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United Nations Development Programme

ADAPTING TO CLIMATE CHANGE

UNDP-GEF INITIATIVES FINANCED BY THE LEAST DEVELOPED COUNTRIES FUND, SPECIAL CLIMATE CHANGE FUND AND STRATEGIC PRIORITY ON ADAPTATION

BO LIM (1958-2011)

This publication is dedicated to Bo for her commitment and inspiration in helping to create a system — including nurturing a cadre of professionals — within UNDP to assist countries to adapt to climate change.

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CONTENTS

MESSAGE

FROM THE EXECUTIVE COORDINATOR, UNDP-GEF

"Environment and Energy Group advisers are working closely with their colleagues from UNDP's other thematic and cross-cutting groups to ensure that the diverse impacts of climate change are addressed as holistically as possible."

Climate change is one of the most pressing threats to development today. Unless we significantly cut global greenhouse gas emissions and address vulnerabilities in the countries and communities hardest hit, climate change alone may prevent attainment of the MDGs.

Through initiatives funded by the Least Developed Countries Fund (LDCF), Special Climate Change Fund (SCCF) and Strategic Priority on Adaptation (SPA), UNDP is working to strengthen the capacities of national partners to adjust to the reality of climate change. Advisers from UNDP's Environment and Energy Group, together with UNDP Country and Regional Office staff, are helping countries identify their adaptation needs and catalyse financing to implement effective responses. The UNDP-GEF partnership provides a crucial mechanism through which countries can access funding and the technical and policy support needed to identify and implement their nationally defined adaptation priorities.

Because climate change impacts reach across the development spectrum, our responses must be multidisciplinary. Environment and Energy Group advisers are working closely with their colleagues from UNDP's other thematic and cross-cutting groups—such as Gender—to ensure that the diverse impacts of climate change are addressed as holistically as possible. UNDP-GEF initiatives such as the global Community-Based Adaptation programme draw on the thematic expertise of various UNDP staff and partner entities to ensure adaptation responses that are as comprehensive as the challenges they seek to address.

This Report showcases the UNDP-GEF adaptation portfolio, focusing on both the principles underlying the UNDP-GEF approach to adaptation programming and the key processes involved in removing barriers to successful adaptation measures. We report on the emerging achievements of UNDP-GEF initiatives around the world and explore the future of low-emission climate-resilient development. As the UNDP-GEF portfolio continues to mature, we look forward to continuing to share results and lessons learned so that the successes achieved can be replicated and brought to scale.

Yannick Glemarec
Executive Coordinator, UNDP-GEF
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FOREWORD

Over the last 20 years, the GEF has invested more than $3 billion and leveraged close to $20 billion for climate change projects.

As an operating entity of the Financial Mechanism of the United Nations Framework Convention on Climate Change (UNFCCC), the Global Environment Facility (GEF) has a unique mandate to assist developing countries and transition countries in their struggle to cope with adverse effects of climate change. Over the last 20 years, the GEF has invested more than $3 billion and leveraged close to $20 billion for climate change projects. With respect to adaptation, the GEF's goal is to support developing countries to increase resilience to climate change through both immediate and longer term adaptation measures in development policies, plans, programs, projects and actions. The role of the GEF has been increasingly important and recently has been enhanced by four key factors: First, the scientific and empirical evidence on the impacts of climate change has reached an unprecedented level of international consensus and awareness, and as a result, developing country demand for adaptation funding has grown exponentially as well as the estimated costs of adaptation.

Second, the parties to the UNFCCC have provided clear guidance to the GEF on adaptation, underlining its responsibility to assist developing countries to meet the goals of the Convention, including continuing its efforts to mobilize additional resources.

Third, independent evaluations have stressed both the importance of scaling up the effort, as well as dramatically increasing the funding which is a prerequisite for increasing the scale of impact.

Last but not least, the need for predictable and adequate funding for adaptation has been recognized as a key feature of a successful global climate regime.

Following the success of pilot Strategic Priority on Adaptation window within the GEF Trust Fund, the Least Developed Country Fund (LDCF) and the Special Climate Change Fund (SCCF) have been established directly under the Climate Convention (UNFCCC). To date, contributions to LDCF are $322.6 million and for SCCF $180 million. However, as highlighted at the 2009 Copenhagen UNFCCC COP and in the following negotiating sessions, new and additional financing is needed to support adaptation. The role of the GEF in catalyzing resources for climate resilient development has been strengthened through the management of the LDCF and SCCF, which have been already included as part of the "fast start" package for climate change financing post COP15.

The GEF is pleased to be associated with this publication prepared by UNDP on how GEF-managed funds are used by countries to prepare themselves to meet the challenges of climate change. Since 2007, 140 million of LDCF funds and $124 SCCF funds, managed by the GEF, have been implemented by UNDP. The publication is an overview of these GEF/UNDP-supported initiatives from around the world. This together with other similar publications that will be released by other GEF Agencies over the coming year are important means to convey to the world the incredible range of initiatives that are currently ongoing. It is our hope that these types of initiatives will be replicated and scaled up and that additional resources will be made available to countries.

Monique Barbut
CEO and Chairperson of the GEF

UNDP AND GEF: PARTNERS IN ADAPTATION

UNDP and GEF work together to assist countries in accessing the financial, technical and policy support necessary to design and implement successful climate change adaption initiatives.

UNDP'S ROLE AS A GEF IMPLEMENTING AGENCY

As the United Nation system's development programme and a GEF Implementing Agency, UNDP is uniquely positioned to assist countries in integrated planning and programming by addressing development, climate and ecosystem sustainability priorities.

The UNDP-GEF unit supports developing countries to make low-emission, climate-resilient environmentally sustainable development not only possible, but also economically attractive. To achieve this, capacities are developed to put in place the right mix of regulatory and financial incentives, remove institutional and policy barriers, and create enabling environments that attract and drive private sector investment into green development. In doing this, UNDP/GEF assists partner countries to access, combine and sequence resources from a wide range of funds, and financial instruments and mechanisms.

Over the past 18 years, UNDP has helped developing countries access more than $3.3 billion in project financing from the GEF Trust Fund and associated Least Developed Countries Fund and Special Climate Change Fund through GEF-4, as well as leveraging an additional $9.2 billion in co-financing. The GEF operates as a partnership between three Implementing Agencies — UNDP, UNEP and the World Bank — and seven Executing Agencies (Asian, African, and Inter-American Development Banks, the European Bank for Reconstruction and Development, FAO, IFAD and UNIDO), to integrate global environmental benefits into county-led development.

UNDP-supported programmes and projects with GEF financing are normally developed and executed by national governments, although international agencies and non-governmental organizations (NGOs) are used on occasion. A wide range of public and private sector agencies and institutions, including local communities, are involved in project implementation. These programmes and projects are mainstreamed into overall UNDP operations and are primarily managed by UNDP's network of over 140 country offices. These are supported by technical specialists located in Bangkok, Bratislava, Panama, and Pretoria, coordinated by a team in New York.

THE GLOBAL ENVIRONMENT FACILITY*

The GEF unites 182 member governments — in partnership with international institutions, NGOs and the private sector — to address global environmental issues.

An independent financial organization, the GEF provides grants to developing countries and countries with economies in transition for projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants. These projects benefit the global environment, linking local, national, and global environmental challenges and promoting sustainable livelihoods.

Established in 1991, the GEF is today the largest funder of projects to improve the global environment.

Established in 1991, the GEF is today the largest funder of projects to improve the global environment. The GEF has allocated $9.2 billion, supplemented by more than $40 billion in co-financing, for more than 2,700 projects in more than 165 developing countries and countries with economies in transition. Through its Small Grants Programme, the GEF has also made more than 12,000 small grants directly to NGOs and community organizations, totalling $495 million.

The GEF serves as financial mechanism for the following conventions:

- Convention on Biological Diversity
- United Nations Framework Convention on Climate Change
- Stockholm Convention on Persistent Organic Pollutants
- United Nations Convention to Combat Desertification
- The GEF, although not linked formally to the Montreal Protocol on Substances That Deplete the Ozone Layer, supports implementation of the Protocol in countries with economies in transition.

As the financial mechanism for the UNFCCC, the GEF manages the following global vertical funds dedicated to supporting countries on adaptation to climate change.

* The text that follows is taken from the GEF Web site, www.thegef.org

Least Developed Countries Fund

The Least Developed Countries Fund (LDCF) was established in response to guidance received from the Seventh Conference of Parties to the UNFCCC meeting in Marrakech in 2001. The fund is designed to meet the special needs of the least developed countries under the Climate Convention. Top priority was given to adaptation, in particular to financing the preparation and the implementation of National Adaptation Programmes of Action.

The LDCF therefore aims to support projects addressing the urgent and immediate adaptation needs of the least developed countries, focusing on reducing the vulnerability of the sectors and resources that are central to human and national development, such as water, agriculture and food security; health; disaster risk management and prevention; and infrastructure, as identified and prioritized in their National Adaptation Programmes of Action.

Special Climate Change Fund

The Special Climate Change Fund (SCCF) was established under the UNFCCC in 2001 to finance activities, programmes and measures relating to climate change that are complementary to those funded by the resources allocated to the Climate Change Focal Area of the GEF and by bilateral and multilateral funding.

The SCCF has four different windows:

- Adaptation
- Transfer of technologies
- Energy, transport, industry, agriculture, forestry, and waste management
- Activities to assist developing countries whose economies are highly dependent on income generated from the production, processing, and export or on consumption of fossil fuels and associated energy-intensive products in diversifying their economies.

The Parties to the UNFCCC identified adaptation to climate change as the top priority of the SCCF. The SCCF serves as a catalyst to leverage additional resources from bilateral and other multilateral sources.

Strategic Priority on Adaptation

In response to the UNFCCC in 2001, the GEF established the Strategic Priority on Adaptation (SPA), a $50 million allocation inside of the GEF Trust Fund, to support pilot and demonstration projects that show how adaptation planning and assessment can be practically translated into projects that provide real benefits and can be integrated into national policy and sustainable development planning. The SPA funding was accessible to all countries eligible for GEF funding.

The SPA was a groundbreaking initiative not only within the GEF context but also worldwide, because previously the adaptation-related work of multilateral and bilateral organizations had mainly focused on financing research, assessments and screening tools, rather than on-the-ground interventions.

By September 2009, all the SPA funding had been allocated, and the GEF Evaluation Office is preparing a SPA evaluation. For the GEF-5 in 2010–14, all adaptation-related work of the GEF will be financed through the LDCF and SCCF.

INTRODUCTION

UNDP is working with its national partners on several fronts to combat climate change and its impacts, helping countries to lower their GHG emissions while at the same time reducing vulnerabilities.

Climate change is now an inescapable reality. Human activity is leading to ever increasing levels of greenhouse gas (GHG) emissions and steadily compromising the natural resources needed to maintain the health of the planet. Without a secure natural environment, sustainable human development is impossible. The climate change crisis has the potential to reverse development gains already made and block achievement of the Millennium Development Goals (MDGs) if it is not adequately addressed.

UNDP is working with its national partners on several fronts to combat climate change and its impacts, helping countries to lower their GHG emissions while at the same time reducing vulnerabilities. UNDP's policy and technical advisers in its headquarter, regional and country offices are supporting more than 100 countries to design, finance and implement projects and policy frameworks that develop capacities to manage the causes and consequences of climate change consistent with national development priorities. Through its partnership with the Global Environment Facility (GEF), UNDP is currently supporting 75 countries to design, finance and implement adaptation projects that address immediate and long-term vulnerabilities. With resources from the GEF-managed Least Developed Countries Fund (LDCF), Special Climate Change Fund (SCCF) and Strategic Priority on Adaptation (SPA), and co-financing leveraged from bilateral, multilateral, national partner and other sources, UNDP's adaptation services are targeting the sectors aligned with the MDGs to manage the uncertainties of climate change.

This report is a comprehensive overview of country-led efforts on climate change adaptation supported by the UNDP-GEF partnership with financing from the GEF-managed LDCF, SCCF and SPA funds.

Until recently, climate change measures have followed a largely thematic approach, with funding and projects designated as either mitigation- or adaptation-focused. Recognizing that climate change is a multifaceted problem that requires holistic responses, UNDP is shifting to support countries with a low-emission climate-resilient development (LECRD) approach that integrates both mitigation and adaptation into sustainable development goals and planning processes. LECRD builds upon the synergies between adaptation and mitigation and recognizes that climate change responses are closely intertwined with development choices and actions across multiple sectors. Within this context, UNDP is promoting pro-poor and pro-growth adaptation that encourages climate-resilient economic development and sustainable livelihoods by supporting countries to integrate climate-related risks and opportunities into national planning and poverty reduction initiatives, especially addressing the needs of poor and vulnerable populations.

To help countries meet the costs of shifting to a low-carbon climate-resilient economy, UNDP will focus on supporting countries to leverage public funds to catalyse private finance. UNDP provides targeted assistance to countries to access, sequence and combine adaptive financing from a diverse set of sources. With support from public finance mechanisms such as the LDCF, SCCF and others, UNDP will work with countries to create an enabling environment to attract additional financing. It is expected that changes in policy frameworks, institutional strength, leadership and learning will better position countries to leverage additional support for their long-term climate-resilient development. As barriers are removed and development results realized, incentives will be in place to direct and deliver requisite investments, at scale and at sufficient speed, toward nationally defined climate change priorities.

Adapting to Climate Change: UNDP-GEF Initiatives Financed by the Least Developed Countries Fund, Special Climate Change Fund and Strategic Priority on Adaptation is a comprehensive overview of country-led efforts on climate change adaptation supported by the UNDP-GEF partnership with financing from the GEF-managed LDCF, SCCF and SPA funds. It examines the strategies, approaches and impacts to date of UNDP's adaptation programme and presents the preliminary achievements and lessons learned from projects in the UNDP-GEF portfolio (GEF-3 and GEF-4, 2006-2010). Impacts reported are drawn from Project Implementation Reports, project documents and ongoing evaluations by on-the-ground project staff. Because many of the projects in UNDP's adaptation portfolio are still young, the impacts thus far are largely process and framework oriented. These initial impacts lay the groundwork for future results. Finally, the last section of the report provides a preview of the future: country-driven mobilization of resources to support low-emission climate-resilient development that builds on the inextricable connections between climate change management and sustainable human development.

THE GLOBAL CONTEXT

Climate change poses great challenges to society, particularly in developing countries. The impacts of climate change are expected to reverse decades' worth of human development gains and threaten achievement of the MDGs. While developing countries are often most vulnerable to these present and future threats, they have limited capacity to adapt to the climate change crisis.

IMPACTS OF A CHANGING CLIMATE

Even with the most ambitious reductions in future emissions, past and current GHG levels make climate change inevitable. Current evidence shows warming of the global climate indicated by increasing global air and ocean temperatures, melting snow and ice cover and rising global average sea level. A range of likely additional changes are expected from changes in precipitation patterns, including rising numbers of extreme weather events such as severe droughts, heat waves and tropical cyclones. Many natural and human environments are already affected by regional climate changes, particularly changes in temperature. Warmer temperatures are leading to hotter and longer dry periods and long periods of lower than average annual rainfall are compounding pressures such as land tenure and management issues, contributing to increased desertification in some regions. Mountain glaciers and snow cover have declined on average in both hemispheres, resulting in the loss of freshwater resources and increased probability of hazards. The timing, spatial extent and magnitude of climate change impacts, however, remain to a large extent uncertain.

Just as climate change patterns vary across regions and countries, so do the risks and opportunities associated with those patterns. Beyond exposure, the magnitude of climate change impact is a function of the sensitivity and resilience of affected ecosystems and populations. The poorest regions of the world, which contribute least to the causes of global climate change, are most vulnerable to its consequences. Projected climate change and low adaptive capacity are expected to put countries in Africa, small islands and the mega-deltas of Asia especially at risk. Recent analysis of the implications of climate change on African agriculture shows a significant economic loss at the regional level,

particularly where dryland agricultural practices are the norm.[1] The heavily populated mega-deltas of South Asia are at extreme risk from exposure to sea level rise, storm surges and river flooding. Climate change impacts including sea level rise, coastal deterioration and reduced water resources are expected to threaten the infrastructure and livelihoods of many coastal populations of the Small Island Developing States (SIDS). In short, climate change is likely to be felt most dramatically in many of the regions where the resources needed to cushion its impact are most scarce.

ADAPTATION AND SUSTAINABLE HUMAN DEVELOPMENT

Climate change and human development are inextricably linked. Development can both contribute to climate change and reduce vulnerabilities to its impacts. If left unchecked, climate change will impair the international community's ability to meet the MDGs by altering the natural environment as well as social and economic conditions needed to sustain growth.

With the impact of climate change already apparent and GHG emission levels continuing to increase such that, at the current pace, the world is likely to confront a future well beyond a 2°C increase, ongoing efforts to mitigate the causes of climate change must be accompanied by adaptation measures that reduce and manage its adverse impacts. As part of its commitment to promoting low-emission climate-resilient development, UNDP supports countries to achieve pro-poor and pro-growth sustainable economic development and livelihoods in the face of climate change. This is done through strengthening adaptive capacity and enabling environments to create robust and responsive state institutions, capable public and private sector management, and skilled human resources to innovate, adapt and deliver to the changing conditions. National and subnational systems are enhanced to leverage sources of public finance to catalyse private financing to effect a transformational change on economic growth. Support is provided to national partners to ensure that key sectors fully integrate adaptive measures into their development plans so MDG attainment can remain on track.

While climate change is likely to derail progress toward each MDG, the goals related to food security and poverty, gender equality and environmental sustainability are particularly vulnerable.

1. Mendelsohn, R. and Dinar, A. 2009. *Climate Change and Agriculture: An Economic Analysis of Global Impacts, Adaptation, and Distributional Effects,* Edward Elgar Publishing, England; Kurukulasuriya, P. and Mendelsohn, R. 2008. 'An Analysis of the Impact of Climate Change on African Cropland' *African Journal of Agriculture and Resource Economics*, Vol. 2 No. 1; Seo, N., Mendelsohn, R., Dinar, A., Hassan, R., and Kurukulasuriya, P. 2009. 'A Ricardian Analysis of the Distribution of Climate Change Impacts on Agriculture Across Agro-Ecological Zones in Africa' *Environmental and Resource Economics* 43: 313-332; Seo, N., Mendelsohn, R., Kurukulasuriya, P. and Dinar, A. 2009. 'An Analysis of Adaptation to Climate Change in African Livestock Management by Agro-Ecological Zones' B.E. *Journal of Economic Analysis & Policy,* available at http://www.bepress.com/bejeap/vol9/iss2/art4; Kurukulasuriya, P. and Mendelsohn, R. 2008. 'Crop Switching as an Adaptation Strategy to Climate Change' *African Journal Agriculture and Resource Economics* 2: 105-126.

Fighting poverty by reducing climate vulnerability

The connections between climate change, poverty and hunger are myriad. For example, long-term changes in temperature and precipitation are likely to manifest in changes to ecosystems and the services they provide, including crops, usable water, soil formation, forest products and fish. Decline in the quality and quantity of these services affect the sectoral output, growth rate and livelihoods linked to these systems. Additionally, increased variability in weather endangers assets such as crops, homes and livestock, further threatening food security and livelihoods.

UNDP's adaptation services are helping countries meet their targets under MDG 1 by supporting increased adaptive capacities to safeguard food security and enhance income and employment opportunities. Assistance focuses on developing climate information and dissemination systems; strengthening legislation and frameworks related to food production and ecosystem resilience; integrating climate considerations into planning for sectors such as agriculture, fisheries, forestry, environment and finance; and engaging and building capacities in communities for identification and adoption of technologies and practices for productivity and sustainable livelihoods.

In **Mali**, UNDP is applying resources from the Least Developed Countries Fund (LDCF) to help communities put in place resilient agro-pastoral practices, technologies and income generating activities to support poverty reduction and enhance food security. The '**Enhancing Adaptive Capacity and Resilience to Climate Change in the Agriculture Sector'** initiative focuses on immediate and urgent adaptation priorities identified through Mali's National Adaptation Programme of Action (NAPA). Finance and technical assistance is provided to stakeholders for the application of drought-resistant seeds, implementation of multi-use water management plans, establishment of revolving funds and identification and promotion of microfinance-supported alternative livelihoods. In the **Democratic Republic of the Congo**, another recently launched LDCF-funded initiative based on a NAPA priority is focusing on strengthening the capacity of the agriculture sector to plan for and respond to the additional threats posed by climate change on food production and security in the country's most sensitive agricultural areas.

Empowering women to manage climate change impacts

While both men and women face risks from climate change, women are particularly vulnerable to its impacts. Inequalities manifesting in differentiated capacities, knowledge, roles and rights can reduce women's resilience and restrict their ability to cope with climate variability. In many parts of the world, women are responsible for agricultural production and collection of natural resources such as water, firewood, fodder for livestock and forestry products. Restricted availability of these resources will not only influence women's food security and safety, but increase their labour burden and limit their education and employment opportunities.

Rising incidents of extreme weather events also put women and girls at risk of inequitable access to food, shelter and medicines post-disaster. Health-related burdens for women and girls and infant mortality can also rise significantly as a result of increases in vector- and water-borne diseases. Reduced capacity and resources to combat diseases can lead to increased prevalence of existing diseases such as HIV.

UNDP mandates 'gender mainstreaming' — the identification of gaps in gender equality — in all thematic programme areas. In 2009, UNDP adopted the organization-wide use of the Gender Marker, a pragmatic tool that rates projects for gender relevance. Projects are required to assess how they address differences in the roles and needs of women and men. Quantitative data on the number of women in project staff, project boards and jobs generated by the project are also reported.

UNDP employs various practices to facilitate integration of gender perspectives into adaptation strategies and programming, including conducting gender-sensitive assessments of vulnerabilities, capacities and priorities for adaptation; engaging women stakeholders at all levels in project planning and implementation; and increasing the direct benefits to women of adaptation strategies and measures.

In **Niger**, for example, a community-based adaptation initiative, financed by the GEF/SPA and the Government of Japan, has established and trained management committees comprised of 50 percent women to plan and implement project interventions to enhance resilience of food production systems in food insecure communities. In **Morocco**, vulnerability assessments are conducted in the context of social conventions, with men separated from women. Women are given an opportunity to express themselves in settings where they traditionally engage and discuss matters of importance to the community. This approach plays a critical part in creating enabling conditions for the inclusion of women's contributions toward the achievement of project results.

Although women are disproportionately affected by climate change, they have historically been shut out of most climate-related policy deliberations. Their limited participation in decision-making and representation at national, subnational and local levels can lead to climate change policies and plans that do not reflect the differential impacts of climate change on women, their needs and priorities.

Integrating gender concerns into climate change adaptation policies and programmes ensures that gender-differentiated capacities and impacts are considered and women are involved in the design and implementation of policies, planning and programming initiatives, not just as beneficiaries but as drivers of climate change adaptation.

Ensuring environmental sustainability in the face of climate change

Slow and rapid onset climatic changes pressure natural resources, risking a shift in some ecosystems into new states, with severe ramifications for human wellbeing as tipping points are crossed. Long-term climate change increases stress on natural resources and leads to loss of biodiversity and productive ecosystems. In 2007, the Intergovernmental Panel on Climate Change (IPCC) noted that a combination of climate change and other drivers (such as land use and overexploitation) will likely exceed the capacity of ecosystems to adapt, threatening the services they currently provide.[2] Climate change is expected to

2. *Climate Change 2007: Impacts, Adaptation, and Vulnerability.* 2007. IPCC, Geneva.

Armenia's forest ecosystems contain a high level of biodiversity and represent a key conservation priority in the region. They form part of the eco-corridor of the Eastern Lesser Caucasus, which has been identified as a conservation priority by the Ecoregional Conservation Plan for the Caucasus. Recognizing the need to protect this unique biodiversity, the Government of Armenia has established seven specially protected areas and is in the process of establishing a new one. Climate change, however, exerts significant pressures on the effectiveness of current conservation and management efforts.

According to Armenia's National Communications under the United Nations Framework Convention on Climate Change (UNFCCC), aridification is a particular threat to the country's southern forests. With financial support from the SPA Fund, UNDP is helping the Government of Armenia introduce innovative technologies for forest restoration, pest management and forest fire prevention that take full account of both present and projected climate impacts. Ultimately, 75,000 hectares of forest area will benefit from restoration measures designed specifically to address degradation pressures induced by climate change, including improvement in forest management, pest control and forest fire management. To date, 35 hectares of forest have been rehabilitated with a mix of local tree varieties. An innovative pest control approach will be tested in a 4,000 hectare area, helping to replace the use of pesticides that exacerbate the vulnerability of already fragile forest ecosystems. The project will introduce measures to minimize fire risks by improving thinning and other management operations as well as by raising awareness about actions that lead to forest fires.

Local communities have been directly engaged in these adaptation efforts. As a result, 42 community residents have found temporary seasonal employment. It is expected that this number will increase once the forest ecosystems are restored and the benefit of their services are realized. The project has completed its first year of implementation and will begin documenting the critical lessons of helping the forests adapt and maintain their invaluable ecosystem services.

impact terrestrial and marine ecosystems and alter distribution, rate of extinction and reproductive timings of species, causing potential loss of biodiversity and irreparable damages to ecosystems. Sea level rise could increase inundation and saline water intrusion and accelerate coastal erosion, severely undermining the stability of interconnected coastal and marine ecosystems such as wetlands, mangroves and coral reefs. Oceanic acidification and increased surface water temperatures are expected to affect fish stocks.

Building on UNDP's signature programmes on biodiversity, including protected areas, countries are supported to identify priority areas aligned with landscape features that increase resilience to undesirable change, avoid further fragmentation of priority areas and maintain landscapes as connected in design as possible. UNDP's adaptation programme financed through various sources promotes sustainable development through land and water management. Ecosystem-based adaptation, which uses the sustainable management and conservation of ecosystems to provide services that help populations adapt to climate change, plays an important role in UNDP's approach to supporting countries' adaptation. By incorporating climate change concerns into the agriculture, water, fisheries, forests and environmental sectors, adaptation policies and plans are formulated by countries with UNDP's support to promote a healthy environment and protect biodiversity and ecosystems.

While the influence of climate change is particularly apparent on MDGs 1, 3 and 7, it is relevant to the success all eight goals. Climate variability has consequences for each MDG through its impacts on resource availability, infrastructure, disease and development costs. UNDP's focus on climate change adaptation measures that support national and local capacities and prioritize country-driven development goals pays a double dividend in both addressing the impacts climate change and advancing sustainable development, consistent with the ultimate objective of securing low-emission climate-resilient development.

While the influence of climate change is particularly apparent on MDGs 1, 3 and 7, it is relevant to the success all eight goals. Climate variability has consequences for each MDG through its impacts on resource availability, infrastructure, disease and development costs.

UNDP PRINCIPLES AND APPROACHES FOR ADAPTATION

UNDP's adaptation services are provided in the context of the organization's broader strategy to support countries with low-emission climate-resilient development. Decreasing climate change vulnerabilities through adaptation is one of many critical threads that when woven together strengthen a country's long-term success in achieving its development priorities even in a changing climate. By strengthening adaptive capacity and enabling environments to create robust and responsive state institutions, capable public and private sector management, and skilled human resources to innovate, adapt and deliver to the changing conditions, UNDP helps its national partners achieve pro-poor, pro-growth sustainable development in the face of climate change.

KEY PRINCIPLES OF UNDP ADAPTATION PROGRAMMES

UNDP's adaptation programme is aligned with the four core elements of its corporate strategy on climate change. First, it supports the design of integrated adaptation and mitigation policies, strategies and quantified action plans that promote long-term sustainability and poverty reduction at all levels. Second, it promotes early adaptation actions and long-term adaptive capacity of developing countries in a sustainable manner. Third, it attracts and drives direct private and public investment toward lower carbon technologies and land use practices that promote long-term sustainability and poverty reduction. Finally, it integrates climate change into UN development assistance at the national, regional and global levels to effectively and efficiently service country needs in addressing the challenge of climate change.[3]

UNDP's Adaptation Policy Framework (APF) provides a structured approach to formulating and implementing adaptation policies and strategies to ensure human development in the face of climate variability and change. Four key principles are embodied in the APF:

3. These core elements of UNDP's corporate strategy are informed by the four key results of the Strategic Priority on Environment and Sustainable Development, set forth in UNDP's Strategic Plan for 2008-2011. Those four key results are: (i) mainstreaming environment and energy in MDG-based policy and planning frameworks at the national level; (ii) generating new environment-based sources of finance to significantly scale-up investment in environment and energy to achieve the MDGs; (iii) promoting adaptation to climate change in order to lower the risks to the poor in developing countries and enable the attainment of the MDGs; and (iv) expanding access to environmental and energy services for the poor as a foundation for poverty reduction and economic growth.

- **Climate change includes changes in variability.** Adapting to near-term variability is a basis for reducing vulnerability to long-term climate change in an incremental manner.
- **Adaptation policy and measures are assessed in a development context.** This shifts the focus away from free-standing projects as a response to climate change and toward integration of climate change into key development policy and planning processes.
- **Adaptation occurs at different scales, including at the local level.** This requires a national enabling framework to promote local action.
- **Both the strategy and process by which adaptation occurs are equally important.** By definition, climate change is long-term but adaptation must bring immediate and perceived benefits to stakeholders.

GEF's Adaptation Strategy

As the financial mechanism for the UNFCCC, and in accordance with its mandate "to assist in the protection of the global environment and promote thereby environmentally sound and sustainable economic development,"[4] the GEF provides incremental financing to developing countries to "assist developing countries in piloting how to address the adverse impacts of climate change, including variability, by supporting projects that: identify and implement suitable adaptation measures; build adaptive capacity; and reduce vulnerability and increase ecosystem resilience to the adverse impacts of climate change, including variability." [5]

4. Instrument for the Establishment of the Restructured Global Environment Facility. 2010.

5. Climate Change Focal Area Strategy and Strategic Programming for GEF-4. 2007.

KEY APPROACHES OF UNDP ADAPTATION PROGRAMMES

UNDP's LDCF/SCCF/SPA-supported adaptation projects are designed to align with country priorities and are guided by expected results in the United Nations Development Assistance Framework at the national level. In supporting its national partners to design and implement successful adaptation responses, UNDP's Environment and Energy Group focuses on six key approaches to maximizing gender-sensitive, sustainable, participatory and localized policies and programmes.

Developing institutional and individual capacities

Through its adaptation programme, UNDP supports countries to build the requisite capacity at the systemic, institutional and individual levels to integrate climate information and management of climate risks and opportunities into national development priorities.

In **Burkina Faso**, the National Council for Environment and Sustainable Development is currently being supported to address climate change risks in an integrated manner across the agriculture, livestock, water and agro-forestry sectors. An initiative is ongoing to strengthen capacity to plan for and respond to climate change in the agro-sylvo-pastoral sector, including adjustments to sectoral legislation, policy and planning/programming frameworks to account for the uncertainties of climate change. Local stakeholders at provincial and regional levels are being trained in the skills and tools needed to make informed decisions to manage climate change risk on agro-sylvo-pastoral productivity. This includes testing and adoption of best practices through a community-centred approach.

UNDP's LDCF/SCCF/SPA-supported adaptation projects are designed to align with country priorities and are guided by expected results in the United Nations Development Assistance Framework at the national level.

Integrating gender perspectives

UNDP's adaptation approach supports countries to systematically and comprehensively address the gender-specific impacts of climate change. Measures to address issues of women's equality and empowerment are integrated into adaptation initiatives supported by the LDCF, SCCF and SPA through scoping of adaptation needs, engagement with local stakeholders, vulnerability assessments and capacity development.

UNDP mandates the inclusion of gender in all thematic programme areas. Efforts are measured through a set of indicators reported by all projects. The Gender Marker rates the contributions of investments and expenditures to both gender mainstreaming and targeted interventions for gender equality and women's empowerment. Following a four point scale, projects are rated at the output level according to their contribution to gender equality. Ratings range from zero for projects that are not expected to contribute noticeably to gender equality to three for those that have gender equality as a principle objective. A significant majority of projects in the current UNDP-GEF adaptation portfolio include outputs that are expected to contribute in some way to gender equality. The average gender rating for LDCF, SCCF and SPA projects with signed project documents is 1.162. With initiatives required to report on gender impacts, it is expected that projects' gender relevance will increase.

In **Tanzania** for example, efforts to mainstream adaptation into water resource management in the Pangani River Basin include a focus on supporting the role of women in water management. Water user associations have been formed, with women constituting about 30 percent of the membership. Women have been actively involved in the planning, implementation and leadership of the water user associations and committees. The initiative's output includes gender equality as a significant objective, earning it a gender rating of two.

Catalysing additional financing

By accessing, sequencing and combining adaptation financing from a diverse set of sources, UNDP facilitates climate risk management and adaptive capacities at various levels. The organization plays a key role in assisting countries to mobilize adaptive financing including from bilateral donors, international agencies, NGOs, devel¬opment banks and the GEF-managed adaptation funds.

Because adaptation imposes additional costs on development, it is important that financing for climate change risk management be effectively coordinated and targeted to address appropriate priorities in the context of development needs, especially for the poorest and most vulnerable countries and communities. In financing adaptation initiatives, UNDP follows established aid effectiveness principles. Box 1 explores the alignment of UNDP-GEF financed initiatives with internationally agreed upon aid effectiveness principles. UNDP is also party to the Bangkok Call for Action, a set of recommendations for developing countries and development partners that fund climate change responses. The recommendations focus on strengthening the quality of climate financing based on country analyses in five South East Asian countries.

Engaging multiple stakeholders and partnering for success

UNDP engages multiple stakeholders through consultative and participatory processes in project development, delivery and monitoring and evaluation. In **Bhutan**, for example, project preparation for a glacier lake outburst risk reduction project included a series of consultations with stakeholders at the national and regional levels, including the ministries of agriculture, forestry, livestock, environment, roads, health, geology and mines, finance, planning and home affairs and the *dzongkhag*, or district, administration.

UNDP partners with national and regional institutions, international agencies, private sector entities, NGOs and community-based organizations (CBOs to provide coordinated assistance. Multilateral agencies with which UNDP partners in climate change adaptation activities include the Asian Development Bank (AsDB), the Food and Agriculture Organization of the United Nations (FAO), the Red Cross, United Nations Children's Fund (UNICEF), United Nations Environment Programme (UNEP), United Nations Volunteers (UNV), the World Bank, the World Food Programme (WFP), World Wildlife Fund (WWF) and the World Health Organization (WHO).

Promoting regional and South-South cooperation

UNDP plays a key role in promoting inter-institutional coordination and regional collaboration to strengthen adaptive capacities across institutions, sectors and national boundaries. Regional partnerships are strengthened to prioritize cross-cutting measures that advance environmental and climate change considerations. For example, the **Pacific Islands Adapting to Climate Change Initiative** funded by the SCCF, brings together 13 Pacific Island countries to increase resilience in the areas of food security, water and coastal management. UNDP is implementing this project in partnership with the South Pacific Regional Environment Programme.

Demonstrating adaptation for scale

Prioritizing the need to link global, regional and national policy programming to local adaptive action, UNDP supports the demonstration of adaptive responses to offer lessons to replicate, scale and leverage the interventions to inform national and subnational level policies and programming. In **Liberia**, the Environmental Protection Agency and UNDP are working to enhance resilience of coastal systems by demonstrating adaptive measures such as building a breakwater system for Monrovia's coastal area, restoring mangroves and natural buffer zones and establishing early warning systems.

UNDP plays a key role in promoting inter-institutional coordination and regional collaboration to strengthen adaptive capacities across institutions, sectors and national boundaries.

BOX 1. CLIMATE CHANGE ADAPTATION FINANCING AND AID EFFECTIVENESS

In financing adaptation initiatives, UNDP makes every attempt to follow the aid effectiveness principles set out in the 2005 Paris Declaration on Aid Effectiveness and strengthened in the 2008 Accra Agenda for Action.

Ownership: LDCF/SCCF/SPA-financed country-led adaptation initiatives are formulated, designed and implemented with the full participation, ownership and direction of local stakeholders. Once approached with an official request by a government for assistance in accessing finance for adaptation, support is provided by a UNDP technical team to identify appropriate line ministries or local NGOs to function as an anchor during a design and implementation phase. With the participation of public and private sectors, civil society, academia and other interested parties such as other donors, UNDP facilitates the articulation by local stakeholders of the scope of the initiative for which funding is requested. Technical assistance is provided for local stakeholders to design a technically sound and cost-effective adaptation initiative(s) that is firmly anchored within and managed by an appropriate national entity(ies). All UNDP-GEF adaptation programmes are therefore nationally implemented by specific line ministries with direct access to adaptation financing through the network of UNDP Country Offices. National ownership is further strengthened by the use of GEF resources as co-financing to address climate change risks on government-financed baseline development initiatives.

Alignment: In addition to alignment of intended results to the expected outputs of the United Nations Development Assistance Framework (UNDAF) in the country, UNDP-GEF initiatives are aligned with national priorities for development, as reflected in national development plans or strategies. Furthermore, to enable the use of country systems, GEF funds are implemented through UNDP's National Implementation Modality. The UN Resident Coordinator system ensures that information on funding is shared with relevant ministries, such as finance and planning, for national development planning purposes and with the aim of ensuring that those funds are reflected in the national budget. Moreover, implementation is carried out under the direction of a nominated permanent governmental staff member from the relevant ministry. The latter is critical for ensuring that the results (outcome) and deliverables (outputs) of the initiatives in question are aligned with and complimentary to others pursued by national stakeholders.

Harmonization: UNDP plays a key role in assisting countries to mobilize adaptive financing from bilateral donors, international agencies, NGOs and development banks. By accessing and sequencing GEF-managed adaptation funds and combining these with financing from other diverse sources, support is provided to harmonize international flows supporting climate risk management and adaptive capacities at various levels. Complimentarity is also sought in partnerships with other multilateral agencies including AsDB, FAO, Red Cross, UNEP, UNV, World Bank, WFP, WWF and WHO.

Managing for results: National partners implement LDCF/SCCF/SPA funds according to a results-based management framework that enables monitoring, reporting and verification of adaptation initiatives. The framework elicits explicit consideration of impact, coverage, sustainability and replicability of the adaptation initiatives. Mutual agreement on the initiative's level of performance, monitoring, and reporting requirements is established through participation of multiple stakeholders at various levels. Initiatives also promote dissemination of best practices and lessons learned to facilitate scaling and mainstreaming of adaptation strategies and plans.

Mutual Accountability: UNDP-GEF financing commits support for projects for a duration of five to six years. Multi-year engagements, backed up with multi-year workplans for secured and earmarked funds, ensure predictability of aid and thus facilitate mutual and domestic accountability. Aligned with the Country Programme Document (CPD) outcomes that set out UNDP's contribution to achieve the national results identified in the UNDAF, projects deliver outputs and contribute to achieving country (or regional or global) programme outcomes. Independent evaluations of project and country programme outcomes facilitate mutual accountability. Transparency is promoted through wide dissemination of information on project design, implementation and evaluation results on publicly accessible UNDP and GEF websites.

OPERATIONALIZING ADAPTATION

Designing and implementing adaptation measures requires a multidimensional approach that comprehensively addresses the differences and synergies between adaptation and development. Climate change impacts are dynamic and context specific; communities are unique and threats vary depending on location. Operationalizing adaptation is a cross-cutting task and the design and implementation of adaptation measures should be firmly rooted in nationally defined development goals.

Key considerations for implementing projects that maximize the synergies between development and adaptation include:

- Recognizing that linkages between development and climate change are a starting point to integrate climate change considerations that leverage the synergies and incorporate the differences between development and climate change.
- Focusing on key sectors, themes or issues can define the scope of adaptation by identifying related development objectives and relevant strategies, practices and stakeholders.
- Strengthening adaptive capacities is a broad objective that necessitates identification of gaps and needs at the process, institutional and individual level to build system-wide capacity to address evolving climate risks beyond the project timeframe.
- Adaptation requires changes in practices and behaviors to increase long-term resilience as well as the adoption of measures that reduce current and future climate-related risks.

REMOVING BARRIERS

Aligned with UNDP's strategies and APF principles, several considerations guide UNDP's adaptation programmes in specific climate-sensitive sectors through a set of processes that address both systemic and discrete barriers to adaptation. Systemic barriers to climate change adaptation may include institutional, policy, behavioral and financial challenges while discrete barriers include technological and informational challenges. Box 2 further explores these systemic and discrete barriers to adaptation.

At the systemic level, barrier removal activities include revising or formulating policies and frameworks to mainstream adaptation into development activities; capacity building in technical skills, management and decision-making to

improve climate-sensitive planning; facilitating coordination and partnerships through engagement of multiple stakeholders; promoting awareness, education and training at individual and community levels to build capacity and effect behavioral changes; dissemination of knowledge and best practices for adaptation to facilitate system-wide learning; and access to financing and risk transfer mechanisms such as credit and index-based insurance to ease costs of adaptation.

Barrier removal at the discrete level involves supporting generation, use and codification of information and knowledge such as climate scenarios, risks and vulnerabilities in decision-making and planning, and demonstration of technologies and adaptation practices to promote technology transfer and increase absorption rate.

BOX 2. BARRIERS TO CLIMATE CHANGE ADAPTATION[6]

SYSTEMIC BARRIERS

Institutional barriers typically involve the absence of appropriate institutional arrangements; governance structures; mandates; technical and managerial capacity of staff in key institutions; and coordination and partnerships across various institutions, agencies, and civil society needed to create or contribute to an improved enabling environment for managing the uncertainties of climate change.

Policy barriers typically concern national, subnational and local regulations, policies, directives and other formal and informal declarations for managing key sectors and/or regions to support both planned and autonomous management of the uncertainties of dynamic climate change risks and opportunities.

Barriers to behavioral change include lack of awareness, understanding, capacity and incentives at the individual and community level that hinders uptake of adaptive practices. Systemic behavioral adjustments are also concerned with compliance measures, accountability, organizational structures and procedures.

Financial barriers typically involve the allocation of resources within national and sectoral budgeting mechanisms and systems to incorporate climate change risk reduction; regulatory and fiscal structures to promote low-emission climate-resilient growth; access to innovative financial and risk transfer mechanisms; and sustainability of the financing sources that support long-term adaptation.

DISCRETE BARRIERS

Technological barriers include the absence or failure to use climate-resilient soft and hard technologies and practices such as efficient irrigation systems, drought resilient seeds and improved livestock management techniques. Lack of scientific and technical capacity also hinders access to and promotion of climate-resilient technologies and practices.

Informational barriers involve the lack of access to the information necessary for the planning and management of climate change uncertainty, including climate scenarios; results of integrated (science, biophysical and economic) modeling; vulnerabilities; and risks. This includes barriers in technical capacity to generate and incorporate this information and in management and planning systems.

6. Amended from Pittock, A.B. and Johns, R.N. 2000. 'Adaptation to What and Why?' *Environmental Monitoring and Assessment*. 61:1, 9 – 35.

THEMATIC AREAS OF FOCUS

To guide programming at a practical level, UNDP designs and implements adaptation initiatives in specific climate-sensitive thematic areas that are aligned with the MDGs. UNDP encourages cross-sectoral adaptation approaches but recognizes that a thematic approach helps to target related development goals and objectives.

Sustainable rural development and food security

Current vulnerabilities to climate-driven food insecurity are highest among smallholders, farmers and pastoralists living in marginal areas. Climate change is expected to affect agriculture and food security through its impacts on water availability, land and crop productivity, and the distribution and productivity of rangelands, fisheries and other ecosystems. Changes in temperature and precipitation and increased incidence of extreme events such as droughts and floods can lead to additional stresses on food production systems on top of current baseline stresses associated with climate variability and anthropogenic factors. In many SIDS and coastal nations subject to tropical storms and sea level rise, food prices are increasing as tropical storms and rising sea levels impact groundwater systems and crop production.

In this context, UNDP aims to reduce the impact of climate change on agricultural productivity and food security by reducing the vulnerability of communities and food production systems. Technical assistance is provided to enhance the ability of individuals, communities and institutions associated with rural development and food security to plan for and manage the implications of climate change on food production and distribution.

Based on the current portfolio, countries are implementing a number of measures to better prepare themselves to adapt to climate change. This includes short-term interventions such as promotion of soil and moisture conservation techniques; access to climate-resilient seeds/crops, credit and insurance; and diversification of livelihood. For long-term resiliency, policies, plans and investments related to agriculture, fisheries, rural development and natural resource management are being redesigned and updated to incorporate climate change risks and opportunities.

REDUCING CLIMATE-RELATED FOOD INSECURITY

In **Niger**, the National Council for Sustainable Development is working to increase the resilience of food production systems and food insecure communities. Adaptation measures to improve food security and livelihoods are being explored, including dissemination of drought-resilient crop varieties; construction of cereal banks, fodder banks, fertilizer and pesticide shops, wells and drinking water supplies; stabilization of dunes and river banks; and development of entrepreneurial activities such as sewing supported by the establishment of small-scale savings and credit institutions. Institutional capacity in the agricultural sector is also being enhanced to support climate risk management in pastoral and agricultural land management.

In **Burkina Faso**, UNDP is supporting the implementation of four of the country's 12 NAPA priorities to strengthen adaptation capacities and reduce the vulnerability of the agro-sylvo-pastoral sectors. The sectoral legislation, policy and planning/programming frameworks are being assessed to incorporate climate change information and risks. Commune-level extension agents and provincial technical officers are being trained in the use of information and tools such as forecasting and vulnerability mapping to integrate climate change into farm-level activities and relevant sectors. Risks of climate-induced impacts on agro-sylvo-pastoral productivity are being reduced through demonstrated measures such as the development and testing of new crop varieties, the improvement of aviculture facilities and the renovation of fodder production areas.

Managing climate change risks in coastal areas

Populations living in low-lying coastal areas exposed to storms, storm surges and flooding are most at risk from climate-related coastal hazards. These risks are currently greatest in parts of South and South East Asia, West Africa, South East Africa, Central America, and small island states in the Caribbean, Indian Ocean and Pacific. Climate change poses a long-term threat to coastal systems through a combination of factors, including increases in sea level; accelerated erosion rates; elevated sea surface temperatures; changes to inputs of freswater, including sediment and nutrients from terrestrial sources; ocean acidification; modification of marine ecosystems; and changes in the behavior of storms and atmospheric and marine circulation.

In the context of coastal zones, UNDP works to reduce mortality, morbidity and economic losses for coastal populations and threats to ecosystems arising from climate-related coastal hazards. The aim is to secure coastal development in the face of increasing climate-induced coastal hazards through vulnerability reduction and enhanced adaptive capacity of coastal populations.

Early evidence from the portfolio suggests that adaptation in coastal zones is best managed where coastal development policies and plans incorporate information on climate change and sea level rise within Integrated Coastal

Area Management frameworks. Based on scenario planning that assesses risks and impacts, adaptation measures may range from soft or hard engineering measures, reduced use of coastal zones and planned retreat from high-risk areas.

Managing climate change-induced health risks

Poorer communities are most likely to bear the brunt of the health impacts of climate-related disasters due to socio-economic factors. High-density populations in low-lying coastal regions are also particularly at risk from adverse health outcomes associated with coastal storms and floods. Changes in temperature and precipitation patterns are expected to alter the viable ranges of a number of climate-sensitive infectious diseases. Extreme temperatures would increase exposure to heat stress and food contamination while water scarcity or contamination would exacerbate water-related health risks.

In partnership with WHO, UNDP is supporting a number of countries to minimize mortality and morbidity from climate-sensitive diseases and other climate-related impacts. UNDP utilizes its mandate as a convening authority

PROTECTING COASTAL ZONES

A regional project in **West Africa** is aiming to develop and pilot a range of effective coping mechanisms for reducing the impact of climate change-induced coastal erosion in vulnerable regions in **Cape Verde, the Gambia, Guinea Bissau, Mauritania** and **Senegal** through Integrated Coastal Area Management. Among other outcomes, the pilot project aims to strengthen the resilience of vulnerable communities and coastline ecosystems to the impacts of climate change with the implementation of measures such as stabilization of coastal erosion through rehabilitation of vegetative cover, soil conservation measures to reduce runoff, and diversification of livelihoods including beekeeping and ecotourism.

In **Tuvalu**, UNDP is supporting the protection of livelihoods in island communities from dynamic climate-related damage. The Government of Tuvalu aims to integrate climate resilience into coastal management, public works and agriculture and water sector policies and plans, including the Te Kakeega II (National Development Plan) and corresponding public sector budgets and asset management plans. Community-based adaptation measures are implemented, including technical assessments related to coastal erosion dynamics; identification and adaptation of feasible techniques for coastal protection, including tree planting and soft technologies; and improved crop production through the introduction of salt- and drought-tolerant species.

In **Cambodia**, UNDP is assisting the government to implement a project that promotes climate-resilient agricultural practices and water management. The project works with the Ministry of Agriculture, Forestry and Fisheries and the Cambodian Agricultural Research and Development Institute to support on-farm trials and provide six new rice varieties to farmers in two flood- and drought-prone provinces. According to the participating farmers, the new varieties brought 10 to 50 percent higher harvests on average than traditional varieties farmed on the same size land.

for development at the national level to create and mobilize the power of partnerships to support countries to monitor changes in health risks and strengthen the capacity of officials and communities to cope with current and emerging climate-related health risks.

Adaptation strategies and measures in this sector primarily focus on enhancing health risk management, activities and planning. Surveillance and early warning systems are needed to alert communities and plan interventions to prevent or curb related impacts. Improvements in food and water quality and urban planning would have a major impact on a population's resilience to health risks.

REDUCING HEALTH VULNERABILITIES

As part of **Samoa**'s first NAPA implementation project, the government is undertaking adaptation measures to address climate change impacts in the health sector. Attention is focused on enhancing the organizational and technical capabilities of the Samoa Meteorology Division to monitor climate trends and provide regular, timely and accurate climate risk and early warning information to public health services. In addition, public health sector employees will be trained to access and use risk information to improve the efficiency and impact of disease monitoring/surveillance and prevention programmes.

Through a global programme titled **'Piloting Climate Change Adaptation to Protect Human Health',** UNDP and WHO are working with the Government of **China** to strengthen national capacity to respond to the increased health risks associated with heatwaves. In particular, the impacts of climate change on cerebro-cardiovascular diseases are targeted in vulnerable regions in China through implementation of heatwave forecasting and early warning systems designed to protect human health. The Ministry of Health and the meteorological bureaux are supported to establish systemic and institutional capacities aimed at improved coordination between the entities, including data and information sharing, communication and personnel education and emergency model response to climate change.

UNDP and WHO, in partnership with the GEF, are also supporting **Barbados, Bhutan, Fiji, Ghana, Kenya, Samoa** and **Uzbekistan** on climate change and health-related issues.

Climate change and natural resource management

Anthropogenic pressures resulting in ecosystem fragmentation and degradation increase the vulnerability of natural systems to stresses associated with climate extremes and large-scale, episodic climatic variations. Climatic variations affect plant and animal populations and food webs via changes in temperature, rainfall and other climate-related variables. Extreme events such as storms and droughts can have significant impacts on ecosystems, reducing resources required for foraging and breeding among animal populations, leading to reduced numbers. Climate impacts are expected to lead to increased loss of biodiversity, decline in vegetation, adverse impacts on terrestrial and marine ecosystems, species extinction and other losses.

In the natural resource management sector, UNDP aims to reduce the vulnerability of natural resources and natural resource-dependent livelihoods threatened by climate change and to enhance capacity to manage natural resource sustainably in the face of climate change. Building on UNDP's signature programmes on biodiversity, including protected areas, countries are supported to identify priority areas aligned with landscape features that increase resilience to undesirable change, avoid further fragmentation of priority areas and maintain landscapes as connected in design as possible. A number of national, subnational and community-based initiatives are currently underway in more than 20 countries with others expected to commence shortly. Financing for these initiatives are leveraged by UNDP from numerous sources including $16 million from the GEF/SPA; the Australian International Development Aid Bureau; the New Zealand Aid Programme; and the Government of Japan. UNDP is supported in this effort by UNV.

Climate impacts are expected to lead to increased loss of biodiversity, decline in vegetation, adverse impacts on terrestrial and marine ecosystems, species extinction and other losses.

Consistent with its focus on low-emission climate-resilient development, UNDP follows an ecosystem-based approach to adaptation that advances ecosystem-based solutions as part of an integrated adaptation investment strategy. Ecosystem-based adaptation seeks to conserve biodiversity and make ecosystems more resilient to climate change so that they can continue to provide services that support development. It also aims to preserve and restore natural ecosystems that can provide cost-effective protection against climate change threats. Communities and governments are supported to design and implement measures that maintain the resilience of local ecosystems under new climatic conditions so they can continue to provide resources related to development needs such as livelihood, food, water and health while performing essential protective functions like storing carbon and preventing erosion.

PROTECTING NATURAL RESOURCES

The Government of **Albania** is incorporating climate change considerations into the management of protected areas in the Drini-Mati River Deltas to improve the resilience of key ecosystems and local livelihoods to climate change. The ecosystem monitoring system of the Regional Environmental Agency for the Lezha administrative region is being upgraded to incorporate monitoring of climate change and to conduct regular assessments to evaluate climate change impacts on species indicating the health and resilience of the coastal ecosystem. By mid 2010, 200 individuals from local government, businesses and NGOs had participated in participatory capacity building training on risk assessment and the development of adaptation plans for coastal communities. A significant achievement is the incorporation of identified and agreed upon adaptation measures into the Concept of Regional Development. This strategic document will inform priority programmes and plans for the target coastal region during 2010-2015. Key measures include the establishment of bio-corridors to increase connectivity of coastal protected areas and ecosystem resilience, anti-erosion and flood protection measures, application of a 'living shoreline' approach to rehabilitate coastal dune structure and adjustment of building codes governing construction in the coastal region.

In **Namibia**, the national government is working to enhance the adaptive capacities of farmers, pastoralists and natural resource managers in the north-central provinces as part of an overarching effort to implement an integrated sustainable land management framework. The Ministry of Agriculture, Water, and Forestry is piloting community-based adaptation measures such as improved seed varieties, conservation agriculture and integrated pasture management to improve agro-sylvo-pastoral productivity. Information flows on forecasts are being improved and uptake enhanced for use in decision-making processes through the training of Forest Service officials and communities. The ongoing initiative aims to contribute to the regional climate change policy, the National Drought Policy and other relevant strategies.

Adaptation measures for the natural resource sector largely fall into two categories. First, the reduction of anthropogenic stresses on resources experiencing increased stress due to climate change and the concomitant enhancement of the resilience and adaptive capacity of natural systems; and second, the reduction of the dependence of human populations on natural resources threatened by climate change.

Managing climate change impacts on water resources

Changes in temperature and precipitation are already leading to adverse implications for water resource management. Currently, vulnerability to climate-related water shortages is greatest in semi-arid and low-income countries, where precipitation and streamflow are concentrated over a few months and inter-annual variations are high. At the subnational scale, the groups most vulnerable to climate-driven interruptions to water supply and quality are those whose supplies of potable water and livelihoods are most closely coupled

to climate variability. Projected impacts, including reduced melt-water from glacier or snow melt, protracted and severe droughts and decline in quantity and quality of freshwater resources, will increase water stress and decrease water availability for productive uses.

In the water sector, UNDP's adaptation initiatives seek to raise awareness of water and climate issues and integrate climate change considerations into water governance reform; reduce vulnerability to water-related risks, stress and scarcity of clean water; and strengthen the capacity of water sector institutions (including supply and demand management) and communities to build resilience and respond to long-term climate variability and change.

Countries programming GEF-managed adaptation funds for water initiatives typically seek UNDP assistance in the context of supply management through interventions such as enhancing efficient storage. Some focus on demand management while others are more focused on strengthening water governance for economic effective water use, environmental sustainable water development and equitable allocation of water resources between socio-economic groups and generations.

SECURING WATER RESOURCES

In **Ecuador**, the Ministry of Environment is working to mainstream climate change adaptation into water resource management through the integration of climate risk information and management criteria into key water sector-specific national development plans. Technologies and practices to improve the adaptive capacity of water resources management at the local level are being piloted, including through indirect measures such as adjustment in agricultural practices. Examples include changes in crop patterns, selection of drought-tolerant crops and drip irrigation to promote efficient water use and allocation of water use rights. The incorporation of climate change considerations in provincial hydrological inventories to enable planning is also a focus.

In **Tanzania**, the Pangani Basin Water Board is mainstreaming climate change into Integrated Water Resources Management (IWRM) in the Pangani River Basin. The initiative, which is supported by UNDP in partnership with the IUCN Eastern Africa Regional Office, is promoting increased understanding of the environmental, economic and social implications of different river flow scenarios under a range of climate change scenarios. This includes establishing a sustainable local system for collecting and analyzing flow assessment information over time. Community participation in climate change adaptation and IWRM has been strengthened through establishment of sub-catchment and basin-level fora and training Water User Associations to integrate community-, district- and regional-level concerns into basin-level planning. The initiative is currently under evaluation to measure the impact of the interventions to date.

CORE ELEMENTS OF PROMOTING ADAPTATION

The interventions supported by the UNDP-GEF portfolio reflect a core set of practices that address a multitude of barriers to adaptation. These practices, applied together in priority areas and in the contexts of local knowledge and capacities, aim to reduce vulnerability and enhance adaptive capacity to climate change, including variability. The core elements relate to internalizing climate change risk into the activities of key sectors; formulating policy to incorporate climate change risks and opportunities; building capacity at all levels to address climate change; piloting appropriate technologies and community-based measures; and codifying, disseminating and managing knowledge.

Integrating climate change information and risks into key sectoral plans and activities

It is increasingly becoming evident through the UNDP portfolio that a critical aspect of mainstreaming climate change adaptation is applying relevant knowledge and information about climate risks, opportunities and vulnerabilities to budgeting, decision-making, planning and implementation across various sectors. Assessment and incorporation of this information allows stakeholders to not only evaluate and prioritize local risk reduction and adaptation measures

relevant to the sector, but to engage in long-term sectoral planning and investment decisions as climate change risks and uncertainties evolve over time. Integrating climate risk information also enables development and adoption of innovative technologies, processes and financial and risk transfer mechanisms that would otherwise not be considered in 'development as usual' scenarios.

UNDP-supported country-led initiatives promote capacity building for sectoral planners and decision makers to apply climate change information and provide training to relevant departments, officials and staff in budgeting, planning, management, conflict resolution and development of adaptation strategies and measures. Cross-sectoral impacts of climate change also require sharing information and coordinating planning and management across sectors which is engendered through engagement of multiple stakeholders from various interested ministries.

A critical aspect of mainstreaming climate change adaptation is applying relevant knowledge and information about climate risks, opportunities and vulnerabilities to budgeting, decision-making, planning and implementation across various sectors.

In **Samoa**, for example, the Ministry of Agriculture and Fisheries is working to perform climate-sensitive short- and long-term planning for agriculture and food security. Incorporation of timely and accurate short-term and medium-term climate predictions will enable appropriate contingency and preparedness planning by farmers and sectoral planners. Samoa's long-term strategy for agricultural diversification, including integration of climate change resilience needs into the National Agricultural Sector Plan, is being informed by activities such as enhanced climate risk and crop productivity modeling information; improved GIS-based maps for soil, crop and rainfall distribution; and targeted training initiatives to facilitate the integration of a long-term risk perspective in practical agricultural planning tasks.

In the **Maldives**, climate risk information is being integrated into planning by key departments governing land use, coastal zone management, coastal infrastructure development and land reclamation. Current land use plans and coastal protection measures only take into account historical conditions. Through increased capacity among provincial/atoll and island authorities and civil society leaders, and technical training in relevant departments, climate change risks are being integrated into the land use and island and atoll development plans of four target islands and two atolls. Guidelines and recommendations are being developed on how to assess costs and benefits of adaptation options such as restoration of natural protective barriers, design and manage Environmental Protection Zones, conduct land reclamation, assess infrastructure investment decisions and manage coastal erosion in a changing climate.

Revising or formulating policy to incorporate climate risks and opportunities

Stand-alone adaptations are neither cost-effective nor sustainable as vulnerabilities, risks, local contexts and priorities change over time. To integrate climate risk management and mainstream climate change into national and sectoral development, relevant policies need to be revised or formulated. National and sectoral legal and regulatory frameworks such as coastal zone development regulations must integrate climate change concerns to promote increased resilience of natural and physical resources and vulnerable communities to adverse impacts of climate change. Countries are supported in assessing and revising or developing new policies, strategies and frameworks that are primarily informed by the lessons learned and adaptation measures piloted at the local level to link community-level adaptation to national and subnational policy making.

Stand-alone adaptations are neither cost-effective nor sustainable as vulnerabilities, risks, local contexts and priorities change over time. To integrate climate risk management and mainstream climate change into national and sectoral development, relevant policies need to be revised or formulated.

All initiatives engage national and subnational policy makers and stakeholders through the project design, planning and implementation stages to raise awareness and promote dialogue on policy change for mainstreaming adaptation. UNDP's capacity development efforts include support to strengthen technical and leadership capacities to facilitate national and sector policy making.

In **Bangladesh**, sectoral policies are being assessed and recommendations developed to strengthen policy frameworks to promote the resilience of coastal communities to climate change. Building on lessons drawn from piloted community-based adaptation measures, recommendations will be developed for policies including the National Environment Policy, National Forest Policy, National Land Use Policy and the Coastal Zone Policy, with focus on livelihoods and financial impacts at the community level. Policy recommendations are also planned specifically related to land use to enhance the sustainability of protective systems such as coastal forest cover in the coastal areas. The initiative aims to establish a forest product benefit sharing system with local communities and issue a formal recommendation to the government to extend the duration of afforestation activities on newly accreted lands. A policy recommendation will be issued to preserve a certain portion of newly accreted land as exclusive greenbelt zones and mandate by law the protection of these areas from encroachment.

In **Tajikistan**, the National Biodiversity and Biosafety Center is facilitating the establishment of supportive policy, regulatory and institutional frameworks to promote agro-biodiversity conservation and adaptation to climate

change. Stakeholders will examine existing legislation and policy, such as agricultural and forestry policies, assess their effectiveness, propose modifications and identify strategies to strengthen appropriate policy implementation that supports agro-biodiversity conservation and use and increased socio-ecological resilience to climate change. The objective is to identify policies that when effectively implemented would result in ex situ and in situ agro-biodiversity conservation and use in agro-biodiversity-based enterprises beneficial to local communities and the country as a whole.

Developing individual and institutional capacity

Capacity development at institutional and individual levels is central to promoting climate risk reduction management and ongoing adaptation in the face of climatic uncertainties. Institutions across sectors and at various levels must be strengthened to respond to and prepare for climate change impacts in a coordinated manner. At an individual level, stakeholder capacity must be supported to manage, prepare for and adapt to climate risks.

UNDP supports policy makers and technical officials at various levels as well as NGOs and CBOs to establish organizational frameworks and strengthen relevant technical, managerial and leadership capacities for facilitating climate change risk management and planning. At the community level, adaptive capacities are also enhanced through increased awareness of climate risks and opportunities and training on technologies and adaptation measures through participatory demonstrations.

In **Cambodia**, the Ministry of Agriculture, Forestry, and Fisheries is working to build capacity within local institutions in climate-resilient water management through provision of training for provincial and community officials in climate-risk management and development of climate-sensitive budgets and plans. District and local authorities are also being supported in developing conflict resolution skills to cope with conflict potential in areas prone to climate-induced water shortages. The capacity of Farmer Water Users Communities related to climate risk management, including training in climate-resilient irrigation design, is also being strengthened. Attention to education and awareness-raising is assisting communities in adopting resilient farming techniques as well as water storage and management technologies and practices.

In **Sudan**, initiatives aim to enhance institutional and individual capacities to integrate climate change awareness and risk management into extension

programmes and community livelihood measures. Technical staff and extension workers will be trained in climate proofing and adaptive techniques to support local communities in natural resource management. Pastoralists and farmers, especially women, will be involved in design and implementation of priority adaptation measures such as reseeding the rangeland with heat-resistant varieties of grass and legume species to promote awareness of integrating climate risks into productive activities. Local leadership councils are being planned as an institutional mechanism to facilitate participatory planning and decision-making.

Piloting technologies and community-based measures

Adaptation is local. Reducing vulnerabilities and increasing resilience start with local, community-based adaptation initiatives that engage multiple stakeholders at various levels to design and pilot risk reduction measures and adaptation technologies and practices that increase long-term climate change resilience. Pilot activities are a means to encapsulate the contextual assessment of vulnerabilities, the socio-economic implications of climate change and barriers to adaptation. They also provide an opportunity to evaluate appropriate adaptation options, incorporating existing and traditional knowledge, and to test technologies and adaptation measures. Best practices and lessons learned can be distilled to support learning, scale and replication across other levels and regions beyond the pilot sites.

Reducing vulnerabilities and increasing resilience start with local, community-based adaptation initiatives that engage multiple stakeholders at various levels to design and pilot risk reduction measures and adaptation technologies and practices that increase long-term climate change resilience.

UNDP's SPA-funded Community-Based Adaptation (CBA) programme supports the design and implementation of community-level adaptation measures that engender capacity building, advocacy and multi-stakeholder engagement and promote linkages to policy and planning processes for mainstreaming adaptation. Innovative technologies and practices are targeted at the sectoral level, including resilient farming practices, water management, ecosystem rehabilitation and early warning systems.

In **Bangladesh**, the Ministry of Environment and Forest has initiated a programme to help communities on the remote island of Char Kukri-Mukri reduce vulnerability to sea level rise and tidal surges with ecosystem-based measures to restore and protect coastline mangrove forests that provide protection against sea level rise and serve as carbon sinks. Women in Char Kukri-Mukri have been trained to grow mangrove saplings and timber tress and in

forest management. Mangrove saplings will soon be planted along the coastline to create mangrove forests containing over 2.5 million trees.

In **Bolivia**, a community-based adaptation project is helping communities manage key forest watersheds that act as protective buffers against increasing climate-driven floods, erosion and landslide threats. The local community developed and manages nurseries to raise native tree species that are planted in water catchment areas to protect the soil from threats such as stronger rainfalls. These activities promote increased agricultural production and water availability and improve the livelihoods of the local community members. Workshops and participatory meetings, including engagement with communities, mayors and other local stakeholders, are also facilitating knowledge transfer on climate change impacts and adaptation solutions.

In **Jamaica**, the community in the Martha Brae watershed is working to address threats to livelihood caused by rainfall declines and stronger storms leading to river channels erosion, crops destruction and spread of contaminants. Through a community-based initiative, stone barriers have been built to protect against erosion and culverts constructed. Community members have been trained to successfully implement these measures and awareness of climate change impacts and responses has been significantly raised.

EMPOWERING COMMUNITIES TO MANAGE CLIMATE CHANGE RISKS

Small communities are often the hardest hit yet least equipped to cope with the impacts of climate change. Recognizing that these communities are disadvantaged in accessing resources and capacity development assistance, UNDP's global Community-Based Adaptation (CBA) programme focuses on strengthening the adaptive capacities of local communities by helping them to apply effective adaptation practices, develop capacity-building approaches, disseminate lessons learned on sustainable environmental management and mainstream community-based adaptation measures into regional and national development plans.

Community-based adaptation initiatives are currently being implemented in a diverse range of communities and natural environments, focusing on issues such as the management of ecosystems, watersheds and coastal resources; improved sustainable land management practices; development of local laws and influencing national policy; and promoting technology transfer and diffusion at the local level. CBA initiatives are under implementation in over 30 countries. Information on initiatives in **Bangladesh, Bolivia, Guatemala, Jamaica, Kazakhstan, Morocco, Namibia, Niger, Samoa** and **Viet Nam** can be accessed at www.undp-adaptation.org/project/cba.

Knowledge codification, dissemination and management

Planning and investment decisions at national and sectoral levels and across institutions require climate change information and knowledge about climate scenarios, risks, vulnerabilities and impacts. Supporting national, subnational and community-level institutions, decision makers and stakeholders to develop and codify knowledge on climate change including climate modeling, risk assessments and vulnerability mapping is key to facilitating ongoing and flexible adaptation. Access to such information enables countries to undertake prospective exercises to prepare for and better manage uncertainties in climate change and its impacts.

It is equally important to continually share and disseminate adaptation strategies, best practices and lessons learned from ongoing adaptation efforts to scale, replicate and inform future policies and plans. UNDP-GEF communication strategies to promote knowledge dissemination include the development of information collateral, outreach through workshops, and the creation of forums for dialogue. Global knowledge on adaptation across projects is collected and shared through the Adaptation Learning Mechanism (ALM), which fills the knowledge gap by providing a global knowledge-sharing platform focused on climate change adaptation to accelerate learning through experience. UNDP projects also support advocacy/outreach efforts to facilitate replication of successful approaches.

In the **Lao People's Democratic Republic**, a proposed initiative will strengthen the knowledge base on climate change impacts on agricultural production and food security. The project will support the Ministry of Agriculture and Fisheries to compile existing climate hazard and vulnerability information and assess the scenarios for agricultural production on the basis of global and regional climate change models. A comprehensive national information system for flooding and drought-related hazards and vulnerabilities will be developed and climate risk projections and hazard and vulnerability information integrated. The system will support sectoral planning for agricultural production, land-use planning in flood- and drought-prone areas and enhanced food security.

In **Hungary**, UNDP supported the development and implementation of an 'influencing strategy' to engage stakeholders in supporting an integrated vulnerability assessment and planned adaptation measures for the Lake Balaton system. The strategy consisted of identifying key stakeholders, decisions to be influenced and tools used to communicate project information. The overall project information, methods, results and lessons learned have been synthesized and communicated in a Hungarian language journal with a primary audience of municipal governments. Knowledge related to the watershed model was transferred to the Water Authorities and Water Research Institute. Regional dissemination and replication was promoted through cooperation agreements between municipalities and NGOs. A Climate Change Adaptation experience template was submitted to ALM for global outreach.

MANAGING KNOWLEDGE FOR CHANGE

The Adaptation Learning Mechanism (ALM) is a global knowledge sharing platform implemented by UNDP in partnership with UN agencies and the World Bank with funding from GEF. It provides access to codified knowledge and information on experiences and lessons learned from projects at national and community levels in order to promote the integration of climate change into development and accelerate learning through a global network and community of practice. Through the ALM knowledge management platform, individuals and groups can share learning on good practices, lessons learned, innovative approaches and knowledge needs.

ALM hosts over 1,000 members and has had site visitors from 165 countries. Its database contains 380 projects and 110 case studies of climate initiatives. ALM resources include guidance, methods and training materials. By linking development and environment practitioners around the world and disseminating their shared experiences, ALM can shorten the learning cycle, allowing successes in one country to be more easily replicated in another.

ALM can be accessed at www.adaptationlearning.net

DELIVERING LOCALIZED IMPACTS

EMERGING RESULTS

During the first years of implementation, UNDP projects develop methodologies, raise awareness, undertake vulnerability studies and assessments and begin work on adaptation pilot activities.

This section highlights emerging results from some of the initiatives that make up the UNDP-GEF climate change adaptation portfolio. Many of these projects have been under implementation for only one to two years but they have already established a foundation of scientific data and awareness building that will enable project activities to progress. During the first years of implementation, UNDP projects develop methodologies, raise awareness, undertake vulnerability studies and assessments and begin work on adaptation pilot activities. This section describes progress toward achieving desired outcomes and highlights lessons learned to date.

Integrating climate change information and risks into planning activities within key sectors

Measures that focus on integrating information and risks into planning and activities of key sectors attempt to do so by developing capacity at institutional and community levels for the application of climate information in adaptation planning. Activities are normally designed to promote awareness building and support training workshops on interpretation and use of climate change data in planning activities. Trained experts are expected to transfer their knowledge within their organizations.

- In **Uruguay,** an initiative titled **'Implementing Pilot Climate Change Adaptation Measures in Coastal Areas'** is supporting capacity development among planners in the coastal municipality of Canalones to identify and develop coastal land use plans based on climate change risk management criteria. Adaptation measures are subsequently identified and implemented in vulnerable habitats. Another municipality, Colonia, is also working toward incorporating climate change information, such as sea level rise, into physical planning mechanisms. Based on the progress made, the municipality of Canalones is internalizing findings to date in a new national initiative aimed at developing a low-emission climate-resilient development strategy. If successful, this strategy is expected to catalyse private finance for other climate change risk management priorities.

- In **Hungary, 'Lake Balaton Integrated Vulnerability Assessment, Early Warning, and Adaptation Strategies'**[7] led to the mainstreaming of vulnerability assessment findings and adaptation measures in planning instruments such as the Balaton Regional Development Strategy. A customized soil and water assessment tool has been institutionalized within the Water Management Authority as a decision-support instrument. At local and subnational levels, the project made progress in including adaptation indicators and measures in 29 environmental programmes and waste management plans.

Revising or formulating policy to incorporate climate risks and opportunities

By revising or formulating policy to incorporate climate risks and opportunities, UNDP projects strengthen a country's systemic capacity for adaptation. UNDP projects have resulted in changes to the institutional, legislative, policy and regulatory frameworks at the national and local level to incorporate climate change risks considerations into policies of key sectors.

- In **Bhutan,** an initiative titled **'Reducing Climate Change-Induced Risks and Vulnerabilities from Glacial Lake Outburst Floods'** is assisting the national government to integrate climate change-induced Glacial Lake Outburst Floods (GLOF) hazards into the existing disaster risk management framework. The Disaster Risk Management Bill has been drafted to take into consideration climate change risks, in addition to other disaster risks and hazards. The bill has gone through a comprehensive review and stakeholder analysis, has been translated into national languages and is currently awaiting approval by the Parliament. Furthermore, based on a hazard zoning exercise, a government

7. This project was closed in early 2010.

circular for GLOF-resilient land use planning has been disseminated to local authorities in Punakha, Wangdi and Bumthang. The circular prevents new construction in potentially hazardous sites and a number of planned construction efforts have been put on hold as a result.

- In **Hungary,** activities under the **'Lake Balaton Vulnerability Assessments, Early Warning and Adaptation Strategies'** project influenced a number of policy and development frameworks and paved the way for science-based decisions to manage the lake water resources and its larger watershed. The initiative contributed to the long-term Regional Development Plan by providing input on activities concerning sewage treatment and drainage systems and no-regret options for the rehabilitation of lake shore areas. At the national level, inputs were provided to the National Climate Change Strategy and its two year action plan concerning retention and treatment of rainwater and introduction of sustainable water management practices and the Third National Environmental Program, resulting in a dedicated section on the Lake Balaton region.
- In **Ecuador, 'Adaptation to Climate Change through Effective Water Governance'** has led to the introduction of strategic planning tools that incorporate climate change adaptation issues into several strategies and policies, such as the National Plan of Development, the National Water Plan and the National Environmental Policy. The initiative has helped place climate change on the country's political agenda.
- In **Uruguay, 'Implementing Pilot Climate Change Adaptation Measures in Coastal Areas'** has contributed to mainstreaming climate change into the national development strategy with technical contributions to the creation of a National System to Respond to Climate Change, established in May 2009. Coastal regulations were also revised for Canalones municipality, requiring the development of a specific framework to incorporate climate change risks in decision-making processes related to local coastal planning for development and authorizations for resource use.

Developing individual and institutional capacity

By developing capacity at institutional and individual levels in each thematic area, projects aim to provide stakeholders with the capacity to plan and respond to future changes in climate-related scenarios. Capacity development occurs through vulnerability assessments, awareness and advocacy programmes and training, as well as through the piloting and demonstration of new adaptation ideas, technologies and approaches.

- In **Namibia, 'Adapting to Climate Change through the Improvement of Traditional Crops and Livestock Farming Systems'** is addressing the problem of land degradation by overcoming barriers related to capacity, knowledge and technology dissemination. Five national ministries are working together to overcome these barriers with a Country Pilot Partnership for Integrated Sustainable Land Management, which includes several interventions to address the underlying causes of land degradation. Among other things, the initiative is enhancing the capacity of individuals at the community and regional level to address climate change adaptation and drought preparedness through the development of information materials, local radio talks, community visits and training of service organizations. The capacity of farmers to adapt to climate change has also been strengthened through increased knowledge of modern farming techniques and use of early warning systems.
- In **Bhutan,** institutional arrangements for GLOF preparedness and response are being improved through targeted advocacy and awareness actions. Several rounds of awareness and advocacy programmes on GLOF risks and the existing early warning system and procedure have been conducted in 21 vulnerable communities along the Pho-chu river basin. The project has established District Disaster Management Committees, District Disaster Management Awareness and Planning Teams and Gewog (village cluster) Disaster Management Committees in all three districts covered by the project area. The project has trained these committees in community-based disaster management and GLOF risk management and a bottom-up disaster management planning process at the district, subdistrict and village level has begun.
- In **Hungary,** capacities for climate change adaption have been strengthened in approximately seven institutions and for about 100 individuals (including farmers, small entrepreneurs, members of civil society organizations, employees of public and private companies and researchers) through on-the-job training, workshops and seminars. Measures have resulted in increased understanding of the Lake Balaton ecological and socio-economic systems' vulnerability and resilience and improved capacity in development of watershed management plans by undertaking scenario modeling.
- In **Albania, 'Identification and Implementation of Adaptation Response Measures in the Drini-Mati River Deltas'** has held capacity building workshops for more than 200 individuals from communes, local government, local businesses, NGOs and the education system. The workshops focused on climate change risk assessment and impacts on local ecosystems and economic sectors. The participants are now aware of climate change issues and have discussed ways to minimize damages caused by extreme events, such as the severe flooding that hit the area in December 2009 and January 2010 due to the combined effect of storm surge and sea tide.

- In **Tanzania, 'Mainstreaming Climate Change and Adaptation into Integrated Water Resource Management in the Pangani River Basin'** has trained about 300 individuals from the Pangani Basin Water Office, six districts, three NGOs and key water users from informal groups in Integrated Flow Management to promote an increased understanding of the environmental, economic and social implications of different river flow scenarios under expected climate conditions. Communities have been trained in the Integrated Water Resources Management concept and by empowering local water user associations. The project also supports the Tanzanian policy of decentralization of natural resources management.
- In **Cambodia, 'Promoting Climate Resilient Water Resources Management and Agricultural Practices in Rural Cambodia'** aims to improve the adaptive capacity of key national and subnational institutions and ensure that they efficiently design, monitor and manage climate resilient water resources in their rural development programmes. The project is working toward developing the capacity of district agricultural extension teams in the management of climate risks with respect to water management and is training Commune Councils and Planning and Budgeting Committees in two target districts in climate risk management techniques. In addition, key stakeholders at the community level, including religious leaders and indigenous elders, will be trained to support community-based adaptation planning processes.
- In **Burkina Faso, 'Strengthening Adaptation Capacities and Reducing the Vulnerability of the Agriculture, Forestry and Livestock Sectors'** has provided training to more than 50 producers, women's groups and NGOs in Oualadan province in natural resource management, the application of improved seeds, and pasture management. In Mouhoun province, more than 100 individuals, including women and local leaders, are participating in climate change awareness training, including the piloting of adapted seeds and sheep farming.

Piloting technologies and community-based measures

UNDP supports its national partners to promote the design and implementation of innovative technologies and community adaptation measures. By piloting adaptive technologies, UNDP projects directly support action at the local level to facilitate adaptation to the impacts of climate change. Innovative technologies and practices include resilient agro-pastoral practices, water management and rehabilitation of ecosystems. By showcasing good practices, NGOs and local populations are more likely to implement similar activities.

- Through **'Reducing Climate Change-Induced Risks and Vulnerabilities from Glacial Lake Outburst Floods',** a multidisciplinary team in Bhutan developed and approved an engineering and safety plan for climate change risk reduction measures on Thorthormi Glacier Lake. The lake is ranked as one of the most dangerous in **Bhutan,** with a size of 3.42 square kilometres, thrice the dimension of Lake Lugge, which burst in 1994. The massive ice surrounding Thorthormi is melting rapidly at a rate of 30-35 metres a year, filling up the lake quickly. Following the approval of the plan and the completion of an Environmental Impact Assessment, a 300 person workforce, led by a glaciologist, has commenced work on lowering the water level. As of October 2010, after three months of excavation work, the water level of the artificial lake was lowered by 1.5 metres. The target is to reduce the Thorthormi's water level by 5 metres within three years, to avoid its combination with Lake Rapstreng and prevent glacial lake outburst flood.
- In **Namibia,** an assessment and identification of existing coping strategies with regards to climate change variability has been conducted in the project area to pilot a range of effective coping mechanisms that assist subsistence farmers in Namibia's north-central regions to better manage and cope with climate change, including variability such as droughts and flood.
- In **Hungary,** the implementation of pilot activities such as removal of polluted sediment from certain lake areas, improvements to rainwater-drainage system, and establishment of coastal promenades and afforestation, contributed to adaptation to climate change through the arrangements of the settlements' surroundings, rehabilitation of green spaces and the improvement of waste management. Planting trees and establishing public parks decreased pollution and improved the quality of the environment in general.
- In **Niger, 'Implementing NAPA Priority Interventions to Build the Resilience and Adaptive Capacity of the Agriculture Sector'** has supported local communities to access drought-resilient crop seeds. With support from the National Institute for Agronomical Research, the initiative provided supply seeds and seedlings to about 140 farmers, including 35 women. Through five microprojects reaching 125,874 direct beneficiaries, the initiative is supporting the recovery of 305 hectares of degraded land, construction of 19,000 linear metres of erosion-control barriers and the reforestation of 34,415 plants.

Knowledge codification, dissemination and management

The UNDP-GEF initiatives under implementation promote knowledge codification by enabling development of information on variables such as climate scenarios, vulnerabilities and risks needed to plan for and manage climate change uncertainty. Knowledge dissemination and management is facilitated through information products, local forums for exchanging lessons, seminars and other communication channels. Lessons learned are often captured through Web-enabled resources and knowledge sharing facilities like the ALM and then disseminated though national, regional and international networks.

- In **Hungary,** the Lake Balaton initiative developed several advanced modeling tools and instruments to assess the vulnerability of Lake Balaton to climate change and the impact of future adaptation scenarios. The National Water Management Directorate plans to apply these tools for integrated water management planning. In addition, a Web-based information tool, 'Balaton Trend', provides information on ecological and socio-economic trends in the lake system. It is currently maintained and operated by the International Institute for Sustainable Development and is being replicated in other countries. Scenarios for climate and land cover change also provide the basis for forward-looking planning for the lake and watershed region.
- In **Uruguay,** relevant information on climate change scenarios (temperatures, precipitations, pressure, winds) for the whole coastal area has been updated and developed to enable sound appreciation and understanding of the potential costs and benefits associated with climate change.

LESSONS LEARNED

UNDP routinely reviews lessons emerging from its adaptation portfolio with a view to informing project design and improving the management of ongoing initiatives. The transmission of lessons learned across projects helps identify best practices, bring successes to scale and replicate and evolve adaptation practices under a changing climate. ALM plays a significant role in accelerating this process by promoting a global platform for knowledge capture and sharing of lessons.

The experiences of the UNDP-GEF adaptation portfolio highlight several important lessons.

Adaptation initiatives must be integrated and aligned with existing development plans, programmes and frameworks.

There are multiple avenues for integration of operational programmes including ministries, community projects and regional offices. In **Namibia, 'Adapting to Climate Change through the Improvement of Traditional Crops and Livestock Farming Systems'** has worked to integrate its objectives into the operational and work programmes of the Ministry of Agriculture and collaborated with other community projects and regional offices, as well as GEF projects that focus on climate change-related issues.

It is also imperative to coordinate efforts and cooperate with other climate change initiatives to increase benefits and feedback for ongoing activities. The coordination of efforts across similar initiatives also helps increase cost effectiveness. In **Mozambique, 'Coping with Drought and Climate Change'** worked to identify complementarities and establish linkages, partnership agreements with other programmes, and action plans at regional and subregional levels.

Bottom-up project design and participatory processes are crucial for strong ownership and adaptation responses acceptable in the local and cultural context.

Stakeholder participation in climate risk identification/analysis and identification of response strategies is critical to enhanced ownership of the adaptation measures and acceptance of the project. The participatory community climate risk analysis undertaken in **Zimbabwe** made it possible to characterise five types of drought (i.e. early season, mid-season, terminal, seasonal and extreme) and helped communities to appreciate the spatial difference in climate risks even for areas that geographically appear to be close.

In **Cambodia**, local stakeholders were largely unaware of climate change impacts and therefore had little incentive to explore or develop appropriate solutions. To overcome this barrier and promote stakeholder ownership, **'Promoting Climate Resilient Water Management and Agricultural Practices in Rural Cambodia'** is working with a local NGO with expertise in community education.

To maximize impact, climate change adaptation programmes should focus on strengthening and utilizing local institutional and human capacity.

In **Zimbabwe, 'Coping with Drought and Climate Change'** demonstrated that lack of capacity and leadership in local government results in high expectations from the project to address the skill, knowledge, awareness, coordination and general capacity gaps that must be filled to sustainably address climate variability challenges. Strong local institutions are a critical success factor for adaptation. The Chiredzi Research Station in Zimbabwe is strategically placed for the development of new technologies relevant to the biophysical conditions of the district and beyond. However, the institution needs resources and human capacity to carry out this role.

Strong local institutions are a critical success factor for adaptation.

Developing local capacity is also important as national skills shortages may impact project schedules with more time spent seeking experts for specialized tasks. In **Albania, 'Identification and Implementation of Adaptation Response Measures in the Drini-Mati River Deltas'** encountered unexpected delays in the recruitment of project staff due to the very limited in-country experience for the requisite specialized domain. Moreover, relying on and utilizing existing local capacities during implementation when possible fosters sustainability and replicability of project outcomes. In **Hungary, 'Lake Balaton Integrated Vulnerability Assessment, Early Warning, and Adaptation Strategies'** limited the scope of international partnerships to initial know-how and methodology.

Indigenous knowledge should be valued and included.

Indigenous peoples have a variety of successful adaptive and mitigation strategies, many of which are based on traditional ecological knowledge. Indigenous strategies include application and modification of traditional knowledge, shifting resource bases, altering land use and settlement patterns, blending of traditional knowledge and modern technologies, applying fire management practices, changing hunting and gathering periods and practicing crop diversification.

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Traditional knowledge systems for seasonal climate forecasting can play a role in adaptation. Plant- and animal-based indicators for seasonal rainfall prediction were documented, screened and validated for the project area in **Zimbabwe**. Where the indicator had scientific merit, farmers could use the indigenous knowledge to understand and compliment contemporary science-based predictions. The task of integrating the two in an operational environment is not easy. In the Zimbabwe project, remotely sensed Normalized Difference Vegetation Index data was used to extract the plant characteristics used by farmers in the project area to forecast the season and an indigenous knowledge system (IKS)-based forecast system was developed and validated. The skill of the IKS-based forecast system matches the contemporary science-based forecast.

Coordination among multiple stakeholders, including government and civil society, is essential.

Careful coordination during the implementation stage **(Albania, 'Identification and Implementation of Adaptation Response Measures in the Drini-Mati River Deltas')** coupled with ongoing cooperation and consistent support **(Bhutan, 'Reducing Climate Change-Induced Risks and Vulnerabilities from Glacial Lake Outburst')** have proven vital to ensuring inclusion and engagement across stakeholder groups, including community groups and various government bodies. In **Hungary**, the success of pilot projects under the **'Lake Balaton Integrated Vulnerability Assessment, Early Warning, and Adaptation Strategies'** initiative was enhanced by the cooperation agreements signed by local NGOs and municipalities. These agreements play an important role in ensuring the long-term sustainability and institutionalization of project results. The **'Responding to Coastline Change in its Human Dimensions in West Africa through Integrated Coastal Area Management'** initiative in the West African countries of **Cape Verde, the Gambia, Guinea Bissau, Mauritania** and **Senegal** identified a clear definition of roles and responsibilities at national and regional levels at an early stage as key to ensuring effective cooperation and mitigating uncertainty.

External factors that may influence project outcomes should be taken into account when designing project timelines so that project staff can plan and operate accordingly.

In **Mozambique**, for example, national elections in 2009 led to difficulties in implementing project activities. In **Bhutan**, persistent rains and floods frequently hamper progress in the artificial lowering of Thorthormi Glacier Lake. The mitigation work takes place at high altitudes and in difficult terrain, which further complicates project implementation. These constraints limit the time window for field work to only four months per year. The success of the initiative requires advanced planning and ensuring enough work time each year to keep the labour force motivated and engaged.

Lessons from past experiences in the project area should be incorporated into project design and feasibility determinations.

In **Zimbabwe**, community input and lessons from past interventions played a key role in the determination that irrigation development would not be a target for intervention. Making existing dominant livelihood strategies—such as reliance on rainfed crops and livestock production—more resilient to climate variations was considered more socially acceptable, cost-effective and technically feasible.

CATALYSING ADAPTATION FINANCING

PORTFOLIO OVERVIEW

UNDP helps countries to access, sequence and combine a number of funds to support the design and implementation of innovative adaptation measures. These include the GEF-managed UNFCCC funds (LDCF, SCCF), the GEF Trust Fund's SPA and national and bilateral funds to address country priorities on adaptation. UNDP-supported initiatives have also recently been approved for funding by the newly operationalized Adaptation Fund established under the Kyoto Protocol.

UNDP supports its national partners to access a range of financing mechanisms to leverage maximum impact. Multiple sources of financing include contributions from national governments, such as the Governments of Denmark, Japan and Spain; governments in developing countries; international development banks; and UNDP core funds. Strategic partnerships with multilateral organizations such as the Asian Development Bank, FAO, the Red Cross Society, the South Pacific Regional Environment Programme, UNICEF, UNEP, UNV, the World Bank Group and WHO further extend the reach of UNDP's support to its national partners. Figure 1 shows a breakdown of the key sources financing for the UNDP-GEF adaptation portfolio, including projects under implementation and in the 'hard pipeline'. Projects in the hard pipeline have been approved in concept by GEF. 'Soft pipeline' projects are those that have been proposed but have not yet been approved by GEF.

As of November 2010, UNDP had supported 75 countries to access resources for climate change adaptation. Of this, the UNDP-GEF portfolio funded through the LDCF, SCCF and SPA—including projects under implementation and in both the hard and soft pipelines—represents a total value of $773 million, which includes $166 million in GEF funding and over $607 million in co-financing.[8] Figure 2 shows a breakdown of the UNDP-GEF portfolio in terms of grant funding for projects under implementation and in the hard pipeline.

8. In addition to its partnership with the GEF, UNDP supports climate change adaptation at the global, national and local levels with initiatives such as the 'Africa Adaption Programme', a $92.1 million programme funded by the Government of Japan that supports projects to help create more informed climate adaptation decision-making and more effective implementation of those decisions in 20 African countries. The Government of Denmark's 'Climate Change and Development – Adapting by Reducing Vulnerability' initiative (in partnership with UNEP) is another Africa-focused programme targeting 12 African countries to remove barriers and create opportunities for integrating climate change adaptation into national development planning and decision-making frameworks. The Government of Spain-funded MDG Achievement Fund provides $89 million over four years (2007-2010) to support environment, climate change adaptation and mitigation work toward reaching the MDGs. UNDP directly supports 13 countries on specific adaptation issues through this initiative.

FIGURE 1: KEY SOURCES OF FINANCING FOR UNDP-GEF ADAPTATION PORTFOLIO

Projects under Implementation and in Hard Pipeline ($ million)

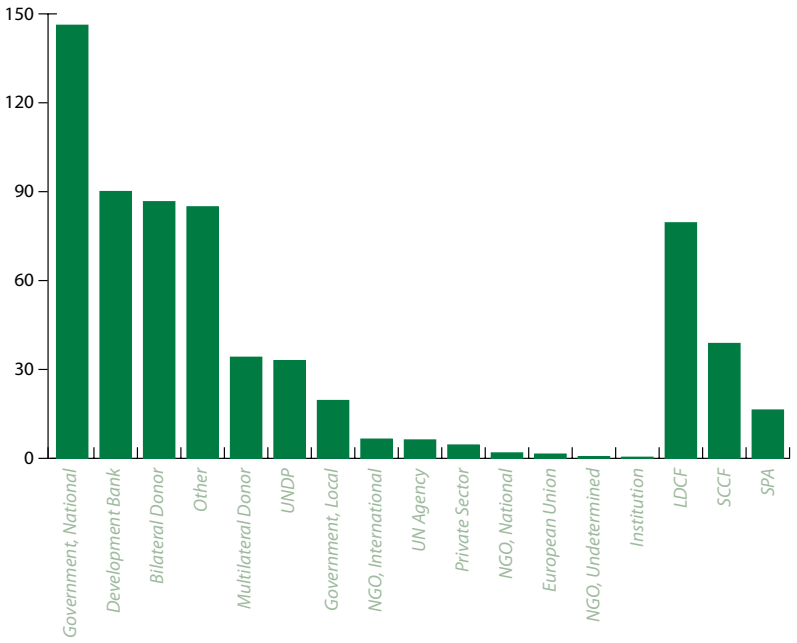


FIGURE 2: UNDP-GEF ADAPTATION PORTFOLIO BY GRANT

(LDCF/SCCF/SPA)
Projects under Implementation and in Hard Pipeline ($ million)

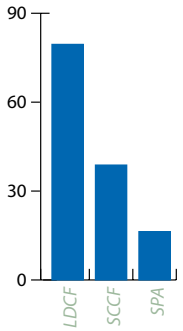
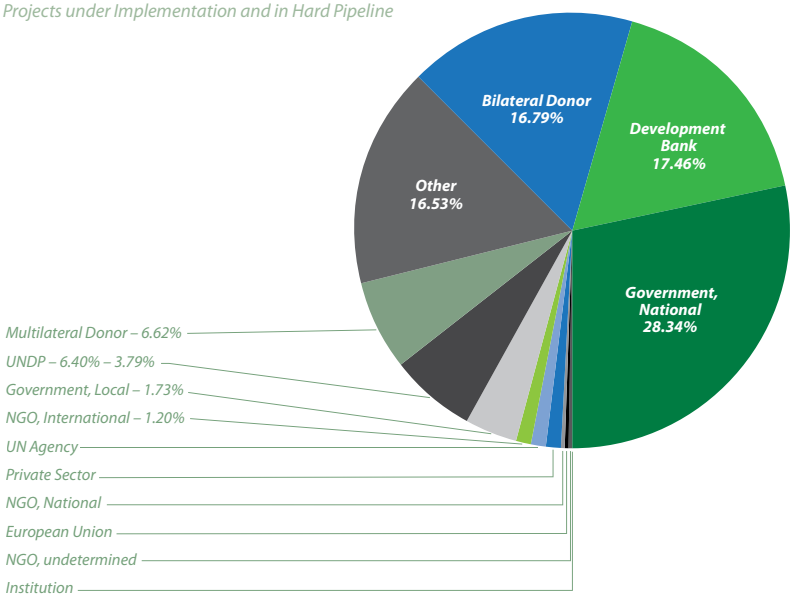


FIGURE 3: DISTRIBUTION OF CO-FINANCING FOR THE UNDP-GEF ADAPTATION PORTFOLIO

Projects under Implementation and in Hard Pipeline



As of November 2010, total co-financing for the UNDP-GEF climate change adaptation portfolio for projects under implementation and in the hard pipeline amounted to $515 million. The distribution of this co-financing is illustrated in Figure 3.

FUNDING BY REGION AND BY SECTOR

The current UNDP-GEF portfolio of climate change adaptation projects includes 32 projects under implementation in 52 countries. The distribution of the projects by region, including projects in the 'soft pipeline', is presented in Figure 4 and the distribution of funding by region is shown in Figure 5. Close to half of UNDP-GEF climate change adaptation projects focus on Africa, with nearly a third of LDCF/SCCF/SPA resources targeting West and Central Africa, where the impacts of climate change are particularly severe.

The projects in the UNDP-GEF climate change adaptation portfolio involve focused interventions in specific sectors as well as cross-sectoral initiatives identified as priorities for mainstreaming adaptation concerns into the countries' development plans and frameworks. The distribution of funding to support various thematic areas of focus for adaptation is presented in Figure 6.

IMPROVING EFFICIENCY

Over the past four years, UNDP has implemented a series of measures to improve the speed of delivery of resources to countries to fast-track implementation. The results are starting to show with country-led project formulation on average less than 12 months and expedited internal administrative processes in place to support fast start operationalization of country-owned initiatives.

FIGURE 4: DISTRIBUTION OF UNDP-GEF ADAPTATION PROJECTS BY REGION

based on number of projects per region

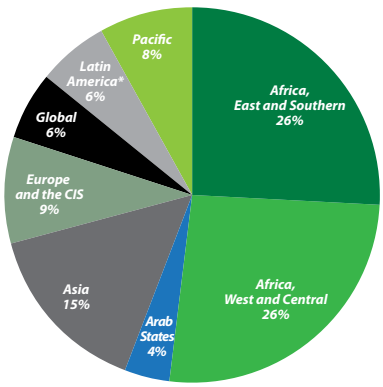


FIGURE 5: DISTRIBUTION OF UNDP-GEF ADAPTATION GRANT FUNDING BY REGION

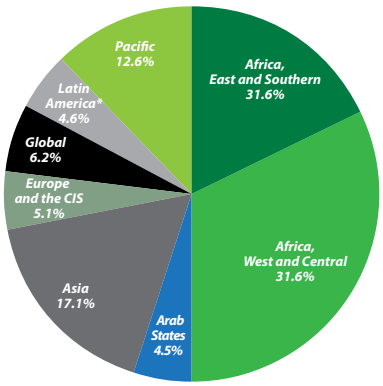
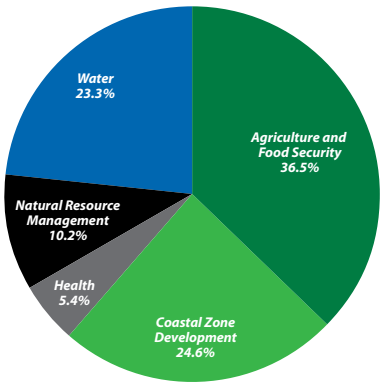


FIGURE 6: DISTRIBUTION OF UNDP-GEF ADAPTATION GRANT FUNDING BY THEMATIC AREA OF FOCUS



**and the Caribbean*

MOVING FORWARD:

TOWARD LOW-EMISSION CLIMATE-RESILIENT DEVELOPMENT

Climate change management efforts must be comprehensive in nature, leveraging synergies between adaptation and mitigation, and understanding inherent trade-offs.

To date, efforts to tackle climate change have focused on isolated, distinct, and often competing goals and actions on mitigation and adaptation. While incremental reductions in emissions and vulnerabilities are important steps, long-term climate change management requires a shift from a sectoral perspective to a holistic approach that integrates climate change mitigation and adaptation into sustainable development goals and planning processes.

Climate change management efforts must be comprehensive in nature, leveraging synergies between adaptation and mitigation, and understanding inherent trade-offs. Such an integrated approach involves multiple stakeholders and recognizes that climate change responses are closely intertwined with development choices and actions across multiple sectors. It also enables countries to mobilize and apply diverse financing and policy options required for low-emission climate-resilient development.

FINANCING LOW-EMISSION CLIMATE-RESILIENT DEVELOPMENT (LECRD)

The financial resources involved in shifting to a low-emission climate-resilient economy are significant but attainable. Climate change financing for mitigation and adaptation activities will come from multiple sources including public and private, bilateral and multilateral, and alternative sources of finance.

The key challenge for financing the transition is to redirect existing and planned capital flows from traditional high-carbon to low-emission and climate-resilient investments that are aligned with country priorities for poverty reduction and economic growth. It is also crucial to develop the capacity of low- income countries to create conditions that reduce regulatory uncertainty and investment risks and increase the return of climate projects for investors and developers to attract new sources of finance.

Over the past few years, the international community has developed a vast array of public policies, public finance mechanisms and market-based instruments to shift investments from fossil fuels to more climate-friendly alternatives. Enabling equitable and fair access to these mechanisms is a key priority to ensure allocation of benefits across countries and socio-economic groups within regions.

UNDP is assisting governments to address these challenges and priorities through environmental finance services to:

- Formulate low-emission and climate-resilient development strategies (LECRDS) to identify priority adaptation and mitigation action and develop portfolios of bankable climate change projects
- Create an appropriate enabling environment—for example by strengthening public policies and financing mechanisms, institutions and national capacities—to reduce perceived investment risks
- Help project proponents access new sources of environmental finance to increase the internal rate of returns and commercial attractiveness of priority climate initiatives

DEVELOPING LECRD STRATEGIES

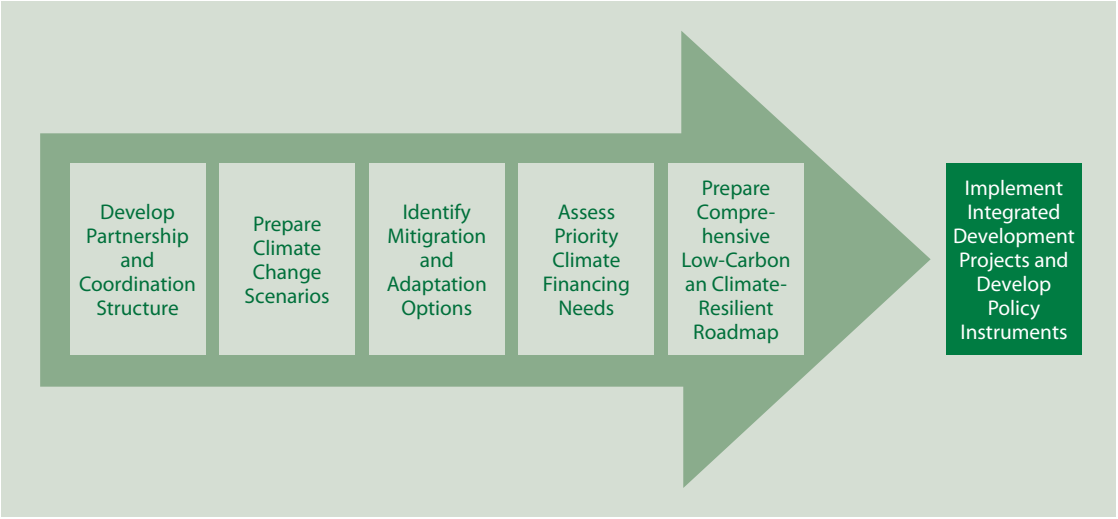
Low-emission and climate-resilient development strategies are part of UNDP's country-driven, multi-stakeholder climate finance frameworks proposed to assist developing countries to scale up efforts to address climate change in a way that strengthens and advances national development priorities. The framework consists of four interrelated mechanisms at the country level:

- Formulation of low-emission climate-resilient ecosystems and development strategies, to foster bottom-up national ownership, incorporate human development, safeguard the long-term provision of ecosystem services and take a long-term outlook.
- Financial and technical support platforms, to catalyse the requisite scale of climate finance and associated capacity.
- NAMA/NAP[9]-type instruments, to bring about balanced and fair access to international public finance.
- Coordinated implementation and Monitoring, Reporting and Verification systems, to bring about long-term, efficient results.

Formulation of low-emission climate-resilient development strategies involves a five step process in which UNDP assists countries to ensure that appropriate methodologies are being developed, provides technical assistance and promotes collaborative action among regions, as illustrated in Box 3.

9. Nationally Appropriate Mitigation Action/National Adaptation Plan.

BOX 3. FIVE KEY STEPS TO PREPARE A LOW-CARBON AND CLIMATE-RESILIENT STRATEGY



The first step in formulating a LECRD strategy is identification of key stakeholders, including government officials, investors, community leaders and technical experts, and to put in place the structures for a participatory planning approach that accounts for synergies and trade-offs.

The second step is the generation of climate profiles and prospective climate scenarios that will help assess current climate vulnerabilities and future risks. These scenarios will help countries develop trajectories resilient to the range of possible climate outcomes and help prepare for the uncertainties inherent in climate change.

Third, through a multi-stakeholder, consultative process, adaptation and mitigation options will be identified and prioritized in various sectors and thematic areas based on a country's development goals and vulnerabilities and opportunities identified for the range of climate scenarios.

Fourth, following an assessment of socio-economic impact and cost-benefit analysis of the identified options, financing and policy instruments will be identified to meet the financial flow requirements for implementation of the options.

Finally, a comprehensive low-emission and climate-resilient roadmap is developed to guide development of projects and policy instruments, and identification of financial flows to support the overall implementation of the strategic plan activities.

Because climate change management can only be realized and sustained through involvement and commitment at all decision-making levels—including regional, provincial, state and municipal—UNDP supports integrated climate change planning through engagement at the subnational and local levels with the development of Integrated Territorial Climate Plans (ITCPs). UNDP is currently providing support to the local governments of Montevideo, Canalones and San Jose in Uruguay to develop a LECRDS through preparation of ITCP. In addition, projects to support subnational governments to prepare ITCPs as part of the LECRDS process are starting in Colombia, Ethiopia, Nigeria, Peru, Senegal and Uganda. These projects are funded primarily by subnational and national governments in Europe and North America, and by the national and local governments that are implementing the projects.

THE FUTURE OF ADAPTATION

Going forward, UNDP will roll out a series of technical services to support national and subnational governments to attract and direct public and private investment toward catalysing and supporting integrated low-carbon climate-resilient economic growth and human development.

UNDP-GEF projects are anchored in GEF's focal area strategy for climate change and align with the Results-Based Management (RBM) Framework for the GEF-managed LDCF and SCCF funds. The framework provides objectives and outcomes in order to direct the strategies towards tangible global environmental benefits and to enable adequate reporting on the implementation of the strategies. The results architecture for the LDCF- and SCCF-funded initiatives is framed in Box 4.[10]

Adaptation programme outcomes with the objective of reducing vulnerability aim to increase knowledge and understanding of climate risks and opportunities through vulnerability and risk assessments; strengthen adaptive capacity to reduce risks through training and coverage under risk reduction systems; and enhance ownership and awareness of adaptation and risk reduction strategies at the local level by targeting populations.

By increasing adaptive capacity, projects aim to mainstream adaptation in broader development frameworks, policies and strategies at national and sectoral

10. *Implementation of Results-Based Management under the LDCF and the SCCF.* 2009. Global Environment Facility.

BOX 4. GEF LDCF AND SCCF RESULTS-BASED MANAGEMENT FRAMEWORK

Goal: Support developing countries to become climate resilient by integrating both immediate and longer-term adaptation measures in development policies, plans, programmes, projects and actions.

Impact: Reduced absolute economic losses at country level due to climate change, including variability.

Objective 1: Reduce vulnerability to the adverse impacts of climate change, including variability, at local, national, regional and global levels.

Objective 2: Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional and global levels.

Objective 3: Promote the transfer and adoption of adaptation technology.

levels, increase resilience in development sectors' services and strengthen physical infrastructure and natural resources, and diversify and enhance livelihoods and sources of income for vulnerable populations.

Finally, to promote the transfer and adoption of adaptation technology to increase resilience, projects aim to enhance policy and regulatory environments to enable technology transfer and demonstrate technologies in order to increase uptake and absorption.

Ecosystem-based solutions will also play an increasingly important role as part of UNDP's integrated adaptation investment strategy. This includes managing ecosystems to enhance their resilience to climate change by maintaining the structural integrity, functional diversity and ecological processes — such that they are able to continue to provide ecosystem services that will reduce the vulnerability of people to climate change. UNDP will ensure that adaptation objectives will be more systematically integrated into conservation plans and management actions. Successful climate change risk management will require a dramatic scaling up of ecosystem-based adaptation efforts at all levels, enabled by a coordinated mix of policy and financial instruments.

With this in view, UNDP has teamed up with UNEP and IUCN to establish the Ecosystems-Based Adaptation Flagship Programme. A key focus of the Programme will be on piloting ecosystem-based adaptation approaches, establishing the determinants of success, and establishing the costs and cost effectiveness of ecosystem-based adaptation approaches against other adaptation strategies. Ecosystem-based adaptation will need to be pursued as part of an integrated adaptation strategy, combining structural measures and behaviour-focused actions. The Flagship will assist countries to develop an appropriate mix of adaptation measures, by determining where ecosystem-based approaches should be adopted, and where other approaches may be more appropriate. The EBA Flagship Programme received an initiation grant from the Government of Germany, and the three partners will work with Germany and other countries to secure additional funding.

As a result of UNDP's assistance in alignment with the GEF results framework, several key outcomes are expected through contributions projects will make toward barrier removal to effect systemic as well as discrete changes.

These include:

Support to key sectoral governance entities to develop and strengthen policies, institutions and knowledge for integrated low-emission climate-resilient development based on:

- Development, dissemination and application of improved climate change risk information relevant to a broad range of end users
- Strengthened institutions across sectors and at different levels in conjunction with harmonized institutional mandates to coordinate and jointly formulate and implement climate change policy
- Establishment of policy development and review mechanisms to iteratively integrate climate change risk information and experience into relevant policies, strategies and plans
- Mainstreaming adaptation according to broader development frameworks and sectoral strategies
- Increased knowledge and understanding of climate variability and change-induced threat at the country level and in vulnerable areas
- Strengthened awareness and ownership of adaptation and climate risk reduction processes at the local level
- Enhancement of enabling environment and successful demonstration and deployment of relevant adaptation technologies to facilitate technology transfer

Use of the full range of public and private financing mechanisms by ministries of finance and national and subnational planning bodies to support low-carbon climate-resilient development that includes:

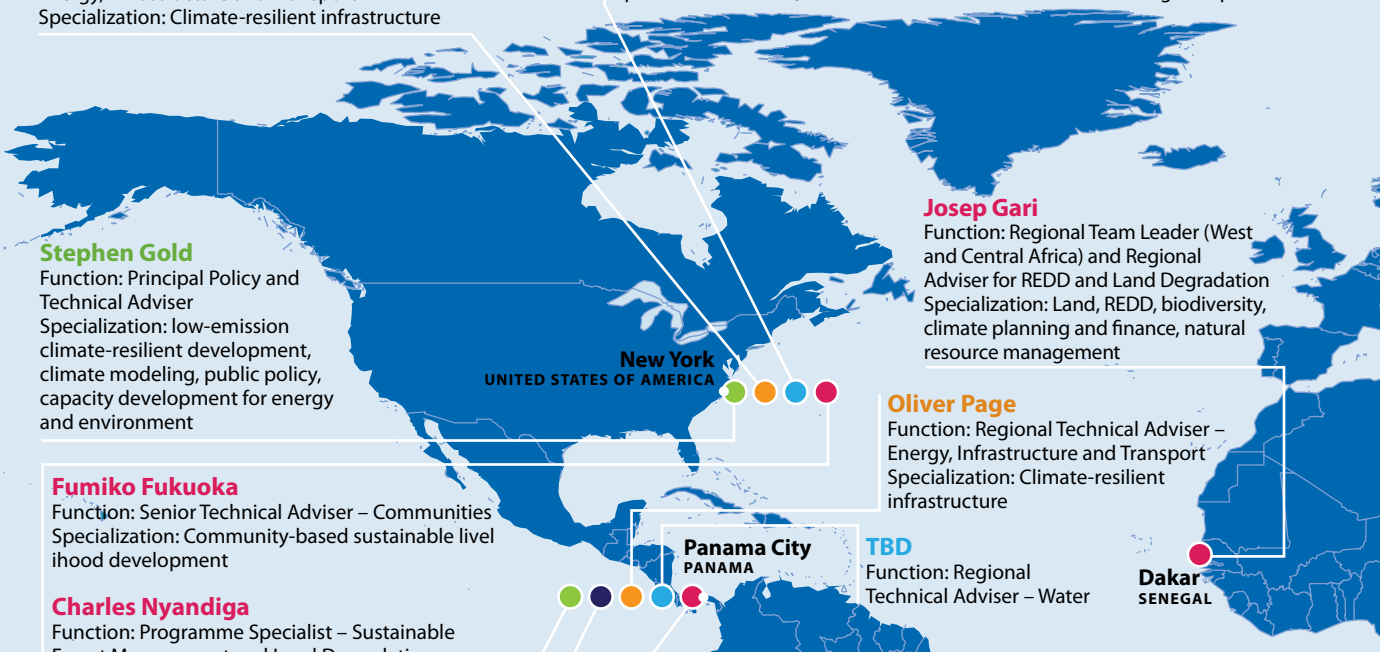
- Pro-poor public sector budgeting adjusted to incorporate climate change risk
- Design and application of climate change risk finance mechanisms

Implementation of incentive structures by ministries of finance and national and subnational planning bodies designed to effect behavioral adjustments by the public and private sectors. Examples include:

- Regulatory and fiscal incentive structures adjusted/expanded in relevant institutions, including key sectoral ministries and subnational governing bodies, to stimulate climate change risk reduction and/or carbon emissions reduction by the private sector and households
- Social safety nets enhanced to support vulnerable groups, especially women, impacted by climate change

AT A GLANCE

SUPPORTING CLIMATE CHANGE ADAPTATION WORLDWIDE



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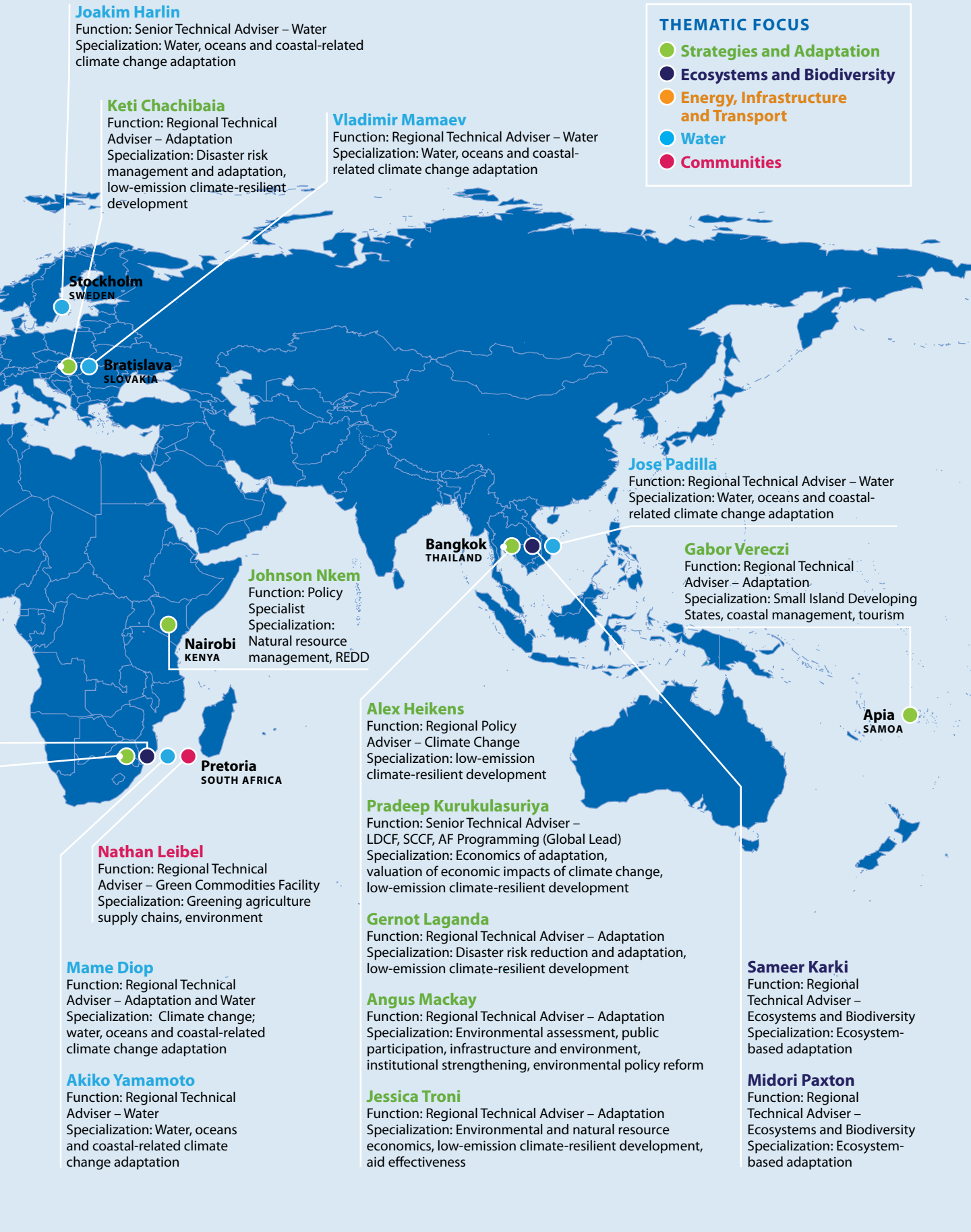
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ACRONYMS

AF	Adaptation Fund
ALM	Adaptation Learning Mechanism
APF	Adaptation Policy Framework
AsDB	Asian Development Bank
CBO	Community-based organization
FAO	Food and Agriculture Organization of the United Nations
GEF	Global Environment Facility
GHG	Greenhouse gas
GLOF	Glacier Lake Outburst Floods
IPCC	Intergovernmental Panel on Climate Change
ITCPs	Integrated Territorial Climate Plans
IUCN	International Union for Conservation of Nature
IWRM	Integrated Water Resource Management
LDCF	Least Developed Countries Fund
LECRD	Low-emission climate-resilient development
LECRDS	Low-emission climate- resilient development strategy
NAPA	National Adaptation Programme of Action
NGO	Non-governmental organization
SCCF	Special Climate Change Fund
SIDS	Small Island Developing States
SPA	Strategic Priority on Adaptation
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
UNV	United Nations Volunteers
WFP	World Food Programme
WHO	World Health Organization
WWF	World Wildlife Fund

Acknowledgements

This report was prepared by Srilata Kamilla (Harvard University/MIT), with important contributions from UNDP staff around the world, including in Country Offices, Regional Centres and UNDP headquarters (New York). Peer review of the draft report was provided by UNDP/GEF Regional Technical Advisers overseeing adaptation projects around the world. The report was edited by Emily Schabacker and coordinated by Caitlin E. Connelly. The report was prepared under the oversight of Pradeep Kurukulasuriya at the Energy and Environment Group, Bureau for Development Policy at UNDP (New York).

Layout: Suazion, Inc. (suazion.com)

Production: Wing Press Incorporated (wingpress.com)

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April 2011

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