



MAINSTREAMING CLIMATE CHANGE ADAPTATION INTO DEVELOPMENT PLANNING: A Guide for Practitioners



**MAINSTREAMING CLIMATE CHANGE ADAPTATION
INTO DEVELOPMENT PLANNING:
A Guide for Practitioners**

The Poverty-Environment Initiative (PEI) of the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) is a global UN-led programme that supports country-led efforts to mainstream poverty-environment linkages into national development planning. The PEI provides financial and technical assistance to government partners to set up institutional and capacity strengthening programmes and carry out activities to address the particular poverty-environment context.

Mainstreaming Climate Change Adaptation into Development Planning: A Guide for Practitioners is also available online at www.unpei.org.

Published 2011
© 2011 UNDP-UNEP

Produced by the UNDP-UNEP Poverty-Environment Facility
Directors of Publication: Philip Dobie, John Horberry and David Smith
Research, writing and project coordination: Sophie De Coninck
Publication coordination: Henrike Peichert
Editing: Karen Holmes
Design and layout: Nita Congress

Cover photos:

Storm-battered mangroves, Khulna Province, Bangladesh © Tim Laman/NaturePL/SpecialistStock;
mangrove afforestation for coast and climate protection, Mombasa, Kenya © Joerg Boethling/Still Pictures

Chapter headline photos:

1. Flooded city of Dhaka, Bangladesh © Trygve Bolstad/Lineair/Still Pictures; flood protection embankment, Kalabogi Village, Bangladesh © Joerg Boethling/Still Pictures
2. Sand drifting, village near Nouakchott, Mauritania © Jorgen Schytte/Still Pictures; tree plantation fences, Magtaa-lahjar, Mauritania © Jorgen Schytte/Still Pictures
3. Coral death bed, Fitzroy Island, Australia © Andre Maslennikov/BioSphoto/Still Pictures; artificial reef, Bali, Indonesia © Wolfgang Poelzer/WaterFrame/Still Pictures
4. Aftermath of devastating cyclone, Khulna, Bangladesh © Shaikh Mohir Uddin/Photo Bangladesh/SpecialistStock; house raised to combat flooding caused by climate change, Ganges Delta, Bangladesh © David Woodfall/Still Pictures
5. Field of sunflowers drying © Gunther Michael/BioSphoto/Still Pictures; drought-resistant maize, Kenya Agriculture Research Institute © Anne Wangalachi/CIMMYT
6. Trees knocked down by coastal erosion caused by sea level rise, Funafuti Atoll/Tuvalu © Ashley Cooper, SpecialistStock; plastic bags filled with sand as erosion control, Maldives © Robert Harding, SpecialistStock

All \$ referred to in this report are US\$, unless otherwise specified. The term “billion” in this report means a thousand million.

This publication may be reproduced in whole or in part and in any form for educational or non-profit purposes without special permission from the copyright holder provided acknowledgement of the source is made. The UNDP-UNEP Poverty-Environment Facility would appreciate receiving a copy of any publication that uses this publication as a source. No use of this publication may be made for resale or for any other commercial purpose whatsoever without prior permission in writing from UNDP and UNEP.

The views expressed in this publication are those of the authors and do not necessarily reflect the views of UNDP and UNEP. The designation of geographical entities in this report, and the presentation of the material herein, do not imply the expression of any opinion whatsoever on the part of the publisher or the participating organizations concerning the legal status of any country, territory or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

While reasonable efforts have been made to ensure that the contents of this publication are factually correct and properly referenced, UNDP and UNEP do not accept responsibility for the accuracy or completeness of the contents and shall not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on, the contents of this publication, including its translation into languages other than English.

Table of Contents

Acknowledgements • vii

Preface • ix

Chapter 1. About the Guide • 1

- 1.1 What Is Poverty-Environment Mainstreaming? • 2
- 1.2 Need for Mainstreaming Climate Change Adaptation • 2
- 1.3 Purpose and Approach • 2
- 1.4 Target Audience • 4
- 1.5 Structure • 4

Chapter 2. Understanding Mainstreaming Climate Change Adaptation • 5

- 2.1 Identifying Linkages between Climate Change, Development and Poverty • 6
- 2.2 Understanding Mainstreaming of Climate Change Adaptation as an Integrated Policy Approach • 10
- 2.3 Defining Levels of Intervention in Mainstreaming Climate Change Adaptation • 10

Chapter 3. An Approach to Mainstreaming Climate Change Adaptation • 11

- 3.1 Challenges • 12
- 3.2 Introducing Elements of an Approach for Mainstreaming Climate Change Adaptation • 13
- 3.3 Measuring Progress • 15

Chapter 4. Finding the Entry Points and Making the Case • 17

- 4.1 Preliminary Assessments: Understanding the Climate-Development-Poverty Linkages • 18
- 4.2 Preliminary Assessments: Understanding the Governmental, Institutional and Political Contexts • 20
- 4.3 Raising Awareness and Building Partnerships • 22
- 4.4 Evaluating Institutional and Capacity Needs • 26

Chapter 5. Mainstreaming Climate Change Adaptation into Policy Processes • 29

- 5.1 Impact, Vulnerability and Adaptation Assessments • 30
- 5.2 Economic Analyses • 36
- 5.3 Demonstration Projects • 41
- 5.4 Influencing Policy Processes • 44
- 5.5 Developing and Climate-Proofing Policy Measures • 52

Chapter 6. Meeting the Implementation Challenge • 59

- 6.1 Strengthening the National Monitoring System • 60
- 6.2 Budgeting and Financing Measures for Climate Change Adaptation • 64
- 6.3 Supporting Implementation at National, Sector and Subnational Levels • 69
- 6.4 Strengthening Institutions and Capacities • 74

Abbreviations and Acronyms • 79

Glossary • 80

References • 84

Boxes

- 2.1 Impacts of Climate Change on Livelihoods, Resilience and Health of the Poor • 8
- 2.2 Impacts of Climate Change on Key Sectors • 8
- 3.1 Progress Checklist for Climate Change Adaptation Mainstreaming • 16
- 4.1 Guiding Questions for Assessing Climate-Development-Poverty Linkages • 20
- 4.2 Guiding Questions for Assessing the Governmental, Institutional and Political Contexts • 21
- 4.3 Initiating the Dialogue in Colombia • 23
- 4.4 Towards a Strategic Framework and National Action Programme: Malawi • 24
- 4.5 Possible Champions for Mainstreaming Climate Change Adaptation • 25
- 4.6 Guyana: Vulnerability and Capacity Assessment of the Agricultural Sector • 27
- 4.7 Guiding Questions for Evaluating Institutional and Capacity Needs • 28
- 4.8 Identifying the Need for an Institutional Coordination Mechanism in Cape Verde • 28
- 5.1 Taking into Account Non-Climatic Vulnerabilities: Drought and Agriculture • 31
- 5.2 Regional Predictive Modelling: PRECIS • 33
- 5.3 Conveying the Message in Ethiopia • 37
- 5.4 Economic Analysis of Current and Future Drought-Related Losses: Maharashtra, India • 37
- 5.5 Making the Economic Case for Adaptation in Mozambique • 39
- 5.6 Country-Specific Evidence Supports Various Entry Points for Adaptation Mainstreaming in Kiribati • 39
- 5.7 Integration of Climate Risks into the PRSP in Cambodia • 40
- 5.8 Assisting Sector Mainstreaming through Pilot Activities: China's Agricultural Sector • 42
- 5.9 Raising Awareness of Communities in Support of Pilot Projects • 43
- 5.10 Defining the Climate Lens • 44

- 5.11 Use of Strategic Environmental Assessment to Integrate Climate Change Recommendations into Fiji's Tourism Development Plan • 49
- 5.12 Climate-Proofing the Strategic Development Plan of the Federated States of Micronesia • 50
- 5.13 Linking the Recommendations Arising from the NAPA to the PRSP: Rwanda • 51
- 5.14 Index Insurance as an Effective Instrument in Reducing Climate-Related Risks • 52
- 5.15 Understanding Vulnerability due to Current Policy Measures: The Case of Paddy Rice in Andhra Pradesh, India • 53
- 5.16 Harvesting Co-Benefits through Sustainable Agricultural Land Management Practices in Kenya • 56
- 5.17 Guiding Questions for Prioritizing Adaptation Measures • 58
- 5.18 Prioritization and Integration of Adaptation Options in Kiribati • 58
- 6.1 Matching Financing of Budget Allocations in Kiribati • 65
- 6.2 Performance Budgeting as an Element of Mainstreaming Climate Change Adaptation in the Pacific • 65
- 6.3 Examples of Multilateral Funds for Adaptation in Developing Countries • 66
- 6.4 Participatory Budgeting • 67
- 6.5 Guiding Questions for Engaging in the Budgeting Process • 68
- 6.6 El Salvador's Experience with Integrating Climate Change into an Environmental Fund • 68
- 6.7 Integrating Adaptation into Environmental Impact Assessments • 70
- 6.8 Climate Change, Coastal Resources and Flood Planning: Pilot Study of La Ceiba, Honduras • 72
- 6.9 Making Small Adjustments for Climate Change Adaptation in the Flood Forest Ecosystem of Youwarou, Mali • 73
- 6.10 Effective Cooperation of Sector Ministries at the Local Level: Watershed Management • 76
- 6.11 National Coordination Arrangements for Response to Climate Change in Malawi • 77
- 6.12 The Inter-Ministerial Commission on Climate Change in Mexico • 78
- 6.13 Annual Performance Contracts in Rwanda • 78

Figures

- 2.1 Three Levels of Intervention • 10
- 3.1 A Programmatic Approach to Mainstreaming Climate Change Adaptation • 14
- 3.2 Relationship of the Programmatic Approach to the National Development Planning Cycle • 15
- 5.1 Average Annual Loss as Percentage of Gross Value Added Owing to Droughts: Andhra Pradesh, India • 38
- 5.2 Impact of Uncertainty on Adaptation Measures • 54

Tables

- 2.1 Potential Impact of Climate Change on the Millennium Development Goals • 9
- 4.1 Possible Entry Points for Mainstreaming into National Development Planning • 18
- 5.1 Questions/Steps and Approaches/Tools to Perform an Assessment: Natural Resource Management • 33

- 5.2 Properties and Uses of Decision-Support Tools for Climate Change Adaptation • **34**
- 5.3 Estimated Economic and Social Impacts of Disasters in Selected Pacific Island Countries (1950–2004) • **36**
- 5.4 Examples of Mainstream Adaptation Measures and Specific Adaptation Measures for Selected Sectors • **53**
- 5.5 Levels of Regret and Associated Implications • **55**

Acknowledgements

The preparation of this guide has been made possible through generous financial support provided by our development partners: the Belgian Development Cooperation, the Danish Ministry of Foreign Affairs, the European Commission, Irish Aid—Department of Foreign Affairs, the Norwegian Ministry of Foreign Affairs, the Spanish Ministry of Foreign Affairs and Cooperation, the Swedish Environmental Protection Agency, the Swedish International Development Cooperation Agency, the UK Department for International Development and the US Department of State.

The guide has been developed by the United Nations Development Programme–United Nations Environment Programme (UNDP-UNEP) Poverty-Environment Initiative (PEI), under the direction of Philip Dobie, John Horberry and David Smith. Sophie De Coninck has been in charge of researching, writing and review of the guide. Henrike Peichert coordinated the publishing process.

Our thanks are due to all contributors who participated in the review of the guide, in particular Jessica Ayres (International Institute for Environment and Development—IIED), Steve Bass (IIED), George Bouma (UNDP), Marjolaine Côté (UNDP), Barry Dalal-Clayton (IIED), Aitziber Echeverria (PEI), Mounkaila Goumandakoye (UNEP), Nanki Kaur (IIED) and Henrike Peichert (PEI).

We would also like to acknowledge and thank Karen Holmes (editing) and Nita Congress (graphic design).

The guide would benefit from further contributions and experiences shared by practitioners at the country level. Any comments or enquiries are welcome and should be directed to:

Facility.unpei@unpei.org

UNDP-UNEP Poverty-Environment Facility
UN Gigiri Compound, United Nations Avenue
P.O. Box 30552-00100, Nairobi, Kenya

Preface

Efforts to mainstream climate change adaptation into national development planning are still at a relatively early stage in many countries. Countries are increasingly requesting the United Nations Development Programme–United Nations Environment Programme Poverty-Environment Initiative (PEI) to tackle the **mainstreaming of climate change adaptation** into their national development planning, **as part of broader poverty-environment mainstreaming efforts**. The present guide addresses this need for integrating climate change adaptation considerations into the work of PEI. In addition, by building on PEI lessons in the field of poverty-environment mainstreaming in general, the guide can provide useful insights to adaptation specialists interested in mainstreaming their efforts.

The approach recommended in this guide builds on the overall poverty-environment mainstreaming framework presented in the publication *Mainstreaming Poverty-Environment Linkages into Development Planning: A Handbook for Practitioners* (UNPEI 2009a). The present guide follows the same structure as the handbook. It is designed to assist champions and practitioners engaged in mainstreaming climate change adaptation. It should be seen as an invitation for mainstreaming specialists and adaptation experts to partner, each bringing their added value to the overall endeavour.

The framework proposed in this guide consists of three components, each of which involves a set of activities or modules for which a range of tactics, methodologies and tools can be used.

- 1. Finding the entry points and making the case** is concerned with setting the stage for mainstreaming. This entails understanding the linkages between climate change and national development priorities, as well as understanding the governmental, institutional and political contexts and needs, in order to define pro-poor adaptation outcomes on which to focus. From this vantage point, the mainstreaming team can identify entry points into development planning and make the case for mainstreaming climate change adaptation.
- 2. Mainstreaming adaptation into policy processes** focuses on integrating adaptation issues into an ongoing policy process, such as a national development plan or sector strategy. Such efforts are based on country-specific evidence, including impact, vulnerability and adaptation assessments, socio-economic analysis, and demonstration projects.

3. Meeting the implementation challenge aims to ensure mainstreaming of climate change adaptation into budgeting and financing, implementation and monitoring, and the establishment of mainstreaming as standard practice.

Stakeholder engagement occurs throughout, from inception through policy development, implementation and monitoring.

Each successive component builds on previous work, but the chronology is not fixed. Rather, mainstreaming is an iterative process in which activities may take place in parallel or in an order different from that presented here, according to a country's particular priorities and needs. Some modules or activities may even be skipped, in particular when already undertaken by other actors in the country. However, it is likely that a certain number of them will need to be carried out so that the mainstreaming effort leads to the expected outcomes and provides lasting results.

Because efforts to mainstream climate change adaptation into national development planning are still at a relatively early stage in many countries, the proposed approach will need to be tested and improved as the wealth of experience across regions increases.

By continuing this work, practitioners can help ensure that climate change adaptation is factored in in a way that reduces poverty, promotes sustainable economic growth and helps achieve the Millennium Development Goals.



1. About the Guide



1.1 What Is Poverty-Environment Mainstreaming?

Experience shows the vital contribution that better environmental management can make to improving health, resilience to environmental risks, economic development, and livelihood opportunities, especially for the poor. To fight poverty and to preserve the ecosystems that form the foundation of poor people's livelihoods, pro-poor economic growth and environmental sustainability must be placed unequivocally at the heart of our most fundamental policies, systems and institutions (UNPEI 2009a).

One way to do this is through **poverty-environment mainstreaming**, which aims to integrate the linkages between the environment and poverty reduction into policy-making, budgeting and implementation processes at national, sector and subnational levels. Poverty-environment mainstreaming is a multi-year, multi-stakeholder process, geared to change the very nature of a country's decision-making culture and practices.

The United Nations Development Programme–United Nations Environment Programme (UNDP-UNEP) Poverty-Environment Initiative (PEI) supports country-led programmes to mainstream poverty-environment linkages into national development planning. It supports countries throughout the mainstreaming process—from conducting preliminary assessments to designing and implementing policy measures and monitoring their impact. Countries can access financial and technical assistance to establish dedicated country teams and carry out activities to address the particular country situation.

1.2 Need for Mainstreaming Climate Change Adaptation

Climate change adaptation—adjustments in human and natural systems in response to actual or expected climatic variation, with a view to moderating harm or exploiting beneficial opportunities (IPCC 2007)—is an area of growing concern and engagement for many developing countries. The myriad and uncertain effects of a changing climate pose significant risks for development and achievement of the Millennium Development Goals (MDGs).

Numerous initiatives and financing mechanisms aimed at assisting countries with climate change adaptation have been rolled out or are in various stages of development. Important areas of work in the field of climate change adaptation include understanding climate change, its impacts, and the vulnerability of a country and its population to the adverse impacts of climate change. Efforts also concentrate on developing specific adaptation measures, with a focus on the ones that correspond to countries' "most urgent and immediate needs," as detailed in national adaptation programmes of action (NAPAs).

Increasingly, countries are coming to realize that, in the long term, climate change adaptation needs to be supported by an integrated, cross-cutting policy approach—in other words, mainstreamed into national development planning. A growing number of developing countries have asked PEI for support in tackling the **mainstreaming of climate change adaptation into their national development planning** as part of a broader poverty-environment mainstreaming process. PEI provides useful experiences to help such mainstreaming in close collaboration with ongoing climate change adaptation efforts.

1.3 Purpose and Approach

The purpose of this guide is to provide practical, step-by-step guidance on how governments and other national actors can mainstream climate change adaptation into national development planning as part of broader mainstreaming efforts.

Definition

Mainstreaming climate change adaptation is the iterative process of integrating considerations of climate change adaptation into policy-making, budgeting, implementation and monitoring processes at national, sector and subnational levels. It is a multi-year, multi-stakeholder effort grounded in the contribution of climate change adaptation to human well-being, pro-poor economic growth, and achievement of the MDGs. It entails working with a range of government and non-governmental actors, and other actors in the development field.

The framework proposed here consists of three components, each of which involves a set of activities or modules for which a range of tactics, methodologies and tools can be used:

- **Finding the entry points and making the case** is concerned with setting the stage for mainstreaming. It involves understanding the linkages between climate change and national development priorities and understanding the governmental, institutional and political contexts that inform efforts to define pro-poor adaptation outcomes, find entry points into development planning, and make the case for adaptation mainstreaming.
- **Mainstreaming adaptation into policy processes** focuses on integrating climate change adaptation issues into an ongoing policy process, such as a national development plan or sector strategy, based on country-specific evidence (i.e., impact, vulnerability and adaptation assessments, socio-economic analysis and demonstration projects).
- **Meeting the implementation challenge** aims at ensuring mainstreaming of climate change adaptation into budgeting and financing, implementation and monitoring, and the establishment of mainstreaming as standard practice.

Stakeholder engagement occurs throughout, from inception through policy development, implementation and monitoring.

Each successive component builds on previous work, but the chronology is not fixed. Rather, mainstreaming is an iterative process in which activities may take place in parallel or in an order different from that presented here, according to a country's particular priorities and needs. Depending on country circumstances and needs, the reader can thus go directly to the chapter or section relevant to his or her interest.

The approach recommended in this guide builds on the overall poverty-environment mainstreaming framework presented in *Mainstreaming Poverty-Environment Linkages into Development Planning: A Handbook for Practitioners* (UNPEI 2009a). This guide follows the same structure and color-coding for the various chapters, so that readers interested in additional information or guidance on a particular component or step of the overall mainstreaming process can easily find it.

Because efforts to mainstream climate change adaptation into national development planning are still at an early stage in many countries, the proposed approach will need to be tested as the wealth of experience increases. This guide is thus designed as a working document, with a view to encouraging feedback from country practitioners to inform subsequent revision and strengthening of its content. The process and activities outlined in this guide should also be seen as encouraging partnering of mainstreaming specialists and climate change adaptation experts (e.g. national communications teams), each contributing their knowledge and experience to the overall endeavour.

1.4 Target Audience

The target audience for the guide consists primarily of champions of the mainstreaming process and practitioners at the country level.

- **Champions** are practitioners who take on the role of advocating the integration of climate change adaptation considerations into development planning at national, sector and subnational levels. These include high-level decision makers and government officials who serve as ambassadors for mainstreaming climate change adaptation.
- **Practitioners** include stakeholders from the government (head of state's office, environment, finance and planning bodies, sector and subnational bodies, political parties and parliament, national statistics office and judicial system), non-governmental actors (civil society, academia, business and industry, the general public and local communities, and the media) and development actors in the environment, development and poverty reduction fields.

A secondary audience consists of officials at United Nations agencies, including United Nations resident coordinators and country teams that engage with governments on national development priorities and whose work involves mainstreaming adaptation considerations. As such, this guide also complements the publication *Integrating Climate Change Considerations in Country Analysis and the UNDAF: A Guidance Note for United Nations Country Teams*, which focuses on United Nations common programming processes (UNDG 2010).

1.5 Structure

The guide is divided into several chapters, outlined below, which can be read individually according to user interests and needs, referring to other sections of the guide as required. Key messages are highlighted throughout the text, and numerous examples are presented.

- **Chapter 2** describes key concepts related to mainstreaming climate change adaptation, including the linkages between climate change, development and poverty, the relevance of climate change adaptation to the achievement of the MDGs, and the various dimensions of climate change adaptation.
- **Chapter 3** presents an overview of a possible approach to mainstreaming climate change adaptation, describing the various modules involved in each of its three components and proposing a checklist for measuring progress.

Chapters 4 through 6 detail the three components of the approach. Each chapter presents step-by-step guidance, providing references and illustrative cases.

- **Chapter 4** provides guidance on finding the entry points into national development planning and making the case to decision makers for mainstreaming. It explains how to carry out relevant modules, including initial assessments, awareness raising and partnership building, and evaluating institutional and capacity needs.
- **Chapter 5** describes how to integrate climate change adaptation into policy processes, including collecting country-specific evidence and using it to influence policy processes and to develop or climate-proof policy measures.
- **Chapter 6** offers guidance on meeting the implementation challenge. It discusses how to strengthen national monitoring systems, how to engage with budgeting processes, how to support policy measures at national, sector and subnational levels, and how to strengthen institutions and capacities to sustain the effort.



2. Understanding Mainstreaming Climate Change Adaptation



Key Messages

- Climate change poses a risk to development and achievement of the MDGs. It affects livelihoods, health and economic development.
- Development affects a country's vulnerability to the adverse effects of climatic instability as well as its capacity to adjust and adapt.
- A country's adaptation response should be formulated as part of broader policies for development, including areas not directly related to climate change.
- Mainstreaming climate change adaptation can be defined as the process of integrating adaptation considerations into policy-making, budgeting and implementation processes at the national, sector and subnational levels.

2.1 Identifying Linkages between Climate Change, Development and Poverty

Symptoms of changing climate—such as greater frequency and severity of extreme weather events, changes to average temperature and precipitation, and sea level rise—have implications for a country's environmental and socio-economic situation. Just as environmental management and development affect each other, climate change poses a risk to development—and development planning should take account of the anticipated impacts of climate change.

The poorest countries already often face an **adaptation deficit**, characterized by a failure to adapt adequately to existing climate risks (IPCC 2007). Neglected development and natural resource management efforts in marginal areas, lack of market access for agricultural products, and limited knowledge and access to credit are all examples of adaptation deficits in the agricultural sector (World Bank 2010, GN 4). As climate change accelerates, the adaptation deficit has the potential to rise much higher unless a serious adaptation programme is implemented.

At the same time, a country's development choices can worsen its vulnerability to the impacts of climate change, a phenomenon known as **maladaptation**. For instance, development strategies can increase dependency on climate-sensitive resources (e.g. certain crops), or there can be a mismatch between adaptation activities supported by external aid and the development priorities of recipient countries (IIED 2008).

Climate change thus adds urgency to current activities to improve policies and institutional mechanisms that affect development and the well-being of the poor. There may also be a need for changes in development

Example: Impacts of Climate Change on Development

- **Rising sea levels** will particularly affect low-lying coastal areas and small island developing states. Coastal development and management thus have to take into account and plan for such impacts.
- **Changing weather patterns** affect hydro-power. The development of the energy sector consequently needs to take into consideration the medium- and long-term risks posed by climate change.

Source: OECD 2009.

Example: Maladaptation—Natural Disasters, Human Settlements and Agriculture

- Destroying mangrove forests can increase a country's vulnerability to climate-related impacts, such as stronger and/or more frequent hurricanes or cyclones (OECD 2009).
- New roads might be weatherproofed from an engineering standpoint, even taking future climate into account, but they might trigger new human settlements in areas highly exposed to particular impacts of climate change such as coastal zones vulnerable to sea level rise or floodplains (OECD 2009).
- Investment in an irrigation scheme that fails to take account of climate-related shifts in rainfall may not be sustainable in the long term. Irrigation may in fact increase the agricultural sector's dependency on water as well as practices or crops reliant on it in the short term (IIED 2008).
- An agricultural policy might support a monoculture of high-value crops (e.g. through subsidies) with the objective of maximizing production and incomes. In the absence of insurance against yield losses, farmers' income becomes more vulnerable to climate variability (World Bank 2010, GN 4).

planning or institutional reform to take account of climate risks (DFID 2004a). There can be trade-offs between climate change and development, particularly when the two are considered in isolation.

Impact of Climate Change on Livelihoods, Resilience, Health and Economic Development

Poor people are highly vulnerable to external shocks, such as droughts or floods, that can damage or destroy crops, livestock, and homes. Poverty alleviation helps increase resilience to those shocks, for example by enabling investment in better land management to improve soils and help mitigate against the adverse impacts of extreme weather events.

Climate change will exacerbate many current environmental risks and introduce others, which will interact. For example, the effects of more extreme weather will be exacerbated by higher ground temperatures, reducing the ability of crops to deal with water stress.

In general, climate change is likely to have a negative impact on the poor by affecting the following:

- Poor people's **livelihoods** and the assets upon which they depend (e.g. forests, water, shelter) (box 2.1)
- **Vulnerability** of these populations to changing environmental risks (e.g. through the loss of assets, vulnerable settlements, health problems) (box 2.1)
- **Health** of the poorest groups (e.g. affected by water-, air- and vector-borne and infectious diseases, malnutrition, accidental deaths, disrupted access to health services, displacement, heat stress) (box 2.1)
- **Economic development**, which is critical to eradicating poverty (e.g. through diversion of funds to relief and rehabilitation, disrupted government revenues, or losses of agricultural and fisheries productivity) (box 2.2)

Box 2.1 Impacts of Climate Change on Livelihoods, Resilience and Health of the Poor

- During the 1998 floods in **Bangladesh**, some households were able to use emergency food and change their employment away from agriculture in order to cope. However, poorer households coped through reducing food consumption and through the sale of assets, reducing their resilience to future shocks.
- Climate plays a role in the productivity of fisheries, as seen during the dramatic decline of the **Peru** anchovy fishery during El Niño episodes and the reduced fish stock following Hurricane Lenny in **Saint Lucia**.
- In **the Gambia**, diarrhoea in young children has been linked with the summer rains. In **West Africa**, meningitis is associated with dust in semi-arid conditions, and among people with poor, overcrowded living conditions.

Sources: DFID 2004c, 2004d.

Box 2.2 Impacts of Climate Change on Key Sectors

- **Agriculture and natural resources.** A temperature increase of 2°C would dramatically reduce the total area available for growing robusta coffee in **Uganda**, and restrict it to higher altitude areas. Economic modelling studies of farm incomes in **India** suggest that a 2–3.5°C increase in temperature would result in a decline in farm net revenues by 9–25 percent.
- **Water resources.** Rainfall in the wet season in **Pakistan** could increase by 5–50 percent by 2070, with a doubling in the frequency of high-intensity rainfall events. These changes may have significant economic effects owing to the vulnerability of cotton, Pakistan's main cash crop, to flooding in its early stages of growth.
- **Health.** Countries with intensive malaria grew by 1.3 percent less per person per year between 1965 and 1990, and a 10 percent reduction in malaria is associated with a 0.3 percent increase in economic growth.
- **Infrastructure.** In **Honduras**, 1998's Hurricane Mitch affected more than 25 percent of households and caused an estimated 7 percent drop in agricultural output. In the absence of the hurricane, predicted gross domestic product (GDP) growth would have lifted half a million people out of poverty between 1998 and 2018; due to the hurricane, GDP growth has been retarded and the number of people living in poverty is growing.

Source: DFID 2004b.

Linkages between Sensitivity, Adaptive Capacity, Vulnerability and Poverty

The vulnerability of countries and societies to the effects of climate change depends not only on the magnitude of climatic stress, but also on the sensitivity and capacity of affected societies to adapt to or cope with such stress.

- **Sensitivity** to climatic stress is higher for activities entailing climate-dependent natural resources, such as agriculture and coastal resources—often critical for the livelihoods of the poor.

- The **capacity to adapt** and cope depends upon many factors including wealth, technology, education, institutions, information, skills and access to resources, which are generally scarce in poor countries and communities.
- The concept of **vulnerability** recognizes that socio-economic systems play a role in amplifying or moderating the impacts of climate change (OECD 2009).

The links between climate change, poverty reduction and human well-being can also be expressed in terms of the MDGs (table 2.1).

Table 2.1 Potential Impact of Climate Change on the Millennium Development Goals	
Goal	Examples of climate change linkages
1. Eradicate extreme poverty and hunger	• Climate change is projected to reduce the value of the assets and degrade the livelihoods of many poor people, e.g. in terms of health, access to water, homes and infrastructure. • Climate change is expected to alter the path and rate of economic growth due to changes in natural systems and resources, infrastructure and labour productivity. A reduction in economic growth affects poverty through, e.g. reduced income opportunities. • Climate change is projected to alter regional food security. Particularly in Africa, food security is expected to worsen. Adverse impacts on food security could be seen in Latin America as well as in South and Southeast Asia.
3. Promote gender equality and empower women	• In the developing world in particular, women are disproportionately involved in natural resource-dependent activities, such as agriculture, which are particularly vulnerable to climate change. • Women's traditional roles as primary users and managers of natural resources, primary caregivers and labourers engaged in unpaid labour (i.e., subsistence farming) mean they are involved in and dependent on livelihoods and resources that are put most at risk by climate change.
4. Reduce child mortality 5. Improve maternal health 6. Combat major diseases	• Direct effects of climate change include increases in heat-related mortality and illness associated with heat waves (although fewer winter cold-related deaths may happen in some regions). • Climate change may increase the prevalence of some vector-borne diseases (e.g. malaria and dengue fever), and vulnerability to water-borne, food-borne or infectious diseases (e.g. cholera and dysentery). • Children and pregnant women are particularly susceptible to vector- and water-borne diseases. Anaemia, which results from malaria, is responsible for a quarter of maternal mortality. • Climate change will likely result in declining quantity and quality of drinking water in many locations. It will also exacerbate malnutrition—an important source of ill health among children—by reducing natural resource productivity and threatening food security, particularly in Sub-Saharan Africa, but also in many other low-latitude areas.
7. Ensure environmental sustainability	• Climate change is likely to alter the quality and productivity of natural resources and ecosystems, some of which may be irreversibly damaged. These changes may also decrease biological diversity and compound existing environmental degradation.
8. Develop a global partnership for development	• Climate change is a global issue and response to it requires global cooperation, especially in helping developing countries adapt to its adverse impacts.

Source: Adapted from OECD 2009, table 1.1.

2.2 Understanding Mainstreaming of Climate Change Adaptation as an Integrated Policy Approach

Considerable efforts are under way in developing countries to prepare national communications—and, in least developed countries, to create NAPAs—in line with the United Nations Framework Convention on Climate Change (UNFCCC) reporting modalities. These can provide useful information and processes on which a mainstreaming effort can build—for example, by making use of guidance and engaging stakeholders from these processes, making use of vulnerability assessment findings, or following up on and integrating priority adaptation actions. While heading towards and sometimes recommending mainstreaming as a priority intervention, they generally do not focus directly on mainstreaming climate change adaptation into development planning.

Given the cross-cutting nature of climate change impacts—that is, cutting across economic sectors, geographic and administrative boundaries, and time scales—it is essential that adaptation policies or strategies are formulated as part of broader policies for development. Implementing specific adaptation measures (geared to specific problems, sectors or population groups) may be effective in certain circumstances, but in the long run, a project-based approach to adaptation planning and financing may not produce the scale of results that is needed. In this respect, efforts to formulate national adaptation policies or climate change strategies will need to be supported by a cross-cutting, integrated policy approach.

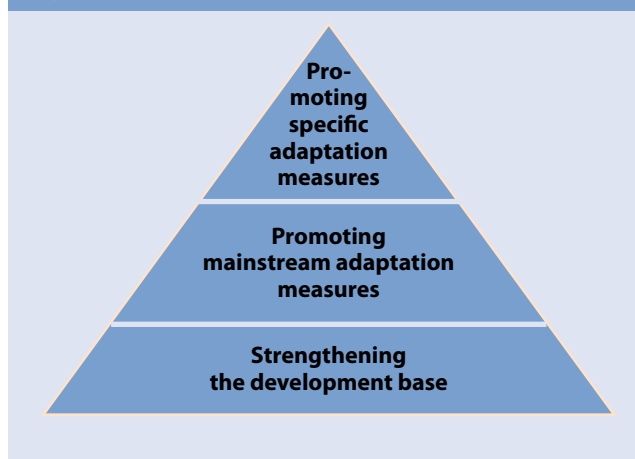
2.3 Defining Levels of Intervention in Mainstreaming Climate Change Adaptation

Mainstreaming climate change adaptation can be seen as requiring three levels of intervention (figure 2.1):

- The first level consists of making development efforts consciously aimed at reducing vulnerability (not necessarily to climate change) while avoiding maladaptation. This can be seen as strengthening the base for adaptation by addressing the adaptation deficit and increasing the overall resilience of the country and population.
- The second level is about ensuring that climate change is considered in the decision-making of relevant government agencies so that (mainstream) policy measures catering to climate change are developed. This means not only climate-proofing policies but also addressing emerging needs for adaptation within the different sectors or geographical areas.
- The third level calls for specific adaptation policy measures targeting issues that the first two levels have not yet tackled.

Each of these levels requires changes in the way government deals with policy-making, budgeting, implementation and monitoring at national, sector and subnational levels.

Figure 2.1 Three Levels of Intervention





3. An Approach to Mainstreaming Climate Change Adaptation



Key Messages

- Poverty-environment mainstreaming and mainstreaming climate change adaptation face common challenges and thus can benefit from a common approach.
- The poverty-environment mainstreaming approach provides a credible platform to assist countries in mainstreaming climate change adaptation into development planning processes.
- While the proposed set of activities or modules and their sequence are not fixed, a certain number will likely be needed to produce lasting results.

3.1 Challenges

Based on experience to date with poverty-environment mainstreaming as well as climate change adaptation, a number of challenges can be anticipated for mainstreaming climate change adaptation:

- **Raising awareness and building knowledge.** Climate change is a complex issue with many links to development issues. To make it relevant to decision makers across the government, it is important to understand the linkages with broader poverty reduction and pro-poor economic growth. This entails identifying the potential economic costs of climate change as well as the benefits of taking action to enhance adaptive capacity.
- **Making the issue central in the government.** Although the responsibility for climate change adaptation often lies with the ministry of environment, it is critical to have the issue recognized as an economywide issue. It is advisable that the process of mainstreaming climate change adaptation be coordinated by a ministry with an economy-wide mandate/portfolio, such as the planning or finance ministry.
- **Involving sectors and subnational bodies.** Just as environmental sustainability requires the involvement of key sectors (e.g. agriculture, land use, water) and subnational bodies, climate change adaptation calls for the active participation of most sectors of the economy, as well as of subnational authorities.
- **Linking local-level impacts with national-level responses.** Climate change impacts manifest themselves at the local level, affecting the livelihoods, health and vulnerability of the population, especially the poorest. It is thus important that the responses put forward at the national level be rooted in local conditions, recognizing the great damage that climate change can cause to livelihoods.
- **Meeting the implementation challenge.** Following the successful integration of adaptation considerations into policy processes, the challenge of translating words into action (in terms of financing, measuring the impact of policy measures, etc.) requires persistence.
- **Strengthening institutions and capacities sustainably at various levels.** Institutionalizing mainstreaming—in particular by making mainstreaming a standard practice (e.g. mandates, coordination mechanisms, procedures)—is critical for the sustainability of such work.
- **Ensuring political will.** Climate change is a long-term issue whose consequences are not yet fully visible. It is also an issue that requires managing risks and taking decisions in an environment of considerable uncertainty, with limited and/or imperfect

information. This uncertainty is not conducive to decision-making on the part of political leaders or government officials whose mandates and terms are shorter, and who are concerned with political cycles.

Inherently, mainstreaming can be seen from two points of view: the viewpoint of actors inside institutions with a mandate to lead on an issue to be mainstreamed, and the viewpoint of development actors seeking to improve practice in a wide range of areas. As with poverty-environment mainstreaming, the task for decision makers in the poorest countries, led by the ministry of finance and planning, is to understand the relevance of climate change and adaptation for development and poverty reduction and to ensure a coherent response across all sectors of the economy. Ultimately, the goal is full integration of climate change adaptation as standard development practice.

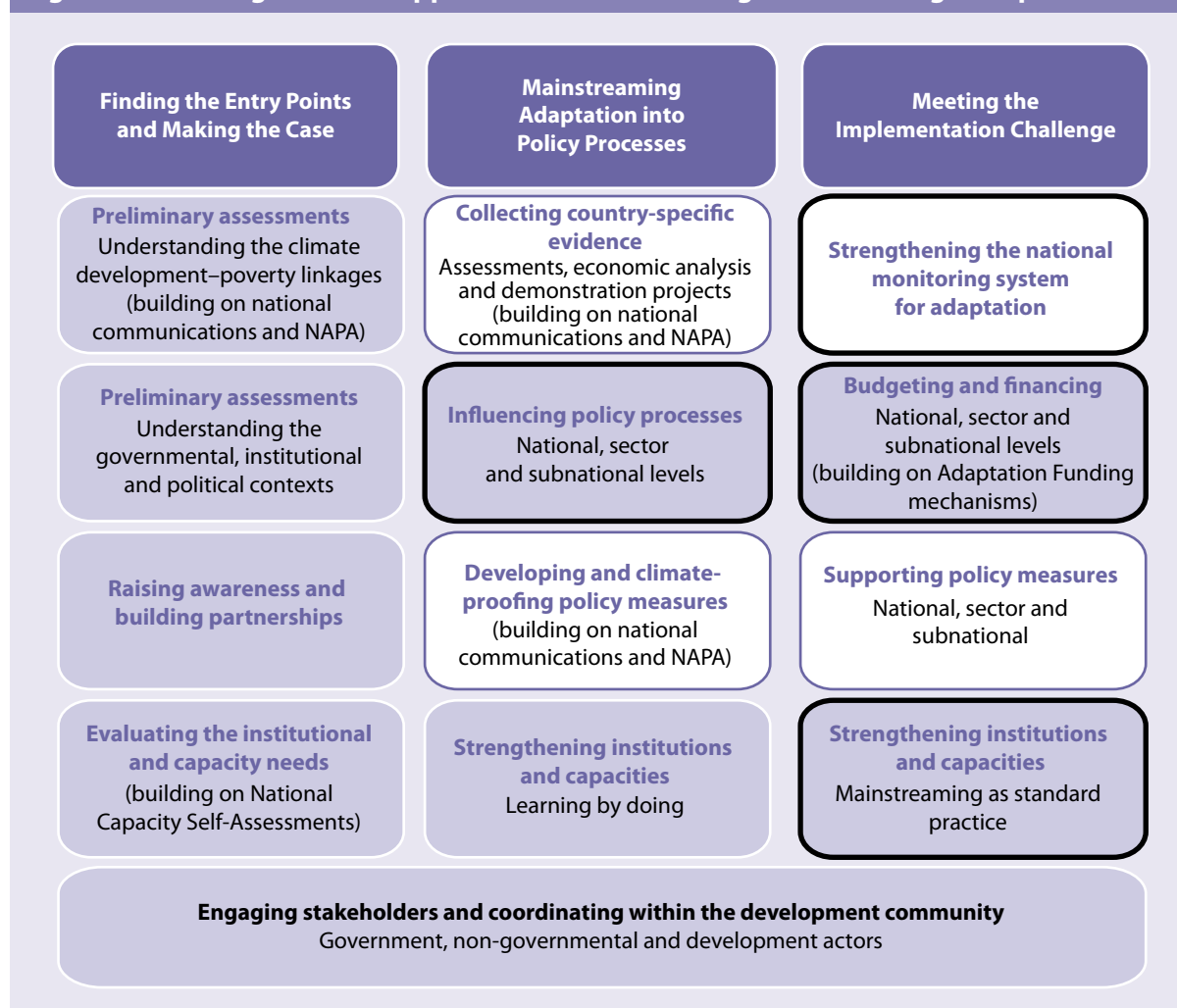
3.2 Introducing Elements of an Approach for Mainstreaming Climate Change Adaptation

The poverty-environment mainstreaming approach set out in *Mainstreaming Poverty-Environment Linkages into Development Planning: A Handbook for Practitioners* (UNPEI 2009a) provides a starting point to help countries successfully mainstream climate change adaptation into development planning processes, as illustrated by figure 3.1.

The approach can be revised and used as a framework for adaptation mainstreaming, building on climate-related information, work and processes such as national communications and NAPAs:

- **Finding the entry points and making the case** is concerned with setting the stage for mainstreaming. Adaptation-specific activities include understanding the linkages between climate change, development and poverty as well as the governmental, political and institutional contexts relevant to adaptation (e.g. climate policies, plans and programmes; current level of mainstreaming; roles and mandates; coordination mechanisms). Adaptation mainstreaming also requires specific awareness raising and partnerships, in particular among climate specialists, planners and financiers.
- **Mainstreaming into policy processes** focuses on integrating issues into an ongoing policy process, based on country-specific evidence. Complementary to country-specific evidence developed as part of a poverty-environment mainstreaming effort are, for example, impact, vulnerability and adaptation assessments; socio-economic analysis of the costs and benefits of adaptation options; and the lessons drawn from adaptation demonstration projects. Based on this evidence, policy documents and measures need to be analysed in light of climate change, be climate-proofed and include additional priority interventions as appropriate.
- **Meeting the implementation challenge** aims at ensuring mainstreaming into budgeting and financing, implementation and monitoring. Adaptation mainstreaming requires investing in climate change monitoring and forecasting (both science and policy related) as part of broader national monitoring efforts. Budgeting and financing adaptation means both integrating adaptation into national systems and leveraging special funding sources and modalities. Policy measures at different levels include both general measures revisited with a climate lens and adaptation-specific measures.

Institutional and capacity strengthening for adaptation focuses on making mainstreaming a standard government practice (e.g. through mandates, institutional arrangements, procedures, systems and tools). It concentrates on climate change science and its

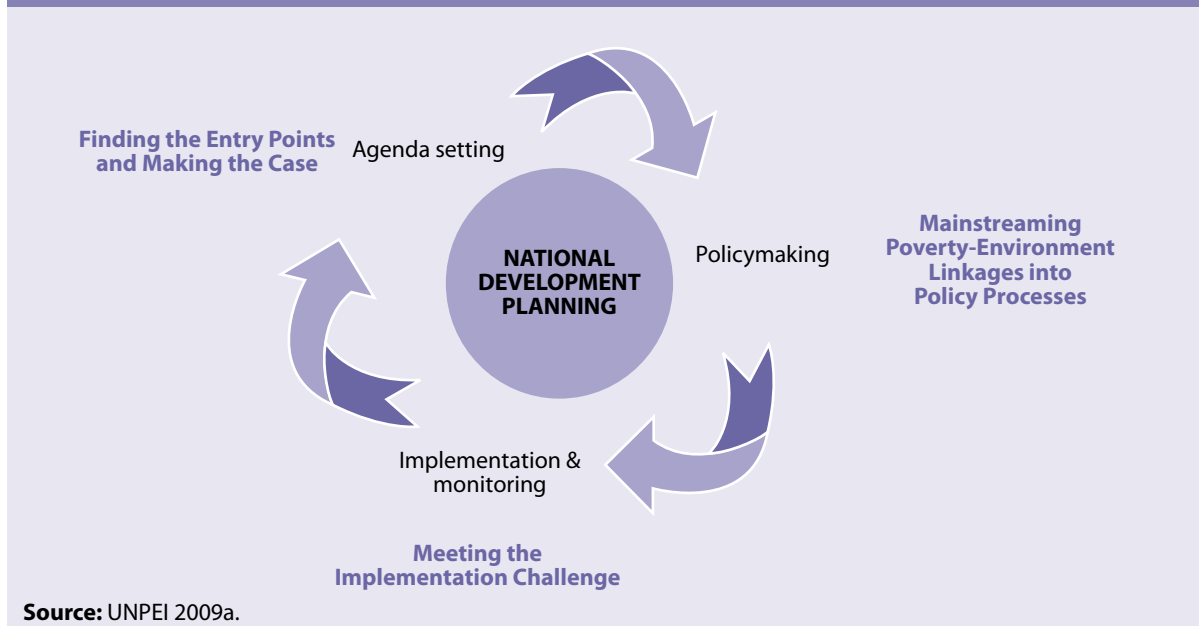
Figure 3.1 A Programmatic Approach to Mainstreaming Climate Change Adaptation

interface with policy-making. To this end, a variety of approaches to institutional and capacity strengthening can be used, as in other integration efforts.

While the sequence is not fixed and some activities may even be skipped when already tackled by other actors in the country, it is likely that a certain number of modules will need to be undertaken so that the mainstreaming effort leads to the expected outcomes and provides lasting results. These core modules are outlined in black in figure 3.1. Modules focusing specifically on climate change—and hence building on existing adaptation efforts and to be carried out in partnership with and/or led by climate experts—are in white boxes, while mainstreaming modules to be revisited with a climate lens are in purple boxes.

Using this approach can help in prioritizing mainstreaming efforts in a specific national context and seeing more clearly how different activities and tactics can be combined to achieve intended outcomes at different stages in the design or implementation of development planning (figure 3.2).

Figure 3.2 Relationship of the Programmatic Approach to the National Development Planning Cycle



3.3 Measuring Progress

Box 3.1 provides a checklist of outcomes to be achieved throughout the application of the approach.

Box 3.1 Progress Checklist for Climate Change Adaptation Mainstreaming**Finding the Entry Points and Making the Case**

- ✓ Entry points for adaptation mainstreaming agreed on and related roadmap taken into account in the workplan for the next stage of the effort
- ✓ Key ministries (e.g. environment, finance, planning, sectors) and other non-governmental actors (e.g. representatives of communities and the private sector) relevant to the agreed entry points are members of the steering committee or task force of the adaptation mainstreaming effort
- ✓ Adaptation mainstreaming champions liaising with in-country donor coordination mechanisms
- ✓ Increased awareness that poor people are likely to be the most affected by climate change, that national development goals and key sector strategies (e.g. agriculture, health, energy, tourism) can be affected by climate change and that national development and sectors can in turn affect the vulnerability of the country and the poor
- ✓ Activities to be implemented in collaboration with finance and planning or relevant sector ministries included in the workplan for the following stage of the effort

Mainstreaming Climate Change Adaptation into Policy Processes

- ✓ Country-specific evidence collected on the costs and benefits of climate change and adaptation (e.g. impact, vulnerability and adaptation assessment, socio-economic analysis, demonstration projects)
- ✓ Adaptation and its links to development and poverty reduction included in the working documents produced during the targeted policy process (e.g. documents produced by the working groups of the relevant national, sector and subnational planning processes)
- ✓ Adaptation and its links to development and poverty reduction included as a priority in the completed policy documents of the targeted policy process (e.g. poverty reduction strategy paper, MDG strategy, relevant sector or subnational plan)
- ✓ Climate-proofed and specific adaptation policy measures for climate change adaptation costed by finance and planning or sector ministries and subnational bodies

Meeting the Implementation Challenge

- ✓ Adaptation-related indicators linked to policy documents of national development planning integrated in the national monitoring system
- ✓ Increased budget allocations and public expenditures for adaptation policy measures of non-environment ministries and subnational bodies
- ✓ Adaptation mainstreaming established as standard practice in government and administrative processes, procedures and systems (e.g. budget call circulars, systematic inclusion of adaptation in public expenditure reviews, coordination mechanisms, systematic climate-proofing, monitoring)

Long-Term Outcomes

- ✓ Institutions and capacities strengthened for long-term adaptation mainstreaming
- ✓ Conditions for simultaneous improvement of adaptation and poverty reduction enhanced



4. Finding the Entry Points and Making the Case



Refer to the relevant sections in chapter 4 when:

- There is a need to better understand the linkages between climate change and development in the country (section 4.1) and the related governmental, institutional and political contexts (section 4.2) to identify the entry points into development planning
- The level of awareness of climate change and its relevance for national development priorities needs to be raised, and/or the partnerships for mainstreaming climate change adaptation have to be further developed (section 4.3)
- The institutional and capacity requirements for mainstreaming climate change adaptation need to be evaluated to design the mainstreaming effort (section 4.4)

This component sets the stage for mainstreaming. It focuses on activities designed to help countries identify entry points into the development planning process (table 4.1) and make a strong case for the importance of mainstreaming climate change adaptation.

Table 4.1 Possible Entry Points for Mainstreaming into National Development Planning	
Planning level	Entry points
National government and cross-sector ministries	Poverty reduction strategy paper
	National development plan
	MDG-based national development strategy
	National budget allocation process or review (e.g. medium-term expenditure framework, public expenditure review)
Sector ministries	Sector strategies, plans and policies (e.g. agricultural sector plan)
	Preparation of sector budgets
	Public expenditure reviews
Subnational authorities	Decentralization policies
	District plans
	Preparation of subnational budgets

Source: UNPEI 2009a.

4.1 Preliminary Assessments: Understanding the Climate-Development-Poverty Linkages

Identifying Pro-Poor Adaptation Outcomes

At an early stage, the needs of vulnerable groups and existing gaps in meeting them should be assessed, in order to define a set of pro-poor adaptation outcomes that will be the target for mainstreaming climate change adaptation. Such needs or challenges faced by the poor may include a lack of access to credit or insurance; loss of assets, livelihoods or incomes (e.g. from agriculture); health-related issues; lack of secure land tenure rights hindering adaptation measures; lack of infrastructure (e.g. to access health services or markets); and lack of functioning early warning systems, among others.

At this stage, mainstreaming needs to be informed by a clear understanding of how to address the needs of the poor in the face of a changing climate. The mainstreaming effort is particularly focused on the institutional and policy dimensions of climate change adaptation (e.g. institutions involved, coordination mechanisms needed) from the local to the national levels, and how mainstreaming can play a role in creating the enabling conditions needed to achieve the intended pro-poor outcomes.

Identifying National Development Priority Issues Relevant to Climate Change

As explained in chapter 2, the relevance of climate change to development needs to be understood and highlighted across sectors, including the underlying causes of vulnerability (IIED 2008) (see section 5.1).

With national priority issues identified, a dialogue on climate change impacts and adaptation can be initiated and a fruitful collaboration launched.

Example: Priority Issues for National Dialogue on Climate Change Impacts and Adaptation

- In **Kenya** and **Bangladesh**, food security concerns related to drought or floods have effectively fostered the dialogue on climate change impacts and adaptation.
- In some **Eastern European and Central Asian countries**, land degradation and natural resource management were identified as adequate vehicles for addressing climate change, as they tackle problems of livelihoods, vulnerability and resilience.
- Water resource management issues often constitute priorities for governments, particularly in **South Asia**, the **Middle East and North Africa**, and **Sub-Saharan Africa**. This sector can open up opportunities for mainstreaming climate change adaptation, aimed at achieving development objectives such as increased water efficiency and productivity.

Source: World Bank 2010, GN 1.

Further Guidance: Questions and References

Preliminary assessments of climate-development-poverty linkages are based primarily on existing information. Thus, preparing these assessments entails collecting information from existing sources and mobilizing local expertise. A number of guiding questions can help government actors understand and assess climate-development-poverty linkages (box 4.1).

Further guidance can be found in the following source documents:

- *Mainstreaming Adaptation to Climate Change in Agriculture and Natural Resources Management Projects, Guidance Note 1: Engaging Key National Institutions in the Adaptation Agenda* (World Bank 2010, GN 1). This note illustrates ways to identify institutional counterparts that, depending on the circumstances, are most likely to effectively take the lead on mainstreaming adaptation to climate variability and climate change in national planning or on implementing adaptation measures. It also provides a range of specific suggestions and information to help engage counterparts in the adaptation agenda.
- *The Impact of Climate Change on the Vulnerability of the Poor* (DFID 2004b), *The Impact of Climate Change on the Health of the Poor* (DFID 2004c) and *The Impact of Climate Change on Pro-Poor Growth* (DFID 2004d).

Box 4.1 Guiding Questions for Assessing Climate-Development-Poverty Linkages

- What is the climate situation (baseline)? What is the state of the environment? What is the current situation with respect to climate change adaptation (e.g. is there an adaptation deficit)?
- What population groups, sectors and regions are most vulnerable to the impacts of climate change or current climate variability? Why are they at greatest risk (e.g. poor development, poverty, degraded natural resources)?
- Will climate change exacerbate existing vulnerabilities? What are the links between the impacts of climate change and vulnerability?
- What are the links between current and future climate and national development priorities/key sectors?

4.2 Preliminary Assessments: Understanding the Governmental, Institutional and Political Contexts

Targeting the Outcomes

With the priority issues related to climate change in mind, the governmental, political and institutional settings need to be carefully assessed (UNPEI 2009a). Issues to address include the following:

- Planning processes
- Institutions and actors
- Mandates and decision-making processes
- Existing policies and initiatives
- Governance and political situation

This review will allow mainstreaming to focus on the most appropriate entry points into decision-making processes, in line with national development priorities and the pro-poor outcomes to be achieved.

For example, where food security is a priority development issue and/or poor farmers are already suffering from current climate variability, mainstreaming can focus on integrating climate change adaptation concerns in the national agricultural strategy and/or budget, taking into account the government calendar for these various processes.

The review can also help increase understanding and highlight the need to improve the existing institutional setting to better integrate climate change adaptation throughout the government. For example, where institutions and ministries leading the national communication and NAPA processes are environmental or meteorological agencies, there is a need to involve the ministry of finance or planning or have it lead the broader adaptation effort (see section 6.4).

Collecting and Analysing Information

The review should cover official documents (e.g. policies and legislation) and sector studies which should include institutional analysis and mapping, budgeting and staffing information. It should also rely on interviews with staff from different government institutions at the national, sector and subnational levels as well as experts.

Based on such information, a number of suitable entry points in the planning, policy and budgeting processes can be identified, along with potential champions of the mainstreaming effort. For example, an institutional review can, through mandate analysis, help identify the most suitable ministries, departments or agencies to involve as champions or implementers (World Bank 2010, GN 1).

The review can also have broader objectives, such as assessing the capacity of relevant institutions at different administrative levels (see section 4.4).

Further Guidance: Questions and Example

Box 4.2 presents several questions that the mainstreaming team can try to address as part of the preliminary assessment of the governmental, institutional and political contexts. The answers to these questions can help the team increase its understanding of the national planning framework (among other issues) and subsequently identify the most appropriate entry points for mainstreaming climate change adaptation.

As an example, the World Bank's Mexico country note on *Climate Change Aspects in Agriculture* (2009) lays out the country's institutional context in addition to providing an overview of climate change impacts, ongoing and completed policy initiatives at the intersection of climate change and agriculture, and country-specific mitigation and adaptation measures. It identifies institutional actors and agricultural sector institutions that might be useful counterparts to approach when engaging in a project related to adaptation and agriculture.

Box 4.2 Guiding Questions for Assessing the Governmental, Institutional and Political Contexts

- Is the country a signatory to the UNFCCC?
- What is the content and process that led to the latest national communication and NAPA, if applicable?
- Who is the national climate change focal point in the government? Is there a national climate change committee as a part of the implementation processes for the national communication and NAPA? Who chairs it (e.g. senior civil servant, UNFCCC focal point, president, prime minister or deputy prime minister)?
- Is there a national adaptation or climate change policy (integrated national policy or strategy for climate change or climate change adaptation)?
- Is climate change adaptation integrated in national, sector or subnational policies?
- Is climate change adaptation integrated in disaster risk reduction and/or environmental policies? How do the disaster risk and meteorological agencies collaborate?
- In light of other preliminary assessments (e.g. for poverty-environment mainstreaming), what are the gaps and opportunities and possible entry points for mainstreaming? Who are the potential champions?

4.3 Raising Awareness and Building Partnerships

One predictable challenge for mainstreaming climate change adaptation is the lack of awareness and knowledge among policy makers and development practitioners about the risks posed by climate change. Climate change and its potential impacts should thus be brought into discussions on poverty reduction and development in order to raise awareness of the links between these issues. Decision makers might then agree to continue the effort—for example, by identifying the sectors of the economy most vulnerable to current and future climate change, integrating adaptation into policies, and strengthening institutions and capacities.

Initiating the Dialogue

The dialogue on adaptation can begin with the stakeholders from the government in charge of the relevant national priorities as identified in the preliminary assessments (e.g. head of state's office, environment, finance and planning bodies, sector and sub-national bodies) (box 4.3). It should also include non-governmental actors (e.g. civil society, academia, business and industry, the general public and local communities) and development actors in the fields of environment, development and poverty reduction.

Identifying and Mobilizing the Lead Institution(s) at the National and Sector Levels

The concerned government actors should decide which institution(s) will lead the effort.

In general, having a line ministry assume the leadership role on mainstreaming climate change adaptation entails greater risk of various operational difficulties, such as constraints in mobilizing funds or budgeting and coordinating with other sectors. Due to the cross-cutting nature of climate change, a central body such as the head of state's office or the ministry of planning or finance is usually the most suitable entity to lead the mainstreaming effort, in close collaboration with environmental institutions. In Malawi, for example, it was not until three years after the country's NAPA was first published that a presidential intervention to relaunch the document succeeded in sparking cross-ministry interest in adaptation. A central or cross-ministry body is much better positioned to coordinate the activities of line ministries and is more likely to have the political power to attract the necessary budget for allocation among implementing ministries and agencies.

Line ministries, on the other hand, often have better implementation capacity. In countries with highly decentralized administrative structures, line ministries can generally ensure good outreach at the local level (World Bank 2010, GN 1). It is thus critical to support their efforts, including strengthening the political and technical capacities of the environmental ministries or agencies, as adaptation funding is expected to increase.

Malawi provides an interesting example of partnership building. Here, the lead institution is the Ministry of Economic Planning and Development, supported by the Ministry of Lands and Natural Resources (box 4.4).

The working mechanisms that will drive the mainstreaming of climate change adaptation should be defined. This could include sector working groups, stakeholder and/or donor consultation, and coordination, which may (or not) be different than for other mainstreaming efforts.

Box 4.3 Initiating the Dialogue in Colombia

- **Understanding the governmental, institutional and political contexts.** UNDP's Integrating Climate Change Risks and Opportunities into National Development Processes and United Nations Country Programming project prepared an initial review of stakeholders involved in climate change in Colombia. The information was collected through semi-structured interviews, official documents on climate change from environment sector institutions, and presentations made at a number of public events. The exercise identified 136 institutions related to climate change adaptation and 128 institutions involved in climate change mitigation in Colombia. The list included public institutions, municipal and regional governments, universities, nongovernmental organizations, local indigenous authorities, private entities, unions and associations, United Nations agencies, development agencies and cross-institutional initiatives.
- **Raising awareness.** Following the stakeholder analysis, 30 individuals from 21 institutions attended a two-day workshop to enhance their understanding of key climate change concepts, such as climate projections, risks, adaptation, maladaptation and no-regret measures, through presentations, group exercises and discussion topics.
- **Building partnerships through national dialogues.** UNDP hosted two events with the objective of fostering opportunities for collaboration and supporting the Colombian government in taking action on climate change. First, in March 2009, UNDP sponsored a National Panel of Experts in Poverty Policies and Adaptation to Climate Change. Then, in August 2009, UNDP organized a National Dialogue: Fight against Poverty and Adaptation to Climate Change, in collaboration with the Department of National Planning, the Institute of Hydrology, Meteorology and Environmental Studies, and the Ministry of Environment, Housing and Territorial Development. This last event focused on providing recommendations for national policies on the fight against poverty and attaining the MDGs, risk management, environmental health and healthy surroundings, and food and nutritional security. Each topic was discussed by a working group of 13–20 individuals from a broad range of institutions. To serve as a basis for discussion, a brief paper was commissioned from national experts on each topic, summarizing the country situation, analysing the projected impacts of climate change, and identifying principal public policies and national initiatives. Participants formulated their recommendations, which were later submitted to Colombian decision makers. During the final plenary session of the workshop, 10 participating institutions volunteered a set of individual commitments to move towards a climate-resilient development path in Colombia.

Sources: UNDP 2009a, 2009b.

Identifying and Mobilizing Champions

Champions who have an interest in and knowledge of the topic and can relate global climate change issues to the national context are ideal candidates to engage as disseminators and facilitators (box 4.5). Since communication is often lacking between climate change experts and development practitioners, there is a need to build partnerships with institutions that can act as intermediaries between science (including socio-economics) and policy-making.

Box 4.4 Towards a Strategic Framework and National Action Programme: Malawi

- **Raising awareness.** Rain-fed agriculture employs approximately 80 percent of the Malawian workforce and contributes over 80 percent of foreign exchange earnings. The distribution and intensity of rainfall is erratic and water storage capacity is limited, making Malawi vulnerable to severe droughts and floods. Initially, climate change was perceived primarily as a source of increased disaster risk, and a NAPA was developed to enable Malawi to address urgent and immediate adaptation needs. Subsequently, there has been growing recognition of a wide range of potentially adverse impacts of climate change on economic growth and development, including food security, energy and water supply, and health. This has raised awareness of the cross-sector implications of climate change, and of the need to mainstream a climate change response in the Malawi Growth and Development Strategy (MGDS).
- **Building partnerships.** During 2007, Principal Secretaries from six key ministries—Development Planning and Cooperation, Agriculture and Food Security, Irrigation and Water, Lands and Natural Resources, Energy and Mines, and Health—collaborated with each other and external development partners to identify a strategy for Malawi's response to climate change that would encompass all ongoing or potential climate change-response initiatives. This included, but was not limited to, Malawi's NAPA. As a result, a Government of Malawi-Development Partner Working Group was revitalized to provide policy and technical direction to government and development partners on climate change, with the Principal Secretary, Development Planning and Cooperation, and the UN Resident Coordinator serving as co-chairs. At about the same time, the Principal Secretary Committee for Environment and Natural Resources was revived and requested to include climate change on its agenda.
- **Undertaking preliminary assessments.** The working group agreed that an inventory of ongoing climate change projects and policy work, an institutional analysis and a climate risk assessment should be produced. The Environmental Affairs Department was designated to guide implementation of the agreed work program, with some technical support from UNDP.
- **Coordinating within the development community.** UNDP undertook to organize One-UN support for government-led consultations on the approach to climate change in Malawi. In April 2008, stakeholders agreed on the need to develop a national multisector framework program, with the goal of protecting MDG and MGDS achievements from the impacts of climate change. In mid-June, it was decided to merge the joint World Bank-Food and Agriculture Organization of the United Nations (FAO) funding proposal for diagnostic work and identification of investment options for managing climate risk with other institution-building activities to be supported by UNDP.
- **Launching a programme.** With technical support from UNDP, FAO and the World Bank, the Government of Malawi has undertaken a programme to develop a strategic framework for managing response to climate change, linked to a national action programme and implementation plan that integrates adaptation and mitigation into ongoing sector programmes and planning processes (e.g. agriculture, food security, water, land management, forestry, energy, environmental, health and disaster risk reduction). An 18-month time-frame is envisaged for completing the strategic framework and national action programme, based on a series of broad stakeholder consultations and relevant results from the diagnostics work. Intervention design and formulation of investment plans will continue for another nine months. The ongoing programme will be implemented across a number of sectors, and will entail cross-ministerial collaboration at national, district and community levels (see box 6.11).
- **Establishing working mechanisms.** The government intends to develop a "cross-sector basket fund arrangement" for channelling external resources for the national action programme on climate change.

Source: Adapted from Government of Malawi, One-UN and World Bank 2009.

Box 4.5 Possible Champions for Mainstreaming Climate Change Adaptation

Possible ministries or departments that could assume the role of champions for adaptation mainstreaming include the following:

- The ministry or agency in charge of food security can be a good champion when impacts of floods and droughts on food security and safety are the main immediate concern.
- The ministry or agency in charge of spatial planning can be a good champion, given the expected impacts of climate change on infrastructure and human settlements.
- The ministry or agency in charge of development planning can effectively take a leading role when the objective is mainstreaming climate change adaptation into medium- to long-term planning, although implementation should remain with sector ministries.
- The ministry of finance should in any case be involved in high-level discussions, particularly if adaptation can bring about important development and economic co-benefits.
- Because of its local nature, mainstreaming can also find champions at the sub-national and local levels. These can be governmental, non-governmental and development actors and include subnational bodies, political parties, the general public and local communities, and the media.

Source: Adapted from World Bank 2010, GN 1.

Further Guidance: Example and References

- *World Bank, Country Notes on Climate Change Aspects in Agriculture*. Published by the World Bank's Latin America and the Caribbean region, these notes provide an overview of country-specific climatic constraints and policy interventions related to the agricultural sector and highlight the institutional make-up in the realm of climate change and agriculture. Other regions, including Europe and Central Asia, are currently preparing similar notes.
- *Mainstreaming Adaptation to Climate Change in Agriculture and Natural Resources Management Projects, Guidance Note 1: Engaging Key National Institutions in the Adaptation Agenda* (World Bank 2010, GN 1). This note illustrates ways to identify institutional counterparts that, depending on the circumstances, are most likely to effectively take the lead on mainstreaming adaptation to climate variability and climate change in national planning or on implementing adaptation measures. It also provides a range of specific suggestions and information to help engage counterparts in the adaptation agenda.
- *Mainstreaming Adaptation to Climate Change in Agriculture and Natural Resources Management Projects, Guidance Note 2: Engaging Local Communities and Increasing Adaptive Capacity* (World Bank 2010, GN 2). This note specifically focuses on interventions to enhance engagement and adaptive capacity at the community level. It provides support on how to strengthen community awareness of climate change adaptation, guide the assessment of communities' adaptive capacity, and promote community participation in identifying and adopting sustainable adaptation strategies.

4.4 Evaluating Institutional and Capacity Needs

Evaluating institutional and capacity needs is an important step in designing an effective mainstreaming effort. This entails addressing both the need to build individual capacities (e.g. trainings) and the need for institutional strengthening (e.g. coordination mechanisms) (see section 6.4). Understanding institutional and capacity needs is also key to framing the arguments and making the case for mainstreaming climate change adaptation into national development planning.

Focus on Technical and Communication Capacities

The needs assessment should focus first on identifying the level of understanding among the national actors with regard to climate change, adaptation and their links to development and poverty reduction.

More specifically, technical capacities (e.g. climatology, disaster risk management) as well as the capacity of the institutions to develop, disseminate and communicate knowledge on climate impacts and adaptation are other elements to assess. This includes institutional mandates, institutional mechanisms and technical capacities as illustrated by the case of Guyana (box 4.6).

Start from Existing Institutional Assessments

National circumstances help determine the best way to work with a counterpart in assessing institutional and capacity needs. Institutional reviews may already have been commissioned (by a different donor agency working on climate change in that particular country, or a national capacity self-assessment), so assessing what is already available before embarking on a review is recommended (World Bank 2010, GN 1). If necessary, a complementary study may be carried out, focusing on the institutional and capacity needs for mainstreaming in relation to the various stages of the planning cycle.

Typically, the assessment should be carried out at the national level, including sector-specific and subnational aspects, and multiple institutions with mandates relevant to adaptation, from government and non-governmental actors. The assessment can take the form of a SWOT (strengths, weaknesses, opportunities and threats) analysis.

Whatever method is chosen, the suggested output is a baseline report that enables comparison of the initial situation with targeted outcomes to be achieved by and through the mainstreaming process (World Bank 2010, GN 4).

Highlight Options for Institutional and Capacity Strengthening

Based on the results, the needs assessment can highlight options to strengthen institutions and capacities to deal with adaptation.

Further Guidance: Example, Questions and References

Box 4.7 lays out several questions that the mainstreaming team can address as part of the evaluation of institutions and capacity needs. The example of Cape Verde (box 4.8) highlights the importance of identifying and addressing institutional needs (see section 6.4).

Further guidance can be found in the following reference documents:

Box 4.6 Guyana: Vulnerability and Capacity Assessment of the Agricultural Sector

Background. The Vulnerability and Capacity Assessment project in Guyana sought to develop decision-support information and tools to help civic and business leaders in the agricultural sector make critical decisions to mitigate climate hazards. Another key objective was to develop a cadre of climate impacts personnel as a resource for Caribbean Community governments. This approach complemented a climate risk vulnerability assessment with a survey of agencies that play an integral role in the agricultural sector, including those having an indirect impact on its functioning (i.e., non-governmental organizations and educational agencies).

Issues assessed. The assessment focused on the following:

- Level of education and awareness (i.e., through training programmes) of staff members on climate variability and change and, specifically, on how to prevent/mitigate impacts on the agricultural sector
- An analysis of the agencies' mandates/functions and their perceived direct or indirect role in adapting to climate variability and/or mitigating climate risks
- Influence of climate-related risks on the capacity of the organization to function effectively, and the types of instruments (institutional, technical, financial or legislative) available to the agency to mitigate these risks
- Human (i.e., level of education and specific skills) and technical capacity (type of equipment for climate data collection and monitoring, geographical information system, quality of information technology services, etc.) available within the organizations to support activities for adapting to and/or mitigating the impacts of climate variability and change on the agricultural sector
- Information management systems in place to monitor and evaluate climate data (including maintenance status and personnel)
- Financial capacity to respond to technical and human capacity needs for sustaining efforts to reduce and/or mitigate the impacts of climate variability and change
- Legal and regulatory capacity, including scope for laws and regulations that govern the agencies to support activities for reducing and/or mitigating the impacts of climate variability and change; and weaknesses and strengths of existing laws and regulations in promoting climate risk management and adaptation, as well as mechanisms to foster compliance
- Specific projects/action plans addressing climate risk management/climate change issues, including perceived obstacles in implementing them
- Collaboration and communication with other agencies or bilateral/multilateral exchanges with other countries (South-South or North-South collaboration) on addressing climate variability and change

Source: Adapted from World Bank 2010, GN 4.

- *Mainstreaming Adaptation to Climate Change in Agriculture and Natural Resources Management Projects, Guidance Note 4: Developing Readiness for Institutional Capacity Development and an Enabling Policy Framework* (World Bank 2010, GN 4). The first section of this note guides practitioners through the main steps, approaches and tools to assess institutional capacity and needs in the context of mainstreaming climate change adaptation.

Box 4.7 Guiding Questions for Evaluating Institutional and Capacity Needs

- What government institutions are relevant to mainstreaming climate change adaptation? What are their mandates?
- Are there overlapping mandates? Are there any specific mandates that are missing (e.g. in areas such as flood risk management)?
- How do the government institutions coordinate and make decisions on the issue of adaptation? Are there any coordination gaps? Do the mechanisms in place need to be strengthened? How?
- Have there been (recent) institutional changes? Are institutional changes necessary in the context of mainstreaming climate change adaptation? How can such changes be fostered?
- What are the planning and programming mechanisms in place? What are the operating procedures of the government institutions? Do the mechanisms and procedures need to be strengthened? How?
- What are the needs in terms of technical capacities (e.g. for monitoring or sector-relevant expertise)?
- What are the budget allocations of these institutions?

Box 4.8 Identifying the Need for an Institutional Coordination Mechanism in Cape Verde

UNDP consulted a number of ministries and other national institutions in the island country of Cape Verde to identify gaps where the organization could provide assistance. The consultation showed that a number of these institutions were actively involved in climate change-related activities; yet it also revealed that no mechanism—formal or informal—existed to allow national stakeholders to meet and discuss issues related to climate change. As a consequence, Cape Verdean institutions have incomplete knowledge of efforts being undertaken nationally, which results in missed opportunities for collaboration, and an absence of a strategic vision in their response to climate change and its implications for development.

To initiate a collaborative process, UNDP organized a workshop where national stakeholders from ministries, national institutes, academia, non-governmental organizations and bilateral donors identified over 30 active national projects related to climate change, implemented by seven different institutions. Participants also agreed on a set of priority actions to improve collaboration on climate change, including the creation of a climate change commission.

Source: UNDP 2010a.

- The UNDP *Capacity Assessment Methodology User's Guide* provides interested practitioners with an overview of UNDP's approach to capacity development and capacity assessment and step-by-step guidance for conducting a capacity assessment using UNDP's Capacity Assessment Framework and Supporting Tool (UNDP 2007).
- The *Resource Kit for National Capacity Self-Assessment* introduces a step-by-step approach for national teams to conduct their national capacity self-assessment using a variety of tools. It was developed to assist project teams undertaking national capacity self-assessments with support from the Global Environment Facility (GEF), but is of wider utility. The kit provides a framework of possible steps, tasks and tools that countries can adapt to fit their own priorities and resources (GEF 2005).



5. Mainstreaming Climate Change Adaptation into Policy Processes



Refer to the relevant sections in chapter 5 when:

- Various types of evidence on the costs and benefits of climate change and adaptation are not readily available and thus need to be collected (e.g. impact, vulnerability and adaptation assessment, socio-economic analysis, demonstration projects) (sections 5.1, 5.2 and 5.3)
- Targeted policy processes are to be influenced (section 5.4) and policy measures developed or climate-proofed (section 5.5)

The second component is concerned with integrating climate change adaptation into a policy process and the resulting policy measures. This component targets a specific policy process—such as a national development plan, poverty reduction strategy paper (PRSP), MDG strategy or sector strategy—identified as an entry point for mainstreaming climate change adaptation (see chapter 4).

Based on the information collected through the preliminary assessments (sections 4.1 and 4.2), more extensive analytical studies illustrating the impacts of climate change on, and the benefits of climate change adaptation for, national development can help inform the mainstreaming effort. These include impact, vulnerability and adaptation assessments; economic analyses of climate change impacts; and demonstration projects.

Based on high-quality, targeted information on how climate change affects national priorities, country-specific evidence helps make the case for mainstreaming climate change adaptation into policy processes and related measures. To this end, scientific information will need to be communicated in accessible language and formats that diverse stakeholders, including policy makers and planners, can use in practice (IIED 2008).

5.1 Impact, Vulnerability and Adaptation Assessments

Current climate shocks and stresses already seriously impinge on the well-being of the poor. Increasing frequency and intensity of extreme weather events, as well as gradual changes in prevailing average temperatures, will exacerbate these impacts. Climate change adds urgency to the need to understand and address the vulnerability of the poor to current and future climate variability, and to reevaluate the role of policies and programmes in reducing this vulnerability (DFID 2004d).

Assessments can help identify the population groups, regions and sectors that are **currently** the most vulnerable, due to present climate risks, state of development, poverty and/or natural resources. For example, densely populated coastal areas, areas already suffering from droughts or floods, resource-poor smallholder farmers, and women and children may already be vulnerable. Assessments can also be used to estimate **future** impacts and vulnerabilities, and to gauge adaptation needs. In other words, the assessments are concerned with the following:

- Current climatic trends and/or projected future climate change in specific geographical areas
- Vulnerabilities of local natural systems and/or communities to current or projected climate-related impacts
- Climate-related risks in specific sectors
- Possible adaptation measures

Vulnerability and adaptation assessments—especially those prepared for national communications to the UNFCCC—can provide useful information, particularly during the initial stages of policy development. Although mainstreaming should rely as much as possible on existing assessments, a number of factors are important to keep in mind when reviewing these assessments, commissioning complementary studies where applicable or conveying the findings to target audiences.

Focus on Current Climate Variability

A climate risk assessment should analyse risks resulting from both current climate conditions and projected, long-term climate change. It should indicate how the climate has been changing in recent years and provide an approximation of what might happen in the years to come. In most developing countries, an adaptation deficit to current climate variability already exists, and many communities are highly vulnerable. Consequently, efforts to mainstream climate change adaptation should not focus exclusively on future climatic projections—which, in many cases, fail to provide detailed predictions of anticipated impacts (World Bank 2010, GN 3).

Account for Non-Climatic Vulnerabilities

Climate risks are usually part of a wider set of vulnerabilities affecting a community or region. Thus, the success of adaptation measures also requires addressing non-climatic issues and drivers of vulnerabilities at the local level (World Bank 2010, GN 3). In the case of the agricultural sector, for example, the implications of climate change might need to be viewed in conjunction with other pressures, such as water availability (box 5.1), demographic trends, and trends in trade and commodity prices. Such integrated information is important to both national governments and external donors to facilitate more meaningful integration of adaptation at the sector level (see section 5.4).

Box 5.1 Taking into Account Non-Climatic Vulnerabilities: Drought and Agriculture

A projected increase in drought in a specific region could put crop production, from both irrigated and rainfed agriculture, at high risk. One possible adaptation strategy suggested as a result of climate risk assessment might be to promote adoption of more drought-tolerant crop varieties. However, adaptive capacity at the local level might be constrained by factors such as weak institutions, inadequate infrastructure and poor access to markets. These constraints may make implementation of the proposed adaptation strategy difficult or even impractical.

Another possible adaptation measure might be to modernize irrigation systems to ensure availability of water during dry spells. However, the pro-poor benefits of such an intervention may be limited if water rights are inequitably distributed, or if some users make illegal withdrawals from the system. Such factors may be more important in triggering vulnerability to drought than outdated water supply technology.

Source: World Bank 2010, GN 3.

Aim for Sufficient Information

A detailed risk or vulnerability assessment may not be necessary, especially as it may require more time and/or financial resources than are readily available. The key here

is not to develop perfect information, but to ensure sufficient information to enable thoughtful consideration of possible policy reforms or measures.

Generally speaking, assessments can be done quantitatively and/or more qualitatively through expert judgement. When it comes to sector assessments, however, there may be a need to commission targeted studies due to the lack of available information to complement the available literature on climate change impacts (OECD 2009).

Focus on the Appropriate Scale of Analysis

Vulnerability and climate assessments need to be undertaken at an appropriate scale for consideration by policy makers and communities. A general climate change assessment for the whole of Fiji, say, may be of little use when one side of the island is relatively dry and the other distinctly wetter. As much as possible, information should be context specific and not rely on broad regional or national averages (World Bank 2006a).

Use a Spatial Approach to Communicate Risks and Vulnerabilities

Adopting a spatial approach and presenting assessment results using visual tools may more powerfully communicate the need for climate change adaptation (World Bank 2010, GN 1). For example, vulnerability maps can be used to show the areas where population is most likely to be affected by climate variability or disaster risk.

Account for and Communicate Uncertainty

When climate change scenarios and projections are used in the analysis, uncertainty needs to be thoroughly accounted for and properly communicated. This may be done by providing a range of estimates or specifying a confidence level for projected climate impacts.

In communicating uncertainty about projected climate change impacts, it is essential to emphasize the need to adapt to both current and future climate variability, in order to avoid undermining the message about the urgent nature of climate change adaptation (World Bank 2010, GN 1).

Further Guidance: Questions, Tools and References

In carrying out an assessment, a series of steps and questions can guide the practitioner (table 5.1).

A variety of tools are being developed to improve decision-making to reduce vulnerability and create opportunities associated with climate variability and change. These tools can be used by various stakeholders, from vulnerable communities to policy makers, with the aim of better understanding how they may be affected by climate change. A number of such tools are listed on www.adaptationlearning.net/explore. These include broad information providers on the following:

- Climate projection, e.g. PRECIS (Providing Regional Climates for Impacts Studies)—see box 5.2
- Disasters, e.g. UN-ISDR (UN–International Strategy for Disaster Reduction)
- Vulnerability, e.g. CAIT (Climate Analysis Indicators Tool)
- Project design, e.g. CRiSTAL (Community-Based Risk Screening Tool—Adaptation and Livelihoods)

Table 5.1 Questions/Steps and Approaches/Tools to Perform an Assessment: Natural Resource Management

Main question/step	Approach/tool
What is the study area (region, subregion, district, water basin, etc.) and the time horizon of interest (2020, 2050, 2100)?	Expert opinion, project team interest
What is the nature and extent of current and future climate risks in the area of interest? What is the degree of uncertainty?	Application of user-friendly tools, such as the World Bank Climate Change Knowledge Portal, literature review, climate trend analysis, application of global climate models and regional climate models
What are the most important climate variables that the agriculture and natural resource management sectors may be sensitive to in the study area (trends and long-term projections and annual and seasonal precipitation, water runoff, temperature, number of consecutive dry days, etc.)?	Literature review and expert opinion
What coping strategies are being used to deal with current climate variability? Are adjustments necessary in the face of long-term change?	Review of existing information on current local risks, vulnerability and coping strategies
What is the extent and nature of the sector's sensitivity and vulnerability to changes in climate variables in the study area over the assessment period (impacts of increasing droughts, soil erosion or increased precipitation on crop yield production)?	Employment of user-friendly sector- and location-specific climate risk screening tools, use of agro-nomic models, surface water runoff models, etc., coupled with climate projection models
What are the non-climate-related drivers of risk and vulnerability in the study area (land-use change, soil degradation, lack of basic rural infrastructure, lack of income diversification opportunities, distortion in agricultural subsidies, etc.)? What are the uncertainties involved? What is the importance of climate vulnerabilities versus other vulnerabilities (market volatility, infrastructure and health)?	Field surveys, participatory rural appraisals, interviews with key informants and local communities Special attention should be given to how these impacts affect the most vulnerable and disadvantaged populations, including women, children and marginalized groups
Given the above, what are suitable adaptation options in the study area?	Suggested adaptation measures from climate risk screening tools, outcomes of field surveys, results from adaptation projects/studies in other areas, interviews with key informants and local communities, and expert opinions
Given all the available options, which ones should be carried out first?	Participatory approaches, economic analysis

Source: Adapted from World Bank 2006a.

Box 5.2 Regional Predictive Modelling: PRECIS

PRECIS is a freely available, portable version of the Hadley Centre's Regional Climate Model. With a resolution of about 50 sq km, it can be run on an inexpensive, easily accessible personal computer. Researchers can run climate scenarios and make their own predictions of national patterns of climate change, which can then be used to assess local vulnerabilities and impacts. This allows horizon scanning to identify future climate risks, such as sea level rise, and changes in temperature and precipitation, to feed into predicted changes in frequency of floods or droughts and severity of storms.

Source: DFID 2004a.

These tools also include those that take a screening approach to evaluate portfolios and justify design changes—e.g. ORCHID (Opportunities and Risks of Climate Change and Disasters). Table 5.2 provides information on the properties and uses of such decision-support tools. See also sections 5.4 and 6.3 for more information on the use of tools such as ADAPT (Assessment and Design for Adaptation to Climate Change: A Planning Tool), and CRiSTAL.

Table 5.2 Properties and Uses of Decision-Support Tools for Climate Change Adaptation

Tool/developer	Type of tool	Current climate	Climate change scenarios	Climate change sector impacts	Analysis of adaptation options	Analysis at the community level	Economic analysis
Climate Change Knowledge Portal; ADAPT/World Bank	Data generators, databases and data platforms/computer-based	✓	✓	✓	✓	✓	
Adaptation Learning Mechanism/UNDP	Computer-based/frameworks for adaptation/climate risk management processes	✓	✓	✓	✓		
SERVIR/USAID, NASA, CATHALAC, IAGT, University of Colorado	Information generation, databases and platforms	✓	✓	✓			
Climate Change Explorer (CCE)/SEI	Data generators, databases and data platforms	✓	✓	✓		✓	
CRiSTAL/IISD, IUCN, SEI	Computer-based	✓		✓		✓	
Adaptation Wizard/UK Climate Impacts Programme	Computer-based		✓		✓	✓	✓
ORCHID/IDS	Frameworks for adaptation/climate risk management processes	✓	✓	✓		✓	
Climate Change and Environmental Degradation Risk and Adaptation Assessment (CEDRA)/Tearfund	Frameworks for adaptation/climate risk management processes	✓	✓	✓	✓	✓	
Climate Wizard/The Nature Conservancy	Data generators, database and platforms	✓	✓				

Source: www.adaptationlearning.net/explore.

Note: CATHALAC = Centro del Agua del Trópico Húmedo para América Latina y El Caribe; IAGT = Institute for the Application of Geospatial Technology; IDS = Institute of Development Studies; IISD = International Institute for Sustainable Development; IUCN = International Union for Conservation of Nature; NASA = National Aeronautics and Space Administration; SEI = Stockholm Environment Institute; USAID = US Agency for International Development.

Further guidance can be found in the following reference documents:

- *Mainstreaming Adaptation to Climate Change in Agriculture and Natural Resources Management Projects, Guidance Note 3: Assessing Climate Risk* (World Bank 2010, GN 3). The objective of this guidance note is to provide information on climate risk assessment and introduce existing tools that can be used to screen for climate risk in project development. Specifically, this note aims to describe basic concepts and steps to carry out climate risk assessments, and introduce existing tools that support such assessments. It also suggests adaptation pathways for particular locations, and aims to assist development practitioners in selecting the most suitable tools and interpreting their results.
- *Compendium on Methods and Tools to Evaluate Impacts of, Vulnerability and Adaptation to Climate Change* (UNFCCC 2008). The compendium provides users with information about available frameworks and tools, special features of each framework or tool, and information on how to obtain documentation, training or publications supporting each tool. It has been designed for use as a reference document to identify available frameworks and tools for assessing vulnerability and adaptation. This is not a manual describing how to implement each tool, but rather a survey of possible tools that can be applied to a broad spectrum of situations and a map to point users to additional sources of information.
- *Screening Tools and Guidelines to Support the Mainstreaming of Climate Change Adaptation into Development Assistance—A Stocktaking Report* (Olhoff and Schaer 2009). Section 5 of the report presents a comparative overview and analysis of climate risk screening tools and guidance in support of mainstreaming climate change adaptation.

5.2 Economic Analyses

Collecting country-specific evidence of the potential economic costs of climate change impacts and the benefits of investing in adaptation is a key step in the mainstreaming process. It is important for convincing decision makers at various levels that climate change has economic implications that will make achievement of development objectives more difficult, so they are more likely to factor climate change adaptation into their decision-making processes. Country-specific evidence of economic impacts will also help ensure allocation of sufficient financial resources for policy measures in support of climate change adaptation, whether such measures entail revising existing or planned measures to factor in climate change or implementing new measures specifically targeted at climate change adaptation.

Understanding the Challenge

The first issue concerns estimating expected impacts from climate change in the absence of adaptation (see section 5.1). As with other environmental issues, valuing physical or ecological changes (biodiversity loss, loss of critical environmental services, etc.) in monetary terms remains a challenge.

The second issue concerns estimating the value of damage avoided through adaptation investments (see section 5.5). The expected value of avoided damage (the gross benefits of adaptation) is the difference between the projected cost of climate change–induced damages without adaptation and the projected cost of such damages with adaptation. There are significant limitations to developing reliable baseline estimates of expected local impacts from climate change in the absence of adaptation as well as a general lack of experience regarding the effectiveness of adaptation measures in terms of avoiding damages. Given these constraints, valuing the gross benefits of adaptation investments can become sophisticated guesswork (World Bank 2010, GN 7).

Literature Review and Simple Data Analysis

Despite the complexity of the issue, a simplified assessment based on a literature review and simple data analysis may, in some cases, suffice. For example, evidence on the linkages between temperature increase and disaster frequency can be complemented by regional data on the socio-economic impacts of disasters in the region of interest to get a sense of how the situation might worsen in the coming decades (table 5.3).

Table 5.3 Estimated Economic and Social Impacts of Disasters in Selected Pacific Island Countries (1950–2004)

Country	No. of disasters reported	Total reported losses in 2004 (million \$)	Average pop. affected (%)		Average impact on GDP (%)	
			Disaster years	All years	Disaster years	All years
Fiji	38	1,174.6	10.8	5.1	7.7	2.7
Samoa	12	743.4	42.2	6.1	45.6	6.6
Vanuatu	37	384.4	15.5	4.5	30.0	4.4
Tonga	16	171.1	42.2	5.3	14.2	1.8
Guam	11	3,056.3	3.7	0.5	n.a.	n.a.

Source: World Bank 2006a.

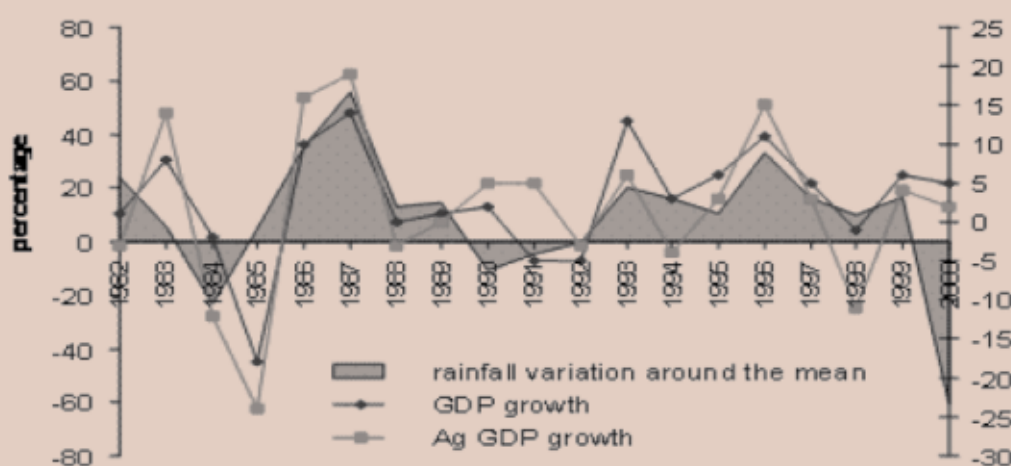
Note: n.a. = not available.

Correlations between key climatic and economic variables, coupled with a trend analysis and/or future projections for key climatic variables, may also prove very effective in conveying the message (box 5.3).

Box 5.3 Conveying the Message in Ethiopia

In Ethiopia, a simple analysis was undertaken to correlate time-series data on GDP growth—economywide and in the agricultural sector in particular—with time-series data on rainfall variation. A resulting graph (below) proved to be a powerful visual aid to show the high level of dependence of Ethiopia's economy on agricultural production and the high degree of sensitivity of the agricultural sector to variations in rainfall.

Rainfall variability and GDP growth in Ethiopia



The exercise was later repeated for Kenya (see World Bank 2010, GN 1, Annex 6).

Source: World Bank 2004a.

Making Use of More Comprehensive Analysis

For priority or highly vulnerable sectors such as agriculture, more comprehensive analysis or case studies may be useful (box 5.4).

Box 5.4 Economic Analysis of Current and Future Drought-Related Losses: Maharashtra, India

In the Indian state of Maharashtra, researchers evaluated the economic loss associated with drought. Even without climate change, drought-related losses amount to some 30 percent of the state's food and grain production and severely affect 15 million small and marginal farmers.

By 2030, a significant drought could lead to a countrywide agricultural loss of more than \$7 billion, and affect the income of 10 percent of the population. Historically, significant droughts have occurred on average every 25 years. Extreme climate change could increase that frequency to once every eight years.

The case study identified a number of measures that could protect crop production and farmers' incomes in Maharashtra, including expanded drip and sprinkler irrigation, drainage construction, improved soil techniques and crop engineering. Maharashtra can eliminate much of its expected drought loss by 2030 through low-cost measures with benefits that often exceed their cost.

Source: Economics of Climate Adaptation Working Group 2009.

In highly vulnerable countries where adaptation may imply major policy changes in key economic sectors, more comprehensive countrywide socio-economic analyses of climate change impacts, vulnerability or adaptation response may also be needed. If such analyses have already been undertaken, they should be used within the mainstreaming process. If not, it may be necessary to undertake such assessments.

Figure 5.1 illustrates the results of a macroeconomic analysis to estimate the impact of drought on the main economic sectors of the Indian state of Andhra Pradesh, India, including agriculture and livestock. The model developed for the study focused on eight selected drought-prone districts, which together account for 70 percent of the average drought-related loss in agricultural production statewide and 88 percent of overall crop production variability in the state.

Figure 5.1 Average Annual Loss as Percentage of Gross Value Added Owing to Droughts: Andhra Pradesh, India



Source: World Bank 2006b.

Factoring Uncertainty Selectively

Many, if not most, of the needed investments in climate change adaptation (e.g. in the agricultural sector) are low- or no-regret measures—that is, they will bring development benefits irrespective of how much the climate changes. At the other end of the spectrum, some adaptation responses produce large benefits only in the context of major climate change. Examples of such responses include infrastructure projects (e.g. dams, dikes) that proactively respond to projected changes in factors such as runoff and sea level rise. Only in the latter case must the uncertainty of climate change, and the costs and benefits of adaptation, be explicitly considered in evaluation (World Bank 2010, GN 7).

Economic evaluation with uncertainty usually takes the form of considering a set of future scenarios judged to have various degrees of likelihood. More sophisticated extensions of this approach will postulate explicit probability distributions for key factors, construct an implied distribution of results (in terms of net present value), and examine the mean (or median) and variability of the net benefits. There are a few drawbacks to these approaches in evaluating adaptation and methods available to deal with them. For more information, see *Mainstreaming Adaptation to Climate Change in Agriculture and Natural Resources Management Projects, Guidance Note 7: Evaluating Adaptation via Economic Analysis* (World Bank 2010, GN 7) and its annexes.

Making the Economic Case

Making the case in economic terms is often crucial to convince policy makers. Quantitative evidence and economic estimates of the impacts of climate variability and climate change on key poverty and economic indicators can be very effective. Box 5.5 provides an example from Mozambique.

Box 5.5 Making the Economic Case for Adaptation in Mozambique

A 2005 study on the impact of water resources on Mozambique's economy showed that climate-related disasters currently have had, by far, the single greatest impact on the economy, more so than factors such as price fluctuation. The study's results were brought to the government's attention. Since then, the study has often been quoted, the assessment of economic impacts of natural disasters is now part of the annual national economic assessment, and its implications are discussed at high-level meetings.

Source: World Bank 2010, GN 1.

Methods for capturing and quantifying costs and benefits need to go beyond traditional assessment techniques. They should include concepts such as social return on investment, in which stakeholders help identify hidden costs and benefits that are not part of formal markets. They should also encompass issues related to learning, equity and marginalized communities.

Example: The Importance of Going Beyond Traditional Economic Analysis

In **Namibia** and **Tanzania**, economic analyses found that the estimated impact of climate change on GDP was less than 1 percent. However, analysis of equity and distributional impacts revealed that the burden would fall heavily on smallholding farmers and the urban poor.

Source: IIED 2010.

Further Guidance: Examples and References

The case of Kiribati, one of the first countries hit by climate change, provides an interesting example of how country-specific evidence combining vulnerability assessment and economic data has contributed to mainstreaming into various entry points, from policy-making to budgeting, financing and institutional strengthening (box 5.6). Cambodia provides another interesting example on which to draw (box 5.7).

Box 5.6 Country-Specific Evidence Supports Various Entry Points for Adaptation Mainstreaming in Kiribati

In Kiribati, an extensive Vulnerability and Adaptation Study (1999–2000) indicated that by 2050, in the absence of adaptation measures, the island's increasing vulnerability to climate events could result in damages valued at \$8–\$16 million per year. Factors influencing these costs include Kiribati's population density and concentration of coastal development along a vulnerable shoreline.

An innovative strategy by the Government of Kiribati involves a two-year, economywide assessment of potential adaptation interventions to identify the changes in economic policies and budgetary allocations required to adapt to increasing storm severity and sea level rise. This process is aimed at creating an agreed national vision for adaptation.

A second phase will begin once adaptation benchmark indicators are agreed as the basis for donors to provide incremental "top-up" grant financing for public expenditures.

The programme is overseen by an Adaptation Working Group, chaired by the secretary to the Cabinet and managed by the Ministry of Finance and Economic Planning.

Source: DFID 2004d.

Box 5.7 Integration of Climate Risks into the PRSP in Cambodia

Cambodia's national communication (2002) identified potential drought- and flood-related impacts on agriculture, forestry, human health and the coastal zone. Both drought and floods have caused significant damage to Cambodia, and are a regular occurrence. The flood of 2000 caused damage estimated at approximately \$145 million. As a result, Cambodia has prioritized specific coastal zone and disaster management measures, and additional sector adaptations.

These priorities have been effectively integrated into Cambodia's PRSP (2003), which includes a significant component devoted to disaster risk management.

A National Committee for Disaster Management has been established. In addition, a comprehensive, long-term flood management and mitigation strategy has been developed, based on the identification of at-risk communities and assets, and the incorporation of climate forecasting to determine risk.

Source: DFID 2004d.

Further guidance can be found in the following reference documents:

- *Mainstreaming Adaptation to Climate Change in Agriculture and Natural Resources Management Projects, Guidance Note 7: Evaluating Adaptation via Economic Analysis* (World Bank 2010, GN 7). The main objective of this guidance note is to present various methodologies that can be used to carry out an economic evaluation of adaptation investments in agriculture and natural resource management. The note provides some guidance in selecting the most suitable approach for the project under consideration.
- *Making the Economic Case: A Primer on the Economic Arguments for Mainstreaming Poverty-Environment Linkages into Development Planning* (UNPEI 2009b). The primer is designed to help practitioners engaged in mainstreaming succeed in making the case for integrating environmental management into national development plans, budgets and implementation programmes. It aims to assist practitioners in making the argument that better environmental management contributes to poverty reduction, pro-poor growth and government finances.
- *Shaping Climate-Resilient Development: A Framework for Decision-Making* (Economics of Climate Adaptation Working Group 2009). The report offers a comprehensive and replicable methodology to determine the risks that climate change imposes on economies. It provides a set of tools for decision makers to adopt a tailored approach for estimating these costs based on local climate conditions, and for building more resilient economies. These tools do not include estimates or measures for emissions reduction, which would need to be examined separately.

5.3 Demonstration Projects

Local pilot projects that demonstrate the relevance and effectiveness of adaptation measures—and highlight the enabling conditions needed to scale them up—can make the difference in convincing policy makers to act. Evidence from local demonstration projects is often a powerful means to foster interest and commitment at both the subnational and higher institutional levels.

Take Account of Local Capacities and Needs

A key first step in developing pilot adaptation projects is building a good understanding of rural communities' adaptive capacity, including their needs, vulnerabilities and coping strategies, as well as limiting factors that could constrain the adoption of adaptation measures. Demonstration projects should be grounded in—and, at the same time, evaluate the extent of—local understanding of climate variability and climate change impacts (World Bank 2010, GN 2).

In determining the target area of pilot adaptation projects, the organizational preparedness of villages and districts should be one of the most important selection criteria (World Bank 2010, GN 5).

Identify Suitable Measures

Identifying suitable adaptation measures is another key step. It requires, among others things, providing local communities with information in a form they can use as a basis for decision-making and action, identifying several adaptation options with communities, and explaining to communities the possible economic benefits of shifting towards more sustainable (e.g. food-secure and climate-resilient) livelihoods (World Bank 2010, GN 2).

Address Non-Climatic Concerns of Target Groups

An essential element in successful demonstration projects is emphasizing solutions that enable communities to attain multiple objectives, including non-climatic as well as climate change concerns. Similarly, it is important to provide incentives for communities to take on new adaptation measures, for example, by helping them understand innovative mechanisms such as insurance (e.g. for drought and flood) and credit. Many community members may be averse to the risks involved in trying out new approaches. To overcome this risk aversion, the project may need to provide some sort of measures to ensure financial security for those willing to test new ideas (World Bank 2010, GN 2).

Design the Project for Eventual Scale-Up

Local-level demonstration projects should be designed for easy eventual scale-up to build on local successes achieved by the project. This entails consideration from the outset of issues that could constrain eventual scale-up, such as potential policy barriers (e.g. fiscal and regulatory, including natural resource rights), market conditions, financing needs and sources, institutional and capacity needs, and networks and other support services required. To maximize the potential for scaling up local successes, it is important to choose demonstration projects that are easily implemented, highly visible and desirable; this can help build confidence that adaptation is feasible and not excessively costly (World Bank 2006a).

Involve Both Government and Non-Governmental Actors

Working with local institutions, communities and the private sector to demonstrate good practice is critical to securing support for local pilot projects. Collaborating with both government and nongovernmental actors can help convince policy makers and planners of the relevance of climate change to their work and promote learning from demonstrated results (IIED 2008).

Further Guidance: Examples and Reference

Box 5.8 shows how mainstreaming at the sector level can be assisted by strategic project interventions to help identify, prioritize, demonstrate and implement adaptation measures through pilot activities.

Box 5.8 Assisting Sector Mainstreaming through Pilot Activities: China's Agricultural Sector

A new GEF-funded project from the World Bank, Mainstreaming Climate Change Adaptation in Irrigated Agriculture, aims to ensure that climate change adaptation is mainstreamed into China's Comprehensive Agricultural Development (CAD), the country's policy on macro-agricultural adjustment and the promotion of sustainable agricultural development.

Policy framework. The policy framework for mainstreaming climate change adaptation into the agricultural sector includes China's initial national communication to the UNFCCC as well as the CAD. China's national communication (2004) highlights the negative impact of climate change on agriculture, leading to higher costs of production, which will in turn require a greater focus on management techniques. Thus far, the CAD has not addressed climate change issues.

Type of engagement. The project will use the existing World Bank-implemented Irrigated Agricultural Intensification III Project as leverage. The project will mainstream climate change adaptation in the national CAD programme through capacity building, implementation of a management information system and a monitoring and evaluation system focusing on adaptation measures, and preparation of a national climate change adaptation plan for the CAD.

Actors involved. Implementation is guided by the State Office for Comprehensive Agricultural Development, with the close cooperation of the National Development and Reform Commission and the Ministry of Finance's national climate change adaptation offices. Because of this institutional location, the project has significant influence with all the provinces and close working arrangements with central sector agencies concerned with climate change adaptation, including the Ministries of Water Resources and Agriculture.

Source: OECD 2009.

As mentioned earlier, in developing and implementing demonstration projects, it is important to engage with both local actors and higher-level decision makers and help raise their awareness of climate-development-poverty linkages. This will help ensure that the lessons of demonstration projects are applied more broadly. Some successful awareness-raising activities that have been undertaken in various fields and are also suitable for climate change adaptation are presented in box 5.9.

Box 5.9 Raising Awareness of Communities in Support of Pilot Projects

Examples of awareness-raising activities include the following:

- Establishing confidence and dialogue with communities with the help of trusted local intermediaries (e.g. non-governmental organizations, community groups, extension workers or government bodies) to avoid conflicting information on climate change issues from “non-trusted” sources
- Educational activities for youth through open discussions, peer learning and training
- Village-level “knowledge centres” targeting community-based organizations
- Cultural activities, such as drama, singing and the use of visual media (movies, short videos, documentaries, etc.)
- “Exhibition farms” that successfully demonstrate the use and adoption of innovative techniques and adaptation options (i.e., improved soil management and introduction of new stress-resistant breeding varieties)
- Orientation programmes and workshops addressing climate change impacts on specific activities (e.g. water management)
- Field visits and guided tours as experiential learning opportunities

Source: World Bank 2010, GN 2.

Further guidance is available in the following document:

- *Enabling Local Success: A Primer on Local Ecosystem-Based Solutions to Poverty-Environment Challenges* (UNPEI forthcoming). This primer assembles current knowledge and illustrative case materials on the benefits of, and enabling conditions for, local ecosystem-based initiatives. It documents how nature-focused activities and enterprises, originated and executed by local actors, can sustain ecosystems and improve the livelihoods of the rural poor.

5.4 Influencing Policy Processes

Influencing policy processes refers to integrating adaptation-relevant objectives within long-term development visions, poverty reduction strategies or their equivalent, and sector and subnational strategies and plans. This requires alignment with governance mechanisms shaping the targeted policy process, using existing development planning processes rather than creating new ones.

Ideally, mainstreaming of climate change adaptation should be coordinated by central ministries, such as finance or development planning. If this is not the case, it is crucial to make sure there is effective communication between the lead ministry dealing with climate change adaptation (e.g. ministry of environment) and central ministries such as finance and planning. This may be accomplished through, for example, a multi-stakeholder committee (see section 6.4).

The resulting output of the targeted policy process should include strategic and sector-specific goals and targets, supported by implementation strategies relevant to adaptation.

Applying a Climate Lens

A climate lens needs to be applied in the formulation and implementation of policies and strategies (box 5.10). The result of applying a climate lens should be a strategy or policy more effective at reaching its original objectives in the face of a changing climate. For example, planned development of certain geographical zones (e.g. coastal areas vulnerable to sea level rise and storm surges) or sectors (e.g. hydropower) may be viewed in a different light when the medium- to long-term risks posed by climate change are taken into consideration (OECD 2009).

Box 5.10 Defining the Climate Lens

A climate lens is an analytical tool to examine a strategy, policy, plan or policy measure (e.g. law and regulation) during its formulation or review stage. It involves examining the following:

- The extent to which a strategy, policy, plan or policy measure under consideration could be vulnerable to risks arising from climate variability or change
- The extent to which climate risks have been taken into consideration in the course of formulating the strategy, policy, plan or policy measure
- The extent to which the strategy, policy, plan or policy measure could increase vulnerability, leading to maladaptation (e.g. for certain population groups, regions or sectors)
- What amendments might be warranted in order to address climate risks

Source: Adapted from OECD 2009.

One possible way to apply the climate change adaptation lens is by using the framework provided by a strategic environmental assessment (SEA)—which can be used for mainstreaming generally—and tailoring it specifically to the purpose of mainstreaming climate change adaptation. At the national level, a key focus of an SEA would be to identify which sectors and geographical areas are likely to be particularly adversely affected by climate change. An SEA can make use of tools such as spatial analysis, multicriteria

decision analysis, stakeholder consultations and cost-benefit analysis. Typically, an SEA consists of four steps: establishing the context, implementing the SEA; informing/influencing decision-making, and monitoring and evaluation. All of these steps could be tailored to climate change adaptation (OECD 2009).

The formulation or review of a planned or existing policy can thus highlight elements that negatively affect the objective of pursuing climate change adaptation, as well as opportunities to more directly support climate change adaptation. Among the ways policy makers can explore the scope for recalibrating the policy or strategy are the following:

- Defining the policy or strategy goals and/or time scales
- Introducing an explicit provision for revision every few years, to ensure that the policy or strategy is revised in a timely fashion to adjust to new information on climate impacts, vulnerability and adaptation needs
- Engaging different stakeholders in the policy or strategy formulation process to ensure a broad consensus on adaptation measures
- Providing stronger legal support for mainstreaming adaptation into development planning in general
- Avoiding specific policy measures (including economic incentives) that are counter-productive (see section 5.5) (World Bank 2010, GN 4)

Start with Current Climate Variability

In order to make the case and influence policy makers, presenting projections of medium- to long-term climate change impacts might not always be the best strategy. Indeed, this may create a false sense of the lack of urgency in tackling important vulnerabilities to climate variability and change. Rather, the urgency of taking immediate decisions to enhance climate change adaptation might be better communicated by first showing how current climatic variability is already influencing fundamental poverty indicators, and then suggesting how future climate change will exacerbate these impacts (World Bank 2010, GN 1). It is also important to demonstrate how climate change will make existing development challenges more costly to address.

Targeting Policy Processes at the National Level

Currently, the majority of national visions, policies and strategies do not mention climate change and the risks arising from it. Climate change should be recognized as being capable of generating significant economic, social and environmental risks; it should be reflected in all components of national development plans or strategies where there may be substantial impacts.

Why Mainstream at the National Level?

The national level provides the overall national priorities and guiding policy framework within which lower administrative levels (sector and subnational) operate. The incorporation of adaptation may help increase recognition of the significance of climate change and its impacts and the need to adapt. This increasing recognition would hopefully filter to lower levels of decision-making and create a groundswell for systematic consideration of climate risks and the need for adaptation at all levels of decision-making, including sector and subnational levels and budgeting.

For example, the analysis of the national development plan, PRSP or common country assessment may reveal key sectors vulnerable to climate change and provide new directions for the development of those sectors. These new directions would then have to be taken into account in sector policies. Moreover, relations with other countries are managed at the national level (e.g. shared water resources, multilateral environmental agreements relevant to adaptation, and donor relations) (OECD 2009).

Who to Engage?

Integrating adaptation will require the involvement of all key national-level players. The main players at this level of government include the office of the head of state, ministries of finance or planning, as well as central-level bodies responsible for coordination across various government agencies (for disaster risk management, cross-sector coordination, etc.) (OECD 2009). Other important players include parliamentarians, development actors (e.g. donors), representatives of civil society, academia, business and industry, the general public and the media.

Which Policy Processes to Target at the National Level?

Key processes include long-term (15–20 years) visions and national development strategies as well as shorter-term (3–5 year) national policies and poverty reduction strategies. Such documents have a very high potential to foster adaptation at various levels since they set the stage for national plans and legislation, sector and subnational plans and policy measures, and resource allocation (see section 6.2).

- **National visions and sustainable development strategies** have a long-term time horizon which makes them particularly relevant for climate change adaptation, which also has to consider longer-term time frames (OECD 2009).
- **Poverty reduction strategies and multi-year national and sector development plans** have shorter time horizons (3–5 years). In principle, this makes it more difficult to integrate considerations of the longer-term risks posed by climate change. Adaptation to current climate variability, however, has close synergies with what might be required to cope with longer-term climatic changes, and should be considered within poverty reduction strategies and development plans. Given the projected impacts of climate change on development and poverty reduction efforts—and the potential for development policies to lead to maladaptation if climate change is not considered—it is vital that the linkages between climate change, growth and poverty be discussed in poverty reduction strategies and development plans. Further, the operational significance of poverty reduction strategies and development plans is relatively high, since they directly influence near-term decision-making and action.

PRSPs have particular relevance in the context of development cooperation as they provide the basis for most multilateral and bilateral aid (OECD 2009). The inclusion of disaster risk reduction in national priorities within a few recent PRSPs provides useful examples of an entry point that could be utilized to foster the climate change adaptation agenda. Similarly, the common country assessment and United Nations Development Assistance Framework processes can also influence national development planning and ongoing donor support (UNDG 2010).

Multi-year national development plans are based on both top-down input from national policies and bottom-up input from sector-level development plans. If considerations of climate change adaptation have been effectively integrated in national policies, the

Example: Inclusion of Disaster- and Climate-Related Risks in Policy Documents

- **Kenya's** Vision 2030 calls for enhancing disaster preparedness in all disaster-prone areas and improving capacity to adapt to climate variability and change (World Bank 2010, GN 1).
- **Mongolia** is highly dependent on pastoralism and already suffers from climate variability, particularly severe winters and summer droughts. Mongolia's national communication to the UNFCCC (2000) recognized that global climate change has increased this threat, and highlighted the need to integrate adaptation into development. Climate risks have therefore been addressed in Mongolia's poverty reduction programme, including activities to strengthen land policy reform, community management of pastureland, natural resource management and the use of "green zones" (DFID 2004a).
- The 2006 PRSP for **Mozambique** and the 2007 PRSP for **Madagascar** underline that these countries are vulnerable to natural disasters and highlight prevention and mitigation of disasters, including forecasting systems and mapping of risk zones, as priority interventions (World Bank 2010, GN 1).
- The PRSP of **Tajikistan** (2002) proposes the development of a national strategy for sustainable natural resource use and environmental protection. A significant part of this effort will focus on measures—such as watershed management and afforestation—to reduce the risk of extreme weather events (DFID 2004a).

top-down input from these should have already been assessed through the climate lens and should therefore be "climate-proofed." That is, the sustainability of development investments over their entire lifetime should be ensured by taking explicit account of a changing climate. However, the bottom-up sector plans may not have been screened against climate risks; if so, they will need to be assessed in light of climate change (OECD 2009).

Targeting Policy Processes at the Sector Level***Why Mainstream at the Sectoral Level?***

Some sectors, such as agriculture, are directly affected by climate, while others incur mainly indirect impacts. Key climate-sensitive sectors include agriculture, forestry, fisheries, health, environment, energy and infrastructure. For example, industrial production can be affected if climate change reduces (or enhances) hydropower production for electricity—as recently happened in Ghana, where drought conditions have limited hydropower production, cutting economic growth by 2 percent.

The incorporation of adaptation in sector policies should lead to systematic consideration of climate change and adaptation in the subsequent sector planning stage. In addition, the explicit consideration of climate change and adaptation in sector policies may later enable stakeholders operating at lower levels to hold sector ministries accountable for their actions and policies relating to climate change (OECD 2009).

Who to Engage?

The main players include line ministries, sector-specific commissions, parliamentary committees, development partners and non-governmental organizations (NGOs) with a sector focus. The range of sector players noted above indicates the emphasis that needs to be given to the coordination of climate change adaptation.

Which Policy Processes to Target at the Sector Level?

Sector strategies are critical to highlight the impacts of climate change from the viewpoint of a particular sector, set sector-related priorities, and promote investments to reduce climate-related impacts and vulnerability in its domain of interventions. Such strategies establish the broad objectives to be pursued in a given sector (e.g. development of irrigated agriculture in a given region of the country for the production of commercial export crops) over a given time horizon, the main approaches to be employed (e.g. a mix of smallholder and commercial-scale operations), and the associated policies to be implemented to reach the targeted objectives (OECD 2009). Sector strategies also need to include clear indicators of impact to enable the effectiveness of measures to be monitored over time. The strategies are then translated into concrete measures, including through budget allocations (see section 6.2), which provide another opportunity for adaptation mainstreaming (see section 5.5).

Tools such as SEA may be useful for facilitating careful reflection of direct and indirect climate-related impacts (box 5.11).

Targeting Policy Processes at the Subnational Level**Why Mainstream at the Subnational Level?**

Climate change affects the local level in relation to the geography and other environmental, economic and socio-political factors. It is also most clearly observed at the local level. Similarly, vulnerability and adaptive capacity are context specific, resulting from the interactions among factors such as poverty level, education, settlement patterns, infrastructure, ecosystem and human health, and gender issues. It is thus critical to address those factors through mainstreaming at the subnational level (OECD 2009).

Who to Engage?

Actors to be engaged at the subnational level include subnational governments and bodies, business and industry, NGOs, community-based organizations, the general public (e.g. individuals, households) and the media (OECD 2009).

Which Policy Processes to Target at the Subnational Level?

- **Rural development plans.** Rural development plans focus on the effective delivery of public services and on the distribution and management of natural resources in sustainable production systems. The aim is to protect and strengthen rural livelihoods, contributing to poverty reduction and economic development at all scales. Climate change considerations thus need to be incorporated into locally driven rural planning processes. Rural development plans are short- to medium-term (1–5 years) plans providing guidance for development at a decentralized decision-making level (parish, district). They are usually developed by local governments through a consultative process with community stakeholders. These plans are supported by appropriate budgetary

Box 5.11 Use of Strategic Environmental Assessment to Integrate Climate Change Recommendations into Fiji's Tourism Development Plan

Background. The World Wide Fund for Nature–South Pacific Programme (WWF-SPP) and the Asian Development Bank formed a partnership agreement to carry out an SEA of Fiji's Tourism Development Plan. Climate change was central in the assessment as it was likely to affect the tourism industry, one of Fiji's most important economic sectors. For example, it could make Fiji's environment more fragile and less resilient to human impacts, and could result in a less pleasant tourist destination, given that Fiji's temperature is already often oppressively hot. Policy responses to climate change, including elements of both mitigation and adaptation, were suggested in the SEA.

Approach. The Asian Development Bank as well as the permanent secretary of the Ministry of Tourism endorsed the SEA report. The report was discussed in the Cabinet and its content was integrated into the tourism plan.

Findings. There continue to be some issues with the sustainability of tourism development in Fiji. Unsustainable major development projects—such as a major new road to an unspoiled tract of coast on the main island and a large upmarket resort—seem to have moved towards implementation. More recently, another outbreak of the underlying political, economic and ethnic tension between native Fijians and Indians has led to decreased tourism investments and brought a halt to ambitious and strategic policy implementation. Mass tourism development has slowed, but the political will and capacity to support small-scale, locally owned tourism and to enforce good environmental practice has also likely diminished.

Outcome. Due in large part due to the well-received SEA and its exploration of the direct and indirect impacts of climate change on the tourism industry, elements of climate change adaptation and mitigation have now been permanently integrated into tourism policies in Fiji. Efforts continue to ensure the tourism industry mitigates and adapts to climate change.

Source: OECD 2009.

allocations and fall within the framework of an overall national development planning process. Village action plans are small-scale, community-driven, and somewhat autonomous development plans targeted at a particular sector (e.g. health, education) or problem (e.g. food security, water quality) and resulting in the formulation of community micro-projects. Rural development plans are thus very important for mainstreaming climate change adaptation.

- **Urban development plans.** Urban development plans often prioritize economic growth and the infrastructure development to support it. As such, they should build resilience to a range of hazards and risks, including the factors underlying the vulnerability of urban dwellers and infrastructure (e.g. poverty and climate change) (OECD 2009).

Further Guidance: Examples and Reference

Box 5.12 explains how the Federated States of Micronesia climate-proofed its strategic development plan.

Box 5.12 Climate-Proofing the Strategic Development Plan of the Federated States of Micronesia

In 2003, the Federated States of Micronesia prepared a new, national Strategic Development Plan, which was approved by the National Congress. This new plan includes the following provisions.

Infrastructure sector

- Risk exposure is to be used as a criterion to rank infrastructure investments nationally across sectors and states.
- Natural hazard risk assessments are to be carried out at the state level as the basis of guidelines ensuring that risks to infrastructure are identified and addressed at the design stage.
- Infrastructure must be located, built and maintained in line with codes and practices ensuring that it remains functional for the projected lifetime of the investment and avoids unacceptable risks associated with natural hazards and climate change.

Health sector

- The plan recognizes the mostly adverse health impacts of climate variability and change, including an increase in vector-borne diseases (such as dengue fever and malaria), water-borne diseases (such as diarrhoea), diseases related to toxic algae (such as ciguatera fish poisoning), declining food security, heat stress, air pollution and extreme events.
- It proposes assessments of climate-related health risks, strengthening of early warning systems and environmental health monitoring.
- Public health risks related to climate variability and change are to be documented and findings included in relevant public programmes.

Environment sector

- The plan mentions the need for communities to prepare and implement risk reduction strategies to address natural hazards, while preparing for the anticipated impacts of climate change. These strategies should identify structures, infrastructure and ecosystems at risk.
- Climate change and sea level rise considerations are to be incorporated in strategic and land-use planning for infrastructure and buildings, and social services.
- Potential impacts of climate change on the tuna industry (e.g. as a result of changed migration patterns) are to be determined, with the findings to serve as the basis for strategies to minimize impacts on the fisheries sector.

Source: World Bank 2006a.

Box 5.13 explains how countries that have developed NAPAs could link the associated recommendations to their PRSPs.

Further guidance is available in the following documents:

- *Integrating Climate Change Adaptation into Development Co-operation: Policy Guidance* (OECD 2009). Chapters 7, 8 and 10–12 of the guidance are structured around the national, sector and local levels. For several of these levels, the governance structure and steps within the policy cycle are described and a diagram illustrating these is provided. Each step corresponds to a generic function ranging from policy-making to resource allocation and implementation of projects/activities on the ground. While

Box 5.13 Linking the Recommendations Arising from the NAPA to the PRSP: Rwanda

In Rwanda's NAPA, the process of prioritizing adaptation activities took into account the urgent and immediate needs established in the PRSP, Economic Development and Poverty Reduction Strategy (EDPRS) and other development programmes.

In addition, one of the multicriteria decision analysis criteria used to prioritize the adaptation options was the contribution of that option to sustainable development. Furthermore, for each high-priority project selected, links between the objectives of the project and key development strategies of Rwanda (including the Rwanda Vision 2020, the Rwanda PRSP and other relevant national and sectoral policies) were provided.

Besides these links, Rwanda's NAPA was actually used to inform the second national poverty reduction strategy, the EDPRS. The review of the first PRSP in February 2006—as part of the development of the EDPRS—helped to integrate environmental and other aspects of climate change into the EDPRS as an essential element of economic development. The EDPRS itself includes a clear recognition of the importance of providing the framework to facilitate adaptation and mitigation activities. It specifically states that “an incentive framework will be put in place to implement the National Programme for Adaptation on Climate Change (NAPA).”

Source: OECD 2009.

different institutions may be organized in different ways, these steps/functions are sufficiently generic to cover a wide range of possible arrangements. The objective is to identify particular points in the cycle where consideration of climate change adaptation could be incorporated.

- *Quality Standards for the Integration of Adaptation to Climate Change into Development Programming.* This methodology to evaluate climate change risks and opportunities was piloted in five countries as part of a project funded by the Government of Spain, and will lead to the incorporation of climate change into UNDP's environmental screening and assessment policy and procedures. As it stands, the methodology provides technical experts with a way to evaluate existing or new development plans, projects and strategies for climate change risks and opportunities that could affect development results. The four “standards” that serve as a basis for the evaluation are (1) identification of climate change risk, (2) identification of the probability that these risks could result in maladaptation, (3) identification of opportunities for adaptation and synergies with the development process, and (4) identification and assessment of potential measures for adaptation and proposals for changes in planning. The product of this screening is a report that summarizes the climate change risks and opportunities, which can then be used to reformulate or adjust the project, policy or strategy screened (UNDP 2010a).
- *Mainstreaming Poverty-Environment Linkages into Development Planning: A Handbook for Practitioners* (UNPEI 2009a). Chapter 5 of the handbook provides detailed guidance for mainstreaming poverty-environment linkages into policy processes, and in particular how to influence a targeted policy process, which is a key element of any mainstreaming effort.

5.5 Developing and Climate-Proofing Policy Measures

Following successful mainstreaming into the policy documents, this activity consists of developing and climate-proofing policy measures at national, sector and subnational levels, based on country-specific evidence collected earlier on (see sections 5.1, 5.2 and 5.3).

Understanding the Types of Measures

There can be two types of measures. First, there might be a need to further develop or revise existing or planned general measures (measures not specific to climate change adaptation) to take account of climate impacts and risks. This may entail reviewing and revising relevant regulations and standards to reflect climate change impacts (e.g. building codes and land-use plans).

Second, it may be necessary to develop measures specifically targeted at adaptation. For example, in light of a greater frequency and severity of extreme weather events, governments might expand their function as an insurer or establish a sufficient policy framework for this function to be fulfilled by the private sector (box 5.14). More investments in research and development and more effective markets for technology innovation—which also require government intervention—may also be needed (World Bank 2010, GN 5). Additional examples of measures are presented in table 5.4.

Box 5.14 Index Insurance as an Effective Instrument in Reducing Climate-Related Risks

By covering part of the financial risks related to disasters, insurance can help protect livelihoods and prevent a plunge into poverty after a catastrophe has struck. However, in developing countries, traditional insurance solutions have met with little success in covering risks from natural disasters. As compared to conventional schemes, index insurance has the advantage of not being based on direct damage assessment. Instead compensation is based on variation of predefined indices (e.g. centimeters of rainfall, variation of temperature, wind speed and seismic activity on Richter scale) from expected values. Once a predefined threshold is reached, payments will be made. As this is easily verifiable, disputes will normally not occur. This helps to lower transaction costs and to speed up payouts to the affected populations.

On the other hand, insurance premium payments can be lowered for infrastructure and livelihoods that demonstrate a certain level of climate resilience.

Sources: European Commission 2008; OECD 2009.

Understanding the Vulnerability of General Measures to Climate-Proof Them

A general policy measure (i.e., not initially specific to adaptation) may be directly or indirectly vulnerable to the impacts of climate change. At the same time, it may increase or decrease the vulnerability of the systems and populations it concerns, as highlighted by the case of paddy rice in Andhra Pradesh, India (box 5.15).

The vulnerability of the measure will depend on the following:

- Type of sector supported and its own vulnerability to climate change (e.g. agriculture)
- Type of infrastructure involved, if applicable (e.g. a road network)
- Geographic location (e.g. coastal areas, arid areas)
- Lifetime (e.g. short- or long-term lifespan)

Table 5.4 Examples of Mainstream Adaptation Measures and Specific Adaptation Measures for Selected Sectors

Sector	Mainstream adaptation measures	Specific adaptation measures
Infrastructure	Revising regulations and standards (e.g. building codes) to reflect climate change risks	Coastal defence infrastructure
Agriculture	Regulations covering prices of crops and use of various agricultural technologies to foster diversification and limit farmers' risks	Agriculture extension services and research and development for crop varieties more suited to the changing climate
Social development	Including climate change in awareness-raising and education programmes	Insurance schemes related to climatic events (e.g. for households)
Disaster risk reduction	Building on early warning systems to include medium-term (and long-term) climate impacts	Disaster risk management plans and emergency relief specifically focused on extreme weather events
Land-use planning	Revising regulations and standards to reflect climate variability (e.g. areas available for human settlements)	Ensuring that planned infrastructure investments are sited so as to withstand future climatic conditions
Water	Fostering loss reduction (e.g. leakage control, conservation plumbing)	Capacity increase (e.g. new reservoirs, desalination facilities) in line with projections
Health	Improvements in public health (e.g. for flood-related diseases or accidents)	Vector control programmes focused on new areas at risk

Source: Drawn from various source materials, notably OECD 2009 and World Bank 2010, GN 6.

Box 5.15 Understanding Vulnerability due to Current Policy Measures: The Case of Paddy Rice in Andhra Pradesh, India

The rationale for widespread cultivation of paddy rice in the drylands of Andhra Pradesh is based in part on government price-support policies for producers, which buffer the risk of price volatility and thus dilute incentives to switch to more environmentally appropriate, drought-tolerant crops. As flooded rice is a highly unsuitable crop in drylands, the price incentive distorts the farming system from what it optimally should be under dryland conditions.

A better policy to support drought adaptation would be to eliminate such a distorting subsidy or at least provide a similar price incentive for millet, one of the best cereals to cultivate in drylands. This is but one example of how policies lead to good or bad practices from the perspective of drought risk management. A review of such policies should be included in a complete strategy to optimize farming systems and the livelihoods of people living in drylands.

Source: World Bank 2010, GN 4.

The vulnerability of a measure may be direct (such as irrigation facilities affected by changes in runoff as well as changes in demand for irrigation) or indirect (e.g. if the area in which a project is established undergoes significant socio-economic modifications as a result of climate change). For example, a hospital designed to serve a given level of population will no longer be adequate if large scale in-migration occurs as a result of changing climate conditions. Similarly, a facility designed to process certain crops may no longer be economical if the crop mix in its service area shifts in response to climate change (OECD 2009).

Collaborating with sector and subnational bodies to build their capacities to climate-proof their own policy measures is therefore critical. Climate-proofing might include integrating resilient characteristics, such as diversifying measures to better absorb external shocks, ensuring feedback mechanisms and learning points, and introducing adjustment mechanisms within policies to foster flexibility. Measures should also be screened to avoid maladaptation.

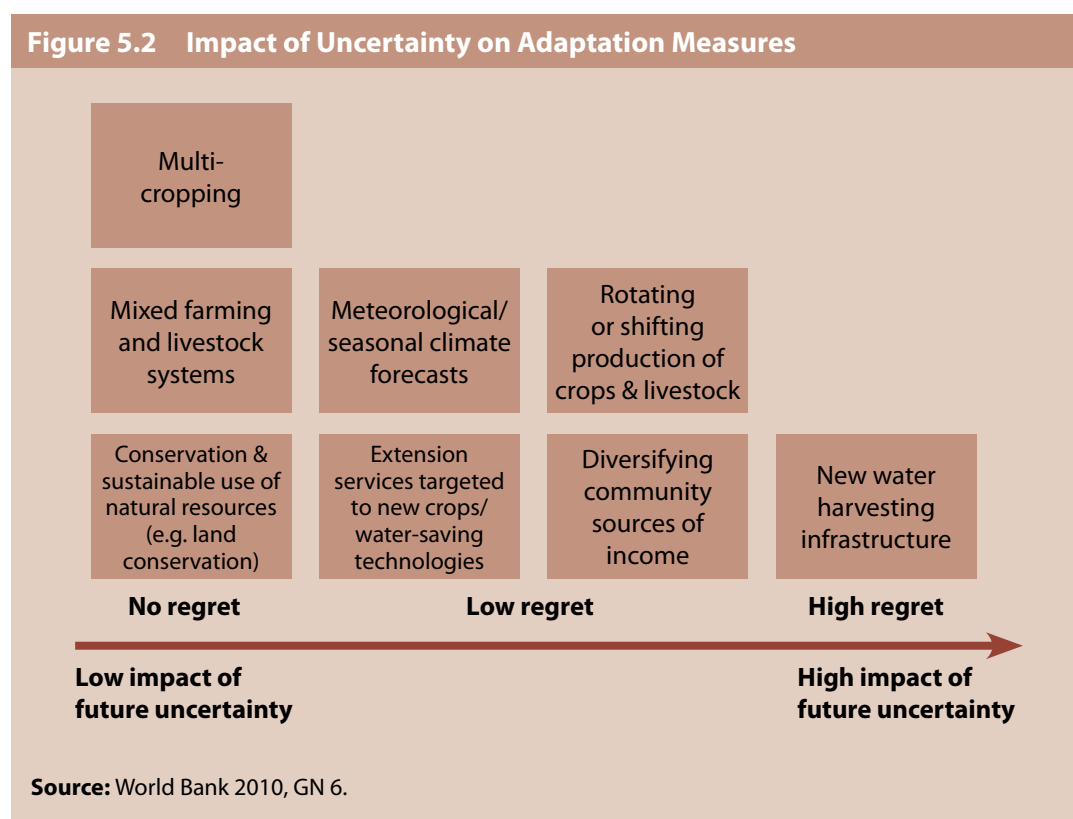
A wide array of specific adaptation measures may be identified or proposed, which will need to be prioritized and further developed. In doing so, the following elements should be considered.

Start with No- or Low-Regret Measures

Collecting country-specific evidence and climate information will take time and uncertainties will remain. Given the links between climate change adaptation, development and poverty reduction, many measures will provide joint benefits, even under conditions of uncertainty (OECD 2009).

As figure 5.2 shows, adaptation measures can be classified into no-regret, low-regret and high-regret investments, according to the potential impact of the uncertainty associated with projections of future climate change. In general, measures characterized by high levels of complexity, cost and risk (e.g. resettlement of a large population) and investments with high irreversibility (large infrastructure projects such as sea level walls, large reservoirs, etc.) are more likely to be classified as high-regret measures (World Bank 2010, GN 6).

Being aware of the level of regret is important because different levels have different implications with respect to climate information, timing of investment, planning horizon and economic evaluation (table 5.5).



Example: No-Regret or Low-Regret Adaptation Measures

- Investments in development, particularly those that enhance the capacity of a society to adapt to climate change
- Enhancing climate information and access to early warning systems for local communities living in flood- and/or drought-prone areas
- Promotion of drought-resistant crop varieties in areas where drought risk is projected to increase
- Reducing pollution and destruction of natural habitats
- Water conservation
- Enhanced public health system

Sources: World Bank 2010, GN 6; OECD 2009.

Table 5.5 Levels of Regret and Associated Implications

Item	No regret	High regret
Consideration of future climate projections	Benefits of no-regret projects are likely to materialize irrespective of how the climate will change; as a result, the availability and accuracy of climate information and data are not as crucial as in the case of high-regret options	High-regret adaptation decisions must be based on data and information on future climate that reflect uncertainties related to climate change
Timing of investment	No-regret investments can be implemented immediately, as more information on future climatic changes will not influence their desirability	When considering high-regret options, an important question to be answered is whether to undertake adaptation measures now (sustaining the necessary costs) or wait in order to gain more information on the impacts of climate change
Planning horizon	No-regret adaptation decisions (improved farming practices, crop choices, training and capacity building, etc.) generally have effects in the short term (1–15 years)	Most high-regret adaptation will have effects in the distant future—e.g. new irrigation projects have an average lifetime of 30–40 years, large dams of 60–80 years, and resettlement of communities will have lifelong impact
Economic analysis	No-regret investments can generally be evaluated with standard economic approaches, considering specific issues in estimating costs and benefits of adaptation	High-regret investments call for explicit consideration of uncertainty in decision-making; specific techniques should be used

Source: Adapted from World Bank 2010, GN 6.

Evaluating Adaptation Measures via Economic and Non-Economic Approaches

For specific adaptation measures, both benefits and costs can be assessed relative to a no-measure alternative. For a measure that integrates adaptation within a broader set of development objectives, the comparison should be made relative to a business-as-usual project without adaptation components. There is thus an inherent subjectivity and need for expert judgement in defining the hypothetical alternative as a basis for comparison (World Bank 2010, GN 7).

In many cases, information on the monetary value of potential benefits from adaptation measures is scarce, and significant amounts of informed judgement must be substituted. For example, in gauging the impacts of climate change on ecosystem services and the benefits of adaptation measures (say to combat land degradation), one approach might be to conduct structured interviews with affected local citizens who collectively could possess a great deal of qualitative information on how prior changes in ecosystem conditions affected productivity. This may be more useful than seeking to directly apply an economic value of avoided ecosystem damages through survey-based methods (World Bank 2010, GN 7). In other cases, additional data on the likely impacts of climate change will need to be collected and costed.

Decision makers often need or want to evaluate alternatives across a range of different criteria. In such cases, the application of a cost-benefit analysis may not be sufficient, and additional approaches, such as multicriteria decision analysis, can be more useful (World Bank 2010, GN 7).

Promoting Co-Benefits with Development

Co-benefits arising from adaptation and socio-economic development are another important element to consider when prioritizing measures. These co-benefits might be job creation, net benefits to the economy through energy or water efficiency, the development of a malaria programme, etc.

In many cases, vulnerability to climate change may be reduced more effectively and comprehensively by addressing non-climate factors than by implementing a technology or management plan narrowly tailored to a particular climate change impact which may have no substantial development benefits given the local context (box 5.4). As mentioned earlier, measures should also be assessed to avoid maladaptation.

In addition, co-benefits for adaptation and mitigation should be considered—such as reduced land degradation and deforestation; and soil management measures that increase carbon sequestration while leading to improved resilience to droughts, lower soil erosion and higher yield (OECD 2009) (box 5.16).

Box 5.16 Harvesting Co-Benefits through Sustainable Agricultural Land Management Practices in Kenya

Sustainable agricultural land management practices, such as agroforestry, mulching, and soil and water conservation techniques, can combine both mitigation and adaptation benefits while increasing agricultural productivity. The incentives for farmers to adopt sustainable agricultural land management practices are twofold.

- On the one hand, farmers generate carbon revenues for contributing to emission reductions via carbon soil sequestration.
- On the other hand, such practices increase the carbon content of the soil and thus lead to higher yields.

Additionally, they facilitate climate change adaptation through reduced water stress and increased soil water retention capacity.

Source: World Bank 2010, GN 1.

Building in Flexibility and Factoring in Long-Term Consequences

Flexibility should be introduced in measures where decision-making processes and regulations are based on historical climate information (e.g. water resource management). For example, it is critical that regulation and standards do not lock in adaptation to past climate but encourage recognition of changing climate trends and incorporation of projected change in climate. Regulations and standards may therefore need to be regularly updated to account for observed changes in climate and revised projections of future climate change—and be enforced. Increasing flexibility also means using approaches that provide benefits under a variety of conditions. Reducing stress on an affected system, such as reducing pollution or demand, can increase flexibility (OECD 2009).

Particular emphasis should be placed on investments or decisions that have long-term consequences, for which climate change impacts will most likely become relevant during the planned life of the investment or decision. In such cases (e.g. water and sanitation systems, bridges and ports), it will be more cost-effective to make adjustments early on, in the design phase of the project, rather than incur the cost and inconvenience of expensive retrofits (OECD 2009).

Example: Market-Based Incentives Supporting the Enforcement of Regulations and Standards

Often, adaptation does not require new laws but better enforcement (and monitoring) of existing legislation, standards and codes. The **Samoa** and **Tonga** building code programmes suffer from weak enforcement and lack of consequences for non-compliance, with the Tonga building code not yet legally mandatory. The Caribbean has experienced the same problems with command and control regulations but has started to adopt more effective market-based incentives. In **Antigua** and **Barbuda**, insurance premiums increase for property owners who fail to comply with building codes.

Source: World Bank 2006a.

Further Guidance: Questions, Example/Steps and References

In order to prioritize adaptation measures, several factors need to be evaluated and assessed, and the decision should take into account a number of considerations (box 5.17).

Kiribati's mainstreaming of climate change adaptation into its National Development Strategy and economic planning provides a good example and highlights key steps in the process (box 5.18).

Further guidance is available in the following documents:

- *Integrating Climate Change Adaptation into Development Co-operation: Policy Guidance* (OECD 2009). Chapter 9 focuses on development projects that may need to be climate-proofed.
- *Screening Tools and Guidelines to Support the Mainstreaming of Climate Change Adaptation into Development Assistance—A Stocktaking Report* (Olhoff and Schaer 2009). Section 5 presents a comparative overview and analysis of climate risk screening tools and guidance in support of mainstreaming climate change adaptation.

Box 5.17 Guiding Questions for Prioritizing Adaptation Measures

- What are the characteristics of the measure (e.g. objective, location, timing of and responsibilities for implementation, and financing)?
- How effective is the measure in reducing vulnerability (e.g. more unpredictable weather, fewer and more intense storms, increased frequency and duration of consecutive dry days)?
- To what extent would it help in reducing the impacts of extreme events (e.g. floods and droughts)?
- What are the economic costs and benefits?
- What is the level of regret?
- Is the measure feasible? Are there important limiting factors for implementation and sustainability, such as lacking legal, financial, technical and institutional resources?
- Are there secondary or cross-sector impacts, externalities (maladaptation) or co-benefits?
- How effective is the measure under different future climate scenarios? To what extent does it address short-, medium- and/or long-term climate change impacts?

Sources: World Bank 2010, GN 6; OECD 2009.

Box 5.18 Prioritization and Integration of Adaptation Options in Kiribati

Since 2003, Kiribati has used a participatory approach to mainstream climate change adaptation into its National Development Strategy and economic planning. The key steps included the following.

Participatory identification of coping strategies. The government convened a First National Consultation, where representatives from each of the major inhabited islands identified recent large hazards and proposed coping strategies.

Adaptation prioritization and responsibilities. During a Second National Consultation, island representatives rated the adaptation options and classified them in four categories: A = urgent options that could be done by communities themselves; B = urgent options for which communities needed assistance from the government; C = options that were less important/urgent; and D = options for which there was no need or willingness to implement. Category B adaptation options were then assigned to the responsible ministries.

Assessment of type of response required. The adaptation options derived from the national consultations were divided into five categories according to the nature of the response: (1) changes to government policies and strategies; (2) changes to laws and regulations; (3) interaction of extension and information with communities; (4) formal adaptation investments and engineering works by government, island councils and contractors; and (5) informal adaptation investments by communities.

Final prioritization. The final prioritization was made by taking into account nine criteria: results of the national consultations, extent to which the adaptation option addressed vulnerability (according to expert judgement), likely cost-benefit, urgency, likely degree of environmental impact, cultural acceptability, degree of community participation, synergies with poverty reduction, and synergies with international conventions.

Mainstreaming into ministries' operational plans. The adaptation priorities were then circulated to all the relevant ministries. Those judged to be relevant and consistent with ministerial strategies were identified for funding under specific government programmes and matched by external funding at 50 percent. Urgent adaptation measures implementable by communities alone are expected to be supported through a small grants programme.

Source: World Bank 2006a.



6. Meeting the Implementation Challenge



Refer to the relevant sections in chapter 6 when:

- Adaptation indicators (related to the targets set in policy documents of national development planning) are to be integrated in the national monitoring system (see section 6.1)
- Adaptation policy measures of (non-)environment ministries and subnational bodies require new or increased budget allocations and public expenditures (see section 6.2)
- Implementation of adaptation policy measures at national, sector and subnational levels is to be strengthened (see section 6.3)
- Mainstreaming of climate change adaptation is not yet established as standard practice in government and administrative processes, procedures and systems (e.g. budget call circulars, systematic inclusion of adaptation in public expenditure reviews, coordination mechanisms, systematic climate-proofing, monitoring) (see section 6.4)

The final, most sustained phase of mainstreaming climate change adaptation focuses on making mainstreaming operational through engagement in budgeting, implementation and monitoring processes. These activities are aimed at ensuring that mainstreaming becomes established as standard practice within the country.

6.1 Strengthening the National Monitoring System

An important prerequisite for informed decision-making on adaptation is that it is based upon the best available information on the implications of current and future climate change for the country. Meeting the implementation challenge thus calls for the integration of adaptation in the national monitoring system to track emerging trends related to climate change as well as the implementation and impact of policies. Building on the goals and targets included in policy documents, priorities are to design appropriate climate-related policy and scientific indicators, strengthen data collection and management, and fully integrate climate change adaptation in the national monitoring system.

The approach to this activity consists of monitoring climate change issues within the framework of the existing national system, working closely with the national statistics office and other institutions involved in monitoring.

Understanding the Challenge

Adaptation creates new challenges for identifying suitable indicators and for designing the monitoring component to be integrated in the national system. This complexity is due, in part, to the following (World Bank 2010, GN 8; OECD 2009):

- The **uncertainty** surrounding climate change impacts—including the frequency and intensity of extreme events as well as the long-term repercussions of climate change effects—can make it difficult to assess the impacts of climate change and adaptation policies.
- The **indirect effects** of climate change—including impacts on health, social turmoil and conflicts, and migration—can considerably affect the outcome of policies and measures targeting adaptation.
- The **long-term nature of climate change** means that the benefits of some adaptation measures may not be realized until the climate changes significantly.

- Measures designed to reduce vulnerability to infrequent extreme events can be evaluated **only if the foreseen event occurs**. If such an event does not occur, it may be difficult to determine whether the measure was effective (World Bank 2010, GN 8).

Building on Existing Institutions and Sources of Information

Ministries of planning or economic development are likely to contain monitoring and evaluation units that coordinate with the national statistical service on the collection and analysis of performance-related indicators across a range of sectors.

Weather and historical climate data are usually available from national meteorological services. Assessments of climate change impacts and vulnerabilities have also been conducted in most developing countries, and their results are typically summarized in their national communications to the UNFCCC. There are also a growing number of web-based resources on climate change and adaptation that could be relevant for national-level policy makers (table 5.2). In principle, these information sources represent good starting points for strengthening the national monitoring system (OECD 2009). However, existing sources are likely to be of variable quality, depth and scope. These sources may need to be revisited or complemented with additional data in order to adequately inform national development planning over the long term.

Developing Indicators

It is important to include not only indicators that are narrowly focused on climate, but also to develop indicators that show how climate change is affecting the poor and the key sectors of the economy and how policies themselves are addressing climate change and adaptation.

Example: Outcome Indicators for Mainstreaming Climate Change Adaptation

In view of most adaptation objectives, there is often a need to develop and establish outcome indicators to track the following, among others:

- Capacity to identify current climate risks and assess likely future **climatic trends**
- Percentage of **sector staff equipped and trained** to incorporate climate change considerations into their work (vulnerability and risk assessment, economic analysis, policy aspects, adaptation measures)
- Inclusion of acquired knowledge about current and future climate risks in **decision-making** at various levels
- Number of **policies** that incorporate adaptation issues
- Number of adaptation **measures** (climate-proofed or specific) at the national level (economic incentives such as insurance, subsidies or low-interest loans, capacity-building initiatives, infrastructure, sustainable land tenure, etc.)
- Level of **enforcement** of policy (e.g. on land and water rights)
- Creation of an academic, private sector, NGO, public sector, civil society and government **partnership** for developing, implementing and up-scaling adaptation efforts (e.g. establishment of inter-institutional committees)

Source: Adapted from World Bank 2010, GN 8.

The process of selecting indicators should begin with an analysis of what is available and feasible given resource and capacity constraints. Indicators based on data not yet available should only be included in the monitoring system if setting up a mechanism to collect and analyse them is realistic (World Bank 2010, GN 8).

Ideally, monitoring aimed at mainstreaming adaptation should include the following categories of data (World Bank 2010, GN 8):

- Climate data (e.g. temperature, extreme events, seasonal precipitation, start and length of the rainy season)
- Ecosystem services (e.g. agricultural yields, water salinity, erosion)
- Socio-economic data (e.g. health, livelihoods, job and income generation, GDP)
- Institutional and policy processes

Correlations between climate data and other types of data can help refine understanding of climate change impacts. Starting from historical baseline data, climate change projections and more ambitious scenario-building can also be considered (see section 5.1).

Communicating the Information and Strengthening the Institutions

Once climate-related information (including on the potential economic impacts of climate change) has been generated, it is crucial to inform policy makers and stakeholders about the existence of the information and its relevance to policy-making. Even when information is available, it is not always used, hence the need to strengthen that dimension of monitoring.

It is important that this information is presented to development-related decision makers in terms that are easily understood and relevant to the outcomes they are responsible for delivering. Key messages will also likely need to be presented repeatedly. Such an approach will require investment in strengthening institutions and capacities at various levels.

Further Guidance: Examples

Presented below are samples of adaptation indicators by sector (World Bank 2006a, table 8) as well as examples of the socio-economic dimensions of adaptation indicators (World Bank 2010, GN 8, annex 6).

Adaptation Indicators by Sector

- **National**
 - Trends in annual mortality due to disasters
 - Trends in average annual economic impact of disasters relative to previous year's GDP (in real terms)
 - Trends in percentage of population affected by disasters
 - Risk management of natural hazards (RMNH) principles reflected in national development plans and major sector planning documents
 - Percentage change in public expenditures dedicated to RMNH
 - Adoption of risk management criteria for approval of major investments
 - Percentage change in country's vulnerability index (as defined by the Pacific Islands Applied GeoScience Commission)

- **Infrastructure**
 - Housing building codes adopted and enforced
 - Climate-proof standards applied to all public infrastructure
- **Water**
 - Percentage change in economic impact of floods (or droughts) in real terms
 - Percentage decline in unaccounted-for water in reticulation systems
- **Agriculture**
 - Change in yields
 - Change in loss value of output
 - Changes in availability of local food during scarcity months
- **Coastal**
 - Change in property values in vulnerable coastal areas (in real terms)
 - Change in percentage of coastline mapped and rated for different classes of hazards (e.g. erosion)
 - Change in number of people settled in areas with high hazard ratings
- **Health**
 - Change in epidemic potential of vector-borne diseases (e.g. malaria, dengue fever)

Adaptation Indicators and Socio-Economic Dimensions

- Percentage of households at risk due to sea level rise
- Percentage of households at risk due to floods or droughts
- Damage per household/farm due to extreme events (e.g. floods, drought)
- Percentage of households having access to credit or insurance
- Period of freshwater availability
- Rise in groundwater level
- Crop yield and yield variability
- Percentage of farms that have concerns related to soil erosion
- Household income and its inter-annual stability
- GDP

6.2 Budgeting and Financing Measures for Climate Change Adaptation

To ensure progress towards climate change adaptation, policy measures identified earlier (see section 5.5) should be accompanied by suitable budgetary allocations. This will likely entail developing or leveraging existing financing options, i.e., existing national budgets and external sources.

Making Use of Public Expenditure Reviews

A public expenditure review can be used to assess to what extent existing budgets and expenditures are effective and efficient in relation to reaching the overall goals of climate-resilient development. Such a review should include analyses and projections of tax revenue, budget allocations and public spending across various relevant sectors (agriculture, education, health, transport, etc.).

It is recommended that the analysis not focus exclusively on climate change adaptation but rather assess to what extent public financial management systems contribute to overall development. At the same time, the review should examine to what extent climate risks are adequately considered in budget allocations and expenditure decisions (World Bank 2010, GN 4). A public expenditure review can focus on various aspects of budget and expenditures, such as the following:

- **Budget planning process.** Analysis might focus on how budget allocations are formulated and approved, and whether climate risk considerations play any role in decision-making.
- **Expenditure trends and categories.** Analysis might address actual spending in relation to budget allocations and estimate how much of the total budget has been spent on adaptation interventions (e.g. climate risk management, climate monitoring, climate-resilient development policy measures). Trends in levels of budgetary allocation to relevant government institutions might also be assessed.
- **Budget financing.** Analysis might consider the level and trends of domestic resources and external funds against expenditure categories. Possibilities for increasing internal revenues for adaptation, including as a result of modifying policies and laws in support of adaptation, might also be explored.

Since adaptation is a cross-sector issue, data collection and budgetary analysis should ideally be undertaken at the same time across multiple sectors. A public expenditure review should thus be endorsed by the ministry of finance or planning before it is begun. The review should be carried out in close collaboration with the most relevant ministries and agencies, depending on the priority issues at stake (World Bank 2010, GN 4).

Ensuring Adequate Resource Allocations for Measures Identified during Policy Processes

A number of options can be investigated to help ensure adequate resource allocations for adaptation measures. Among these are the following:

- Incorporating climate change risks in the **screening criteria** used to assess project proposals before their inclusion in investment programmes (OECD 2009)
- Working with international donors to encourage action on adaptation through **budgetary support mechanisms**, sector-level budget support and sectorwide approach (OECD 2009), as illustrated by the case of Kiribati (box 6.1)

Box 6.1 Matching Financing of Budget Allocations in Kiribati

In the Kiribati Adaptation Program, adaptation investments budgeted by the government are envisaged to be matched at 50 percent financing—the higher the allocation in the budget, the higher the external financing. This provides an incentive for programmes dealing with natural hazards risk management to grow as a proportion of the total budget.

Source: World Bank 2006a.

- Setting up a **horizontal fund** (a cross-cutting fund) for adaptation, managed by the ministry of finance or planning. Sector and subnational bodies could tap the fund to meet the additional costs of integrating adaptation considerations into their own measures or to take on measures specifically targeted at adaptation as part of their portfolio of responsibilities and activities (OECD 2009)
- **Foster longer time scales** in decision-making. Government institutions, in particular subnational authorities, might be prevented from planning across longer time scales due to short-term budgetary cycles from national government ministries (World Bank 2010, GN 4). Working with medium- or longer-term frameworks (e.g. medium-term expenditure frameworks; longer-term investment strategies) can thus be useful to foster a longer-term perspective in decision-making.
- Consider **reallocating funding to more vulnerable sectors/regions**. In order to adapt, governments may have to reallocate some of the national budget to more vulnerable sectors/regions. Sectors or regions will need financial support to assess their policies and measures against climate change (i.e., using a climate lens and climate-proofing) but also to develop specific adaptation measures (OECD 2009).

Several countries are promoting **performance budgeting** as part of their adaptation mainstreaming efforts (box 6.2) and are working with international donors to encourage implementation of climate-related indicators in performance assessment frameworks (OECD 2009). Without performance budgeting, government may find it difficult to assess whether the country as a whole is embarking on a vulnerability-reduction path or whether its efforts are being undermined by contradictory measures (World Bank 2006a).

Box 6.2 Performance Budgeting as an Element of Mainstreaming Climate Change Adaptation in the Pacific

Many Pacific island countries and territories have adopted performance budgeting in recent years, supported by Australian Agency for International Development and Asian Development Bank efforts. Some countries—e.g. **Samoa, Cook Islands, Kiribati** and **Fiji**—have also introduced performance contracts for chief executive officers/secretaries. For most, however, the economic planning process is not yet sufficiently robust to be fully accountable for programme outcomes. Nonetheless, provided that basic elements are in place, programmes on natural hazards risk management can go hand-in-hand with the strengthening of economic planning, as in Kiribati.

Source: World Bank 2006a.

Leveraging Domestic and External Funding Sources

The country also needs to develop or leverage existing financing options, national budgets and external sources, which are becoming increasingly available as donors develop

initiatives and funding mechanisms for adaptation (box 6.3). Approaching bilateral donors at an early stage of the mainstreaming effort may also increase sources of external funding.

Box 6.3 Examples of Multilateral Funds for Adaptation in Developing Countries

Adaptation Funds

- The **Strategic Priority on Adaptation (SPA)** is an ecosystem-focused fund ensuring that climate change concerns are incorporated in the management of ecosystems through GEF focal area projects. The aim is to increase the resilience and adaptive capacity of ecosystems and communities vulnerable to the adverse effects of climate change. Projects must focus on reducing vulnerability to climate change impacts as their primary objective.
- The **Adaptation Fund** is administered by the GEF and began to generate significant resources in 2010. The fund was principally established to finance concrete adaptation projects and programmes in developing countries that are parties to the Kyoto Protocol. The fund is financed with a share from the proceeds of Clean Development Mechanism (CDM) project activities; it can also receive funds from other sources.

Development-Focused Funds

- The **Least Developed Countries Fund (LDCF)** is operated by the GEF and provides support to least developed countries as they prepare NAPAs. Support for national communications for non-Annex I parties is also available through the GEF.
- The **Special Climate Change Fund (SCCF)** is concerned primarily with activities, programmes and measures in the development sectors most affected by climate change. The SCCF was established in 2001 to finance projects relating to adaptation; technology transfer and capacity building; energy, transport, industry, agriculture, forestry and waste management; and economic diversification.

Climate Investment Funds

- **Climate Investment Funds (CIF)** to be managed by the World Bank include the Clean Technology Fund and the Strategic Climate Fund, which will support various programmes.

Climate Mainstreaming-Related Funds

- Under the **Strategic Climate Fund**, the Pilot Programme for Climate Resilience will focus on mainstreaming climate change into development planning and budgeting, through technical assistance and investment programmes.
- The **Spanish MDG Fund** includes mainstreaming of climate into development as a means of adaptation.
- The **Global Climate Change Alliance** (of the European Commission) will focus on integrating adaptation plans into poverty reduction and development strategies.

The Climate Investment Support Facility being established by UNDP will provide specialized advice and support for the development of climate change financing frameworks based on the various financial instruments available to support climate change activities.

Engaging the Subnational Level

Through actions such as collecting taxes or user charges, subnational governments may be able to generate revenue needed to support identified budget items related to adaptation efforts. However, subnational governments in developing countries are often faced

with financial constraints due to dwindling national budgets, confusion over roles and responsibilities for financial management among different levels of government, or a general lack of capacity to manage financial matters. In cases where subnational governments are given the authority to raise revenues and allocate them to development priorities, addressing adaptation may call for different levels and sources of local revenue, as well as modified budget allocations (OECD 2009).

Exploring different options for channelling funds to the subnational level may be considered. For example, a municipal infrastructure fund to which local governments and civil society groups can apply may be an appropriate way through which international donors can channel funding. Such a fund could help identify cities or smaller urban centres most at risk from climate impacts as well as helping to develop appropriate local responses. This may also mean working more collaboratively with groups at high risk to the impacts of climate change or those most directly dependent on climate-sensitive livelihoods. Some local governments have worked successfully with the inhabitants of informal settlements to provide infrastructure and services and improve the quality of housing (OECD 2009). **Participatory budgeting** may also make development plans more supportive of local adaptation (box 6.4).

Box 6.4 Participatory Budgeting

Participatory budgeting is a system in which the inhabitants of a locality are able to make proposals for how to allocate part of a public budget. By instituting more accountable and democratic governance processes, local realities are better reflected and addressed in development decision-making. For example, guided by an awareness of the risks associated with climate change, residents in a settlement at risk from landslides can prioritize spending on slope stabilization infrastructure or land management practices, while residents in another area can prioritize increased water and sewerage connections.

Source: OECD 2009.

Further Guidance: Questions, Example and References

Box 6.5 provides guiding questions for engaging in the budgeting process. Box 6.6 provides an example of integration of climate change considerations in an existing national funding mechanism.

Further guidance can be found in the following reference documents:

- *Mainstreaming Adaptation to Climate Change in Agriculture and Natural Resources Management Projects, Guidance Note 4: Developing Readiness for Institutional capacity Development and an enabling Policy Framework* (World Bank 2010, GN 4). Section B guides the practitioner through the main steps, approaches and tools to assess and foster adaptation-friendly policies, legal frameworks and public expenditure frameworks.
- *Integrating Climate Change Adaptation into Development Co-operation: Policy Guidance* (OECD 2009). Chapters 7, 8 and 10–12 are structured around the national, sector and local levels. For several of these levels, the governance structure and steps within the policy cycle are described and a diagram provided. Each step corresponds to a generic function ranging from policy-making to resource allocation and implementation of projects/activities on the ground. While different institutions may be organized in different ways, these steps/functions are sufficiently generic to cover a wide range

Box 6.5 Guiding Questions for Engaging in the Budgeting Process

- Are budget planning and expenditures being directed toward the appropriate priorities in view of adaptation? For example, is sufficient budget allocated and spent for irrigation modernization/development and water conservation in areas subject to increasing water stress and droughts; flood protection measures for critical infrastructure; and reversing trends of land degradation in productive areas?
- Do recent changes in budget allocations and expenditures provide evidence for increased attention to adaptation to climate variability and disaster preparedness?
- Do public investment decisions consider geographical distribution of climate risks and vulnerabilities? For example, are investments in water harvesting going toward the most water-stressed areas? Are investments in crucial transport networks going to cyclone-prone areas and, if so, is there any expenditure conditionality to ensure that critical infrastructure is climate-proofed?
- How can the revenue-generating, budget planning and allocation, and expenditure management systems be improved and/or revised to enhance the contribution of relevant economic sectors to adaptation, development and poverty reduction?

Source: Adapted from World Bank 2010, GN 4.

Box 6.6 El Salvador's Experience with Integrating Climate Change into an Environmental Fund

El Salvador's Fondo Iniciativa para las Américas (FIAES)—Enterprise for the Americas Initiative Fund—is an important environmental conservation mechanism, presided over by the Vice-Minister for Environment and Natural Resources. Through annual calls for proposals, FIAES finances local development projects to restore ecosystems, encourage renewable energy, and foster natural resource management and pollution remediation. FIAES's rules of funding eligibility outline the scope and conditions of funding and are revised annually. To fully mainstream climate change risks and opportunities into the 2010 rules, UNDP provided technical backing and led 12 training sessions between November 2009 and February 2010.

The FIAES team took part in an introductory capacity development workshop to become more familiar with climate change concepts. Then, the team, in collaboration with UNDP, identified five entry points to approach the mainstreaming exercise, including FIAES's thematic areas, eligible activities and geographic areas. The adoption of a participatory and collaborative approach was ideal to undertake an in-depth analysis of the activities using a climate lens and offered a unique opportunity to enhance the team's knowledge and capacity. The success of this initiative owes much to FIAES management, which from the outset was convinced of the necessity to protect its investment from climate change impacts.

Source: UNDP 2010b.

of possible arrangements. The objective is to identify particular points along the cycle where consideration of climate change adaptation could be incorporated.

- *Mainstreaming Poverty-Environment Linkages into Development Planning: A Handbook for Practitioners* (UNPEI 2009a). Chapter 6 provides detailed guidance to meet the implementation challenge, and in particular how to influence a targeted budgeting process, which is a key element of any mainstreaming effort.

6.3 Supporting Implementation at National, Sector and Subnational Levels

Meeting the implementation challenge also means collaborating with national, sector and subnational bodies to build their capacities to implement policy measures for adaptation. This includes both climate-proofed general measures (those not aimed primarily at climate change adaptation) and measures specifically designed to enhance adaptation.

Understanding the Challenge

Following adaptation mainstreaming into policy-making, budgeting and the national monitoring system, it is important not to lose sight of adaptation objectives during the implementation of the measures themselves.

From an administrative point of view, implementers may not have sufficient flexibility and may be constrained in terms of the changes they can make once a measure or project has been selected at the national or sector level. Any modifications to established practice and guidelines might also incur resistance, as well as additional costs (OECD 2009).

Targeted efforts for capacity building and piloting of initiatives (see section 5.3) can thus help implementers better understand the implications of climate change and be better equipped in terms of how to incorporate adaptation considerations within their decision frameworks. Such efforts might need to be tailored for specific types of measures and projects (infrastructure, livelihood, etc.) given their diverse needs (OECD 2009).

Sector and subnational agencies may need support from development partners (e.g. missions) to help them realign themselves to allow for more effective medium- to long-term efforts—a process that may create tension with shorter-term political imperatives (OECD 2009).

Screening Measures for Potential Climate Risks

The screening of measures for potential climate risks represents a first step towards effective integration of such risks in implementation (see section 5.5). The measures (or projects) to be implemented should be screened to identify not only the ones at risk of climate change but also those that are not climate sensitive and do not, therefore, require further risk analysis.

First, measures may be identified as sensitive to climate change. For example, measures on water resources, coastal resources, agriculture, forestry, natural ecosystems and some aspects of human health (effects of extreme weather and vector-borne diseases) are likely to be directly sensitive to climate change. Other measures may be indirectly sensitive—for example, if they are affected by climate-related impacts on hydropower production, water supplies, etc. (OECD 2009).

The screening process should also enable the identification of measures that have the potential to increase vulnerability and/or encourage maladaptation. Such measures might increase vulnerability directly, or through indirect means, for example, by triggering new settlement in areas at risk of climate change (OECD 2009).

For the purpose of screening projects, climate change can eventually be integrated into environmental impact assessments (EIAs) performed by sectors or subnational bodies (box 6.7).

Box 6.7 Integrating Adaptation into Environmental Impact Assessments

Opportunity. In many cases, an EIA is carried out at in the evaluation of a measure or project appraisal. The objective of an EIA is to identify the impacts of a project on the environment with a view to building in mitigation measures or, in extreme cases, recommending that the projects be significantly reformulated or even cancelled. An EIA of investment proposals is mandatory in most countries, even if weakly implemented. Hence, this represents an opportunity to make integration of climate change adaptation a standard practice.

Limits. One critical limitation is the fact that EIAs are designed to identify a project's impact on the environment, but not the impact of environmental change on the project. The first step of an EIA is to identify activities likely to have significant environmental impacts in order to examine them further. "Environmentally benign" activities are therefore not considered, even though they may be vulnerable to the impacts of climate change. Another limitation concerns the fact that the EIA is conducted once a project has been selected for implementation and most of its parameters have been set. Further, in many cases EIA procedures are codified in legal obligations, thus making it difficult to modify them to take climate risks into account. Applying EIA procedures for climate change adaptation purposes would thus require modification at the level of initial project screening, and possibly changes in existing legislation.

Source: OECD 2009.

Engaging Non-Governmental Actors

The implementation of adaptation measures at various levels can benefit from the involvement of non-governmental actors. The private sector can contribute to implementation in many areas, such as research and agriculture extension (World Bank 2010, GN 5). Similarly, the involvement of communities can be very helpful in such areas as early warning systems, climate monitoring and community-based natural resource management (World Bank 2010, GN 5). Engaging in a fruitful dialogue is particularly essential in the case of climate trends that require the implementation of new (and sometimes completely different) approaches for sustaining livelihoods (e.g. community resettlement from increasingly flood-prone areas) (World Bank 2010, GN 2).

Monitoring and Evaluation and Retrofitting Lessons Learned

Monitoring and evaluation of the implementation of adaptation-related measures is an essential step. It is indispensable for correcting past mistakes, improving current practices and building knowledge through learning-by-doing. The engagement of relevant stakeholders is critical at this stage, including in the selection of indicators, so as to ensure a broad consensus on any assessments (OECD 2009).

Monitoring will need to be specifically focused on assessing whether the identified adaptation options were actually put in place and on any unexpected problems that arose in the implementation process. In addition, monitoring should address whether the adaptation options had any adverse or positive impacts on other sectors or regions, and whether the costs of adaptation exceeded budgeted amounts (OECD 2009).

Evaluation of the progress and success of the adaptation measures that were implemented should assess whether the project delivered the intended benefits and whether it caused adverse, unanticipated outcomes. The conclusions of the evaluation process can be taken into account when planning and implementing similar measures (OECD 2009) (see section 6.1).

Further Guidance: Examples and References

A pilot study of the city of La Ceiba, located on the north coast of Honduras, was carried out to develop and test a process by which adaptation can be factored into project planning. The study examined the types of interventions required to ensure that climate change is mainstreamed into project-level activities and identified the wide range of actors that make such mainstreaming possible (box 6.8).

Mainstreaming adaptation may translate into adjustments to current practices, such as changing building codes, land subdivision regulations, land-use management and infrastructure standards. The sum of all these minor adjustments over time can, however, build greater resilience without high costs, as illustrated by the case of Mali (box 6.9).

Further guidance can be found in the following sources:

- *Mainstreaming Adaptation to Climate Change in Agriculture and Natural Resources Management Projects, Guidance Note 5: Furthering an Enabling Institutional Environment* (World Bank 2010, GN 5). Section A provides guidance on how to deal with the fact that adaptation is largely a context-specific, locally driven process, requiring local communities to efficiently manage common resources.
- *Integrating Climate Change Adaptation into Development Co-operation: Policy Guidance* (OECD 2009). Chapters 7, 8 and 10–12 are structured around the national, sector and local levels. For several of these levels, the governance structure and steps within the policy cycle are described and a diagram illustrating these is provided.
- *Compendium on Methods and Tools to Evaluate Impacts of, Vulnerability and Adaptation to Climate Change* (UNFCCC 2004). The compendium provides users with information about available frameworks and tools; special features of each framework or tool; and how to obtain documentation, training or publications supporting each tool. It has been designed as a reference document to identify available frameworks and tools for assessing vulnerability and adaptation. This is not a manual describing how to implement each tool, but rather a survey of possible tools that can be applied to a broad spectrum of situations and a map to point users to additional sources of information.
- *Screening Tools and Guidelines to Support the Mainstreaming of Climate Change Adaptation into Development Assistance—A Stocktaking Report* (Olhoff and Schaer 2009). Section 5 presents a comparative overview and analysis of tools for climate risk screening and guidance in support of mainstreaming climate change adaptation.

Box 6.8 Climate Change, Coastal Resources and Flood Planning: Pilot Study of La Ceiba, Honduras

Background. The city of La Ceiba is vulnerable to flooding, coastal erosion, and coastal storms. The pilot study aimed to address risks to coastal development, urban drainage and upstream land management from both current and projected climate change. Based on the study findings, a priority adaptation action—building an enhanced urban drainage system that could cope with the projected impacts of climate change—was identified.

Types of interventions. The process of incorporating climate change into project planning involved six stages:

- **Screening.** A preliminary assessment examined whether climate change/variability would compromise the integrity, effectiveness or longevity of the city's infrastructure.
- **Identifying adaptations.** Interventions included involving local stakeholders in identifying potential adaptation topics.
- **Analysis.** This stage involved evaluating the effectiveness, costs and feasibility of adaptation for reducing climate-related vulnerabilities. International and national researchers carried out a variety of analyses of the identified adaptation topics.
- **Identifying course of action.** Interventions at this stage included presenting study findings to technical experts to review the feasibility of the identified adaptation options and consultations with the planning authority to select adaptation strategies.
- **Developing an implementation plan.** Interventions at this stage involved presenting options for implementation to the US Agency for International Development (USAID) that were consistent with the agency's mission and categorizing the rest as options that could be implemented by other agencies.
- **Evaluating adaptation.** Interventions at this stage will follow after the strategies are implemented.

Actors involved. Various stakeholders played a key role in assessing the impacts of climate change and in the development of feasible adaptation options.

- **Initial consultation stage.** Stakeholders included project staff, federal and municipal government representatives, the business and consulting community, and representatives from NGOs.
- **Identifying adaptations and analysis stages.** Stakeholders included individuals consulted during the initial consultations and subject experts/researchers.
- **Selecting course of action stage.** Actors involved in this stage included technical experts, the mayor and the municipal corporation responsible for selecting identified adaptation options.
- **Implementation stage.** USAID was responsible for selecting options that it can implement.

Source: OECD 2009.

Box 6.9 Making Small Adjustments for Climate Change Adaptation in the Flood Forest Ecosystem of Youwarou, Mali

Background. For the last three decades, the productivity and functioning of the flood forest ecosystem of Youwarou, located in the Inner Niger Delta in northern Mali, has been threatened by a combination of human activities and climate stress, with rainfall levels steadily declining since 1970. Among other functions, the flood forests serve as important breeding sites for hundreds of thousands of palearctic and afro-tropical birds, provide much-needed shade to cattle during the dry season, and host a rich aquatic biodiversity. The forests also represent an important economic resource, as local communities rely on fishing and *bourgou* (aquatic grass) harvesting for their livelihoods.

Approach. In 2004, IUCN (International Union for Conservation of Nature) launched a project to restore and protect the flood forest ecosystem through decentralized natural resource management, using an approach that emphasized poverty reduction and participation. In 2005, Youwarou was selected as the first test site for the project management tool CRISTAL. Working with tool developers from the International Institute for Sustainable Development and IUCN, local project staff consulted with community stakeholders to understand how project activities were reducing or could reduce vulnerability to climate change.

Findings. Consultations revealed that drought, reduced flooding and extreme heat were the main climate hazards in Youwarou. The impacts of these hazards included crop damage and loss, water scarcity, income loss and social tensions. Coping strategies ranged from gathering of wild food to migration and asset liquidation. Against this climate-livelihood context, several specific project activities were examined for their impact on local vulnerability and adaptive capacity. Stakeholders subsequently proposed specific adjustments to these activities, including the construction of small footpaths and pedestrian bridges across flood channels, increasing the number of hectares of reforested land, maps showing endangered species habitats (to reduce human-wildlife conflicts), and improved safety and early warning measures on fishing boats.

Lessons learned. The proposed project adjustments were neither unfamiliar, complicated nor expensive. Rather, they represented small changes or elaborations to existing activities that were already supported by local stakeholders. The direct involvement of community members in the CRISTAL process not only helped raise local awareness about climate change but also helped secure the local buy-in needed to support effective implementation of revised project activities.

Source: OECD 2009.

6.4 Strengthening Institutions and Capacities

In tandem with other aspects of this component, the overall objective remains the long-term strengthening of institutions and capacities. It is critical to establish mainstreaming of climate change adaptation as standard practice in government and administrative procedures, systems and tools at all levels.

Approach

The cross-cutting nature of climate change calls for tackling the issue from different angles, in a synergistic and coordinated way, at various institutional levels from national to local. Significant and long-term adaptation measures promoted via development projects can only be undertaken if a conducive, institutional framework is in place. Institutions may also have to change their operating and decision-making procedures. An enabling institutional environment is thus crucial in promoting efficient adaptation and ensuring the effort can be sustained over the long term.

Moving the Coordination for Adaptation to Central Bodies

Moving the coordination of adaptation into a central body with convening and/or decision-making powers vis-à-vis line ministries (especially with respect to funding allocations) should be considered. This might include, for example, the office of the president or prime minister, the ministry of finance, the planning ministry or equivalent.

Example: Moving the Coordination of Adaptation Efforts into Central Bodies

- In **China**, the National Development and Reform Commission is the lead agency for climate change issues, putting climate change at the centre of development. Similarly, both the Irrigated Agriculture Intensification III Project and the related adaptation project are managed by the State Office for Comprehensive Agricultural Development in the Ministry of Finance, while the Ministry of Water Resources, the Ministry of Agriculture, the State Forestry Administration and the State Environmental Protection Agency provide technical support.
- In **Kenya**, the Office of the President is responsible for managing the Arid Lands Resource Management and Kenya: Adaptation to Climate Change in Arid and Semi-Arid Lands projects.

Source: World Bank 2010, GN 5.

Establishing or Improving Coordination Mechanisms

Establishing or improving coordination mechanisms is an important element for institutional strengthening, as various countries have found (box 6.11).

However, coordination among different institutional levels, and different sectors and/or actors, is a complex undertaking that may prove difficult to implement.

Coordination should preferably be done through a pre-existing inter-sector mechanism, e.g. for food security, disaster risk reduction and management, sustainable land management or environmental management. This arrangement would allow better mainstreaming of climate change considerations in dealing with key social and economic issues.

It is important to clarify responsibilities among various agencies involved in the effort. Effective national-local coordination to reach the ultimate beneficiaries of the policies and systems at the national level is also critical.

Example: The Importance of Coordination Mechanisms

- In **Ethiopia**, a formal decision was made to develop and implement a national framework for sustainable land management. Steps were taken to establish a platform at the federal level to engage and align contributions of all relevant stakeholders and to foster donor-government coordination. Such a mechanism is in an optimal position to coordinate strategies for climate risk management related to sustainable land management.
- In **Kenya**, the Food Security Meeting, consisting of key concerned sector ministries and external partners, plays a key role in overall drought management and is becoming more formally linked with government drought and disaster coordination mechanisms.
- In **Mozambique**, a survey of donors and national experts cited the lack of inter-institutional coordination and communication as the greatest barrier to adaptation. This can also be the case within the same sector. For example, in **India**, water resource management falls within the purview of at least seven ministries. The situation is even more complex when different sectors are involved (e.g. agriculture, water and forestry), as will often be the case in adaptation interventions.

Source: World Bank 2010, GN 5.

Building on Existing National Mechanisms for Disaster Risk Reduction

As mentioned above, climate change adaptation is closely related to disaster risk reduction, for which there generally are existing platforms and coordination mechanisms at the national level. Adaptation will therefore need to be closely linked to these mechanisms. Existing disaster risk reduction mechanisms may also need to better reflect how climate change might affect the frequency and severity of certain types of natural disasters, such as droughts, floods, hurricanes and cyclones, and therefore affect the adequacy of disaster-related policies and measures. At all these levels, arrangements established to respond to potential disasters (contingency plans, risk mapping, ex ante assessment of the vulnerabilities of communities and assets, etc.) will benefit from taking into account projected changes in the nature, intensity and frequency of hazards (OECD 2009).

Institutionalizing Flexibility

Uncertainty regarding future climate change impacts requires flexibility. This includes a commitment to revise policies at pre-identified future times in order to reassess available knowledge about current and future risks and to recalibrate legislation accordingly (World Bank 2010, GN 5).

Adaptation can also be integrated into government and administrative practices, procedures and systems in support of future national development planning. Examples include sectorwide guidelines and/or procedures as well as criteria for prioritizing and screening measures, programmes and projects.

Strengthening Institutions at the Subnational Level

Subnational governments can create an enabling environment for local adaptation action. They should provide a supportive framework of norms, standards, financial incentives, and other types of knowledge, services and capacities to help individuals, households and community organizations take decisions that reduce their exposure to

climate risks. Subnational governments can play several roles in helping communities understand and reduce climate risks—for example, as representatives of the local population; as planners; and as part of delivering public services in areas such as water and sanitation, health, law enforcement, education, emergency response, social protection, and engineering and public works (OECD 2009).

In addition, decentralized national institutions, where they exist, may help ensure effective national-local coordination. They can assume a leading role in the adaptation process at the field level, and constitute an effective support to community-level initiatives. Decentralization is a promising means of enabling coordination between climate risk management services provided by central agencies and local needs. Decentralization can also foster integration among line ministries at the subnational level (box 6.10).

Box 6.10 Effective Cooperation of Sector Ministries at the Local Level: Watershed Management

A recent review found that watershed management has been mostly successful where community responsibility for land and water management in the local micro-watershed was supported by a “frontline” presence at the micro-watershed level of the public agency or agencies responsible for watershed management at the national level. The main reason was that the micro-watershed turned out to be the level at which cooperation and coordination among officials coming from different sector ministries worked best.

Source: World Bank 2010, GN 5.

Many current decentralization reforms are characterized by insufficient transfer of powers and/or resources to local institutions. Moreover, these local institutions often are not accountable to local communities (World Bank 2010, GN 5). Strong subnational institutions and capacities are thus critically important to implementing adaptation on the ground.

The cases of Malawi and Mexico provide examples of setting up an inter-ministerial mechanism in support of long-term institutional strengthening for climate change (boxes 6.11 and 6.12).

Another example of institutionalization of adaptation is to include targeted measures supporting local climate risk management in government accountability mechanisms, such as performance contracting (box 6.13).

Further Guidance: References

Further guidance can be found in the following sources:

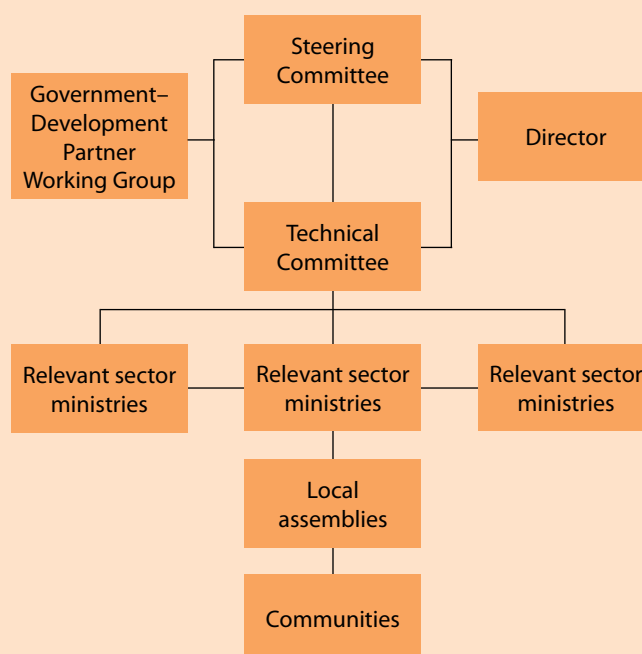
- *Mainstreaming Adaptation to Climate Change in Agriculture and Natural Resources Management Projects, Guidance Note 5: Furthering an Enabling Institutional Environment* (World Bank 2010, GN 5). This note provides some guidance on how to deal with selected institutional challenges and includes examples from adaptation projects.
- *Integrating Climate Change Adaptation into Development Co-operation: Policy Guidance* (OECD 2009). Chapters 7, 8 and 10–12 are structured around the national, sector and local levels. For several of these levels, the governance structure and steps within the policy cycle are described and a diagram provided.

Box 6.11 National Coordination Arrangements for Response to Climate Change in Malawi

In Malawi, a national steering committee is providing policy direction for the development of the strategic framework and national action programme (see box 4.4).

The steering committee, composed of principal secretaries of key government ministries, is chaired by the Principal Secretary for Development Planning and Cooperation. Reporting to the steering committee will be a technical committee on climate change, comprising technical representatives of all relevant government departments, together with selected representatives of civil society (NGOs, private sector, academia) and the donor community. It will be co-chaired by the Director of the Meteorology Department and the Director of the Land Resources Conservation Department (Ministry of Agriculture and Food Security). The Environmental Affairs Department will provide the secretariat for both these committees.

Technical coordination responsibilities within government have been assigned as follows:



- **Development Planning and Cooperation**—Policy and planning with reference to mainstreaming climate change in the Malawi Growth and Development Strategy (MGDS), framework development and cross-sector programme formulation, monitoring and evaluation
- **Meteorology Department**—Climate information, climate change projections
- **Environmental Affairs Department**—Knowledge management, impact and risk monitoring and assessment, technical analyses of adaptation and mitigation options, climate change policy formulation
- **Relevant sector ministries**—Implementation of adaptation and mitigation projects and programmes

The Ministry of Development Planning and Cooperation, the Environmental Affairs Department and other implementing government institutions will develop a set of goals and objectives for the strategic framework on climate change that are harmonized with those of other MGDS programmes. They will identify the sector actions needed to achieve these goals and objectives. A series of stakeholder workshops and retreats will be organized to facilitate broad-based dialogue.

The outcomes of the formulation phase should lead to clarification of permanent institutional arrangements for cross-sector coordination of climate change response.

Source: Adapted from Government of Malawi, One-UN and World Bank 2009.

Box 6.12 The Inter-Ministerial Commission on Climate Change in Mexico

The Inter-Ministerial Commission on Climate Change was established in 2005 to mainstream climate change into development policy. It is the designated national authority on climate change—in particular, on the Clean Development Mechanism (CDM)—and is responsible for the following:

- Formulating and coordinating the implementation of national climate change strategies and incorporating them in sector programmes
- Promoting national climate change research
- Promoting greenhouse gas emission reduction projects

The commission consists of seven line ministries—including the Ministries of Agriculture and Finance—organized across different working groups. For example, the Working Group on Adaptation was formed to support the formulation of adaptation actions (policies and strategies) at the sector, regional and national levels. One of the six key systems under consideration is agriculture, cattle farming, forestry and fisheries.

The commission receives advice from the Consultative Council on Climate Change, which is composed of scientists and representatives of civil society and the private sector.

Source: World Bank 2009.

Box 6.13 Annual Performance Contracts in Rwanda

Background. In Rwanda, the government has instituted a system of performance contracts among different levels of government in order to monitor, evaluate and ultimately hold decision makers accountable to local populations. These performance contracts are made between the central government and provinces, provinces and districts, districts and sectors, sectors and villages, and villages and cells (the latter being a verbal agreement rather than a signed agreement). Each contract consists of a summary of the development situation in the village/sector/district/province, as well as a series of tables outlining specific development goals, indicators that will be used to measure the achievement of these goals, and activities that will be undertaken to achieve these goals. Development goals in these performance contracts are typically divided into four main categories: health; education, culture and sports; agriculture and livestock; and infrastructure, energy, water, environmental protection and cooperatives.

Opportunity. The performance contracts hold real potential for integrating and supporting climate risk reduction. For example, the International Institute for Sustainable Development has been working with the Kigali Institute for Science and Technology in Rwanda to implement a series of field-based, policy-relevant activities that will reduce the vulnerability of two hydroelectric stations to climate variability and enhance the livelihoods of upstream communities through measures that simultaneously protect the watershed (and therefore hydro potential) and local resilience to climate stress. These activities are being undertaken in two districts in Rwanda's Northern Province. Upon closer review of the performance contract between one of the sectors and its corresponding district, a few entry points for adaptation were identified.

Example. Under the health category, development interventions targeting increased access to drinking water and identification of families vulnerable to poverty could contribute to climate risk management at the community level. Drinking water sources can be identified with a climate lens (locating wells and boreholes in areas less prone to flooding and contamination), while methods for identifying vulnerable families can take climate risks into account.

Way forward. The potential for integrating climate risk into performance contracts seems obvious, but challenges remain, as awareness about climate change continues to be low.

Source: OECD 2009.

Abbreviations and Acronyms

ADAPT	Assessment and Design for Adaptation to Climate Change: A Planning Tool
CRiSTAL	Community-Based Risk Screening Tool—Adaptation and Livelihoods
EIA	environmental impact assessments
GEF	Global Environment Facility
GDP	gross domestic product
MDG	Millennium Development Goal
NAPA	national adaptation programme of action
NGO	non-governmental organization
ORCHID	Opportunities and Risks of Climate Change and Disasters
PEI	Poverty-Environment Initiative
PRECIS	Providing Regional Climates for Impacts Studies
PRSP	poverty reduction strategy paper
RMNH	risk management of natural hazards
SEA	strategic environmental assessment
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

Glossary

adaptation. Adjustments in human and natural systems, in response to actual or expected climate stimuli or their effects, that moderate harm or exploit beneficial opportunities (IPCC 2007).

adaptive capacity. The ability of a system to adjust to climate change (including climate variability and extremes) moderate potential damages, take advantage of opportunities or cope with the consequences. Adaptive capacity is a function of the relative level of a society's economic resources; access to technology; access to information on climate variability and change; and skills to make use of the information, institutions (i.e., degree to which institutions can help adaptations be adopted) and equitable distribution of resources (societies with relatively more equitable resource distribution will be better able to adapt than societies with less equitable distributions). The level of adaptive capacity tends to be positively correlated with the level of development; more developed societies tend to have more adaptive capacity. However, possessing adaptive capacity is not a guarantee that it will be used effectively (IPCC 2001, 2007).

adaptation deficit. Failure to adapt adequately to existing climate risks largely accounts for the adaptation deficit. Controlling and eliminating this deficit in the course of development is a necessary, but not sufficient, step in the longer-term project of adapting to climate change. Development decisions that do not properly consider current climate risks add to the costs and increase the deficit. As climate change accelerates, the adaptation deficit has the potential to rise much higher unless a serious adaptation program is implemented (World Bank 2010, GN 4).

adaptation mainstreaming. The iterative process of integrating adaptation considerations into policy-making, budgeting and implementation processes at national, sector and subnational levels. It is a multi-year, multi-stakeholder effort that entails working with government actors (head of state's office, environment, finance and planning bodies, sector and subnational bodies, political parties and parliament, national statistics office and judicial system), non-governmental actors (civil society, academia, business and industry, general public and communities, and the media) and development actors.

climate change. Refers to any change in climate over time, whether due to natural variability or as a result of human activity. This usage differs from that in the United Nations Framework Convention on Climate Change (UNFCCC), which defines climate change as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to

natural climate variability observed over comparable time periods” (IPCC 2007). *See also* **climate variability**.

climate-proof. Ensuring the sustainability of development investments over their entire lifetime by taking explicit account of a changing climate.

climate variability. Variations in the mean state and other statistics (standard deviations, statistics of extremes, etc.) of the climate on all temporal and spatial scales beyond that of individual weather events. Variability may be due to natural internal processes within the climate system (internal variability), or to variations in natural or anthropogenic external forcing (external variability) (IPCC 2007). *See also* **climate change**.

climate lens. An analytical tool to examine a strategy, policy, plan or policy measure (e.g. law and regulation). It involves examining the extent to which a strategy, policy, plan or policy measure under consideration could be vulnerable to risks arising from climate variability or change; the extent to which climate risks have been taken into consideration in the course of the formulation of the strategy, policy, plan or policy measure; the extent to which it could increase vulnerability, leading to maladaptation (e.g. for certain population groups, regions or sectors); and what amendments might be warranted to address climate risks (OECD 2009).

high-regret measures. Involve decisions on large-scale planning and investments with high irreversibility. In view of the considerable consequences at stake, the significant investment costs and the long-lived nature of the infrastructure, uncertainties in future climate projections play a crucial role when making decisions about whether to implement high-regret adaptation measures (World Bank 2010, GN 6).

low-regret measures. Those where moderate levels of investment increase capacity to cope with future climate risks. Typically, these involve over-specifying components in new builds or refurbishment projects. For instance, installing larger diameter drains at the time of construction or refurbishment is likely to be a relatively low-cost option compared to having to increase specification at a later date due to increases in rainfall intensity (World Bank 2010, GN 7).

maladaptation. Occurs when an action or process increases vulnerability to climate change-related hazards. Maladaptive actions and processes often include planned development policies and measures that deliver short-term gains or economic benefits, but can eventually lead to exacerbated vulnerability in the medium to long term (UNDP 2004).

mitigation. An anthropogenic intervention to reduce the anthropogenic forcing of the climate system; it includes strategies to reduce greenhouse gas sources and emissions and enhancing greenhouse gas sinks (IPCC 2007).

national adaptation programme of action (NAPA). NAPAs provide a process for least developed countries (LDCs) to identify priority activities that respond to their urgent and immediate needs with regard to climate change adaptation. The rationale for NAPAs rests on the limited ability of LDCs to adapt to the adverse effects of climate change. To address the urgent adaptation needs of LDCs, a new approach was needed that would focus on enhancing adaptive capacity to climate variability, which itself would help address the adverse effects of climate change. The NAPA takes into account existing coping strategies at the grassroots level, and builds upon that to identify priority activities, rather than focusing on scenario-based modelling to assess future vulnerability and long-term policy at the state level. In the NAPA process, prominence is given to

community-level input as an important source of information, recognizing that grass-roots communities are the main stakeholders. All the countries that are signatory to the United Nations Framework Convention on Climate Change are obligated to submit national reports. The Global Environment Facility provides financial assistance to non-Annex I countries for the preparation of their national communication and NAPA.

national communication. A national report submitted by a signatory country of the United Nations Framework Convention on Climate Change (UNFCCC) to the conference of the parties. The core components of the report include national circumstances; national greenhouse gas inventory; programmes containing measures to facilitate adequate climate change adaptation; programmes containing measures to mitigate climate change; other information relevant to the achievement of UNFCCC objectives; constraints and gaps; and related financial, technical and capacity needs (UNFCCC 2008). All the countries that are signatory to the UNFCCC are obligated to submit national reports. The Global Environment Facility provides financial assistance to non-Annex I countries for the preparation of their national communication and NAPA.

no-regret measures. Adaptation measures that would be justified under all plausible future scenarios, including the absence of man-made climate change impact (World Bank 2010, GN 7).

poverty-environment mainstreaming. The iterative process of integrating poverty-environment linkages into policy-making, budgeting and implementation processes at national, sector and subnational levels. It is a multi-year, multi-stakeholder effort that entails working with government actors (head of state's office, environment, finance and planning bodies, sector and subnational bodies, political parties and parliament, national statistics office and judicial system), non-governmental actors (civil society, academia, business and industry, general public and communities, and the media) and development actors.

resilience. The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, capacity for self-organization and capacity to adapt to stress and change (IPCC 2007).

risk. The result of the interaction of physically defined hazards with the properties of the exposed systems—i.e., their sensitivity or social vulnerability. Risk can also be considered as the combination of an event, its likelihood and its consequences—i.e., risk equals the probability of climate hazard multiplied by a given system's vulnerability (UNDP 2004).

sensitivity. The degree to which a system is affected, either adversely or beneficially, by climate variability or change. The effect may be direct (e.g. a change in crop yield in response to a change in the mean, range or variability of temperature) or indirect (e.g. damages caused by an increase in the frequency of coastal flooding due to sea level rise) Sensitivity includes exposure that considers the nature and magnitude of climate change and whether a system would be affected by such change. For example, the low-lying coastal areas of Bangladesh are exposed to sea level rise, whereas the Rift Valley in Africa, because of its elevation, is not. Sensitivity also considers the extent to which an exposed system can be affected by climate change. Some crops such as maize are quite sensitive, while systems such as manufacturing are much less sensitive to climate change, although they can be affected by extreme events, reductions in water supplies and power disruption (IPCC 2001, 2007).

vulnerability. The degree to which a system is susceptible to, and 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 change and variation to which a system is exposed; its sensitivity; and its adaptive capacity. Vulnerability increases as the magnitude of climate change or sensitivity increases; it decreases as adaptive capacity increases. Reducing vulnerability can happen through any combination of reduced magnitude of climate change, reduced exposure or increased adaptive capacity (IPCC 2001, 2007).

References

Note: All URLs listed here were verified in June 2011.

- DFID (Department for International Development). 2004a. "Taking Initial Steps towards Adaptation." Key Sheet. www.unpei.org/PDF/resourceefficiency/KM-resource-DFIDTaking-initial-steps.pdf.
- . 2004b. "The Impact of Climate Change on Pro Poor Growth." Key Sheet. <http://webarchive.nationalarchives.gov.uk/+http://www.dfid.gov.uk/documents/publications/climatechange/2propoorgrowth.pdf>.
- . 2004c. "The Impact of Climate Change on the Health of the Poor." Key Sheet. www.unpei.org/PDF/resourceefficiency/KM-resource-DFID-impact-on-healthofpoor.pdf.
- . 2004d. "The Impact of Climate Change on the Vulnerability of the Poor." Key Sheet. www.unpei.org/PDF/resourceefficiency/KM-resource-DFID-impact-climatechange-vulnerability.pdf.
- Economics of Climate Adaptation Working Group. 2009. *Shaping Climate-Resilient Development: A Framework for Decision-Making*. www.mckinsey.com/App_Media/Images/Page/Images/Offices/SocialSector/PDF/ECA_Shaping_Climate%20Resilient_Development.pdf.
- European Commission. 2008. "EU Supports Global Insurance Fund to Help ACP Countries Weather 'Future Storms' from Climate Change." Press release. <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/1782&guiLanguage=en>.
- GEF (Global Environment Facility) Global Support Programme. 2005. *Resource Kit for National Capacity Self-Assessment*. New York: UNDP.
- Government of Malawi, One-UN and World Bank. 2009. "Strategic Framework and National Action Program for Managing Response to Climate Change in Malawi: Formulation Phase." Joint project document.
- IIED (International Institute for Environment and Development). 2008. "Taking Steps: Mainstreaming." *IIED Briefing*. <http://pubs.iied.org/17040IIED.html>.
- . 2010. "Beyond Cost-Benefit: Developing a Complete Toolkit for Adaptation Decisions." *IIED Briefing*. <http://pubs.iied.org/17081IIED.html>.
- IPCC (Intergovernmental Panel on Climate Change). 2001. "Chapter 18: Adaptation to Climate Change in the Context of Sustainable Development and Equity." In IPCC, *Climate Change 2001: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Third Assessment Report*. Cambridge, UK: Cambridge University Press.
- . 2007. "Appendix I: Glossary." In M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, eds., *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report*. www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-app.pdf.

- OECD (Organisation for Economic Co-operation and Development). 2009. *Integrating Climate Change Adaptation into Development Co-operation: Policy Guidance*. www.oecd.org/dataoecd/0/9/43652123.pdf.
- Olhoff, A., and C. Schaer. 2009. *Screening Tools and Guidelines to Support the Mainstreaming of Climate Change Adaptation into Development Assistance: A Stocktaking Report*. New York: United Nations Development Programme.
- UNDG (United Nations Development Group). 2010. *Integrating Climate Change Considerations in Country Analysis and the UNDAF: A Guidance Note for United Nations Country Teams*. www.undg.org/docs/11473/1952-UNDG-GuidanceNote_ClimateChange.pdf.
- UNDP (United Nations Development Programme). 2004. *Adaptation Policy Frameworks for Climate Change*. Cambridge, UK: Cambridge University Press.
- . 2007. *Capacity Assessment Methodology User's Guide*. New York: UNDP.
- . 2009a. *Mapping of Actors, Institutions and Projects Related to Climate Change in Colombia*. Project: Integrating climate change risks and opportunities into national development processes and United Nations country programming. Bogotá: UNDP.
- . 2009b. *National Dialogue: Fight against Poverty and Adaptation to Climate Change*. Report on event. Project: Integrating climate change risks and opportunities into national development processes and United Nations country programming. Bogotá: UNDP.
- . 2010a. *Cape Verde Final Project Report*. Project: Integrating climate change risks and opportunities into national development processes and United Nations country programming. New York: UNDP.
- . 2010b. *Mainstreaming Climate Change in Colombia: Screening for Risks and Opportunity*. Project: Integrating climate change risks and opportunities into national development processes and United Nations country programming. Bogotá: UNDP.
- UNFCCC (United Nations Framework Convention on Climate Change). 2008. *Compendium on Methods and Tools to Evaluate Impacts of, and Vulnerability and Adaptation to, Climate Change*. http://unfccc.int/adaptation/nairobi_work_programme/knowledge_resources_and_publications/items/2674.php.
- UNPEI (United Nations Development Programme–United Nations Environment Programme Poverty-Environment Initiative). 2009a. *Mainstreaming Poverty-Environment Linkages into Development Planning: A Handbook for Practitioners*. Nairobi: UNDP-UNEP.
- . 2009b. *Making the Economic Case: A Primer on the Economic Arguments for Mainstreaming Poverty-Environment Linkages into Development Planning*. Nairobi: UNDP-UNEP.
- . Forthcoming. *Enabling Local Success: A Primer on Local Ecosystem-Based Solutions to Poverty-Environment Challenges*. Nairobi: UNDP-UNEP.
- World Bank. 2004a. *Ethiopia: Managing Water Resources to Maximize Sustainable Growth*. A World Bank water resources assistance strategy. Washington, DC: World Bank. <http://water.worldbank.org/water/publications/ethiopia-managing-water-resources-maximize-sustainable-growth-water-resources-assistance>.
- . 2006a. *Not If but When: Adapting to Natural Hazards in the Pacific Islands Region*. Policy Note. <http://siteresources.worldbank.org/INTPACIFICISLANDS/Resources/Natural-Hazards-report.pdf>.
- . 2006b. *Overcoming Drought: Adaptation Strategies for Andhra Pradesh, India*. Washington, DC: World Bank. <http://water.worldbank.org/water/publications/overcoming-drought-adaptation-strategies-andhra-pradesh-india>.
- . 2009. "Climate Change Aspects in Agriculture: Mexico Country Note." http://siteresources.worldbank.org/INTLAC/Resources/257803-1235077152356/Country_Note_Mexico.pdf.

———. 2010. *Mainstreaming Adaptation to Climate Change in Agriculture and Natural Resources Management Projects*. <http://climatechange.worldbank.org/climatechange/content/mainstreaming-adaptation-climate-change-agriculture-and-natural-resources-management-project>.

- *Guidance Note 1: Engaging Key National Institutions in the Adaptation Agenda.*
- *Guidance Note 2: Engaging Local Communities and Increasing Adaptive Capacity.*
- *Guidance Note 3: Assessing Climate Risk.*
- *Guidance Note 4: Developing Readiness for Institutional Capacity Development and an Enabling Policy Framework.*
- *Guidance Note 5: Furthering an Enabling Institutional Environment.*
- *Guidance Note 6: Identifying Appropriate Adaptation Measures to Climate Change.*
- *Guidance Note 7: Evaluating Adaptation via Economic Analysis.*
- *Guidance Note 8: Monitoring and Evaluation of Adaptation Activities.*

 Belgian Development Cooperation	 Danish Ministry of Foreign Affairs (DANIDA)
 European Commission	 Irish Aid
 NORWEGIAN MINISTRY OF FOREIGN AFFAIRS Norwegian Ministry of Foreign Affairs	 Spanish Ministry of Foreign Affairs and Cooperation
 NATUR VÄRDS VERKET SWEDISH ENVIRONMENTAL PROTECTION AGENCY Swedish Environmental Protection Agency	 Swedish International Development Cooperation
 UK Aid	 US Department of State

Climate change adaptation is an area of growing concern and engagement for many developing countries. The myriad and uncertain effects of a changing climate pose significant risks for development and achievement of the Millennium Development Goals. Numerous initiatives and financing mechanisms aimed at assisting countries with climate change adaptation have been rolled out and are being implemented. Efforts also concentrate on developing specific adaptation measures, with a focus on the ones that correspond to countries' most urgent and immediate needs.

Increasingly, countries are coming to realize that, in the long term, climate change adaptation needs to be supported by an integrated, cross-cutting policy approach. The purpose of this guide is to provide practical, step-by-step guidance on how governments and other national actors can mainstream climate change adaptation into national development planning as part of broader mainstreaming efforts. The guide draws on substantial experience and lessons learned by the UNDP-UNEP Poverty-Environment Initiative in working with governments to integrate environmental management for pro-poor economic growth and development into national development planning and decision-making.