigated to achieve an integrated sustainable development approach include the impacts of these risks on specific populations or sectors.

Exercise 4: From Brainstorming to Briefing of Hazards

Like with the identification of vulnerable livelihoods, a brainstorming exercise works well to construct an initial inventory of the climatic (and other) hazards. Further details can be provided by relevant experts for each hazard. A briefing note on each hazard could be provided to help the discussion and should include:

1. A short description;
2. An event of record;
3. A matrix and narrative regarding attributes;
4. The impacts on vulnerable groups;
5. Trends in the historical record; and
6. The relation with existing climate change knowledge.

CHECKLIST:

- ☑ List climatic hazards
- ☑ Identify additional threats that compound the effects of climatic hazards
- ☑ Characterise the principle climatic hazards

2.4 HOW SENSITIVE ARE RESOURCES AND GROUPS TO CLIMATIC RISKS?

A sensitivity matrix brings together the exposure of vulnerable livelihoods to the range of climatic hazards. The matrix helps identify the priority vulnerabilities and links with further evaluation of adaptation activities.

Building a sensitivity matrix

The next task is to bring together the analysis of vulnerable livelihoods and climatic hazards. The sensitivity matrix has as its rows the livelihoods in the study region. The rows may also include other elements, such as the productive activities of these livelihoods as well as economic sectors, public infrastructure and ecosystem services that support livelihoods. Thus, the rows of the table are a hierarchy from natural resources to economic activities and vulnerable livelihoods. More generally, the rows are the units of exposure—those elements in ecosystems, populations and economies that are subject to climatic hazards and trends.

The columns of the matrix are the present climatic threats (or opportunities) and trends (if any) that are significant for the vulnerable livelihoods. It is likely that some iteration and refinement will be warranted in the matrix. There are no hard and fast rules for separating ecosystems into services, people into livelihoods, or weather into climatic risks. Indeed, one of the purposes of the matrix is to show how thresholds of vulnerabilities differ between exposure units (and over time).

How sensitive is each element of exposure to each climatic risk?

A rapid scoping exercise might use high, medium or low rankings; on a numerical scale a five-point range is probably sufficient for most analyses. Three technical issues need to be understood:

1. The rating of sensitivities depends on the outcome of exposure to hazards. For instance, sensitivity to mortality has a different pattern of sensitivity than loss of life, livelihood or well-being. In most cases, the initial ratings are related to a broad interpretation of economic assets. However, if the matrix is to be used analytically, it is necessary to specify the consequences or outcomes of the identified vulnerabilities. Most commonly, these include loss of life and loss of property (assets), but some stakeholders may be concerned with the full range of livelihood 'capitals'.

2. It is possible to aggregate the ratings, across the rows, down the columns and for the overall matrix. This provides an overall score that may be useful, but should only be done with caution. The results are likely to be sensitive to individual ratings and rankings of vulnerability across regions and hazards may not be robust. There are several ways to aggregate ratings.The example below shows a simple normalised sum. However, stakeholders may primarily be concerned with 'hot spots' of significant vulnerability. In this case, counting the number of high scores (e.g., those with a 4 or 5) is a better approach than summing all of the values.

3. The matrix is relatively easy to fill in for present conditions. In order to compile a matrix for future vulnerabilities, storylines need to be developed that indicate how livelihoods might change (e.g., their reliance on different ecosystem services and activities, as well as their prevalence), how the climate might change (there might be new hazards or trends that become significant in the future) and how the sensitivities might change (e.g., with new technology). These are the typical concerns of building scenarios. Once a scenario has been constructed, the matrix provides an easy means to compare the results. Note, however, that the NAPA emphasis is on present vulnerabilities, thus formal scenarios of future climate change and socio-economic development may not be necessary.

The matrix provides a ready link to more formal methods of conducting a vulnerability assessment, such as poverty mapping and Geographic Information Systems. The mapping unit should capture the distribution of livelihoods, perhaps by mapping livelihood zones. The layers in the GIS identify the impacts of specific hazards and attributes of the vulnerable livelihoods. Aggregation across the layers could utilise the weighted scheme shown below. The result is a first-cut of a rapid vulnerability assessment.

Table 6: Sensitivity Matrix for Food Security in Africa

	CLIMATIC HAZARDS					*EXPOSURE INDEX*
	Drought	Dry spells	Floods	Warm spells	… others	
ECOSYSTEM SERVICES						
Soil water	▲	■	▲	◦		75
Water supply	▲	○	■	◦		60
Wood fuel	□	◦	○	◦		35
Grazing/fodder	■	○	■	◦		55
…others						
LIVELIHOOD ACTIVITIES						
Food crops	▲	■	□	◦		65
Market crops	▲	□	○	◦		55
Livestock	■	□	□	◦		55
Charcoal	○	◦	○	◦		30
Casual labour	□	◦	□	◦		40
…others						
LIVELIHOODS						
Smallholders	▲	□	□	◦		60
Emerging farmers	□	○	○	◦		40
Traders	□	◦	■	◦		45
…others						
IMPACT INDEX	*73*	*40*	*60*	*20*		

Key: To convert the symbols into scores: ▲ = 5, ■ = 4, □ = 3, ○ = 2, ◦ = 1.

Source: An Excel spreadsheet version of the table is available at www.unitar.org/ccp/pubs/livelihood_matrix.xls

Example: Sensitivity matrix for food security in Africa

The example shown here (Table 6) is based on farming systems in southern Africa—these should not be taken as authoritative ratings, they are intended to show the technique rather than results from formal expert judgements. The vulnerable groups are subsistence smallholder farmers, emerging farmers, and market traders.

Smallholders are highly vulnerable to drought (▲), through the effects of reduced soil water, water supply, grazing and fodder on cropping systems and livestock. However, they are less sensitive to dry spells (□) and floods (□). Compared to emerging farmers or traders, smallholders are more vulnerable with an exposure index of 60 versus an exposure index of 40 and 45 respectively. The exposure index relates to the overall vulnerability of each exposure unit to the range of climatic hazards. The score is calculated as the sum of the columns for each row divided by the total possible score (20), given in percentage. For smallholders, this is (5+3+3+1)/20*100.

Similarly, the impacts index is the aggregate score for a specific hazard (a column) across all the exposure units (the rows). In the example, however, the impacts index is only calculated for the livelihoods, as the preceding rows are elements of the livelihood scores and thus including them would have resulted in double counting. Drought has the highest impact score (73), the calculation being (5+4+4)/15*100.

The aggregate indices (for exposure and impacts) can be weighted. For exposure, the weighting could be based on the probability of the different hazards occurring. The prevalence of the livelihoods could be used to weight the impacts scores which would constitute the first filter leading to the identification of *'urgent and immediate needs'*.

A LEG member assists in building a sensitivity matrix at the regional NAPA workshop in Bhutan.

Exercise 5: Building a Sensitivity Matrix

The sensitivity matrix serves well as a participatory group activity. Begin with the brainstorming exercises to create a list of livelihoods and hazards. Then reduce the number of livelihoods and hazards to no more than 5 each. A 5x5 matrix can be filled in fairly quickly in a small group. If the group or the matrix is too large, consider splitting into sub-groups.

Once the initial ratings have been put on the board, facilitate a discussion of the overall matrix:

1. What does it reveal about who is vulnerable? Where are the high priorities? The ratings of 4 or 5 (or just High) might be highlighted in red. Does the group agree that these are the relatively most important vulnerabilities? If not, what scores would need to change?
2. What are the gaps in knowledge? If the group had trouble deciding on a score, was this because of a lack of information? Further experts may need to be consulted or specific studies commissioned to fill these gaps, especially if they relate to potential priority vulnerabilities
3. What are the relevant indicators of vulnerability (or adaptive capacity)? Many of the indicators will be specific to a certain livelihood or hazard. For instance, crop-drought indicators (such as yield) are of different importance for semi-arid subsistence agriculture than for highland commercial farms. Are there indicators that are relevant to a range of livelihoods and hazards? Household income is one, transport links and access to markets might be others.
4. What is the range of adaptation options? Are the adaptation options specific to livelihoods and hazards or are they more generic?
5. What stakeholders and institutions are relevant to the implementation of the adaptation options for each livelihood? One could review the list of stakeholders produced in Exercise 3 and map their relevance to the priority vulnerabilities identified in this matrix.

The last two bullets points link the vulnerability assessment (Step 3) to the rest of the NAPA process (Steps 5 and 6).

CHECKLIST:

- ☑ Construct first-cut of sensitivity matrix
- ☑ Review matrix with experts and stakeholders, refine if necessary
- ☑ Report high priority vulnerabilities to project team

2.5 HOW ARE THE HIGH PRIORITY VULNERABILITIES CARRIED FORWARD IN SCREENING ADAPTATION OPTIONS?

The rapid participatory vulnerability assessment, Step 3 of the NAPA process, links to the evaluation of adaptive options in several ways. The most important link is the identification of the priority socio-economic groups, sectors and regions for targeting adaptation. This should not be taken as a ranking of 1, 2, 3 etc., but a recognition from the matrix that the combination, for example, of smallholder farmers/drought and the peri-urban poor/floods are high priorities for urgent climate adaptation.
The process of identifying vulnerable livelihoods and stakeholders that is listing climatic hazards and building the matrix is a good way to structure a constructive dialogue within the NAPA team and among stakeholders (Step 4 in the NAPA process). Further notes on stakeholder engagement can be found in Section 1.2 and in the selected bibliography.

The vulnerability assessment also provides insight into good ideas for adaptation activities. The group exercise below is one way to get started on this task.

Vulnerability indicators such as the scores in the sensitivity matrix are similar to the indicators that will be used in evaluating adaptation options in Step 6. Vulnerability assessment is an example of multi-attribute evaluation. There are several dimensions of vulnerability that concern, for example, the five capitals of sustainable livelihoods as described in Figure 4:

- Human capital: loss of life, health, etc.
- Natural capital: crops, arable land, natural resources, etc.
- Financial capital: earning power, income, etc.
- Social capital: livelihood, coping and community sense/coherence, etc.
- Physical capital: infrastructure, equipment and tools, etc.

Aggregating across these dimensions is problematic but some insight can be gained from charting the values (like in the spider diagram in Figure 3) or by looking at the pattern in the sensitivity matrix. Some of the vulnerability indicators should be integrated into the multi-criteria analysis. Two examples below illustrate how this might be done.

Example: Evaluating livelihood projects

This section shows two ways to link the analysis of vulnerability with the screening of adaptation options, using Sudan and Cape Verde as hypothetical examples.

In the hypothetical example based on Sudan (Table 7), the rows represent selected adaptation options, while the first three columns represent various vulnerable livelihoods and demonstrate whether those livelihoods are impacted by the various adaptation options that were identified in NAPA Step 3. The remaining columns are criteria relevant to those livelihoods, that is they are use to rate the different adaptation options. The higher the score an adaptation option receives under a certain criterion, the better it fulfils that criterion. For instance, a score of 100 on the cost index represents the lowest cost, while a 100 in community participation indicates the highest number of people possible that are directly involved with the project. By examining the table, one can see that rangeland rehabilitation has high scores across the board, and benefits pastoralists and agro-pastoralists. It is relatively inexpensive (with a cost index of 100) and draws upon widespread community participation (highest community participation score - 100). However, it might not directly benefit the urban poor. In contrast, development of water points is not an urgent need for pastoralists but would benefit the urban poor, albeit at a high cost (a score of 1) and with relatively limited participation (a score of 17).

Table 7: Evaluating Livelihood Projects - Sudan

	Vulnerable livelihoods			Criteria (scale 0-100)			
Alternative	Pastoralists	Agro-pastoralists	Urban poor	Agricultural production	Livestock production	Cost	Community participation
Rangeland rehabilitation	✓	✓		91	100	100	100
Gum-belt restocking	?	✓	✓	83	0	10	2
Crop/livestock improvement	?	✓		64	20	2	5
Irrigated fodder production	✓	✓		100	0	14	11
Water point development		✓	✓	0	0	1	17

Source: Based on a case study of Sudan developed by SEI-Boston, available at www.VulnerabilityNet.org.

The second example (Table 8), based hypothetically on Cape Verde, illustrates how the qualitative assessment of vulnerable livelihoods and exposure to climatic hazards can be linked to formal multi-criteria assessment. The example will be developed further in Section 3.

Let's suppose the exercise on livelihood exposure and sensitivity to climatic hazards identified the following clusters as the principal concerns:

- Traditional coastal fishing communities exposed to coastal storms, sea level rise and coastal erosion;
- Small-scale farmers exposed to drought; and
- Urban poor exposed to drought, intense rainfall and flooding.

Also of concern, but somewhat lower in priority (in this hypothetical example), might be:

- Critical sectoral infrastructure, such as bridges between ports and agricultural areas; and
- Sensitive ecosystems, such as coastal wetlands, that provide services for priority economic activities.

These concerns for vulnerable livelihoods, economic infrastructure and ecosystems might be collected in one single criterion called here "Targeting of Vulnerable Groups and Resources". They constitute the potential core target for NAPA projects that respond to these groups immediate and urgent needs. Also see the Text Box on page 54. The criterion can only be scored in a relative way, in this instance a scale of 1 to 5 is used. A project that directly targets vulnerable livelihoods might receive the top rating of 5, wereas projects oriented toward economic infrastructure or sensitive ecosystems, but without specifically targeting a priority livelihood, might be rated as 3. Projects that address development infrastructure, hospitals for example, that are less urgent in terms of coping with climatic hazards or targeting a priority livelihood, might be rated as 1.

Two other criteria related to vulnerability are recommended. Poverty reduction is an explicit focus of the NAPA guidelines. For instance, rating the contribution of a project to economic growth in addition to targeting specific vulnerable socio-economic groups should achieve a robust scoring for poverty reduction. In Table 8, the criterion used is the projected economic growth rate of poor people, in % per capita per year. Similarly, the economic losses avoided (the benefits of the project) is a general criterion that could be specifically applied to the losses avoided by poor people (avoiding losses to large landowners is not necessarily going to reduce poverty). Taken together, these criteria identify urgent needs. They are used in the following table for the hypothetical 'Cape Verde' example. Of course, these criteria are just an illustration of how the priority vulnerabilities identified in NAPA Step 3 might be carried forward into the MCA of adaptation options.

The final NAPA output is a set of project profiles for the priority adaptation options. The profiles should be supported by the narrative of who is vulnerable and to what. Adaptation options that have synergies for several livelihoods and hazards may be especially urgent.

Table 8: First Scoring of Criteria - Cape Verde

OPTIONS	CRITERIA		
	Targeting of vulnerable groups and resources (1 to 5 scale)	Impact on economic growth rate of poor people (%)	Losses avoided by poor people ($ per capita per year)
Option 1: Fodder crops	5	1	100
Option 2: Intensive live-stock farming	5	3	200
Option 3: Water reservoirs	4	2	220
Option 4: Drip irrigation	2	3	500
Option 5: More resilient crop species	4	3	500
Option 6: Inorganic fertilisers and organic manure	5	6	50
Option 7: Forest resources management	5	2	200
Option 8: Renewables and LPG	1	2	50
Option 9: Industrial and tourism protected zones	3	5	250
Option 10: Sand and gravel extraction	1	1	50

Exercise 6: Role Playing to Identify Potential NAPA Activities

A role playing exercise with the project team is one way to obtain the elements that will be needed to carry out the next steps of the NAPA process, where the team should consult relevant stakeholders (including community stakeholders) regarding suggestions for adaptation options to screen (Step 5) and formally evaluate them (Step 6).

Start with the stakeholder networks (or regimes) that emerge from the analysis of stakeholders (Exercise 3). Break up into small groups. Each team member will play the role of a specific stakeholder in the selected regime. For instance, a common network (or regime) is national development planning, encompassing the strategic functions of line ministries and national NGOs. Another group is likely to be more local and concerned with development practices 'on the ground'. Another might be the research organisations with particular concerns for monitoring and evaluation (including vulnerability mapping).

Each group should brainstorm a long list of potential adaptation options that their stakeholders might suggest (or indeed have already suggested in existing development plans). Once the list has been generated, review the ideas:

- How relevant are the ideas for the target vulnerable groups? Is it possible to screen some of the ideas as being of relatively less priority at this stage?
- Are there ideas that should be grouped together into a package? For instance, those that would target a wider group?
- Are there ideas that require specific actions to implement? For instance, drought preparedness planning might require activities to improve the accuracy and distribution of drought forecasts.
- Is there likely to be widespread support among the stakeholders for the activities?
- Are there significant barriers to implementing the activities that are beyond the likely resources of NAPA projects?

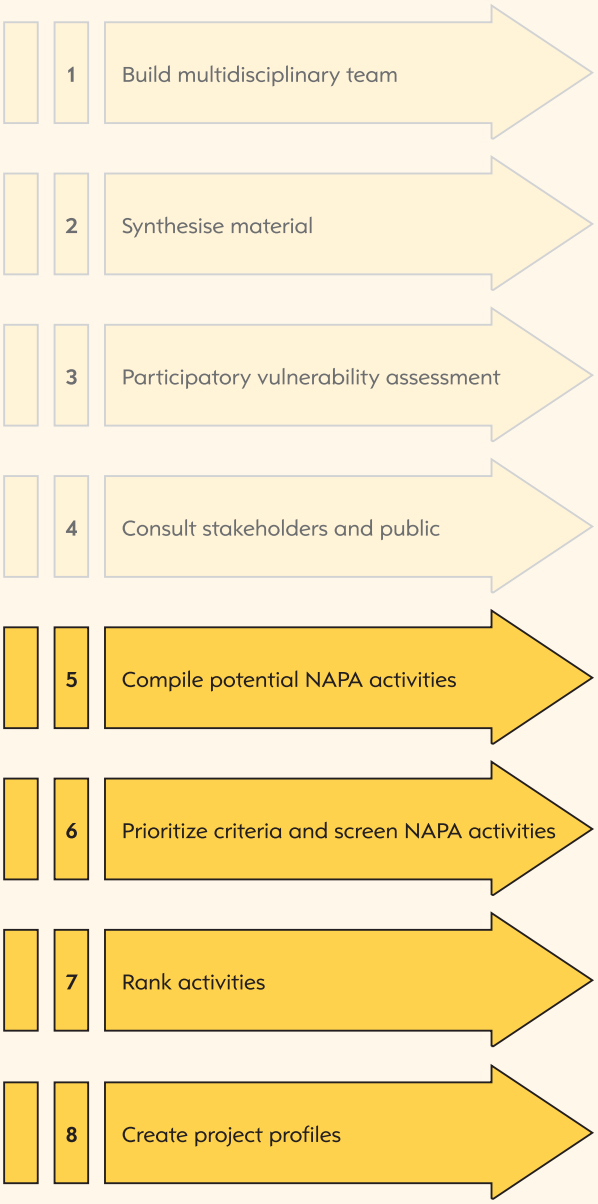
CHECKLIST:

- ☑ Identify indicators of vulnerability for use in screening and evaluating adaptation options
- ☑ Report narratives about priority vulnerabilities for use in final NAPA profiles

THE PROCESS OF FORMULATING NAPA ACTIVITIES - STEPS 5 TO 8

Summary

Potential NAPA activities or options discussed at the end of the NAPA Step 4 should be evaluated in light of national perspectives (i.e. the national development strategy, the fight against poverty, other multilateral environment agreements, etc.). This project formulation and prioritisation phase goes well beyond paperwork and theory, and requires the use of participatory approaches and techniques. The project appraisal and multi-criteria methods are common in ministries of finance and planning. The use of these methods to screening climate change adaptation options should be consistent with existing national frameworks and procedures.



- *Step 5:* The team will formulate key climate-change adaptation measures based on vulnerability and adaptation assessments; such measures will also be responsive to needs identified under other relevant processes.
- *Step 6:* The team should prioritize country driven criteria for selecting priority activities to address the needs arising from the adverse effects of climate change, drawing on the criteria referred to in the previous section.
- *Step 7:* Further criteria for a smaller set of potential options may be included in the MCA, based on NAPA and national development planning guidelines. The multi-criteria analysis ranks the selected high priority adaptation options by the scores they receive from the various criteria used, taking into account the corresponding weight or importance of each criterion. Stakeholders should identify who will likely take the lead in the planning and implementing of each option and which vulnerable groups will benefit.
- *Step 8:* Formulation of project profiles that respond to the identified needs of targeted groups vulnerable to climate risks. The establishment of a generic framework, preferably a Logical Framework (Log Frame), is recommended.

3.1 ARTICULATE POTENTIAL NAPA ACTIVITIES BASED ON IDEAS FROM CONSULTATION

The NAPA team should consult relevant stakeholders regarding the suggestions made for adaptation options in Step 3; refer to Exercise 6 in Section 2. The local communities, among other stakeholders, should be given priority in order to ensure that the options selected respond appropriately to their most urgent and immediate needs (as generated in the vulnerability matrix exercise). This consultation, a frequent topic of discussion during the NAPA workshops, can take various forms according to national practices and circumstances. In countries with a small population (such as a Small Island Developing State like Samoa, with a population of 176,000 and a surface area of 2,840 km^2), the NAPA team will be able to work directly with the population; while in larger countries, the NAPA team should develop means of representation for the population so that the consultations can be held within a reasonable timeframe, given the urgency of their needs. In the case of Ethiopia (with a population of 67.2 million and a surface area of 1.1 million km^2), the institutional structure established will allow for both regional and national stakeholder consultation processes (See Figure 1 and the Text Box on page 13).

In any case, however, the team should reflect upon the following questions:

- Are the proposed options the appropriate response for the target vulnerable groups?
  - Has the target group been properly described, in qualitative terms through the vulnerability profile, and/or in quantitative terms?
  - Has the urgency of the climate hazard(s) been properly demonstrated? Are floods, droughts, cyclones, sea level rise, etc. threats to the target groups?
  - What is the nature and extent of the anticipated losses due to the climate hazards? These losses could come in a number of forms: human, natural, financial, social, and physi - cal (For more detail, see Section 2.5 and Figure 4).
- Is there a lack of data or knowledge, making it difficult or impossible to address the above questions? This question should have already emerged from the earlier consultations. At this stage, it may lead to the downgrading in priority of some ideas.
- What are the basic characteristics of the proposed options and ideas? Are they:
  - Stand alone project-type interventions, e.g. a replicable pilot action addressing a climate hazard for a specific vulnerable group, with a clear 'lead' sector or stakeholder to act, and a limited budget size?
  - Supplementary to ongoing or formulated programmes, addressing hitherto ignored aspects of a climate hazard, with the possibility of 'piggy-backing' the actions onto an ongoing or committed programme by means of negotiating an additional budget allocation?
  - To be grouped together into a (new) package, e.g. that would target a wider group?
  - Dependent upon specific prior actions? For instance, drought or flood preparedness planning might require actions to improve the accuracy and distribution of drought or flood forecasts. This could, for example, be specific meteorological or socio-economic research, specific hardware for meteorological or run-off measurements, data communication, specific capacity building, or a combination of the three.

The team must establish whether or not there is widespread support among the stakeholders for the proposed actions. The NAPA team should also consider the potential adaptation options within a framework that includes elements beyond the vulnerability perspective, as suggested in the Annotated Guidelines for the preparation of NAPA (see Table 9).

Table 9: Summary of the UNFCCC Decision 28/CP.7

Guiding elements of the NAPA approach (Article 7)	Selection criteria (Article 15)	To be applied to: (Article 16)
• Participative process • Multi-disciplinary approach • Complementary approach • Sustainable development • Gender equality • Country-driven approach • Sound environmental management • Cost-effectiveness • Simplicity • Flexibility of procedures based on individual country circumstances	• Degree of adverse effects to climatic changes • Degree of poverty reduction • Synergies with MEAs • Cost effectiveness	*Inter alia* ▸ Loss of life and livelihood ▸ Human health ▸ Food security and agriculture ▸ Water resources (availability and accessibility) ▸ Basic infrastructures ▸ Cultural heritage ▸ Biological diversity ▸ Land use management and forestry ▸ Coastal zones and loss of land ▸ Other environmental amenities (e.g. wetlands, natural attractions)

Source: ENDA, from Annotated guidelines for the preparation of National Adaptation Programmes of Action, July 2002.

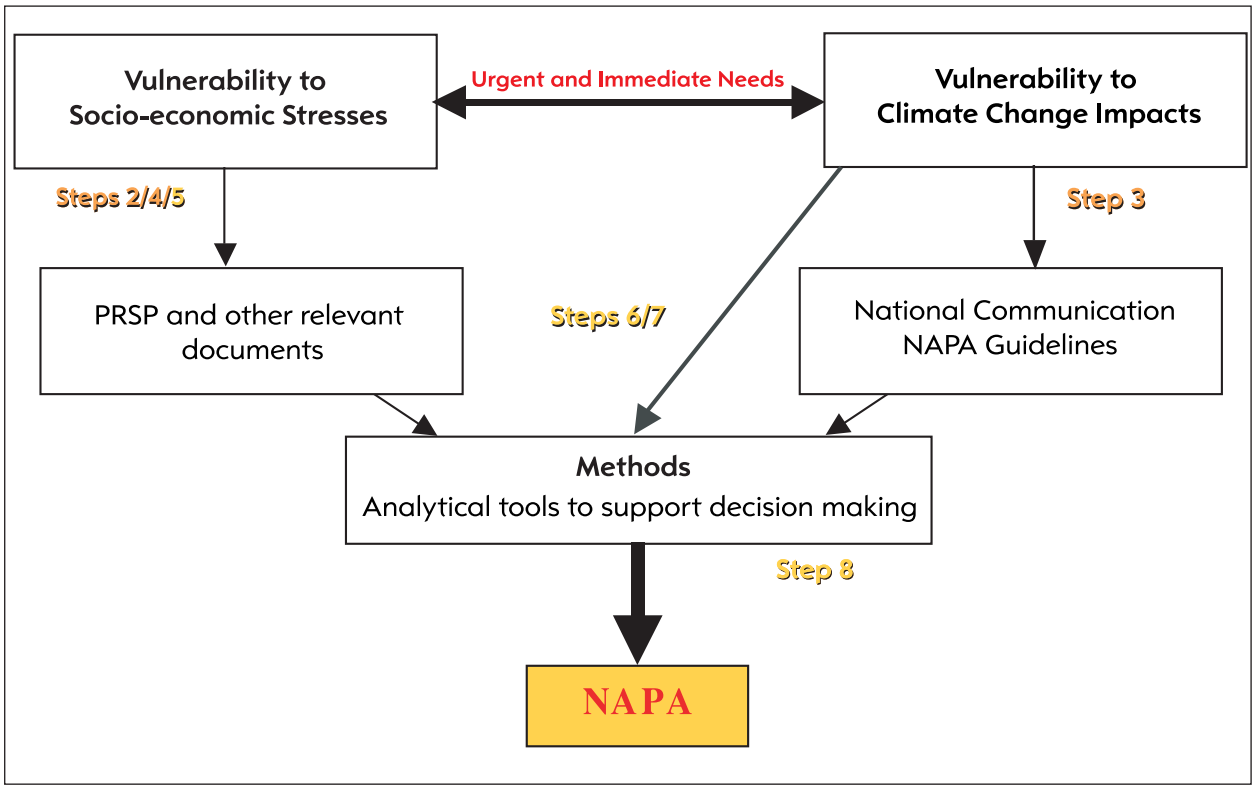
The NAPA Guidelines specify that "a set of locally driven criteria" can be selected by the NAPA team, but should include:

1. The level or degree of adverse effects of climate change (directly related to the vulnerability indicators as formulated in NAPA Steps 3 and 4);
2. Poverty reduction to enhance adaptive capacity;
3. The level of synergy that will be achieved with other Multilateral Environment Agreements, or perhaps with other regional issues (such as those issues related to transboundary river basins); and
4. Cost-effectiveness (financing considerations).

The annotations of the LEG to Article 15 of the Guidelines suggest however that the NAPA team agrees on a limited number of criteria, to keep the process manageable as well as understandable.

Clearly, national development priorities must be taken into consideration: they include policies to combat poverty such as PRSPs; nationally and sectoraly oriented development plans on such issues as water, energy or transportation; other environmental action plans such as desertification and biodiversity strategies, as well as appropriate national communications. In other words, potential adaptation options should respond to a broader framework that is carefully established by the NAPA team. The team is faced with the challenge of cross-analyzing adaptive options in the context of the required criteria (centre column of Table 9), while including the guiding elements of the NAPA approach (left column) and deciding

Figure 5: Framework for Defining Potential NAPA Activities



Source: ENDA, Option, Ouagadougou, Burkina Faso, October, 2003.

on the decision making process or method to be applied to the set of priorities listed in Article 16 (right column). This approach is illustrated in Figure 5.

In this context, technical work and discussion among the NAPA team members is essential: the Ministry of Finance may recommend that the costs of the options be taken into account as a priority (cost-effectiveness criterion), while the Department of the Environment may insist on the selection options that will be consistent with other environmental concerns, such as desertification or the management of shared waters (Synergies with MEAs).

As with any assessment method, the context of the decision and the identification of the options available constitute the first two stages that the team should perform for NAPA Step 5.

A Step 5 example exploring a potential list of options for a hypothetical case in the 'The Cape Verde Islands'.

The 'Cape Verde' case is hypothetical and does not correspond to options actually suggested by the country's NAPA team. Rather, it refers to a list of options produced as an exercise at the NAPA Workshop in Ouagadougou (October 2003).

In Cape Verde, among the poverty alleviation (PRSP) objectives proposed, the creation of opportunities for increasing income through sustained economic growth, as well as for improving the living standards of the local populations, constitute major strategic orientations (c.f. Grand Option Plan 2001). Poor, economically and socially vulnerable populations currently represent a third of the total Cape Verdean population, compared to 10 years ago when 15% of the

population was considered very poor. As described in the previous section, (NAPA Step 4), the exercise on livelihood exposure and sensitivity to climatic hazards identified the following clusters as the principal concerns:

- Traditional coastal fishing communities exposed to coastal storms, sea level rise and coastal erosion;
- Small-scale agriculturalists exposed to drought; and
- Urban poor exposed to drought, intense rainfall and flooding.

Also of concern, but somewhat lower in priority (in this hypothetical example), might be:

- Critical sectoral infrastructure, such as bridges between ports and agricultural areas; and
- Sensitive ecosystems, such as coastal wetlands, that provide services for priority economic activities.

With the vulnerability matrix and the results of the preceding NAPA step with its analysis of various relevant reference documents (PRSP, National Communication, various sector studies), a preliminary list of potential options can be formed. It reads as follows:

Option 1: Developing fodder crop cultivation in areas with the least agricultural potential;

Option 2: Developing intensive livestock farming (especially goats), in arid zones;

Option 3: Building reservoirs to capture and channel excess superficial water runoff from rainfall;

Option 4: Introducing drip-irrigation, particularly in horticulture;

Option 5: Developing more resilient crop species;

Option 6: Developing chemical fertilisers for use in combination with organic manure;

Option 7: Developing a joint management system for forest resources;

Option 8: Developing renewable energy resources and Liquefied Propane Gas (LPG);

Option 9: Protecting the industrial and tourist complexes of Sao Vicente in the Santa Maria Bay; and

Option 10: Optimizing the extraction of sand and gravel.

Obviously, not all of the options listed above could be implemented due to financial constraints and/or the lack of capacity to take on all the activities. At the beginning of NAPA Step 5, some options may be discarded, or amended, provided that there is general agreement amongst the team members. To further refine the list of options, the NAPA country team must develop and apply criteria for option selection as described in the Guidelines. The selected options will address, *inter alia*, immediate and urgent needs. Keeping with the Guidelines, the team may also, along with relevant stakeholders, agree on the inclusion of specific country-driven criteria.

Work to be carried out by the NAPA team

The work to be carried out by the team requires a participatory process that will follow up on the work undertaken by the working group during the previous steps.

Once the selection criteria have been chosen, the NAPA team can begin reflecting on the relative importance of (i.e. the weight that should be assigned to) each criterion. As was stressed throughout Step 4, criteria related to risk/adverse effect due to climate (change), (called "Vulnerable Groups and Resources" in the Cape Verde example), should be given special consideration as they relate directly to immediate and urgent needs.

Each of the options under consideration will require the input of additional information and valid data and may require the assistance of technical departments or specialised research centres to analyse the data.

The screening of adaptation activities for the Cape Verde example led to the selection of three vulnerability indicators/criteria. These indicators facilitated the measurement of the actual benefit derived from the options by the target groups (the poorest peoples). The criteria are called "Vulnerable Groups and Resources", "Economic Growth Rate of Poor People" and "Losses Avoided by Poor People" (see page 41 - 42 for the dicussion of their selection).

As was emphasized at the beginning of this section, the following questions need to be answered before proceeding to the next step (6):

- Do the selected options really correspond to the needs arising from the vulnerability of livelihoods?
- Can the criteria or indicators be quantified (in absolute or relative terms)?
- Can we proceed from the qualitative to the quantitative stage (to what extent and how)?
- Who (stakeholders or target groups) should participate in scoring the criteria?

CHECKLIST:

- ☑ Be informed of the national development plans and programmes, as well as the NAPA Guidelines
- ☑ Review the options formulated in Step 4
- ☑ Review potential criteria and evaluate their relative importance or weight

3.2 UNDERTAKE CRITERIA PRIORITIZATION PROCESS AND SCREEN NAPA ACTIVITIES

A list of adaptive options is now established. There are several possible methods with which to select and prioritise these options. The most commonly used are Cost Benefit Analysis (CBA), Cost Effectiveness Analysis (CEA) and Multi-Criteria Analysis (MCA). The first two are summarized in Annex D of the 'Annotated Guidelines for the Preparation of the NAPA'. The use of either of these methods requires that costs and benefits be expressed in absolute monetary terms. Furthermore, in CEA all options must have the same objectives. Yet, in the climate adaptation field, numerous criteria that may be included in the final decision making process are non-monetary and objectives between options can vary. Therefore, Multi-Criteria Analysis (MCA) is considered to be the quickest and most appropriate method for assessing NAPA adaptation options.

The MCA stages and NAPA Steps correspond to one another as illustrated in Figure 6.

Multi-Criteria Analysis (MCA)

Environmental studies in general, and Vulnerability and Adaptation studies in particular, usually involve variables which cannot be fully quantified, but are nonetheless determinant factors in decision making. In such cases, one must go beyond techniques which use monetary values in order to incorporate all of the important parameters and variables in a comprehensive analysis. This can be done using MCA. In Multi-Criteria Analysis, the definition of objectives and formulation of the different options are carried out as in a CBA or CEA, but the types of criteria, their relative importance or weighted values, their evaluation and the processing or interpretation of such evaluations, are different. MCA is a decision making aid and not an optimisation technique, in the economic sense of the term. In the context of the NAPAs, it is considered to be the most appropriate solution, as it is understandable and accessible to the greatest number of participants in decision making.

See page 40 onwards of the 'Annotated Guidelines'.

Compared to CBA and CEA, the breath of selection criteria is greater in MCA, as this method can handle qualitative parameters and variables. The necessary information on the level or degree of adverse effects of climate change is obtained from a risk/vulnerability assessment carried out during the previous NAPA Steps (particularly from the matrix in Step 3). Sometimes, this information is provided in quantitative or even monetary terms. Other indicators, such as one measuring the synergy between a climate change adaptation activity and the activity's impacts on desertification or biodiversity, cannot normally be expressed in monetary terms. In such cases, one must proceed using expert judgment. Using a scoring scale between 0 and 1 (for example), makes it possible to weight the strength of these synergies. 0 represents the absence of synergy, whereas 1 corresponds to the maximal level of synergy. Intermediate values represent varying degrees of synergy.

Figure 6 : Multi-Criteria Analysis Stages/NAPA Steps

MCA Stages	NAPA Steps
(a) Context of the decision	1-2
↓	
(b) Identification of options	3-4
↓	
(c) Identification of criteria	4-5
↓	
(d) Scoring options / criteria	6
↓	
(e) Standardisation methods	6
↓	
(f) Weighted values of criteria	7
↓	
(g) Analysis of results	7
↓	
(h) Sensitivity analysis of results	7

Adapted from: Paper presented at the NAPA / UNITAR workshop, Ouagadougou 2003.

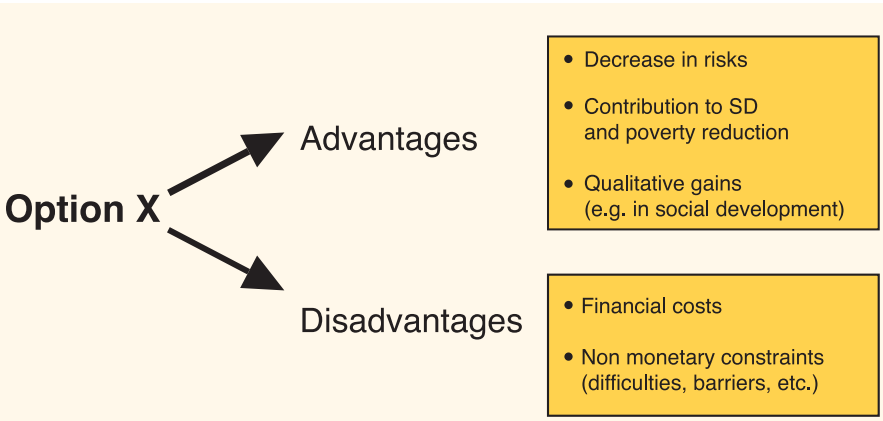
The first two stages of the Multi-Criteria Analysis, (a) "context of the decision" and (b) "identification of options" are common to all decision analyses. They are the activities that took place during NAPA Steps 1 and 2. From stage (c) onward are specific steps to MCA. They are briefly described with some examples in the following section. In stages (c) and (d), the identified options are measured (scored) against the selected criteria according to the scoring method chosen by the NAPA team.

Identification of criteria—Multi-Criteria Analysis stage (c)

As a decision-making tool, a criterion is a standard, a principle or an indicator which makes it possible to evaluate somebody or something. In the Vulnerability and Adaptation field, the selected criteria must be compatible with the priorities of the country concerned in order to guarantee that the options ultimately selected correspond to these priorities. Consequently, at this stage, the NAPA team must identitfy indicators which will reflect (or promote) these priorities.

As the vulnerability study in Steps 3-4 demonstrated, when the main priority group is the most vulnerable poor, one should retain indicators capable of measuring the impact of the actions or project on this population. Thus, one usually shifts from macroeconomic and social indicators to indicators geared towards sub-groups of the targeted populations. Using Multi-Criteria Analysis in the decision making process requires the selection of criteria that correspond either to certain advantages or disadvantages, or to quantitative or qualitative cost/benefit relationships. Criteria can be objective, such as the cost of a meteorological station, or subjective such as the likelihood of one option generating greater employment over another. The NAPA team can use whichever method it feels is most suitable, according to the objectives that it has established for itself, for the presentation of the criteria. The criteria can be analyzed in an individual or sequential manner or grouped in a way that highlights the advantages and disadvantages of an option. Use of the latter technique is illustrated below. Figure 7 is laid out in a more narrative format.

Figure 7: Assessing an Option through a Multi-Criteria Analysis of Advantages and Disadvantages



Source: ENDA, Options, October 2003.

Example of MCA Disadvantages and Advantages Analysis for Option 'X'

DISADVANTAGES –MONETARY OR OTHER

1.1 Financial costs (of the proposed intervention or activities) – costs could comprise 'investment' price and 'running' costs;

1.2 Non monetary issues (e.g. the 'difficulties' in creating policy reform, achieving agency reorganization and/or inter-agency coordination, or in raising 'awareness' of climate risk issues) – perhaps expressed subjectively in 'degree of difficulty'.

ADVANTAGES – MONETARY OR OTHER

2.1 Reduction of Climate (Change) hazards/risks, in terms of:

- 2.1.1 Saving lives – perhaps expressed in numbers;
- 2.1.2 Protecting 'livelihoods' (and further improving them) – perhaps expressed in 'community size';
- 2.1.3 Protecting essential 'infrastructure' (in a broad sense, including for example, 'cultural heritage') – perhaps expressed in 'assets value'.

2.2 Contribution to Sustainable Development, in terms of:

- 2.1.1 Poverty reduction (of target groups including the creation of adaptive capacity), i.e. responding to socio-economic development goals – perhaps expressed as an absolute or relative 'income growth %';
- 2.2.2 Synergy with other MEAs, i.e. responding to environment/ecology preservation goals – perhaps expressed subjectively in 'degree of synergy'.

2.3 Contribution to Basic prior/pre-conditions, in terms of:

- 2.3.1 Climate change risk 'awareness raising' (addressing civil society at large) – perhaps expressed subjectively in 'degree of climate change public awareness';
- 2.3.2 Reduction of the climate change knowledge gap (addressing stakeholders that must act) – perhaps expressed subjectively in 'degree of climate change institutional awareness'.

The NAPA team should always keep in mind that the list of criteria mentioned here is purely indicative, and that local and national conditions can lead the national team to dismiss some of the present criteria or introduce new ones.

Example of Criteria and Scoring suggested adaptation options for 'Cape Verde' — MCA Stages (c) and (d)

In the hypothetical example of Cape Verde, the vulnerability analysis (Step 4) facilitated the selection of three criteria that can ensure that the options selected target the most vulnerable poor: 'vulnerable groups and resources'; 'economic growth rate of poor people'; and 'losses avoided by poor people'. Further discussion within the NAPA team led to the conclusion that:

- Some economic criteria should be modified according to their judgment hence the fact that Table 10 has some different values from Table 8; and
- The number of criteria must be increased.

For the Ministry of Finance, for example, the cost of the options is a key element to be considered in the selection process. For the Department of the Environment, it is essential that the synergies which these options share with other environmental issues, particularly the fight against desertification, be taken into account. These two additional criteria are in line with the criteria listed in Article 15 of the Annotated NAPA Guidelines (see Table 9, 2nd column). The selection of the options will therefore be carried out using these five criteria. This example assumes that the climate-related losses avoided can indeed be estimated— even expressed in a monetary value. Each option is assigned a score for each of the selected criteria: 'Costs' and 'Losses avoided' are expressed in monetary units (millions); the poverty reduction indicator in 'Economic growth rate of poor people' is given in percentage; 'Synergies with other MEAs' has been scored on a scale of 0 to 10; while the 'Vulnerable groups and resources' criterion is indicated by a score on a scale of 0 to 5.

How to identify urgent and immediate needs?

Urgent and immediate needs can be identified by using indicators that measure the degree of vulnerability of target groups or a targeted geographical area. However, 'vulnerability' indicators do not exist as such. Thus, it is necessary to use measurable variables/criteria whose aggregation or joint analysis will make it possible to define the degree of vulnerability in the group or area (as noted in Section 2.5).

Reflecting the guidance of Decision 28/CP.7, the three following criteria were chosen to measure the 'degree of vulnerability':

- impact on vulnerable groups and resources, measured by a score;
- impact on economic growth rate of poor people, in %; and
- losses avoided by poor people ($ per capita per year).

These three variables are analysed simultaneously as three distinct criteria in Tables 10, 11 and 12. They could also be aggregated using a standardisation method, yielding one single vulnerability criteria which can be used to identify urgent and immediate needs. However, this is not the case for our example. Here we chose to increase the number of criteria (to include 'MEAs' and 'costs', as proposed in Decision 28/CP.7) and to carry out the standardisation and ranking process once all criteria were collected. It is, however, logical to expect that these criteria (although not labelled 'vulnerability criteria'), will lead to the identification of urgent and immediate needs.

Table 10: Evaluation of the Criteria for each Option - Cape Verde

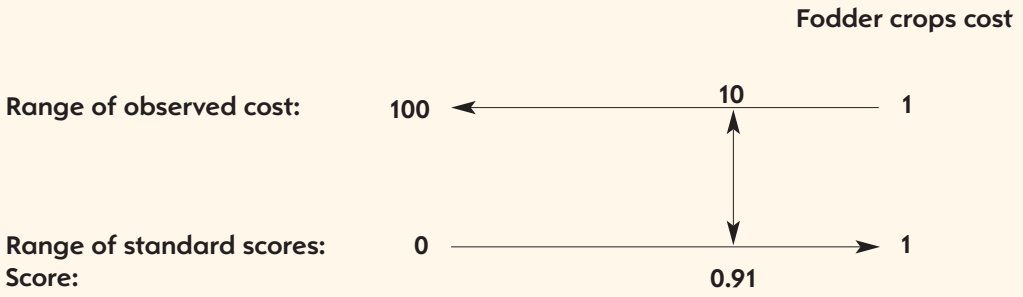
OPTIONS	CRITERIA				
	Impact on vulnerable groups and resources	Impact on economic growth rate of poor people	Losses avoided by poor people	MEA synergies	Cost
Unit	Scale 1 to 5	%	Units per capita per year	Scale 0 to 10	Per million units
Option 1: Fodder crops	5	1	100	1	10
Option 2: Intensive livestock farming	5	2	200	3	8
Option 3: Water reservoirs	4	3	220	7	10
Option 4: Drip irrigation	2	3	500	7	30
Option 5: More resilient crop species	4	3	500	8	12
Option 6: Inorganic fertilisers and organic manure	5	2	50	7	15
Option 7: Forest resources management	5	2	200	6	3
Option 8: Renewables and LPG	1	3	50	6	50
Option 9: Industrial and tourism protected zones	3	5	250	0	100
Option 10: Sand and gravel extraction	1	1	50	0	1

Multi-Criteria Analysis Standardisation method - Stage (e)

As can be seen in Table 10, the different criteria are not all expressed in the same unit of measure. Some are expressed in absolute values, but not necessarily in the same units (costs, rates etc.), others are awarded scores. Though not used in this example, binary choices (that is yes or no) are also possible, as well as a variety of different scoring scales. To be able to compare the criteria, the values must now be standardised; that is, expressed in one common unit, according to one common scale. This standardisation is done by plotting each criterion value on an axis (linear interpolation), ranging from 0 – 1, or from 0 – 100. Higher values correspond to advantages, while lower values correspond to disadvantages. In the case of a cost/benefit criterion, benefits would have higher values than costs.

This standardisation process is undertaken for all options under each criterion, yielding the results presented in Table 11.

Figure 8: Standardisation of Option 1 - 'Fodder crops'



*Using the 'inverse scoring' technique, the highest cost (100) is considered the least advantageous; hence was the lowest scored (0). From the "Cost" column of Table 10, one can deduce that there is a variation of 99 units between the most expensive (Option 9) and the least expensive (Option 1) options, which hold values of 100 and 1 respectively. However, the range of standard scores, in this example, varies from 0 to 1 only, thus it is necessary to convert the observed costs to this scale. To standardise the score, subtract the actual observed cost of the option (10) from the maximum observed cost (100); divide this result by the highest possible variation (ie 99). Therefore the calculation is (100-10)/99 = 90/99 or 0.91. The score is then multiplied by the top standard score. In this case, the top standard score is 1 and thus has no bearing on the score (ie. 90/99*1=0.91).*

Table 11: Standardised Scores and Initial Ranking of the 10 Options - Cape Verde

OPTIONS	Standardised Scores on Option/Criteria All criteria are scored on a scale of 0-1					*MCA 1* *Average score* *(Ranking 1)*
	Impact on vulnerable groups and resources	Impact on economic growth rate of poor people	Losses avoided by poor people	MEA synergies	Cost	
Option 1: Fodder crops	1.00	0	0.11	0.13	0.91	0.43 *(7)*
Option 2: Intensive livestock farming	1.00	0.25	0.33	0.38	0.93	0.58 *(6)*
Option 3: Water reservoirs	0.75	0.50	0.38	0.88	0.91	0.68 *(2)*
Option 4: Drip irrigation	0.25	0.50	1.00	0.88	0.71	0.67 *(3)*
Option 5: More resilient crop species	0.75	0.50	1.00	1.00	0.89	0.83 *(1)*
Option 6: Inorganic fertilisers and organic manure	1.00	0.25	0	0.88	0.86	0.60 *(5)*
Option 7: Forest resources management	1.00	0.25	0.30	0.75	0.98	0.66 *(4)*
Option 8: Renewables and LPG	0	0.50	0	0.75	0.51	0.35 *(9)*
Option 9: Industrial and tourism protected zones	0.50	1.00	0.44	0	0	0.39 *(8)*
Option 10: Sand and gravel extraction	0	0	0	0	1.00	0.20 *(10)*

At this stage, every score for each criterion has been expressed in the same standardized unit (on a 0 to 1 scale). This allows the average scores to be calculated—attaching equal importance or 'weight' to all criteria—and a preliminary ranking to be carried out (see the last column of Table 11):

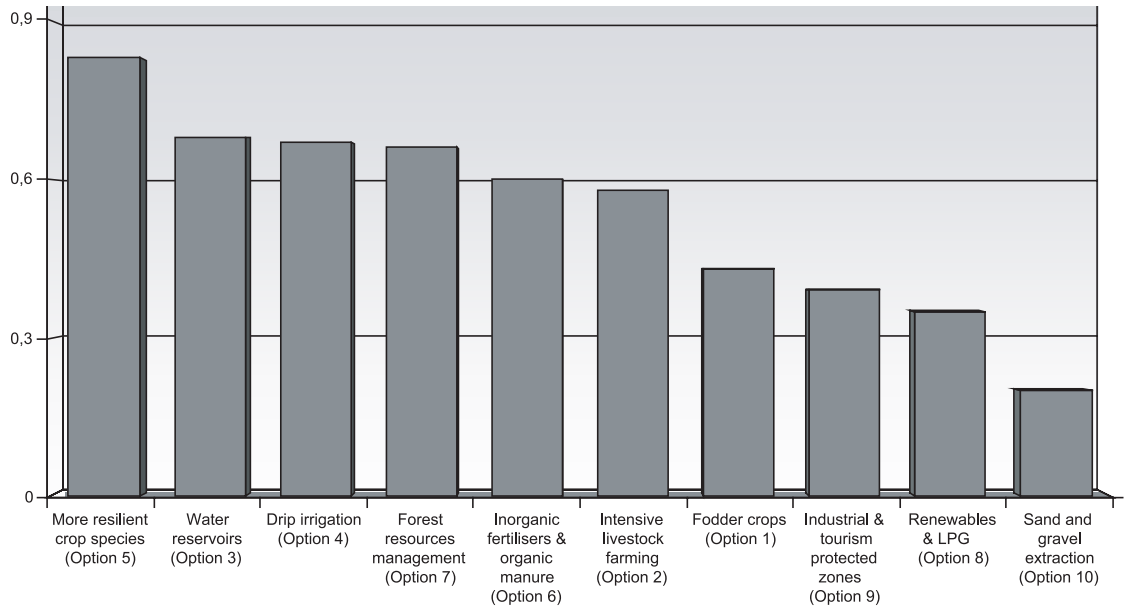
1. The average for each option corresponds to the sum of the standardised values for each criterion, divided by the number of criteria (in this case 5), since the criteria all have equal weighting. For example, the average for Option 1 is expressed as:
1.00+0+0.11+0.13+0.91=2.15 and 2.15/5 = 0.43

2. The option with the highest average receives the highest ranking, the second highest average ranks second, and so on.

Many commercial MCA packages are available, such as Hiview or Definite. They take users through the MCA procedure systematically. The results are provided in a good graphical interface. A few of them were demonstrated to some extent at the fourth regional NAPA workshop in 2003. However, given various limitations on the level of detail and accuracy or reliability of most input data for the NAPA proposals prioritisation and ranking, simple Excel spreadsheet exercises are perhaps preferable, at least initially. The classification obtained can be presented as a diagram showing the average score of each option, as shown in the example below (Figure 9).

The NAPA team might decide to discard some of the options, because their total score is very low and/or because their scores on certain criteria like poverty reduction or MEA synergy are also very low. In this example, it is assumed that Options 10 and 8 are discarded for just those reasons, while the other 8 options are retained for further, more detailed, consideration during Step 7.

Figure 9: Example of DEFINITE Model Output for Simulation MCA 1 with 10 Options (Equal Weighting).



CHECKLIST:

- ☑ Establish a specialized NAPA team to undertake the scoring
- ☑ Explain the MCA method, using a simple example
- ☑ Establish the scores for all options and criteria

3.3 RANK PROJECTS/ACTIVITIES AND DEMONSTRATE INTEGRATION INTO NATIONAL POLICY FRAMEWORKS AND PROGRAMMES

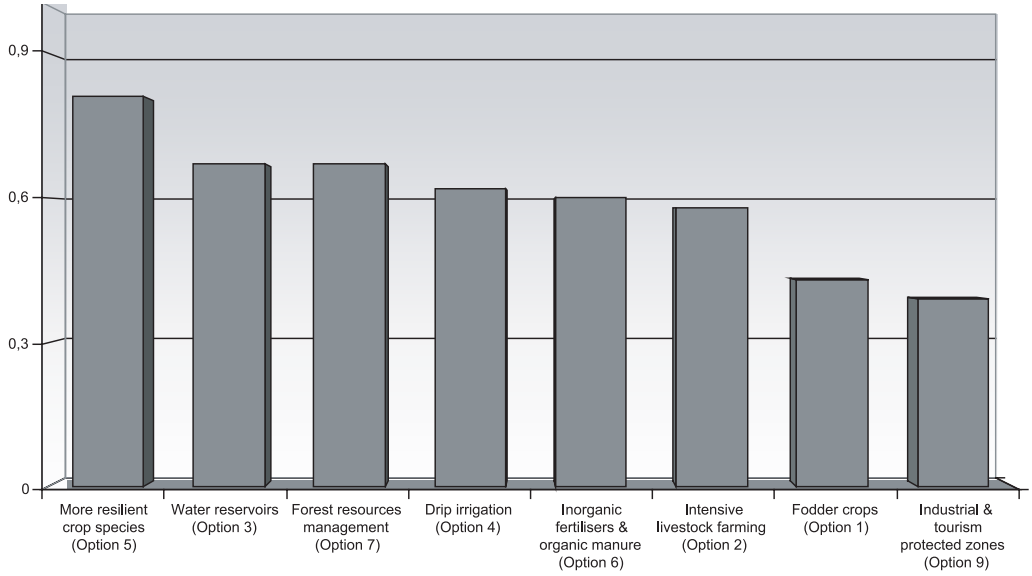
Continuing with the hypothetical Cape Verde example, the eight highest scoring options based on the selection criteria were retained for Step 7. To further reduce the number of options, the standardised scoring exercise should be repeated, as the range of criteria values (from highest to lowest) may no longer be accurate. The new scores are shown in Table 12. Additional criteria, as mentioned in the guidelines, may also be introduced, however this is not done here.

Table 12: Standardised Scores and 2nd Ranking for the 8 Remaining Options - Cape Verde

OPTIONS	Standardised Scores on Option/Criteria All criteria are scored on a scale of 0-1					MCA 2 *Average score* *(Ranking 2)* *(Ranking 1)**
	Impact on vulnerable groups and resources	Impact on economic growth rate of poor people	Losses avoided by poor people	MEA synergies	Cost	
Option 1: Fodder crops	1.00	0	0.11	0.13	0.93	0.43 *(7)* (7)
Option 2: Intensive livestock farming	1.00	0.25	0.33	0.38	0.95	0.58 *(6)* (6)
Option 3: Water reservoirs	0.67	0.50	0.38	0.88	0.93	0.67 *(2/3)* (2)
Option 4: Drip irrigation	0	0.50	1.00	0.88	0.72	0.62 *(4)* (3)
Option 5: More resilient crop species	0.67	0.50	1.00	1.00	0.91	0.81 *(1)* (1)
Option 6: Inorganic fertilisers and organic manure	1.00	0.25	0	0.88	0.88	0.60 *(5)* (5)
Option 7: Forest resources management	1.00	0.25	0.33	0.75	1.00	0.67 *(2/3)* (4)
Option 9: Industrial and tourism protected zones	0.33	1.00	0.44	0	0	0.36 *(8)* (8)

* Ranking 1 from Table 11 is included for comparative purposes.

Figure 10: Example of DEFINITE Model Output for Simulation MCA 2 with 8 Options (Equal Weighting)



Like with the previous ranking, the new classification can be presented as a diagram showing the average score of each option (see Figure 10).

By disregarding two options, the standardised score and ranking of the other options changed. The ranking is similar to before except for two changes. A tie for second place now exists between Option 3 (Water reservoirs) and Option 7 (Forest resources management). The latter moved up from 4th position, while Option 3's position remained unchanged. The one other movement comes from Option 4 (Drip Irrigation) which dropped from 3rd to 4th.

The comparison between these two simulations (Tables 11 and 12) demonstrates the effect of the presence (or absence) of proposals with perhaps 'extreme' scores (either high or low). In this example, the effect was more noticeable on the top ranking options, however the scores of other options where also modified though their ranking remained unchanged.

Sometimes, the ranking may change more significantly. This underlines the need for a reliable and unbiased assessment of each proposal's 'input data' on the basis of the selected criteria.

Weighting of criteria (stage f) and analysis of results (stage g) of the Multi-Criteria Analysis

So far, equal importance has been given to all 5 criteria—each criterion has had a weight of 1, or a relative weight of 0.20 (1/5). The NAPA team now has to consider (and agree on) whether or not some of the criteria should be given a higher importance—or weight—than others. This is a critical phase of discussion for the team, as they must grasp the full importance that should be given to each criterion, and should bear in mind all the elements that are at stake in this process. In the following example (Table 13), a significantly greater importance has been attached to the 'Costs' and 'Vulnerable Groups and Resources' criteria than to the other 3 criteria. Both have been given a weight of 3, whereas the other weightings remained 1; the relative weights of these more important criteria then becomes 0.333 (3/9), while the relative weight of the 3 other criteria becomes 0.111 (1/9); the relative weights of all criteria always adding up to 1. Relative weight is a measure of the relative significance of one criteria compared to another, that is the assigned weight of criteria X divided by the sum of the absolute weights. In this case the sum of the absolute weights equals 9, 3 for 'Costs', 3 for 'Vulnerable Groups and Resources', and 1 for each of the remaining three criteria.

Table 13: Multi-Criteria Analysis 3 (MCA 3)

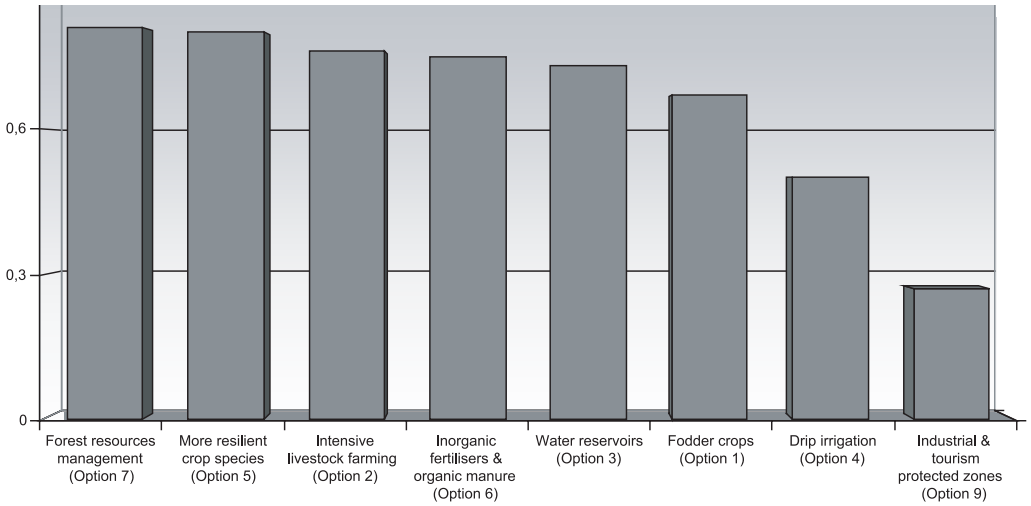
Weighted Scores and Ranking where great importance is attached to 'Costs' and 'Vulnerable Groups and Resources' using an Excel spread sheet and DEFINITE

OPTIONS	STANDARDISED SCORES ON CRITERIA					MCA 3 Scores *(Ranking 3)* *(Ranking 2)**
	Impact on vulnerable groups and resources	Impact on economic growth rate of poor people	Losses avoided by poor people	MEA synergies	Cost	
Absolute weight	3	1	1	1	3	Σ = 9
Relative weight	0.333	0.111	0.111	0.111	0.333	Σ = 1
Option 1: Fodder crops	1.00	0	0.11	0.13	0.93	0.67 (6) (7)
Option 2: Intensive livestock farming	1.00	0.25	0.33	0.38	0.95	0.76 (3) (6)
Option 3: Water reservoirs	0.67	0.50	0.38	0.88	0.93	0.73 (5) (2/3)
Option 4: Drip irrigation	0	0.50	1.00	0.88	0.72	0.50 (7) (4)
Option 5: More resilient crop species	0.67	0.50	1.00	1.00	0.91	0.80 (2) (1)
Option 6: Inorganic fertilisers and organic manure	1.00	0.25	0	0.88	0.88	0.75 (4) (5)
Option 7: Forest resources management	1.00	0.25	0.33	0.75	1.00	0.81 (1) (2/3)
Option 9: Industrial and tourism protected zones	0.33	1.00	0.44	0	0	0.27 (8) (8)

* Ranking 2 from Table 12 is included for comparative purposes.

To calculate the weighted score of an option, one must first multiply the relative weight of a criterion by the option's standardised score for that criterion. Once this is done for each criterion the results are added together, this is the weighted score. For example, the weighted score of Option 1 (Fodder crops) is: 0.333 x 1.00 (for the impact on vulnerable groups and resources criterion) + 0.111 x 0 (for the impact on economic growth rate of poor people criterion) + 0.111 x 0.11 (for the losses avoided by poor people criterion) + 0.111 x 0.13 (for the MEA synergies criterion) + 0.333 x 0.93 (for the cost criterion) = 0.67. Likewise, that of Option 9 (Industrial and tourism protected zones) is: 0.333 x 0.33 + 0.111 x 1.00 + 0.111 x 0.44 + 0.111 x 0 + 0.333 x 0 = 0.27; etc.

Figure 11: Example of DEFINITE Model Output for Simulation MCA 3 with 8 Options (Weight = 3 for 'Costs' and 'Vulnerable Groups')



As a result of the attributed weights, the ranking of the top proposals changes as follows: Option 5 moves from 1st to 2nd position while Option 7 moves into 1st position. Option 3 drops from 2nd/3rd to 5th position, and Option 2 rises from 6th to 3rd position (see Table 14). The lower ranking options also undergo some modification.

As we can see, any combination of weightings is possible, provided that it reflects a choice considered by the NAPA team. With these two exercises, the team can familiarize itself with the MCA approach and the impacts of various weightings on the selection of options before beginning work on its own NAPA.

Sensitivity analysis of results - Multi-Criteria Analysis stage (h)

The example of these different rankings (Tables 11 to 14) demonstrates that their interpretation should always take into account the manner in which the results were obtained. For example, in this hypothetical case, the fact that the 'Renewables and LPG' Option (8) was initially proposed as a priority adaptation option, rather than more significant options from an adaptation perspective, leads one to question the 'relevance of the proposal'. However, the criteria selected (and the scores they produced) corrected for its inclusion, as it ranked very low among the 10 proposals. This illustrates the importance of the composition of the NAPA team/expertise contributing to and influencing the discussion. In this respect, the following essential elements should always be kept in mind:

1. The range of stakeholders—sector and other experts, target groups, NGOs, actual decision makers, development agencies, etc.—each with their own, perhaps markedly different objective, are likely to introduce elements to the group dynamic that will ultimately modify the results.

2. The difficulty of achieving solutions that will satisfy all parties means that the team must accept, in advance, that there will be winners and losers. However, in order to negotiate a consensus between the parties concerned,

these roles could be interchanged in other national processes; compensations could be envisaged, using other mechanisms with alternative sources of funding, or using other regulatory or institutional benefits.

3. As no stakeholders have absolute powers or influence in the NAPA process, decisions can be reached based upon consensual decisions after discussion. However, one must also bear in mind that in the end, the final decision rests with the stakeholder(s) in charge of institutional and financial resources.

In summary, many factors influence the choice of options, criteria, and weighting used. Moreover, it is possible that during the participatory process, issues for discussion or debate may be raised regarding the weighting of the criteria, or any other choice that occurred through the NAPA process. This is why, at the end of an MCA, an analysis of sensitivity of the results should always be carried out. Although the example presented in Table 13 using an Excel spreadsheet, reveals some of this sensitivity, a full sensitivity analysis should be undertaken. This exercise is time consuming when using a simple spreadsheet. Commercial software packages offer both very quick calculation and 'elegant' presentation of sensitivity analyses. An example of the graphical Hiview representation of a partial sensitivity analysis is shown in Annex I.

Exercise 7: Multi-Criteria Analysis - Simulation MCA 4

The Ministry of Finance, might argue that the importance (weight) of the criteria 'Costs' should be equal to the sum of all (4) other benefit categories (see Table below).

CRITERIA	Vulnerable groups and resources	Economic growth rate of poor people	Losses avoided by poor people	MEA synergies	Cost
Score 4 **Absolute weights**	1	1	1	1	4

Task 1: Repeat the scoring/weighting procedure of Table 13 using the weights provided here.

Task 2: Enter the results into Table 14 in column 'MCA 4'. Discuss the changes in the ranking.

Task 3: Try to reach an agreement on the best three (3) options based on the results obtained in Table 14 (Simulations 2 through 4).

Exercise 8: Multi-Criteria Analysis - Simulation MCA 5

The discussion evolved among the NAPA team in such a way that it was decided to return to the original objectives of the adaptation projects, namely that they should target the poorest and most vulnerable population. A higher weight is selected for these criteria in the screening of adaptation activities.

CRITERIA	Vulnerable groups and resources	Economic growth rate of poor people	Losses avoided by poor people	MEA synergies	Cost
Score 5 Absolute weights	3	3	3	0.5	0.5

Task 1: Repeat the scoring/weighting procedure of Table 13 using the weights provided here.

Task 2: Enter the results into Table 14 in column 'MCA 5'. Discuss the changes in the ranking.

Task 3: Try to reach an agreement on the best three (3) options based on the results obtained in Table 14 (Simulations 2 through 5).

As one can see, any combination of weights is possible, provided that it reflects a choice that was discussed by the NAPA team. These two hypothetical examples will familiarize the team with this MCA approach and the impact of the various weightings before they begin work on their own NAPA.

Table 14: Results of the Multi-Criteria Analysis Simulations (MCA 1, 2 and 3)*

	Simulation MCA 1	Simulation MCA 2	Simulation MCA 3	Simulation MCA 4	Simulation MCA 5
	Score (Ranking)	Score (Ranking)	Score (Ranking)	Score (Ranking)	Score (Ranking)
Option 1: Fodder crops	0.43 (7)	0.43 (7)	0.67 (6)		
Option 2: Intensive livestock farming	0.58 (6)	0.58 (6)	0.76 (3)		
Option 3: Water reservoirs	0.68 (2)	0.67 (2/3)	0.73 (5)		
Option 4: Drip irrigation	0.67 (3)	0.62 (4)	0.50 (7)		
Option 5: More resilient crop species	0.83 (1)	0.81 (1)	0.80 (2)		
Option 6: Inorganic fertilisers and organic manure	0.60 (5)	0.60 (5)	0.75 (4)		
Option 7: Forest resources management	0.66 (4)	0.67 (2/3)	0.81 (1)		
Option 8: Renewables and LPG	0.35 (9)				
Option 9: Industrial and tourism protected zones	0.39 (8)	0.36 (8)	0.27 (8)		
Option 10: Sand and gravel extraction	0.20 (10)				

*Blank columns are included for the insertion of the results from further simulations (c.f.: Exercises 7 & 8).

Summary of work on Multi-Criteria Analysis to be undertaken by the NAPA Team

Multi-Criteria Analysis stage (a) ► NAPA Step 2: Context of the decision.

The decision-making context has been outlined in the section dealing with NAPA Steps 1&2 and the key factors involved are summarized (see Figure 5: Framework for Defining Potential NAPA Activities).

Multi-Criteria Analysis stage (b) ► NAPA Steps 3, 4 and 5: Identification of options.

The information for this phase comes mainly from the previous NAPA Steps 3 and 4 (c.f. List of options, page 49).

Multi-Criteria Analysis stage (c) & (d) ► NAPA Step 6: Scoring the options with the selected criteria.

The NAPA team should, at this stage, confer to decide upon the criteria to be retained. Once the list of criteria has been established, each option should be assigned a score in relation to the selected criteria: either a quantitative value corresponding to an estimate (monetary unit, rate or coefficient), or on a scaled score (e.g. 0 – 1, 0 – 5, or 0 – 100, etc.) based upon the judgment of the NAPA team. A score of 0 corresponds to the weakest positive effect between option and criterion; the top score on the scale indicates the best possible result, etc. When there is no quantitative information available on its numerical value, each option/criterion is scored via a participatory stakeholder exercise, and/or based on expert recommendation. As has been emphasised, the NAPA team must integrate all criteria, since they are key determinants in the analysis (as seen in stage f of the MCA). The manner in which the scoring is conducted is key for the subsequent steps. The scoring can be established by discussion and general consensus; by expert consultation; or by a combination of the two. The scoring process of the options can bring to light any possibly contentious results. It is partly on these scores that the analyses of results and their sensitivity will be based.

Multi-Criteria Analysis stage (e) ► NAPA Step 6: Standardisation.

Once the MCA mechanism (initially a 'black box' to most) is understood, the determinant factor for the work of the NAPA team then becomes the relevance of the data used. At this stage, it is worth repeating that the quality of the results can only be as reliable as the quality of the input obtained from the participatory stakeholder/expert consultations. A faulty evaluation of even one of the criteria can affect the entire MCA result. This is why one should always question the relevance of the input, in particular with respect to the basic data or individual country circumstances.

Multi-Criteria Analysis stage (f) ► NAPA Step 7: Weighting criteria.

Here again, each NAPA team will decide on the weighted value that should be assigned to each of the criteria. Given the participatory approach of the team, there is certainly the possibility that disagreements may arise between team members. The coordinator should not try to reach an immediate consensus, but rather, should take stock of the various positions and the arguments of each individual. As indicated in the overview above, the importance of the human factor in the work of the national NAPA team should constantly be taken into account.

Multi-Criteria Analysis stage (g) & (h) ► NAPA Step 7: Analysis of the results and sensitivity analysis.

Based upon the first results obtained, the team should conduct new simulations corresponding to each potential range of selected weightings, or of any other parameter that the team may wish to modify. If the ranking of the options remains identical whichever range of weightings is used, any disagreement between the stakeholders should be easily resolved. However, if changes in the range of weightings significantly affect the ranking (i.e. if the rankings are very unstable or sensitive to modification) consensus will not be

easily reached. It would then be necessary to reformulate the options, incorporating additional information and criteria.

It is always recommended with MCA to carry out several simulations: without weighting and with a variety of weightings. An option consistently obtaining the same result strongly suggests that such an activity should be included among the options retained for the final NAPA Step: the NAPA project profile formulation (see Section 3.4).

The final stage in a Multi-Criteria Analysis is to present the results.

Tables and graphical diagrams are appropriate. While this is the last technical stage of a Multi-Criteria Analysis, the graphical presentation should not be seen as the end result of the process, but as a visual support to feed into the discussion among the NAPA team. Based on the table/graphical analysis and further stakeholders discussions during the sensitivity analysis, a final selection of options to be retained will be made by relevant decision makers and will be carried over into the project profile development stage (NAPA Step 8).

CHECKLIST:

- ☑ Establish the weights for each criterion
- ☑ Apply the MCA matrix resulting in a ranking of the options
- ☑ Analyse the results (rankings) and investigate their sensitivity for various weights
- ☑ Choose the top priority options (with stakeholders) to compile profiles for Step 8

3.4 DEVELOP PROJECT PROFILES AND SUBMIT NAPA

How to formulate NAPA project profiles?

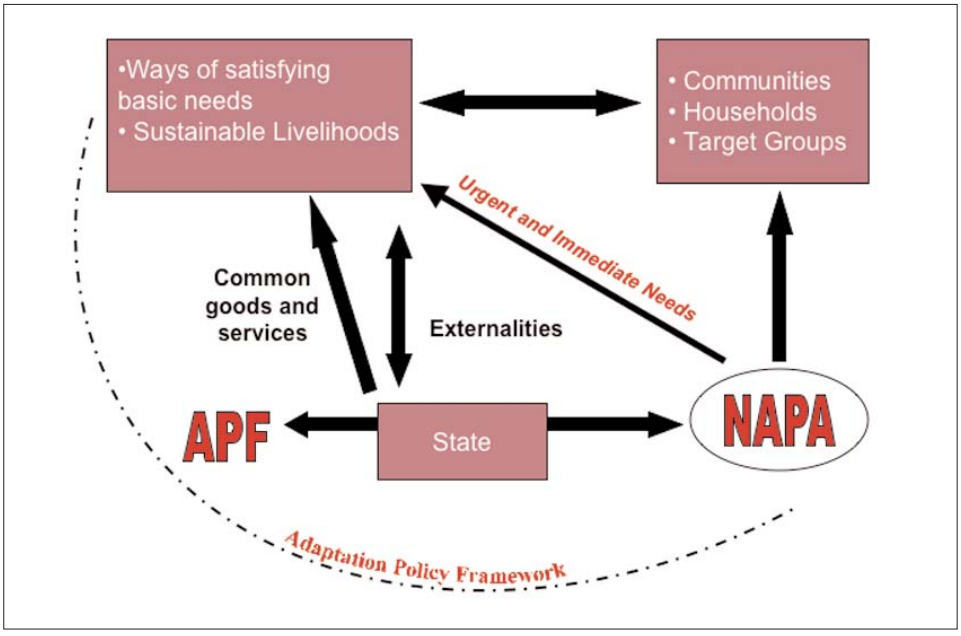
A concrete follow up of the selected priority options requires that project documents be prepared for the final NAPA document. The LEG and the GEF recommendations for carrying out this final phase of the NAPA process were tested to some extent at the NAPA regional workshops, but require further guidance. Projects selected through the NAPA process (Steps 1-7) should be, as a matter of priority, activities supporting target groups, particularly those vulnerable from a socio-economic and climatic perspective, to respond to their urgent and immediate needs, applying an 'endogenous, dynamic' approach. However, they should not comprise activities which would substitute the state's role in providing regular community services. They should be additional activities addressing newly recognized climate risks, yet be integrated or 'mainstreamed' into the overall development programme of the country. The figure below illustrates this approach in a schematic form.

The NAPA approach must be targeted. It constitutes a comprehensive set of realistic and concrete measures to respond to urgent and immediate needs. These measures are complementary to the more global and longer-term approach implemented through adaptation policies (the Adaptation Policy Framework/APF). Indeed, the APF seeks to target global adaptation policies and measures which are generally initiated by public authorities, and with regard to their development policies.

As discovered In the NAPA regional workshops, the formulation of NAPA options can sometimes lead to the identification of broad policy strategies, such as 'improving water access to rural populations'. In such cases, it is necessary (due to human and financial resources constraints for example) to phase in the programme's implementation over time, or to run another round of project selection—within this wider option—using the same methods described earlier. This is similar to prioritising and ranking sub-projects before formulating the profile of the projects that will ultimately be selected.

There is not an approved list of projects or a consensus on what constitutes good projects. Some examples of development strategies and ideas for specific projects were discussed during the NAPA workshops and their brief description is available on: www.unitar.org/ccp/napaworkshops/.

Figure 12: An Endogenous Dynamic



Source: ENDA TM, 'NAPA - UNITAR workshop' presentation, Ouagadougou, Oct. 2003.

Livelihood-based approaches have already been widely developed and funded by the donor community. Two of such projects currently being carried out in Sudan and India offer a good illustration of this approach by focussing on securing basic services while adapting to climate change in dryland communities. They are summarized in *'Sustainable Dryland Management: A Strategy for Securing Water Resources and Adapting to Climate Change'*.

Thus, it is important at this stage, to reaffirm the characteristics of the options that are given a high priority through the ranking process in Step 7.

- Who are the exact target groups?
- Is it an isolated activity or part of a broader programme?
- Is it a sector or multi-sector oriented option?
- Who will execute the programme or project activities?
- Are these activities already (partly) funded? By whom?

Clearly, the project must offer actions aimed at specified needs and for targeted populations. Below is a generic structure, proposed by the LEG, for this step. The NAPA team may refer to it in order to harmonise their individual project profiles.

This generic structure will enable the development of a logical framework, whose main properties are illustrated in the table and examples below. It is essential that the process remains open and participatory even at this stage, as is described in the Text Box on the opposite page (IFAD publication).

1. OVERALL OBJECTIVES

- To enable the individuals concerned to cope with/ adapt to urgent climate change risks (e.g. drought, flash floods, extreme weather conditions, etc.)
- The related impact or outcome indicator would be ' taken by the targeted livelihoods', once empowered by the NAPA interventions

2. PURPOSE OF THE (NAPA) PROJECT

- To reduce losses due to climate risks (or to improve livelihood conditions)
- The related outcome indicator would be materials saved/protected (in number of materials)

3. EXPECTED RESULTS

- 'Hardware' and 'software' delivered and put in operation ('software' in the sense of all boundary conditions needed to get the 'hardware' functioning properly; this could include 'trained institutions')
- The related progress indicator would be materials delivered by the NAPA interventions / activities, including operations/maintenance/management

4. ACTIVITIES

- The NAPA project inputs: Financial means and human resources (expertise)

The logical framework is not a panacea!

- It is an important tool that is the result of much trial and error and that has been validated for many purposes (planning, implementation and M&E).
- The process to arrive at the logical framework is more valuable than the product itself. This is especially true when the logical framework is used as an instrument for dialogue and negotiation with partners.
- The logical framework must be used flexibly and imaginatively. The process should not be dominated by the need to 'fill in the boxes'. Rather, one must 'transcend the boxes'. People should not be discouraged from using other planning tools; in fact, the logical framework should be complemented with other tools so as to meaningfully assist project management in decision-making.

Source: IFAD Participatory Approaches for an Impact Oriented Project Cycle, 2001.

Table 15: Generic Logical Framework

	Narrative of the Intervention Logic	**Objectively Verifiable Indicators of Achievement Sources and Means of Verification**
Overall Objectives	What is the broader overall objective, to which the project will contribute?	What are the key indicators related to the overall objective?
Project Purpose	What are the specific objectives that the project should achieve?	What are the sources of information that exist or can be collected? What are the methods required to get this information?
Expected Results	What are the concrete outputs envisaged to achieve the specific objectives? (they can be listed) • Pilot activity 1 • Pilot activity 2 • Etc....	What are the indicators needed to measure whether, and to what extent, the project achieves the envisioned results and effects? What are the sources of information for these indicators?
Activities	Required human and financial resources.	What are the resources required to implement these activities?

Example from Madagascar

The rural populations in the south of Madagascar are particularly vulnerable to consecutive water shortages as a result of climatic fluctuations. One of the selected priority options is to achieve sustainable levels of water consumption. One of the projects with this goal in mind involves increasing the efficiency of cooking water usage. Potatoes are much more efficient than maize when it comes to cooking water use and to the time involved in preparation. The substitution of potatoes for maize in the target communities is in its formative stage and needs to be reinforced. This is a main goal of the project. It is illustrated in the following logical framework (Table 16).

Table 16: Logical Framework - Example from Madagascar

Crop Substitution, Developed at the NAPA Workshops

	Narrative of the Intervention Logic	Objectively Verifiable Indicators of Achievement Sources and Means of Verification
Overall Objectives	Enabling communities to cope with climate change. • Sustainable water use in Madagascar	Community initiatives. • Solutions/alternatives used in households
Project Purpose	Avoided loss translated into community gains. Substitution of corn with potato in the south of Madagascar to reduce: • Loss of water • Loss of time	Community gains. • Number of m^3 saved • Number of hours saved
Expected Results	Attain the new conditions required for functioning. Awareness in the community regarding ways to: • Pilot activity 1 • Pilot activity 2 • Etc….	Results produced. • Distribution of training material • Number of activities implemented
Activities	Description of NAPA contributions. • Description of the human and financial resources of the NAPA	Detailed budget. • Detailed budget for identified NAPA projects

Example from Senegal

The forestry and stock raising zone in eastern Senegal has, over the past several years, suffered from encroaching desertification. Given the characteristics of this area, the desertification process will be greatly intensified by the warming of the climate. The rural populations have already, on several occasions, tried to launch afforestation or reforestation projects, particularly with fruit-bearing trees. These trees have the added advantage that they also serve as sources of income and sustenance. However, these initiatives have failed, mainly due to the lack of irrigation at the plantations. A project concept seeks to remedy this situation. This is illustrated in the following logical framework (Table 17).

Table 17: Logical Framework - Example from Senegal

Irrigation of the Forestry and Stock Raising Zone in the Department of Linguère

	Narrative of the Intervention Logic	Objectively Verifiable Indicators of Achievement Sources and Means of Verification
Overall Objectives	Enabling communities to cope with climate change and desertification.	Community initiatives. • The populations have experience with plantations but have not been successful.
Project Purpose	Avoided loss translated into community gains and food. Plantation irrigation to reduce: • Loss of trees • Loss of revenues and food	Community gains. • Number of productive trees • Quantity of fruit produced (tons)
Expected Results	Attain the new conditions required for functioning. Awareness of the community (rural community of Lagbar) regarding ways to: • Pilot activity 1 • Pilot activity 2 • etc.…	Results produced. • Ensure the irrigation of the pilot area (quantity of equipment) • Training, installation and maintenance (number)
Activities	Description of NAPA contributions. • Description of the human and financial resources of the NAPA	Detailed budget. • Detailed budget for identified NAPA projects

Source: ENDA from 'Adaptation Strategies to Desertification' - Asa Forsmann, KTG, 2001.

Work to be undertaken by the NAPA team

The NAPA team will undertake the preparation of project profiles, based on the selected option(s). All those participating in the exercise must follow the same principles and objectives, and employ the same methods. It is therefore imperative for all team members to work together at the start of the exercise, before breaking up into small sub-groups to work on specific projects. Otherwise, one runs the risk of creating disparities or will lack coherence in the establishment of the profiles.

In addition, certain questions remain to be answered regarding the selected option/project. As a reminder, below is a summary of the questions to be asked:

- What is the option's 'sectoral orientation'?
- Is it isolated or part of a wider programme?
- Who is being targeted?
- Who is presently carrying out these activities?
- Have the activities been (partly) funded already, and by whom?

A generic logical framework and the above questions constitute an indispensable base for the exercise. However, here again, it is necessary to hold a comprehensive group discussion on each of the questions.

Once the framework has been developed, the overall logical framework should be read horizontally and vertically; from top to bottom and vice versa. During this reading, any misgivings about even one of the linkages will indicate that there is something wrong with the project's logical framework. A working group or team discussion will therefore be necessary to clarify, modify, or amend the presentation. While this step could of course raise much discussion and debate, it is necessary to undertake it given the context of the UNFCCC process for NAPA project profile formulation. A well-conceived Logical Framework will greatly assist the development of detailproject profiles.

Step 8 working group in Ouagadougou, Burkina Faso.

CHECKLIST:

- ☑ Document the characteristics of the proposed projects
- ☑ Choose a logical framework for the projects
- ☑ Reply to questions corresponding to each step in the exercise
- ☑ Verify the pertinence of the project's logical framework
- ☑ Submit NAPA project profiles

ANNEX 1

EXAMPLE OF HIVIEW MCA OUTPUT FOR 'CAPE VERDE' OPTIONS

This presentation uses the same sample data as in Section 3. It allows for easy verification of the results obtained earlier using Excel and Definite. Each underlined item refers to the titles of the Hiview output.

Overall score

The results obtained in the MCA3 simulation are similar to the results obtained with Definite, although Hiview chooses a scale of standardisation between 0 and 100 while Definite has chosen 0 to 1.

Summary report

The shift from absolute scores to average scores is outlined in this summary report. It should be noted that with Hiview, contrary to our Definite example, the options are presented in a different setup: options are here in columns and the criteria in line.

Weights

These lines show the weights that are used for each criterion, with absolute and relative values.

Score

These lines show the scores obtained for each option according to each criterion (called short name): the absolute score, the standardised (normalised) and weighted score.

Report sorts

These lines compare the scoring differerentials (for both absolute and weighted scores) between two options. In the example below, it is 'Water reservoirs' versus 'Resilient crops'.

```
Hiview for Windows     Version 2.00H
Model    c:\hv_eq_db\cap_verd.hvw
Model created 30/03/04
```

Overall scores

Option	overall score
Fodder cro	66.88
Int Livesto	75.60
Water res	72.63
Irrigation	50.44
Resil crop	80.24
Inorg fertile	75.04
Forest ma	81.48
Coast prot	27.16

Summary Report

Criteria	FodderCro	IntLivest	WaterRes	DripIrrig	ResilCro	InorgFerti	ForestMa	CoastProt	Cum Wt
COSTS	10	8	10	30	12	15	3	100	33
LOSSAVOIDED	100	200	220	500	500	50	200	250	11
POVREDUCTI	1	2	3	3	3	2	2	5	11
MEA SYNERG	1	3	7	7	8	7	6	0	11
VulnGr_Res's	5	5	4	2	4	5	5	3	33
Total	67	76	73	50	80	75	81	27	

Weights

	Name	Weight	% weight	Cum Wt
ROOT	COSTS	3	33	33
ROOT	LOSSAVOIDED	1	11	11
ROOT	POVREDUCTI	1	11	11
ROOT	MEA SYNERG	1	11	11
ROOT	VulnGr Res's	3	33	33

Scores

Short Name : COST

Scale : Data
Scale Type : Relative

	Option	Score	Normalised	Weighted
1	Fodder cro	10	93	31
2	Int Livesto	8	95	32
3	Water res	10	93	31
4	Irrigation	30	72	24
5	Resil crop	12	91	30
6	Inorg fertil	15	88	29
7	Forest ma	3	100	33
8	Coast prot	100	0	0

Short Name : LOSSAVOIDED

Scale : Data
Scale Type : Relative

	Option	Score	Normalised	Weighted
1	Fodder cro	100	11	1
2	Int Livesto	200	33	4
3	Water res	220	38	4
4	Irrigation	500	100	11
5	Resil crop	500	100	11
6	Inorg fertil	50	0	0
7	Forest ma	200	33	4
8	Coast prot	250	44	5

Short Name : POVREDUCTI

Scale : Data
Scale Type : Relative

	Option	Score	Normalised	Weighted
1	Fodder cro	1.000	0	0
2	Int Livesto	2.000	25	3
3	Water res	3.000	50	6
4	Irrigation	3.000	50	6
5	Resil crop	3.000	50	6
6	Inorg fertil	2.000	25	3
7	Forest ma	2.000	25	3
8	Coast prot	5.000	100	11

Short Name : MEA SYNERG

Scale : Data
Scale Type : Relative

	Option	Score	Normalised	Weighted
1	Fodder cro	1	13	1
2	Int Livesto	3	38	4
3	Water res	7	88	10
4	Irrigation	7	88	10
5	Resil crop	8	100	11
6	Inorg fertil	7	88	10
7	Forest ma	6	75	8
8	Coast prot	0	0	0

Short Name : VulnGr_Res's

Scale : Data
Scale Type : Relative

	Option	Score	Normalised	Weighted
1	Fodder cro	5	100	33
2	Int Livesto	5	100	33
3	Water res	4	67	22
4	Irrigation	2	0	0
5	Resil crop	4	67	22
6	Inorg fertil	5	100	33
7	Forest ma	5	100	33
8	Coast prot	3	33	11

Report Sorts

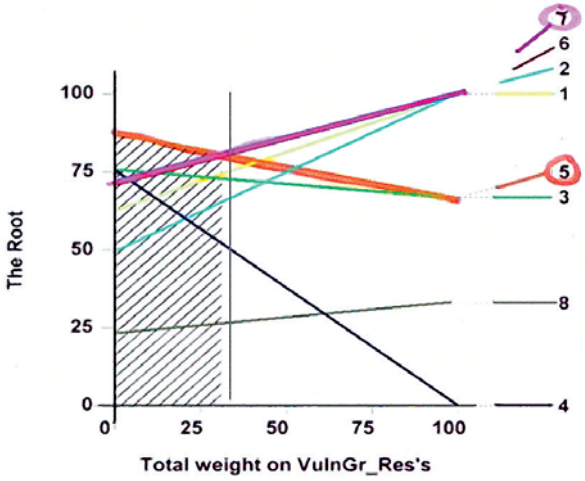
Water res vs Resil crop sorted by CUM WT

Criterion	CUM WT	DIFF	WTD
COSTS	33.33	2.06	0.69
Vuln Gr&Res's	33.33	0.00	0.00
LOSSAVOIDED	11.11	-62.22	-6.91
POVREDUCTI	11.11	0.00	0.00
MEA SYNERG	11.11	-12.50	-1.39

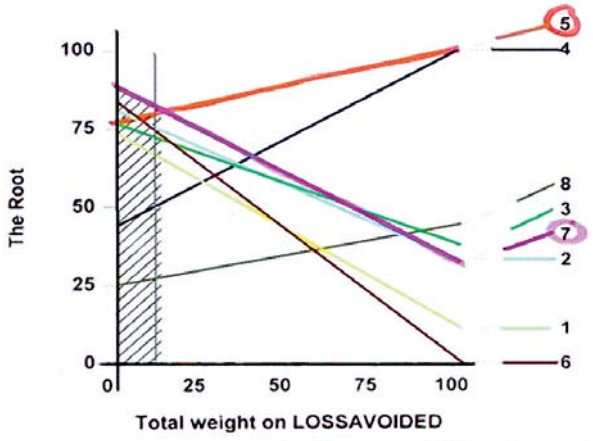
EXAMPLE OF HIVIEW-MODEL OUTPUT SENSITIVITY ANALYSIS 'CAPE VERDE' OPTIONS

The sensitivity of options, based upon individual criteria, can be illustrated graphically. The analysis begins at MCA2 where two of the 10 options have already been dropped; hence only 8 are seen in the graphs below. Each option is represented by a line which originates (origin/root) from the average score of the option (overall score). The slope depends on the score assigned for the criterion in question (scores). If the line has an ascending slope, the criterion strongly influences the option, whereas a downward slope indicates that the criterion's influence is weak. A comparison of the various graphs makes it possible to observe the changes in the classification of the options, i.e. their sensitivity to each individual criterion. The graphs below illustrate the sensitivity of the 8 options to the 'Vulnerable groups and resources', and 'Losses avoided by poor people' criteria.

SENSITIVITY OF "VULNERABLE GROUPS & RESOURCES""



SENSITIVITY OF "LOSSES AVOIDED"



ANNEX 2

GLOSSARY

Adaptive Capacity
Adaptive capacity is the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences. *(IPCC)*

Chappati Diagram
Different sizes of paper cut-outs *(chappati)* are used to indicate the relative importance of various items, events, problems, institutions, etc.

Coping Strategy
A planned response to external events (usually unwanted or unplanned). *Coping* is dealing with events. *Coping strategy* is the particular approach used.

Desertification
Land degradation in arid, semi-arid, and dry sub-humid areas resulting from various factors, including climatic variations and human activities. Further, the UNCCD (The United Nations Convention to Combat Desertification) defines land degradation as a reduction or loss, in arid, semi-arid, and dry sub-humid areas, of the biological or economic productivity and complexity of rain-fed cropland, irrigated cropland, or range, pasture, forest, and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns, such as: (1) soil erosion caused by wind and/or water; (2) deterioration of the physical, chemical and biological or economic properties of soil; and (3) long-term loss of natural vegetation. *(IPCC)*

Extreme weather event
An extreme weather event is an event that is rare within its statistical reference distribution at a particular place. Definitions of 'rare' vary, but an extreme weather event would normally be as rare as or rarer than the 10th or 90th percentile. By definition, the characteristics of what is called extreme weather may vary from place to place. *(IPCC)*

Integrated assessment
A method of analysis that combines results and models from the physical, biological, economic and social sciences, and the interactions between these components, in a consistent framework, to evaluate the status and the consequences of environmental change and the policy responses to it. *(IPCC)*

Livelihood
A combination of the resources used and the activities undertaken in order to live. The resources might consist of individual skills and abilities (human capital), land, savings and equipment (natural, financial and physical capital, respectively) and formal support groups or informal networks that assist in the activities being undertaken (social capital). *(DFID)*

Logical Framework

This is an analytical framework used in formulating and designing projects and programmes. In these logical system objectives, the outputs, activities, and inputs are systematically described and analysed with a focus on their interrelations. It is sometimes called 'LogFrame'.

PAR: Participatory Action Research
An approach introduced to enhance the practice of Participatory Rapid Appraisal (PRA) under the guiding principle of learning from, with and by people incorporated in the process. The PAR team attempts to see 'with the eyes of the people' concerned, including the poor and disadvantaged. Analytical instruments are applied with utmost care and only together with the people. Representatives or advocates of the groups concerned, who are knowledgeable about their situation and able to voice people's interests (mainly for those who cannot / do not speak up themselves) are incorporated before an actual field phase. The team shares people's lives and gets to know people's strategies for solving their problems.

PRA: Participatory Rural/Rapid Appraisal
PRA is a label given to a growing family of participatory approaches and methods that emphasize local knowledge and enable local people to do their own appraisal, analysis, and planning. PRA uses group animation and exercises to facilitate information sharing, analysis, and action among stakeholders. Although originally developed for use in rural areas, PRA has been employed successfully in a variety of settings. The use of PRA enables development practitioners, government officials, and local people to work together on context-appropriate programmes. *(World Bank)*

Ranking activities
Rating or positioning on a scale. A method used as part of Participatory Rural Appraisal (PRA) to investigate decision-making preferences and why people make choices. Ranking processes in PRA include preference ranking (ranks items through paired comparisons), direct matrix ranking (ranks decision criteria), and wealth ranking (investigates perceptions of wealth, a rapid way of assessing the population's social strata).

Stakeholders
People who are affected in some way or another by an activity. Can be divided into primary stakeholders and secondary stakeholders:

- Primary stakeholders are those who are directly affected by an activity, as beneficiaries, losers or implementing agencies or those with a direct influence the activity.
- Secondary stakeholders are indirectly affected by an activity. *(DFID)*

Sustainable Livelihoods
A livelihood is sustainable when it is capable of continuously maintaining or enhancing the current standard of living without undermining the natural resource base. For this to happen it should be able to overcome and recover from stresses and shocks (e.g. natural disasters or economic upsets). *(DFID)*

ANNEX 3

SELECTED BIBLIOGRAPHY

Andreassen, Maria Dyhr & Britha H. Mikkelsen (2003). *Bibliography on participation and participatory methods in development work and research*, IIS/Gl. Kongevej Working Paper 03.3. Web: http://www.cdr.dk/working_papers/wp-03-3.pdf

Adger, W.N., Brooks, N., Bentham, G., Agnew, M. and Eriksen, S. (2004). *New indicators of vulnerability and adaptive capacity. Technical Report 7.* Norwich: Tyndall Centre for Climate Change Research. Web: http://www.tyndall.ac.uk/research/theme3/final_reports/it1_11.pdf

Bohle, H.-G., Downing, T.E. and Watts, M. (1994). Climate change and social vulnerability: the sociology and geography of food insecurity. *Global Environmental Change 4*(1): 37-48.

Broersma, Klaus (2003). *Selection and prioritisation of adaptation measures*. SEM.

Catalyze. *Hiview 3 Software Guide*. UK.

Chambers, Robert (1992). *Rural Appraisal: Rapid, Relaxed and Participatory*. Brighton: Institute of Development Studies.

Chambers, Robert (2002). *Participatory Workshops: A Sourcebook of 21 Sets of Ideas and Activities*. Sussex: IDS.

Cornwall, Andrea, Musyaki, Samuel and Pratt, Garrett (2001). *In Search of a New Impetus: Practitioners' Reflections on PRA and Participation in Kenya*. IDS Working Paper No.131. Web: http://www.ids.ac.uk/ids/bookshop/wp/wp131.pdf

Downing, T.E. (with Butterfield, R., Cohen, *et al.*) (2002). *Climate Change Vulnerability: Toward a frame work for comparing adaptability to climate change impacts*. United Nations Environment Programme. Nairobi: UNEP.

Downing, T.E. and Patwardhan, A., *et al.*(2004). *Vulnerability assessment for climate adaptation. Technical Paper 3 in the Adaptation Policy Framework*. New York: United Nations Development Programme.

GEF (2002). *Operational Guidelines for Expedited Funding for the Preparation of National Adaptation Programs of Action by Least Developed Countries*. Web: http://www.gefweb.org/NAPA_guidelines_revised__April_2002_.pdf

Hauck, V. and T. Land (2000). *Beyond the Partnership Rhetoric: Reviewing Experiences and Policy Considerations for Implementing 'Genuine' Partnerships in North-South Cooperation*. ECDPM Discussion Paper 20. Maastricht: ECDPM. Web: http://www.ecdpm.org/Web_ECDPM/Web/Content/Navigation.nsf/index.htm

Helming, Stefan and Gobel, Michael (1997). *ZOPP: Objectives Oriented Project Planning*. Eschborn: GTZ.

IFAD (2001). *Participatory Approaches for an Impact-Oriented Project Cycle*.
English: http://www.ifad.org/events/past/impact/impact_e.pdf
Espagnol: http://www.ifad.org/events/past/impact/impact_s.pdf

IISD (2003). *Sustainable Drylands Management: A Strategy for Securing Water Resources and Adapting to Climate Change,* Livelihooods and Climate Change Information Paper 3. Winnipeg: IISD.
Web: http://www.iisd.org/pdf/2003/envsec_livelihoods_3.pdf

IMF (2003). Cape Verde, Statistics Appendix.
Web: http://www.imf.org/external/pubs/ft/scr/2003/cr03153.pdf

IPCC (2001). *Climate Change 2001: Impacts, Adaptation and Vulnerability.* UK: Cambridge University Press. Web: http://www.grida.no/climate/ipcc_tar/wg2/index.htm

ISDR (2002). *Living with Risk: A Global Review of Disaster Reduction Initiatives*. Geneva: International Strategy for Disaster Reduction.

Janssen, R., M. van Herwijnen and E. Beinat (2001). DEFINITE for Windows. A system to support decisions on a finite set of alternatives (Software package and user manual). Amsterdam: Institute for Environmental Studies (IVM). Web: http://www.definite-bosda.nl

Munasinghe, Mohan (2003). *Analysing the nexus of sustainable development and climate change: an overview.* OECD.

Naiade Software: Joint Research Centre – EC, ISPRA SITE, Institute for Systems, Informatics and Safety.
Web: http://alba.jrc.it/ulysses/voyage-home/naiade/naiahome.htm

Rennie, J. Keith and Singh, Naresh C. (1995). *A Guidebook for Field Projects: Participatory Research for Sustainable Livelihoods*. UNDP.
Web: http://www.undp.org/sl/Documents/Manuals/Guide_eng/guide_(eng).htm

Roncerel, A., Boyer, B., Alam, M. and Rahman, A. (2003). *Participatory Approaches for NAPA Preparation: An Overview.* Geneva: UNITAR.
Web: http://www.unitar.org/ccp/Addis/STEP%205%20documentation%20Overview.pdf

Sontheimer, S.; Callens, K.; and Seiffert, B. (1999). *Conducting a Participatory Rural Apraisal (PRA) - Training and Modifying PRA Tools to Your Needs. An Example from a Participatory Household Food Security and Nutrition Project in Ethiopia*.
Web: http://www.fao.org/DOCREP/003/X5996E/X5996E00.HTM

Turner, B.L. II, Kasperson, R.E., *et al.* (2003). *A framework for vulnerability analysis in sustainability science*. PNAS 100 (14): 8074-8079.
Web: http://www.pnas.org/cgi/content/full/100/14/8074?ijkey=290f9b14d21e29ead90d7047accef893b37b8e34

UNDP (1998). *Empowering People: A Guide to Participation*.
Web: http://www.undp.org/sl/Documents/Manuals/Empowering/abstract_empowering_people.htm

UNESCAP (2001). *Index of Tools and Techniques for Stakeholder Involvement.*
Web: http://www.unescap.org/esd/environment/publications/gsp/annexes.pdf

UNESCAP. *Stakeholder Participation,* UNESCAP Virtual Conference on Integrating Environmental Considerations into Economic Decision-Making.
Web: http://www.unescap.org/drpad/vc/orientation/M6_intro.htm

UNFCCC (2002). Decision 28/CP.7 Guidelines for the preparation of national adaptation programme of action. Web: http://unfccc.int/resource/docs/cop7/13a04.pdf#page=7

UNFCCC/ LEG (2002). *Annotated Guidelines for the Preparation of National Adaptation Programmes of Action*. Bonn: Least Developed Countries Expert Group.
Web: http://unfccc.int/files/not_assigned/b/application/pdf/annguide.pdf

Willows, R.I. and Connell, R.K., eds. (2003). *Climate adaptation: Risk, uncertainty and decision-making*. Oxford: UKCIP. Web: http://www.ukcip.org.uk/resources/publications/documents/4.pdf

World Bank (2003). *Joint staff assessment of the PRSP.*
Web: http://poverty.worldbank.org/library/topic/3474/3478/

World Bank (2003). *Cape Verde at a Glance*.
Web: http://www.worldbank.org/data/countrydata/aag/cpv_aag.pdf

World Bank (1995). *Designing Community Based Development.* Social Development Notes No.4.

IN FRENCH

FIDA (2001). *Approches participatives pour un cycle des projets orientés vers l'impact.*
http://www.ifad.org/events/past/impact/impact_f.pdf

PNUD. *Recherche Participative pour une Subsistance Durable : Un Guide pour les projets de terrain*.
http://www.undp.org/sl/Documents/Manuals/Recherche/Recherche_Participative.htm

République du Cap Vert, Ministère de l'Agriculture, Alimentation et Environnement (1999). *SE pour l'Environnement -SEPA – Communication nationale sur les Changements Climatiques*.

Schneider, Hartmut and Libercier, Marie-Hélène (1995). *Mettre en Oeuvre le Développement Participatif.* Paris: OCDE.

Thomas, Jean-Philippe; Broersma, Klaus *et al.* (2003). *Sélection et hiérarchisation des options dans le cadre de l'adaptation.* Atelier PANA – UNITAR, Ouagadougou.

UNITAR (2003). Compte rendu Atelier PANA, Ouagadougou.
http://www.unitar.org/ccp/napaworkshops/index.htm

KEY WEB SITES

The UNFCCC secretariat maintains the inventory of methodologies and tools to evaluate climate change impacts and adaptation: http://unfccc.int/Methods_and_Science/impacts_vulnerability_and_adaptation/Methods_and_tools_for_assessment/items/539.php

The United Nations Environment Programme climate change portal is the source of climate change information used by UNEP and its partners, including the GEO process: http://climatechange.unep.net. Also see the UNEP GEF activities: www.unep.org/GEF/; public fact sheets, a guide to the Climate Change Convention: www.unep.org/dec/; and vital climate graphics: www.vitalgraphics.net

The United Nations Institute for Training and Research supports the NAPA process: www.unitar.org/ccp

The United Nations Development Programme GEF website provides operational policies, references, tools, and corporate programmes, including the National Communications Support Programme: www.undp.org/gef/; The Adaptation Policy Framework – User's Guidebook.
http://www.c-ciarn.ca/app/filerepository/50983999B2834D6BA3D30137DDE0CFD9.pdf

The World Bank's Climate Change Team coordinates climate change issues within the Bank and provides technical support to the GEF Program: www.worldbank.org/climatechange/ and www.worldbank.org/gef/

The GEF website includes publications, working papers, and evaluations reports: www.gefweb.org

The Intergovernmental Panel on Climate Change (IPCC) website contains the full text and graphics for the four climate change 2001 reports: www.ipcc.ch

The Climate Ark allows full text searches of other climate change websites: www.climateark.org

A huge amount of information, guidance notes, tools and literature on livelihoods is available from www.livelihoods.org, sponsored by the UK Department for International Development and Institute for Development Studies, University of Sussex.

Partners in the UNEP/UNITAR support programme to the NAPA workshops include ENDA (www.enda.sn), RISOE (http://uneprisoe.org/), BCAS (www.bcas.net), and PSU (see http://www.africaalliance.psu.edu/).

The Stockholm Environment Institute leads development of an international vulnerability network through www.VulnerabilityNet.org. The web site has a public forum for supporting the NAPA workshops, where this report, supporting spreadsheets and related material are posted. Also see: www.sei.se

ELDIS is a gateway to information on development issues, providing free and easy access to wide range of high quality online resources. It hosts a number of resource guides, including a guide on participation issues and tools. See: http://www.eldis.org/manuals/toolspart.htm

The Food and Agriculture Organisation hosts a wide range of resources for stakeholder participation as a part of their Informal Working Group on Participatory Approaches and Methods. Many can be found at: http://www.fao.org/Participation/default.html

INDEX OF TABLES, FIGURES AND EXERCISES

Notes

Notes

Notes

For more information please contact:

Chair of the LDC Expert Group
c/o UNFCCC Secretariat
Martin-Luther-King-Strasse 8
53175 Bonn, Germany
P.O. Box 260124
LEGhelp@unfccc.int

Published by:
UNITAR
Climate Change Programme
Palais des Nations
Avenue de la Paix 8-14
CH-1211 Geneva 10 Switzerland
info-pana-napa@cern.ch

For more information please contact:

Chair of the LDC Expert Group
c/o UNFCCC Secretariat
Martin-Luther-King-Strasse 8
53175 Bonn, Germany
P.O. Box 260 124
LEGhelp@unfccc.int

Published by:

Climate Change Programme
Palais des Nations
Avenue de la Paix 8-14
CH-1211 Geneva 10 Switzerland
info-pana-napa@cern.ch