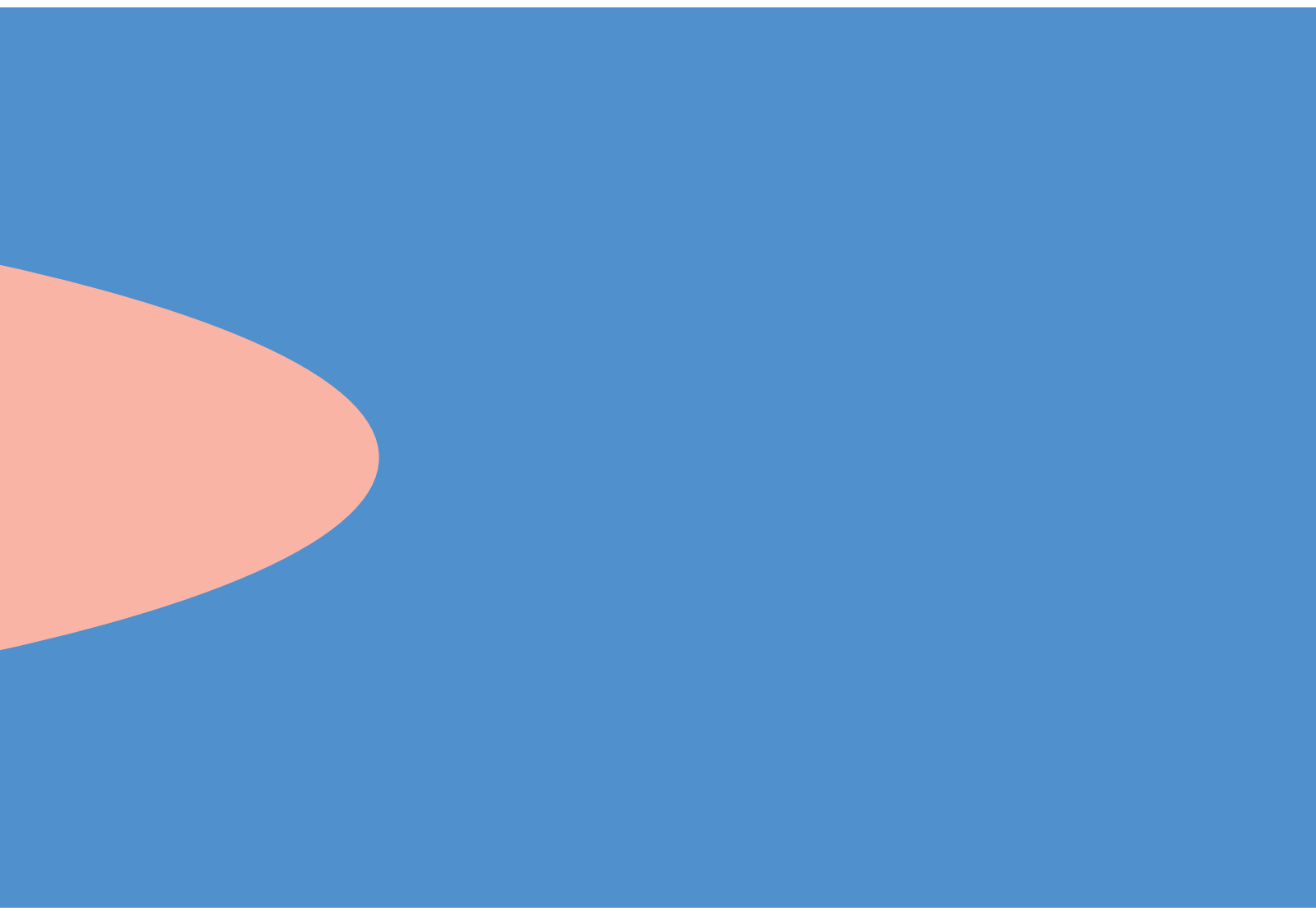
United Nations Framework Convention on Climate Change

THE NAIROBI WORK PROGRAMME
ON IMPACTS, VULNERABILITY AND ADAPTATION TO CLIMATE CHANGE

ACTION ON THE GROUND

A synthesis of activities in the areas of education, training and awareness-raising for adaptation

UNFCCC



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THE NAIROBI WORK PROGRAMME
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ACTION ON THE GROUND:

A SYNTHESIS OF ACTIVITIES IN THE AREAS OF EDUCATION, TRAINING AND AWARENESS-RAISING FOR ADAPTATION

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PART I

1. INTRODUCTION

1.1. BACKGROUND

The Nairobi work programme on impacts, vulnerability and adaptation to climate change was adopted by the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) at its eleventh session, in 2005. The objective of this five-year work programme under the Subsidiary Body for Scientific and Technological Advice (SBSTA) is to assist all Parties, in particular developing countries, including the least developed countries (LDCs) and small island developing States (SIDS), to improve their understanding and assessment of impacts, vulnerability and adaptation, and to make informed decisions on practical adaptation actions and measures to respond to climate change on a sound scientific, technical and socio-economic basis, taking into account current and future climate change and variability. The implementation of the work programme is structured around two broad themes: impacts and vulnerability; and adaptation planning, measures and actions.[1] Under these themes, nine action-oriented areas of work are identified: methods and tools; data and observations; climate modelling, scenarios and downscaling; climate-related risks and extreme events; socio-economic information; adaptation planning and practices; research; technologies for adaptation; and economic diversification.

The Nairobi work programme was designed as a mechanism for facilitating knowledge-sharing and learning and for catalysing action in relation to adaptation to climate change, by engaging a wide range of stakeholders. Since the launch of the Nairobi work programme, 192[2] organizations, including intergovernmental organizations, non-governmental organizations (NGOs) and private-sector entities, have formally engaged in the implementation of the Nairobi work programme as partners. Among them, 49 partner organizations have pledged to carry out 116 actions to address needs and gaps identified under the work programme by Parties and other stakeholders. The Nairobi work programme also mandates the organization of a series of knowledge-sharing events with the broad participation of all adaptation stakeholder groups, and the development and dissemination of a diverse range of knowledge products. In the course of its implementation, the Nairobi work programme has provided a platform for dialogue between Parties and organizations on scientific, technological and socio-economic aspects of adaptation to climate change.

Based on the successful implementation of the first phase of the work programme (2005–2008), Parties requested the UNFCCC secretariat, under the guidance of the Chair of the SBSTA, to continue its efforts in engaging organizations, including those undertaking education, training and awareness-raising activities, in the second phase of implementation (2008–2010). To date, about two-thirds of the 192 Nairobi work programme partner organizations are engaged in activities focusing on education, training and awareness-raising.[3]

1.2. EDUCATION, TRAINING AND AWARENESS-RAISING ACTIVITIES UNDER THE CONVENTION

In addition to forming part of the work under the Nairobi work programme, education, training and awareness-raising activities have featured prominently within the scope of various other UNFCCC initiatives, including Article 6 of the Convention and the least developed countries work programme.

Article 6 of the Convention is the main vehicle by means of which Parties foster action to develop and implement educational, training and public-awareness programmes on climate change. Under Article 6, Parties are to promote and facilitate at the national and, as appropriate, subregional and regional levels:

(a) the development and implementation of educational and public-awareness programmes on climate change and its effects; and
(b) the training of scientific, technical and managerial personnel.[4]

[1] Decision 2/CP.11, annex, paragraph 3.
[2] As at 20 September 2010.
[3] As at 20 September 2010. The actions of some partners are classified under more than one category.
[4] Article 6, paragraph (a)(i) and (iv), of the Convention.

In support of the implementation of Article 6, the secretariat has undertaken a number of activities, including: the development of the Climate Change Information Network, a web portal known as CC:iNet,[5] which serves as a clearing house for information sources; and the organization of thematic regional and subregional workshops to share lessons learned and best practices in the implementation of the amended New Delhi work programme on Article 6 of the Convention, including in relation to adaptation.[6] Furthermore, the secretariat hosts the UNFCCC Fellowship Programme,[7] which contributes to building the capacity of Parties not included in Annex I to the Convention, in particular SIDS and LDCs, to address climate change through the development of in-country professional expertise. Through this programme, fellows have the opportunity to undertake wide-ranging and policy-relevant research projects, including on adaptation, at the UNFCCC secretariat.

The least developed countries work programme, established by the COP at its seventh session, includes the preparation and implementation of national adaptation programmes of action (NAPAs). NAPAs provide a process for LDCs to identify priority activities that respond to their urgent and immediate needs with regard to adaptation to climate change. Furthermore, the Least Developed Countries Expert Group was established to provide technical advice, capacity-building and training to LDCs on the preparation and implementation strategy of NAPAs through the development and provision of guidelines and publications as well as through regional training workshops.[8]

1.3. EDUCATION, TRAINING AND AWARENESS-RAISING TO INCREASE UNDERSTANDING OF VULNERABILITY AND FOSTER ADAPTATION

In the course of the implementation of the Nairobi work programme, a large number of knowledge-sharing events (e.g. technical workshops and expert meetings) have been organized, and mandated knowledge products (e.g. technical papers) developed, under the programme's nine work areas, which have been listed above. While the focus of these activities varies, the following set of priority actions to further enhance work on adapting to climate change has emerged:

- Collaborating and sharing good practices between Parties and stakeholders and across regions, sectors and levels;
- Making relevant knowledge, tools and methods available for use by all stakeholders, including promoting dialogue between providers and users of information;
- Building capacity for the ongoing implementation of adaptation measures across all sectors and levels in an integrated manner, in particular the capacity of developing countries.[9]

Appropriate education, training and awareness-raising activities contribute to addressing these priority areas for action. In response to these requests for priority actions, a number of partner organizations have pledged actions to increase the knowledge base, enhance institutional and technical capacities, and promote awareness in order to increase understanding of vulnerability and foster adaptation. Most of the partner organizations in the Nairobi work programme have made action pledges including components relating to education, training and awareness-raising activities.

The contributions of partner organizations reported in this publication showcase a wide range of awareness-raising activities (e.g. policy dialogues, campaigns, and provision and dissemination of web-based resources) and capacity-building initiatives (e.g. training, workshops, and development and dissemination of assessment tools and methods). These actions have generated practical results on the ground and useful lessons relating to promoting understanding and assessment of impacts, vulnerability and adaptation to climate change, and improving the ability of Parties to make informed decisions on adaptation planning, measures and actions.

1.4 PURPOSE AND SCOPE

As part of the current implementation phase of the Nairobi work programme, the SBSTA requested the secretariat, in consultation with Parties, to develop user-friendly outputs and make these widely accessible.[10] In response to that mandate, this publication provides a synthesis of 37 actions in the areas of education, training and awareness-raising undertaken by Nairobi work programme partner organizations, and highlights the results obtained and lessons learned. It also intends to inform Parties of the knowledge and resources being provided by Nairobi work programme partners through the wide variety of adaptation actions in these areas.[11]

1.5 DEVELOPMENT OF THIS PUBLICATION

Under the guidance of the Chair of the SBSTA, the secretariat invited all partner organizations to make voluntary contributions to the publication by providing synthesis information on the key outcomes of, and lessons learned from, the implementation of relevant actions. A total of 25 partner organizations responded with 37 sets of contributions, providing details on various education, training and awareness-raising activities at the global, regional, national, subnational and community levels. These activities cover a diverse range of adaptation initiatives, including disaster risk reduction (DRR), policy support, research, and natural resources management.

This publication consists of two parts. PART I provides an introduction (CHAPTER 1), a synthesis of information on actions undertaken by Nairobi work programme partners (CHAPTER 2) and key messages and conclusions (CHAPTER 3). CHAPTER 2 is divided into two sections: the first section presents synthesis information on the actions taken to enhance the assessment and understanding of impacts and vulnerability to climate change, while the second section focuses on actions that aim to improve the ability of Parties to make informed decisions on adaptation planning, measures and actions. PART II of this publication provides detailed information on the underlying actions carried out and reported by partners (see the TABLE below for the complete list of actions reported).

As this publication is a synthesis of the voluntary contributions of Nairobi work programme partners, it demonstrates their commitment to achieving the objective of the Nairobi work programme. The secretariat, under the guidance of the Chair of the SBSTA and in consultation with Parties, has played a purely catalytic and facilitative role in developing this second synthesis publication under the Nairobi work programme.

[5] <http://unfccc.int/3514.php>.
[6] <http://unfccc.int/3143.php>.
[7] <http://unfccc.int/4429.php>.
[8] For further information on the work undertaken under the least developed countries work programme, see the Least Developed Countries Portal at <http://unfccc.int/ 4751.php>.
[9] For more detailed information on the gaps and needs identified through the mandated activities under the Nairobi work programme, see the reports on the workshops and expert meetings, which are available at <http://unfccc.int/4300>.
[10] FCCC/SBSTA/2008/6, paragraph 34.
[11] Complete information on the contributions made by partner organizations to this publication and the underlying action pledges are available on the Nairobi work programme website at <http://unfccc.int/5005>.

Overview of the education, training and awareness-raising actions reported by Nairobi work programme partner organizations

Section	Subsection	Reference in Part II	
A. Enhancing the assessment and understanding of impacts and vulnerability to climate change	A.1 Improving the provision, dissemination and application of data, methods and tools for impact and vulnerability assessments	II–1	
		II–2	
		II–3	
		II–4	
		II–5	
		II–6	
		II–7	
	A.2 Promoting the understanding and awareness of impacts and vulnerability to climate change	II–8	
		II–9	
		II–10	
		II–11	
		II–12	
		II–13	
		II–14	
B. Improving the ability to make informed decisions on adaptation planning, measures and actions	B.1 Promoting the development, dissemination and application of methods and tools	II–15	
		II–16	
		II–17	
		II–18	
		II–19	
		II–20	

Overview of the education, training and awareness-raising actions reported by Nairobi work programme partner organizations (continued)

Section	Subsection	Reference in Part II	
B. Improving the ability to make informed decisions on adaptation planning, measures and actions	B.2 Facilitating communication, dialogue and cooperation among different stakeholders	II–21	
		II–22	
		II–23	
		II–24	
		II–25	
		II–26	
		II–27	
		II–28	
	B.3 Enhancing adaptive capacity through technical and institutional capacity-building	II–29	
		II–30	
		II–31	
		II–32	
		II–33	
		II–34	
		II–35	
		II–36	
		II–37	

2. A SYNTHESIS OF INFORMATION ON ACTIONS UNDERTAKEN BY NAIROBI WORK PROGRAMME PARTNERS

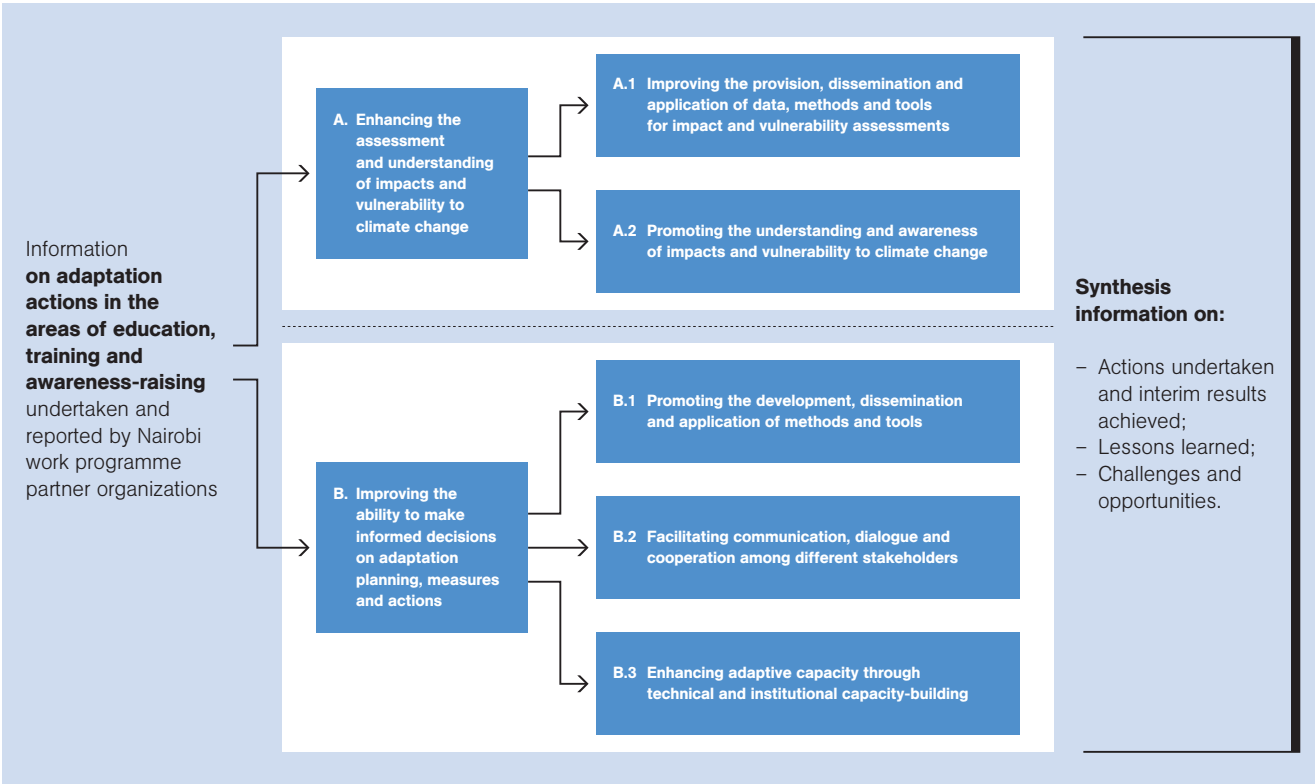
The contributions of Nairobi work programme partner organizations to this publication represent a wide range of awareness-raising activities (e.g. policy dialogues, campaigns, and provision and dissemination of web-based resources) and capacity-building initiatives (e.g. training, workshops, and development and dissemination of assessment tools and methods) aimed at promoting the understanding and assessment of impacts, vulnerability and adaptation to climate change, and improving the ability of Parties to make informed decisions on adaptation planning, measures and actions. This chapter attempts to provide a general overview of these adaptation actions, highlighting:

- Concrete actions undertaken and (interim) results achieved to date;
- Lessons learned from the implementation of actions;
- Challenges, further needs and opportunities.

A full list of the actions reported by partner organizations can be found in the TABLE on page 8, with full details on specific actions presented in PART II of this publication.

There are many possible ways of categorizing the wide range of activities reported. Reflecting the nature of the actions reported, this chapter synthesizes information according to the two thematic areas that define the scope of the work of the Nairobi work programme and the five subthemes which are considered as the focus of actions in delivering the outcomes under these two thematic areas. FIGURE II–1 provides a structural overview of the reported information synthesized in this chapter and compiled in PART II of this publication.

Figure II–1. **Overview of the information presented in this publication**



A. ENHANCING THE ASSESSMENT AND UNDERSTANDING OF IMPACTS AND VULNERABILITY TO CLIMATE CHANGE

This section presents a synthesis of information on actions reported by partner organizations that aim to:

- Improve the provision, dissemination and application of data and technical tools for impact and vulnerability assessments;
- Promote the understanding and awareness of climate change impacts and vulnerability at the international, regional, national, sectoral and local levels.

A.1 IMPROVING THE PROVISION, DISSEMINATION AND APPLICATION OF DATA, METHODS AND TOOLS FOR IMPACT AND VULNERABILITY ASSESSMENTS

The activities undertaken by partner organizations under this subtheme contribute to ongoing adaptation work by:

- Identifying gaps in and practical opportunities to improve access to, and the use of, climate data and observations;
- Improving capacity to collect, manage and use observational data;
- Developing and disseminating methods and tools for impact and vulnerability assessments.

The list of partner organizations that reported on these actions is provided in the TABLE above, from II-1 to II-7, and further details on relevant actions are available in PART II (II-1 to II-7, PP. 26–39) of this publication.

ACTIONS UNDERTAKEN AND INTERIM RESULTS ACHIEVED

Activities reported by partners include the development of web-based data portals, regional climate centres and data networks, and assessment tools, and the provision of training in the use of assessment methods and tools.

These initiatives have helped to demonstrate the application, usefulness and limitations of the tools (e.g. climate models), and to improve Parties and other stakeholders' capacities to use these tools to facilitate the production and use of climate information for impact and vulnerability assessments. The joint workshop programme on climate observations and regional climate modelling in support of climate risk management and sustainable development of the Global Climate Observing System (GCOS) and the action of the World Meteorological Organization (WMO) to improve climate models and projections are examples of such efforts (see II-2 and II-6 for more information on these actions).

Some partners have been working to disseminate climate data and information. The Regional Visualization and Monitoring System (SERVIR) developed by the Water Center for the Humid Tropics of Latin America and the Caribbean (CATHALAC) (II-1) provides a publicly accessible catalogue of geo-referenced environmental information, data and information products in a variety of formats that are tailored to the needs of various stakeholders. The Global Observation of Forest and Land Cover Dynamics project (II-4) of the Global Change SysTem for Analysis, Research and Training (START) aims to improve the availability and quality of remote-sensing observations of forests and land cover at the regional and global levels, and to produce practical information from these data for application in land-cover/land-use management and research through the creation of a regional network data initiative.

WMO has established regional climate centres and collaborated with international and national partners to establish regional climate outlook forums (RCOFs) (II-7) in order to assist WMO member States to deliver better climate services and products, strengthen their capacity to meet national needs for climate information, and develop strategies for how the information can be used to support decision-making in climate-sensitive sectors.

The World Federation of Engineering Organizations (WFEO) (II-5) has developed a tool for assessing the vulnerability of public infrastructure to the impacts of climate change, and has disseminated this tool through capacity-building initiatives in relation to its application. The training needs assessment undertaken by the Institute for Global Environmental Strategies (IGES) (II-3) has informed the development of training modules on methodologies and tools for vulnerability assessments, and the use of climate information for adaptation planning under uncertainty.

LESSONS LEARNED

The actions reported by GCOS, WMO, WFEO and IGES illustrate that the provision and dissemination of data, information, methods and tools for impact, vulnerability and adaptation assessments benefit from a multidisciplinary and multi-stakeholder approach. They highlight the importance of including 'non-traditional' yet important stakeholders in workshops and training activities.

It is also essential to seek opportunities to collaborate (such as in the use of data) and replicate successful initiatives in new regions, where applicable. The plan of GCOS to replicate its workshop programme in regions other than the Greater Horn of Africa, where it is currently being piloted, is one example of this. Further, it is noted that the design and development of capacity-building programmes would benefit from the systematic assessment of the needs for capacity-building of target stakeholders. The training needs assessment employed by IGES provides a good example in this regard.

As illustrated by the action of CATHALAC, targeted training and improved access to data and information have been advancing research in developing countries to improve the understanding and assessment of impacts and vulnerability to climate change.

CHALLENGES, FURTHER NEEDS AND OPPORTUNITIES

Partners engaged in relevant actions reported that further efforts to enhance capacity in vulnerable countries are needed. In particular, capacity-building in relation to systematic observations and vulnerability assessments needs to be continued, as reported by CATHALAC on the long-term capacity-building programme to help integrate SERVIR into the adaptation planning process. Although some partners are engaged in providing free access to climate data and information, the limited capacity of developing countries to use these data for research on global change, natural resources management, and the development of coping strategies to reduce vulnerability remains a primary constraint. Limited financial and institutional resources were identified by partners as challenges in relation to the continuation and enhancement of capacity-building initiatives.

Such challenges and needs, however, also provide opportunities for partners working on relevant issues to collaborate and share experiences and good practices. For instance, to overcome funding constraints, WFEO has been developing a low-cost assessment tool that could facilitate the cost-effective adaptation of existing and planned infrastructure to cope with the impacts of future climate change. In addition, an increasing number of experts and institutions are now engaged in improving the observation, understanding and prediction of climate changes. This provides an opportunity for collaboration and coordination in order to better serve the users of climate information. The development of RCOFs exemplifies how such collaboration among regional and international organizations can work in practice.

A.2 PROMOTING THE UNDERSTANDING AND AWARENESS OF IMPACTS AND VULNERABILITY TO CLIMATE CHANGE

Partners reported on activities aimed at increasing the understanding and awareness of the climate change risks and vulnerabilities in relation to various sectors, ecosystems, cities, regions, countries and society at large, with a view to enhancing the capacity to manage these risks and vulnerabilities. The list of partner organizations that reported on these actions is provided in the TABLE above, from II-8 to II–14, and further details on relevant actions are available in PART II (II-8 to II-14, PP. 42–55) of this publication.

ACTIONS UNDERTAKEN AND INTERIM RESULTS ACHIEVED

The actions in this area reported by partners vary from global campaigns, awareness-raising programmes and the development of climate change networks to actions such as collaborative initiatives, research and technical workshops.

Some actions have facilitated knowledge-sharing and promoted the understanding of climate change impacts on different sectors, such as water and health, and helped build the capacity to understand vulnerabilities. Examples include: the Many Strong Voices (MSV) initiative (II-12) of the United Nations Environment Programme (UNEP)/ Global Resource Information Database (GRID)-Arendal; a workshop organized by the Sahara and Sahel Observatory (OSS) (II-10); the training programme on the vulnerability and adaptation of the water sector by the Bangladesh Centre for Advanced Studies (BCAS) (II-8); and the education, training and awareness-raising initiative on climate change and health of the World Health Organization (WHO) (II-14).

The Cities at Risk initiative reported by START (II-11) and the Climate and Disaster Resilience Initiative reported by the Graduate School of Environment Studies at Kyoto University (II-9) are both contributing to raising the awareness of stakeholders in the areas of urban planning and management of the risks of and vulnerabilities to climate change. To this end, Kyoto University has developed and applied a climate and disaster resilience index to engage urban planners and managers in discussions on disaster resilience in Asian cities.

Research is also being undertaken on the societal implications of climate change. For example, the United Nations University Institute for Environment and Security (UNU-EHS) is studying the impacts of climate change on migration, with a view to identifying possible policy frameworks for addressing climate change related migration (II-13).

LESSONS LEARNED

Partners recognized that actions that promote the understanding of current climate risks and vulnerabilities at various levels in society are crucial to enhancing the understanding of future climate-related risks and coping mechanisms. Actions undertaken by partner organizations such as BCAS, OSS, START and WHO have demonstrated the value of such initiatives in helping to enable policy- and decision makers to develop targeted adaptation actions and strategies.

These actions highlight the importance of sustaining existing training and awareness-raising programmes, and developing more knowledge-management and capacity-building tools as well as innovative ways of encouraging the engagement of different stakeholder groups (e.g. academics and municipal stakeholders) in these activities. The integration of the training programme of BCAS into university curricula in Bangladesh demonstrates an effective means of ensuring that academics benefit from the programme in the long term.

The benefit of the collaboration of multiple institutions and stakeholders has been demonstrated through many initiatives. There are opportunities to further develop collaborative programmes, which can be catalysed by the common risks and vulnerabilities of some regions identified by UNEP/GRID-Arendal. WHO identified the need for close multisectoral collaboration and the integrated capacity to strengthen public-health preparedness and improve the effectiveness of interventions to protect the populations most vulnerable to climate-related health risks.

CHALLENGES, FURTHER NEEDS AND OPPORTUNITIES

Several partners, including UNU-EHS, have noted the challenges associated both with the scarcity of empirical research and data on climate risks and vulnerabilities and the weak information flow among researchers, policymakers and planners. These issues have hindered the effective integration of climate change into development strategies and planning. To address this challenge, OSS, for instance, has organized workshops to brief African researchers on the key findings of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR4).

Partners engaged in collaborative initiatives, such as START, have reported that a lack of collaboration among experts and institutions in coordinating and integrating their ongoing initiatives hinders progress in improving the availability of existing data and in understanding and predicting climate-related risks and vulnerabilities.

Challenges also exist with regard to providing targeted capacity-building to a wide spectrum of stakeholders on various issues, including on disaster risk reduction (DRR) and health. This is due partly to a lack of customized training programmes and resources (e.g. relevant tools, methods and other information in local languages for target audiences), as reported by several partners, including BCAS and WHO.

B. IMPROVING THE ABILITY TO MAKE INFORMED DECISIONS ON ADAPTATION PLANNING, MEASURES AND ACTIONS

The adaptation actions reported by partner organizations under this thematic area have contributed to promoting the understanding and integration of adaptation planning and practices by enhancing the capacities of policymakers, institutions, academics, civil society, local communities and other relevant stakeholders. They have also facilitated effective knowledge-sharing among stakeholders.

B.1 PROMOTING THE DEVELOPMENT, DISSEMINATION AND APPLICATION OF METHODS AND TOOLS

The activities undertaken by partners under this subtheme have contributed to strengthening the capacity of policymakers, researchers and development practitioners to improve adaptation planning, measures and actions, including disaster risk management for various sectors and ecosystems. The list of partner organizations that reported on these actions is provided in the TABLE above, from II-15 to II-20, and further details on relevant actions are available in PART II (II-15 to II-20, PP. 58–69) of this publication.

ACTIONS UNDERTAKEN AND INTERIM RESULTS ACHIEVED

Actions reported by partners under this subtheme include the development of tools, guidance documents and relevant training materials, as well as the provision of training and online seminars for the dissemination and application of methods and tools for adaptation planning.

Training courses on climate change adaptation conducted by the Ibero-American Network of Climate Change Offices (RIOCC) (II-16) and those on climate change and biodiversity conservation led by START (II-17) have helped to strengthen the technical capacity of researchers and public-sector stakeholders to develop and implement adaptation programmes. The International Council for the Exploration of the Sea (ICES) has developed and conducted several training courses on statistical tools and ecosystem modelling for the effective and integrated management of marine ecosystems (II-15). The Climate Risk Management Technical Assistance Support Project (CRM-TASP) implemented by the United Nations Development Programme (UNDP) (II-19) aims to build in-country capacity to assess and manage climate risks.

START has developed user guides and conducted training sessions to improve the capacity of developing countries (Gambia, Namibia and Niger) to conduct sector-specific assessments of climate change related investments and financial flows, which are currently being carried out (II-18).

The 'training of trainers' course organized by Wetlands International and its partners provided necessary tools for and knowledge on ecosystem- and community-based adaptation in Africa (II-20).

LESSONS LEARNED

Recognizing the technical nature of their capacity-building initiatives, ICES, RIOCC, START and UNDP noted the need to improve the design and delivery of the initiatives so as to fully realize their intended outcomes. ICES has indicated the importance of providing participants with clearly defined requisites for participating in certain training programmes. Convening participants with a similar or adequate level of knowledge, as well as developing or adapting the training resources to match the level of knowledge of the intended trainees, are crucial in making training programmes effective. START has recommended a working-group structure as an effective mode of training. RIOCC highlighted that the use of case studies or practical examples would help to make the delivery of the training more effective.

Using existing knowledge products and collaborating with key stakeholders in order to deliver these training initiatives also has inherent benefits. UNDP, through CRM-TASP, has been encouraging multi-stakeholder participation by engaging regional and national organizations in order to tap into local expertise and knowledge. This collaboration has ensured that efforts in gathering and analysing data have not been duplicated and has helped to fill knowledge gaps and synthesize data where possible.

CHALLENGES, FURTHER NEEDS AND OPPORTUNITIES

Although various activities are being carried out to promote the development, dissemination and application of methods and tools for adaptation planning and practices, further training opportunities are needed at the regional, national and local levels. Such needs, however, also provide incentives for relevant partners to develop and/or improve their monitoring and evaluation strategies to assess these capacity-building initiatives in order to improve and extend existing programmes, and to include diverse groups of stakeholders, as appropriate. Partners engaged in these actions have also reported the need to conduct follow-up training in order to consolidate the knowledge gained through the initial capacity-building efforts.

B.2 FACILITATING COMMUNICATION, DIALOGUE AND COOPERATION AMONG DIFFERENT STAKEHOLDERS

The actions undertaken by partner organizations under this subtheme have contributed to promoting information-sharing and cooperation among policy- and decision makers, scientists, the private sector, NGOs, civil society and trade unions on adaptation planning, including in relation to DRR and disaster risk management. The list of partner organizations that reported on these actions is provided in the TABLE above, from II-21 to II-28, and further details on relevant actions are available in PART II (II-21 to II-28, PP. 72–87) of this publication.

ACTIONS TAKEN AND INTERIM RESULTS ACHIEVED

Partners reported a diverse range of modalities to foster effective communication, dialogue and collaboration among different stakeholder groups. These modalities include networks, science-policy dialogues, capacity and knowledge assessments, knowledge-sharing strategies, campaigns, training sessions, workshops and informal meetings to engage and coordinate policymakers and relevant sectors, institutions and communities.

The outcomes of these initiatives are extensive, including the development of sectoral issue papers describing adaptation policy options and a knowledge platform by UNDP (II-27), the organization of a google-based NGO group discussion forum led by Local Initiatives for Biodiversity, Research and Development (LI-BIRD) (II-24), the creation of a multi-stakeholder regional task force to coordinate DRR programmes in schools spearheaded by the United Nations International Strategy for Disaster Reduction (UNISDR) (II-28) and the development of a regional policy brief entitled Making African Forests Fit for Climate Change by the International Union of Forest Research Organizations (IUFRO) (II-23). These actions have improved the understanding of the scientific basis of climate change, impacts and good practices in adaptation efforts, as well as built capacity to assess climate change risks, respond to the adverse effects of climate change and integrate climate change issues into development programmes. These initiatives have also helped to coordinate adaptation actions across various institutions, sectors, countries and regions.

Some partners have been engaged in facilitating science-policy dialogues. The Munich Climate Insurance Initiative (MCII) brought together practitioners, experts and policymakers through policy dialogues on DRR. This action has enhanced the capacity of policymakers to negotiate on climate policy issues, in particular relating to DRR (II-25). START has involved a wide range of stakeholders, including scientists, policymakers, civil society, and private-sector actors, in national science-policy dialogues to discuss climate change issues related to various sectors and to identify adaptation actions (II-26). START has been working on developing regional knowledge-sharing strategies to disseminate climate change information at the regional and national levels. BCAS has also convened a national-level science-policy dialogue and developed a comprehensive knowledge-sharing strategy to facilitate the exchange of information between scientists and decision makers in South Asia (II-21).

Some partners have engaged trade unions and civil society in discussions on adaptation practices and planning. The International Trade Union Confederation (ITUC) has engaged trade unions at the regional, national and local levels through various training programmes and workshops aimed at disseminating information and sharing good practices in relation to adaptation (II-22). LI-BIRD has established an NGO group on climate change to bring together civil society organizations and has coordinated climate change actions across Nepal (II-24).

Activities such as those reported by BCAS, IUFRO, MCII, START and UNDP (II-27) have also attempted to address the lack of information-sharing between scientists and policymakers. These activities not only increased policymakers' technical understanding of relevant issues but also helped in developing long-term plans to address climate change impacts and climate-sensitive development plans and policies.

LESSONS LEARNED

Partners reported that access to information and knowledge on climate change impacts and adaptation actions for all stakeholders can be improved if appropriate mechanisms are established at the local, regional and global levels to facilitate communication and cooperation among them. International DRR campaigns led by UNISDR demonstrated the benefit of collaborating with existing institutions to reach out to more stakeholders. UNISDR partnered up with broad networks of the national and regional offices of the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and WHO to ensure the global reach of their awareness-raising efforts.

As illustrated by the actions of ITUC and LI-BIRD, the engagement of civil society and trade unions (e.g. through networking) is an important step to ensure the flow of knowledge and information to the community level.

CHALLENGES, FURTHER NEEDS AND OPPORTUNITIES

Partners engaged in these actions have reported that the process of generating and sharing information, particularly with vulnerable and rural communities, can be impeded by several factors, including the lack of tailored information and communication technologies. Another major challenge is the difficulty of maintaining the momentum of initiatives without viable monitoring mechanisms, follow-up activities (e.g. activities to address on-the-ground issues with existing networks) and sufficient institutional and financial resources.

Partners engaged in science-policy dialogues indicated that the scarcity of accessible scientific data and information, copyright issues associated with access to data and information, the high uncertainties of climate science, and the political sensitivity of certain policy issues impede the effective communication between the science and policy communities. These issues have posed a challenge in integrating adaptation strategies into national development plans and policies. This challenge, however, also provides an opportunity for partners to collaborate with the international scientific community in developing appropriate strategies for 'knowledge packaging', 'knowledge sharing' and 'knowledge transfer', and integrate it into ongoing and future adaptation programmes and projects.

B.3 ENHANCING ADAPTIVE CAPACITY THROUGH TECHNICAL AND INSTITUTIONAL CAPACITY-BUILDING

The actions under this subtheme aim to increase the awareness and understanding of adaptation plans and projects, with a view to building capacity at the regional, national, institutional and community levels to manage climate risk and adapt to climate change. The list of partner organizations that reported on these actions is provided in the TABLE above, from II-29 to II-37, and further details on relevant actions are available in PART II (II-29 to II-37, PP. 90–109) of this publication.

ACTIONS TAKEN AND INTERIM RESULTS ACHIEVED

Partners have reported a wide array of actions in this area. These include: the development of web-based information; fellowship projects; targeted training of experts, national governments and communities; community-based educational and outreach programmes; and the enhancement of policy dialogues to analyse and manage climate risks, develop targeted adaptation actions and strategies and integrate adaptation programmes into broader national and local development plans.

Some activities have improved web-based knowledge products. Examples include the online database of ecosystem-based projects and related adaptation options of the Convention on Biological Diversity (CBD) (II-29) and the weADAPT knowledge management system, reported by the Stockholm Environment Institute (SEI), which, through the use of geo-referenced data, enables community-based adaptation practitioners and researchers to share experiences and lessons learned in a more effective manner (II-32).

Partners have also conducted targeted training sessions and workshops for stakeholders in Africa to enhance the capacity of African countries to adapt to the adverse effects of climate change. UNDP, for example, has been engaged in training governmental, non-governmental and private-sector entities in Namibia and Zimbabwe to build their capacity to adapt to the impacts of climate change on agriculture and land (II-34). The African Climate Change Fellowship Program, administered by START, aims to train African professionals, researchers and graduate students in advancing and applying knowledge on adaptation (II-33). Currently, 45 fellows from 18 African countries are working on various projects supported by the fellowship programme. Through two workshops, WMO brought together experts and policymakers to share knowledge on adaptation strategies and to develop recommendations for the planning and implementation of an effective regional framework for adaptation in the agriculture sector. Draft regional frameworks that will guide future adaptation work were adopted at these workshops (II-36).

Partners also reported on a notable number of activities with a particular focus on DRR. RIOCC has been engaged in training DRR experts, conducting various awareness-raising activities, and developing and disseminating knowledge products to promote and exchange knowledge for the implementation of DRR strategies in the Ibero-American region (II-31). The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) is engaged in a collaborative initiative to integrate DRR into adaptation as well as into development plans and programmes as part of a wider South Asian Association for Regional Cooperation (SAARC) Action Plan on Climate Change (II-30). This initiative includes the development of: training modules on climate risk assessments, an information kit on climate risks and disaster, concept papers on technology needs assessments, and programme guidelines for facilitating the integration of DRR.

Some initiatives have helped to assess national capacities for adaptation planning and evaluation, such as initiatives of UNDP and the World Resources Institute (WRI). WRI has developed a National Adaptive Capacity framework to identify the strengths of and gaps in countries' adaptation systems (II-37). UNDP has been working with UNEP and the World Bank in undertaking national capacity self-assessments in order to create and strengthen an in-country consultative process to determine the essential capacities needed to meet and sustain global environmental objectives (II-35).

LESSONS LEARNED

Actions, including those of ESCAP, SEI, START, UNDP, Wetlands International and WMO, have illustrated that the understanding of adaptation and risk management at the regional, national and community levels and related adaptation action can be enhanced by building upon the existing knowledge of communities, research organizations, training institutes and networks, and by creating mechanisms to:

- Facilitate collaboration among relevant institutions to ensure synergies and an effective exchange of information;
- Help document, disseminate, scale up and replicate success stories and good practices;
- Enhance the existing capacity of local institutions to scale up adaptation efforts at the community level.

Partners saw that good practices can be replicated by creating effective mechanisms for knowledge transfer or sharing, such as that demonstrated by Wetlands International through its African regional 'training of trainers' course on ecosystem- and community-based adaptation.

Actions reported under this subtheme have also demonstrated the importance of targeting the most vulnerable groups (e.g. poor communities and women) in training and awareness-raising activities to help them cope more effectively with the adverse effects of climate change. These actions also reiterated the benefits of developing and disseminating user-friendly knowledge products, without the use of technical jargon and in multiple languages, to provide easier access to information and to match the needs of a broader stakeholder base. The development of web-based products, such as those developed by CBD and SEI, presents one option for disseminating and facilitating access to information and knowledge products. Partners have indicated that the development of user-friendly and more interactive web-based products (such as search functions based on different criteria) and the provision of training in using these web-based tools could facilitate the use of information by the intended user groups.

CHALLENGES, FURTHER NEEDS AND OPPORTUNITIES

Partners reported that the absence of nationally or regionally coordinated mechanisms for the sharing of knowledge on adaptation impedes awareness-raising and capacity-building efforts. The action of ESCAP presents a potential opportunity to mobilize the existing institutional arrangements of SAARC nations in order to integrate DRR strategies into adaptation plans. However, partners also recognized the challenges associated with coordinating multiple stakeholders. As illustrated by actions reported by ESCAP and RIOCC, challenges remain in coordinating institutions with diverse organizational structures and actors at the regional and national levels. Similar challenges exist in the development of training materials through a multi-stakeholder approach, as noted by Wetlands International, although the outcomes of such participatory exercises were highly valuable.

Assessments of national and institutional capacities carried out by UNDP and WRI have revealed that many countries lack the clear organizational structure necessary to make available adequate human and financial resources for environmental management. Furthermore, these countries may also lack access to, and capacity to manage, existing climate change information, including coordination with other information management systems.

Many partners recognized the challenges associated with ensuring that these capacity-building activities respond to the changing needs and priorities of target stakeholders. The need for the periodic review and necessary adjustment of activities and products calls for the development of a consistent monitoring and evaluation framework. In addition, activities such as training and fellowship programmes often face difficulties in sustaining and replicating efforts, since most of these activities are supported by one-off funding.

Partners recognized that online knowledge products and other resources could be effective means of reaching out to a wider group of stakeholders. However, internet access and computer literacy are still limited in many parts of the developing world, hindering access to information and knowledge in places where they are most needed.

3. KEY MESSAGES AND CONCLUSIONS

This publication provides a compilation and synthesis of the information contributed by Nairobi work programme partners on adaptation actions in the areas of education, training and awareness-raising. These actions were undertaken with a view to strengthening the adaptive capacity of all stakeholder groups. The actions reported represent a wide spectrum of adaptation practices, ranging from those aimed at raising awareness of the potential climate change risks in different sectors and within different social contexts, to actions oriented towards improving policy decisions through institutional and technical capacity-building. Actions reported in this synthesis publication also represent adaptation practices carried out at different levels, from the global and regional to the national and local levels. As some of the reported actions are still ongoing, and a number of relevant activities are in the process of being initiated, information on many good practices in relation to education, training and awareness-raising actions for adaptation has not been included in this publication. Hence, the information presented here provides only an interim snapshot of a broad range of activities being undertaken by Nairobi work programme partners. As they move forward with the implementation of existing and new action pledges, partner organizations will continue to provide updates on their work and share experiences within the wider adaptation community through the Nairobi work programme.

This chapter summarizes some of the key messages that have emerged from the wide array of adaptation actions reported by Nairobi work programme partners.

Good practices and lessons learned relating to effective and sustained capacity-building and awareness-raising are emerging from the diverse range of ongoing activities.

The engagement of key stakeholders is essential to the success and sustainability of education, research and awareness-raising actions.

The importance of engaging stakeholders in the full range of activities is widely recognized by partner organizations. Depending on the context of specific actions, key stakeholders can range from policymakers at different levels (e.g. for raising awareness on issues related to adaptation in order to achieve better policy integration), practitioners (e.g. for the provision of training programmes on climate-resilient development), vulnerable groups, including indigenous communities, women and children (e.g. for the provision of education programmes on potential climate risks and adaptive actions), academia (e.g. for delivering education and training in relation to adaptation) to business leaders (e.g. for raising awareness of the need for businesses to adapt). These stakeholders can, among other things, contribute to the process of delivering education, training and awareness-raising activities by: identifying needs; providing critical resources, such as sector- and location-specific knowledge and information; and acting as change agents within a community.

Regional and local organizations and networks have an important role to play.

Partner organizations also identified the engagement of local and regional organizations as an important success factor. In addition to their valued knowledge of local needs, local organizations can bridge the gap in external initiatives through critical interventions (e.g. periodic monitoring) to ensure that the momentum generated by time-bound projects is sustained over time. Further, partner organizations working with decision makers also recognized the essential role that regional organizations play in providing technical backstopping and supporting policy interventions that are required to adapt current development practices in line with the changing climate.

The integration of activities relating to education, training and awareness-raising into relevant ongoing processes and practices is key to the long-term success of such activities.

Partners engaged in policy support oriented activities highlighted the critical importance of considering climate change concerns as an integral part of development planning processes, noting that adaptation is a continuous process. Similarly, organizations acting to promote adaptation through education and training programmes underscored the importance of integrating these short-term, even ad hoc, programmes into school and university curricula to ensure the long-term usefulness of such programmes.

Successful capacity development and awareness-raising requires creative and practical means for the effective dissemination and communication of climate science.

Given the multitude of uncertainties associated with climate change and the multidisciplinary, multiscale and multi-stakeholder nature of adaptation, the effective dissemination and communication of climate science has been a challenging undertaking. Using local-language and policy-relevant communications as effective tools for the dissemination of complex scientific information to practitioners and communities, and enhancing dialogue between scientists and policymakers and between developers and users of scientific information and products have been identified as important means for the effective dissemination and communication of complex climate science to a varied range of stakeholders.

Learning-by-doing is an effective way of developing technical capacity.

Training programmes involving trainees performing hands-on tasks, using their own data and practical analyses, have proven to be effective in transferring knowledge on analytical tools.

Relevant knowledge, expertise, networks and institutions do exist and can be leveraged for further actions.

As complex and uncertain as the issue of adaptation might be, the analysis, planning and implementation of adaptation actions can benefit from the wealth of knowledge and expertise developed under a variety of disciplines, such as biophysical sciences, economics, sociology and engineering. Further, a significant number of networks, communities of practice and institutions (such as training institutes) exist which could make substantial contributions to the work on adaptation, such as networks and institutions engaged in, among other things, DRR, development, and natural resources management. In addition, it is also beneficial to find ways of integrating local knowledge into the planning and implementation of adaptation actions at the local level. Hence, education, training and awareness-raising activities in relation to adaptation could build on these existing resources, explore ways of strengthening and broadening existing regional networks of individuals and institutions, and seek synergies with ongoing relevant initiatives.

However, there are challenges and further needs which need to be addressed in order to enable the scaling up of education, training and awareness-raising activities in support of adaptation, and to ensure the attainment of desirable and sustainable outcomes.

Deficit of knowledge and information

The most severe information deficits have been identified in relation to: basic climatic trends (particularly at the local level), socio-economic characteristics, current coping strategies, scenario data, potential impacts and risks of climate change, the range of possible adaptation options, and an inventory of relevant ongoing initiatives. Gaps in such fundamental information and knowledge are bound to undermine the effectiveness of education, training and awareness-raising activities. Taking stock of activities that have been or are in the process of being implemented would provide policymakers with information on the existing resources. This would help policymakers to support more targeted and appropriate capacity-building actions so that a greater number of stakeholders could be reached. The absence of a consistent monitoring and evaluation framework has, in many cases, posed a challenge in assessing the effectiveness of ongoing education and training programmes. Periodic assessments and structured reviews of work could help to ensure that initiatives respond to current needs and priorities.

Insufficient institutional, technical and financial capacities and resources.

Insufficient institutional, technical and financial capacities and resources have been the primary underlying causes of the current deficit in adaptation actions, including activities aimed at education, training and awareness-raising. Partners highlighted the inadequate institutional and technical capacities and infrastructural provisions hindering the delivery of such programmes. The lack of coordinated, secure and long-term funding has been limiting the scope and long-term continuity of current activities, including some highly successful initiatives (e.g. policy-support projects to help policymakers to understand the financial requirements of addressing climate change, fellowship programmes, science-policy dialogues, and research work involving the acquisition of scientific data and establishment of computing centres). The lack of adequate technical and institutional capacities also hinders the optimal use of existing scientific data and information.

Building on its strengths and capitalizing on its unique convening role, the Nairobi work programme could enhance further actions relating to education, training and awareness-raising for adaptation by catalysing activities aimed at addressing the challenges and further needs highlighted in this synthesis publication.

As a work programme under the Convention, the Nairobi work programme is uniquely placed to facilitate adaptation activities in the areas of education, training and awareness-raising, through the following three main functional mechanisms:

Engaging stakeholders

Despite the large number of partner organizations engaged in the Nairobi work programme, there is still scope to increase the representation of organizations directly engaged in activities relating to education, training and awareness-raising at the local and community levels, as well as the representation of private-sector organizations.

Catalysing actions at the national and subnational levels

With in-country needs and gaps having been identified by Parties under the Nairobi work programme organizations with specific expertise and means of support can be further mobilized to pledge actions targeting Parties' demands for adaptation.

Facilitating knowledge-sharing and learning

With a wealth of knowledge services and products, including meetings and forums, web-based resources and publications, the Nairobi work programme could further facilitate the exchange of information, knowledge and experiences, with a view to promoting mutual learning among Parties and partner organizations. This is particularly meaningful in relation to addressing issues related both to the deficit of information and knowledge and to needs for enhanced technical capacity, as highlighted in this synthesis publication.

PART II
CONTRIBUTIONS OF NAIROBI WORK PROGRAMME PARTNERS

Under the guidance of the Chair of the SBSTA, the secretariat invited all Nairobi work programme partner organizations to make voluntary contributions to this publication by providing information on the implementation of relevant actions. A total of 25 Nairobi work programme partner organizations reported information on 37 actions on the ground relating to education, training and awareness-raising for adaptation at the global, regional, national, subnational and community levels.

Part II of this publication contains the contributions provided by those 25 Nairobi work programme partners. Partners were requested to provide information on five aspects of their relevant actions: action undertaken, interim results achieved, challenges, lessons learned, and emerging needs for further action. At the end of each entry, contact details are provided for further information. The text in this section has been provided by partners and has been left largely untouched except for minor editorial changes.

All actions reported relate to the two broad themes of the Nairobi work programme: enhancing the assessment and understanding of impacts and vulnerability to climate change; and improving the ability to make informed decisions on adaptation planning, measures and actions. According to the focus of the actions in delivering the outcomes under these two thematic areas, the 37 entries have been compiled in alphabetical order under the following five categories:

- Improving the provision, dissemination and application of data, methods and tools for impact and vulnerability assessments;
- Promoting the understanding and awareness of impacts and vulnerability to climate change;
- Promoting the development, dissemination and application of methods and tools for adaptation planning, measures and actions;
- Facilitating communication, dialogue and cooperation among different stakeholders;
- Enhancing adaptive capacity through technical and institutional capacity-building.

A. ENHANCING THE ASSESSMENT AND UNDERSTANDING OF IMPACTS AND VULNERABILITY TO CLIMATE CHANGE

A.1 IMPROVING THE PROVISION, DISSEMINATION AND APPLICATION OF DATA, METHODS AND TOOLS FOR IMPACT AND VULNERABILITY ASSESSMENTS

1. WATER CENTER FOR THE HUMID TROPICS OF LATIN AMERICA AND THE CARIBBEAN (CATHALAC)

SUPPORTING ADAPTATION PLANNING ACTIVITIES IN MESOAMERICA AND THE DOMINICAN REPUBLIC THROUGH THE IMPLEMENTATION OF THE REGIONAL VISUALIZATION AND MONITORING SYSTEM (SERVIR).

CATHALAC, on behalf of its partner organizations, submitted an action pledge to the Nairobi Work Programme to contribute to the enhancement of the Regional Visualization and Monitoring System (Sistema Regional de Visualización y Monitoreo, (SERVIR)) to develop regional capacity in the use of satellite-based monitoring and forecasting applications for improving adaptation in Mesoamerica and the Caribbean.

SERVIR supports decision-making in the areas of adaptation, environmental management, and early warning for disasters, among others, and serves the region's nine countries via a bilingual virtual platform <www.servir.net>, with an operational facility at CATHALAC in Panama and a rapid prototyping facility at the NASA Marshall Space Flight Center in Alabama, United States of America.

SERVIR is essentially a regional clearinghouse of information relevant to climate change and climate variability, serving as a virtual observatory not only of how the region's climate varies over time but also of the overall effects that climate has exerted on the region. It houses the region's largest publicly accessible catalogue of geo-referenced environmental information, providing data and information products in a variety of formats that are tailored to the range of decision-makers, national adaptation specialists, environmental managers, scientists and researchers, students, and the general public in the areas of ecosystems, infrastructure, hydrology, and agricultural capacity.

INTERIM RESULTS

SERVIR's efforts in adaptation have focused mainly on the identification of areas at risk of climate change and the potential impacts of climate change on the natural resources on which the region's economies are so dependent, including:

- Downscaling global climate models to provide regional governments with the highest resolution climate change scenario data. These have been used by the various countries in their adaptation studies: Guatemala and Honduras have begun development of watershed- and municipal-level adaptation plans (in collaboration with UNEP's Caribbean Environment Programme);
- Conducting a novel study on the potential impacts of climate change on the region's biodiversity, demonstrating, for instance, that a projected 5°C rise in temperature could negatively impact ecosystems on the Caribbean coasts of Costa Rica, Honduras, Nicaragua and Panama by the 2050s. The study identifies areas where future investment/management activities will need to be targeted to protect the region's rich biodiversity (in collaboration with the United States Agency for International Development (USAID)).

A total of thirty-six national- and regional-level workshops have trained 604 professionals from the region in a variety of climate change related themes, including numerical weather forecasting, satellite-based monitoring, and climate change vulnerability modelling.

In 2010, CATHALAC is launching the first ever master's degree climate change programme for the Spanish-speaking countries of the Latin America and Caribbean (LAC) region as part of long-term capacity-building efforts. The programme seeks to enhance the skill sets of the professionals involved in national adaptation activities across the LAC region by introducing them to newly available policy and technological tools which will help the region confront the climate reality.

CHALLENGES

The main challenge in mainstreaming SERVIR as a tool for adaptation planning has been the amount of data and information that have been made available by it. Huge quantities of data that need to be distilled can overwhelm the decision-making process. Nonetheless, CATHALAC and its partners have sought to address this challenge from the standpoint of technology (e.g. developing tools for easy querying and accessing vast data sets), and through capacity-building in environmental information management, remote sensing and modelling.

LESSONS LEARNED

A key lesson learned has been that the information necessary for decision-making in the context of adaptation often has important uses outside the climate change sphere. For instance, while SERVIR's initial focus was specifically on the provision of data and information to support adaptation planning in Mesoamerica, the system's capacities have been expanded to include short-term forecasts of the weather, some extreme events, and even air quality, among others. This shows that the information infrastructure needed for adaptation can support a variety of sectors.

Another lesson learned is that centres and institutes in the developing countries can, with the appropriate level of support, become cradles of research, building on, and adding to, research pioneered by others. For instance, building on its experience in implementing SERVIR, CATHALAC has developed a Tropical Carbon Monitoring System (TROPICARMS 2.0) which utilizes satellite and in-situ data to monitor the carbon stocks in forests and other terrestrial ecosystems.

EMERGING NEEDS FOR FURTHER ACTION

Capacity-building and technology transfer for the countries of Mesoamerica and the Caribbean in issues related to satellite-based monitoring and environmental and vulnerability modelling will require continuous attention, at least in the medium term, until capacity in these areas reaches its true critical mass.

The launching of new earth observation satellites with new and enhanced capabilities, such as the proposed Orbiting Carbon Observatory (to measure carbon dioxide (CO_2) emissions), and the hyperspectral imager, HyspIRI, will likewise require the countries in the region to keep abreast of new scientific and technological developments.

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Image I-1. **SERVIR Portal**

Image I-2. **SERVIR workshop**

2. GLOBAL CLIMATE OBSERVING SYSTEM (GCOS)

JOINT GCOS, WORLD CLIMATE RESEARCH PROGRAMME (WCRP), WORLD METEOROLOGICAL ORGANIZATION (WMO) AND IGAD CLIMATE PREDICTION AND APPLICATIONS CENTRE (ICPAC) WORKSHOP PROGRAMME ON CLIMATE OBSERVATIONS AND REGIONAL MODELLING IN SUPPORT OF CLIMATE RISK MANAGEMENT AND SUSTAINABLE DEVELOPMENT.

The overall objectives of this World Bank-supported initiative include:

- Helping to ensure that due attention is given by countries in the Greater Horn of Africa (GHA) region to observation and data needs;
- Demonstrating the use and value of regional models;
- Providing advice on model limitations;
- Improving capabilities across the GHA region for using observational climate records and model projections for adaptation planning.

The workshop programme aims to demonstrate the application of climate information, especially in the agriculture and water resources sectors.

INTERIM RESULTS

The first of the three integrated workshops planned for the workshop programme was held at the ICPAC headquarters in Nairobi, Kenya from 19 to 23 April 2010.

Participants included representatives of both the climate information provider and climate information user communities from 10 countries of the GHA region.

Participants, using new computers purchased for the project (which they will take back to their home institutions at the end of the project), were trained in the use of RClimDex software. The software enables data to be properly formatted and quality-controlled, which, once done, can be used to calculate a series of 27 climate indices. The indices provide quantified information on weather and climate extremes and enable the analysis of changing climate patterns.

Data providers and users learned how to analyse the data they had brought to the workshop.

Users also indicated some additional indices that they would like to calculate for their specific sectoral needs.

Participants prepared draft country reports for each of the 10 GHA countries. These reports describe the key findings from the perspective of climate information applications. Both the formatted and quality-controlled data will be used in the second (modelling) workshop. A future result will be the preparation of a peer-reviewed paper based on the work of all 10 countries.

CHALLENGES

Some of the participants were only able to bring a limited amount of station data to the first workshop, which hindered the extent of formatted and quality-controlled climate data they could produce at the workshop. In many cases, there were gaps in the data, and, in a few cases, there were errors. The gaps, if not too large, can be dealt with by the software, and the errors can be detected and fixed through quality control procedures.

The inadequacy in quantity and quality of observational data in many GHA countries are hindering the scope of analyses fundamental to the understanding of climate trends and associated risks.

Another challenge exists in convincing both the participants and the institutions they represent of the value of the free exchange of data. The participants have learned, however, the value of the collaborative use of data and standardized indices and their benefit to all.

LESSONS LEARNED

Through the hands-on data formatting and quality control exercises at the workshop, participants were made aware of the need to use as much good data as possible and, hence, of the potential benefits of data rescue.

By the end of the workshop, providers and users of data had gained a better understanding of the limited value of data unless it is analysed and utilized. They also learned about the importance of observations for development.

It was especially valuable for providers and users of climate data to work side by side in the analysis of the data and to begin to understand each other's concerns, although, ideally, a greater number of users should have been involved in the workshop. Thus, one of the goals of the second workshop will be to increase the participation of data users, including impact modellers, which will also improve linkages to the third workshop, the focus of which will be the use of model output in policy development.

EMERGING NEEDS FOR FURTHER ACTION

Although this is a pilot project for the GHA countries, there are many other regions of the world that could benefit from similar training. If successful, and pending the availability of funding, it is the intent of the project partners to replicate this project in other regions through a series of workshops, beginning perhaps with other subregions of Africa. Adjustments will be made, if deemed necessary, to improve the value of the training for future participants.

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Image II-3. **Participants in the workshop held in Kenya**

3. INSTITUTE FOR GLOBAL ENVIRONMENTAL STRATEGIES (IGES)

TECHNICAL CAPACITY DEVELOPMENT FOR CLIMATE CHANGE ADAPTATION PLANNING IN THE ASIA-PACIFIC REGION.

This project aims to build the capacity of key stakeholders such as trainers, policymakers and development practitioners in the Asia-Pacific region in order to mainstream climate change adaptation principles and practices into developmental planning and programming in targeted Asian countries. Its goal is also to transfer knowledge and skills on vulnerability assessment methodologies and tools and the use of climate information for adaptation planning under uncertainty. Countries participating in the project include Bangladesh, Cambodia, the Lao People's Democratic Republic, Mongolia and Nepal.

The main objectives of the project are to:

- Assess the training needs in terms of knowledge and skill areas for effective adaptation;
- Design and develop training modules;
- Deliver training programmes for trainers in key training institutions and for key policymakers in the region;
- Assess the impact of the project activities and provide policy feedback to the countries involved.

The project begins with a Training Needs Assessment (TNA) which informs the development of training modules. The training programme will be delivered in the extended phase of the project. Provisional training modules could include, but are not limited to:

- Vulnerability and risk assessments;
- Adaptation planning;
- Science-based decision-making;
- Information dissemination and awareness-raising.

This one-year project will primarily focus on the agriculture and water sectors and is partly funded by the Asia-Pacific Network for Global Change Research.

INTERIM RESULTS

Preliminary studies under the project indicated that:

- In all participating countries, the agriculture and water sectors have been identified as priority sectors by the national governments;
- Capacity-building in these sectors has been carried out by both governmental and non-governmental institutions;
- There is a considerable deficit in the availability of and/or access to systematic information on current capacity development efforts and training needs;
- As a result, the capacity-building initiatives implemented thus far in these countries typically consist of a series of fragmented events, including lecture presentations by specialists in a classroom environment. These programmes are often knowledge-intensive and carried out in isolation from the 'expected role' of the individual trainee and have therefore not significantly enhanced t he trainee's performance;
- In many instances, the capacity-building programmes are localized to a small region or province and to a specific sector, thereby ignoring the collaboration required among different agencies which is necessary for adaptation. In most cases, the end results of these capacity-building programmes are not publicly available, thereby preventing them from being used by other organizations interested in capacity-building.

CHALLENGES

The most important challenge in achieving holistic capacity-building in the developing Asia-Pacific region is the inadequacy of good quality information on:

- The roles of different stakeholders in adaptation decision-making and their capacity needs;
- The existing capacities of different stakeholder groups;
- The capacity needs and gaps;
- The lessons learned and key outcomes of earlier capacity development efforts.

In most cases, the continuity of capacity-building programmes is limited to the availability of project funding.

Poor infrastructure (training facilities) and insufficient human resources (trainers) hinders the effective delivery of capacity-building programmes.

LESSONS LEARNED

The design and development of capacity-building programmes should be informed by TNAs.

The process of capacity-building should include four stages: carrying out a knowledge, skills and environmental needs assessment (stage I); formulating the training module (stage II); piloting the programme (stage III); and reviewing and revising the programme (stage IV) (see FIGURE III-2 below);

A multi-disciplinary approach should be adopted in the development of training modules on adaptation. Capacity-building efforts should aim to move from autonomous to anticipatory learning.

EMERGING NEEDS FOR FURTHER ACTION

There is a need to:

- Conduct adaptation-specific TNAs at sectoral and subnational levels which inform policymakers of the nature of resources (financial and human) for capacity-building in the agriculture and water sectors;
- Take stock of the varied experiences of capacity-building programmes related to adaptation in the agriculture and water sectors in the region and to develop a compendium of best practices for capacity-building that can be utilized by various stakeholders;
- Formulate a human resources development strategy, both at the national and at specific sectoral levels such as the agriculture and water resource ministries, which prioritizes the specific subsectors, geographical regions and hierarchy of personnel in need of capacity-building, along with a clear road map to implement the strategy.

Contact details for further information:
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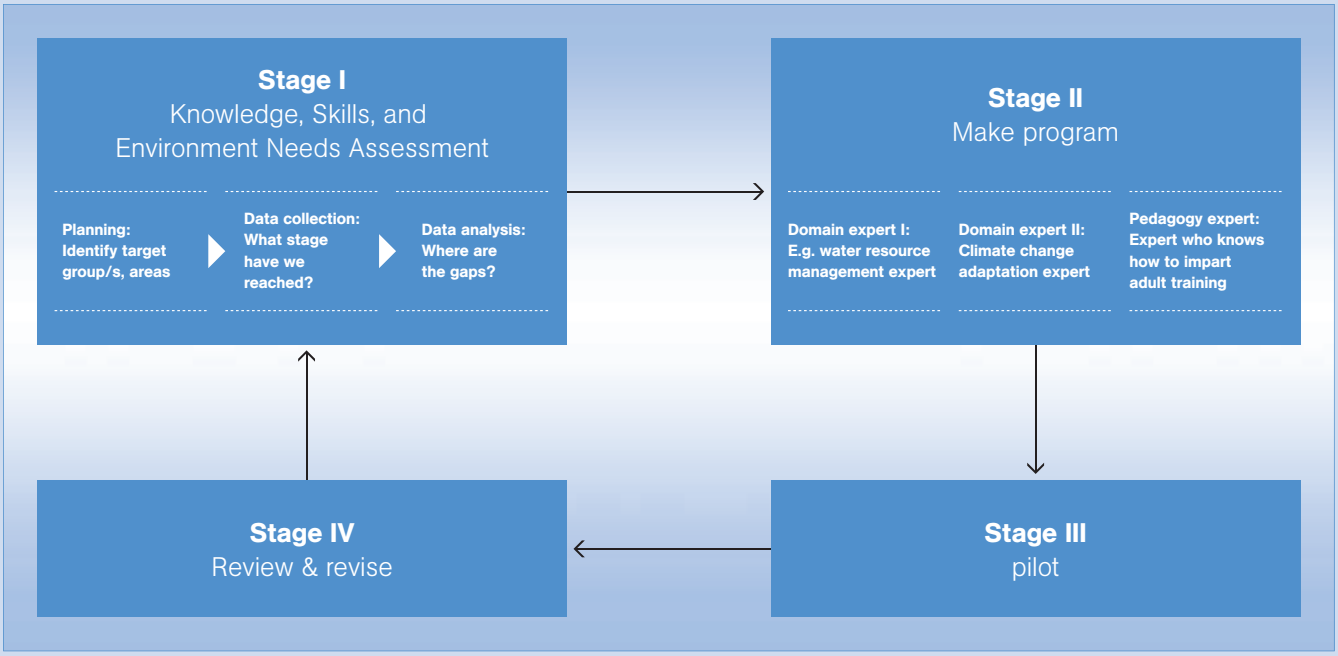
Figure III-2. **The stages involved in capacity-building for adaptation**



4. GLOBAL CHANGE SYSTEM FOR ANALYSIS, RESEARCH AND TRAINING (START)

GLOBAL OBSERVATION OF FOREST AND LAND COVER DYNAMICS (GOFC-GOLD) PROJECT.

The overall goal of the GOFC-GOLD project is to improve the availability and quality of remote-sensing observations of forests and land cover at regional and global levels, and to produce useful information from these data for application in land cover/land use management and research. Under a grant from the National Aeronautics and Space Administration (NASA), START supports the development of regional networks in developing countries to increase their capacity to use earth observation data for regional and national needs, and to contribute to the tasks of the Group on Earth Observations (GEO), including: global land cover; forest mapping and change monitoring; implementation of a fire warning system at global level; forest carbon tracking; and regional networks for ecosystems.

A significant component of this project is the GOFC-GOLD/START Regional Network Data Initiative. This initiative capitalizes on the opening of the Landsat archive to free, web-based access, and aims to undertake the following activities:

- Disseminate United States earth observation data in regions where available distribution methods are not effective;
- Compile regional and in-country data sets relevant to land cover and fire observations and make them freely available;
- Engage regional expertise in global data sets relevant to development, evaluation and validation.

INTERIM RESULTS

A pilot group of data specialists from five sub-regions of Africa received training at the US Geological Survey's Earth Resources Observation and Science Center (USGS/EROS) on data availability and applications, and serve as focal points for data distribution in their sub-regions. Future training sessions are planned for other current and emerging GOFC-GOLD networks.

CHALLENGES

Access to data as well as the capacity to utilize the data remain the primary challenges for developing country scientists, practitioners, and decision-makers who require such data for global change research, natural resources management, and the development of coping strategies to reduce vulnerability to global changes.

LESSONS LEARNED

The participants' evaluations of the training programme were very positive. They also offered some suggestions for strengthening it in future sessions, including additional topics to be included in the workshop agenda; allowing more time to plan for follow-up activities to promote and distribute the data within their respective sub-regions; and finding (or developing) materials for training or publicity regarding the availability of data.

EMERGING NEEDS FOR FURTHER ACTION

Key emerging needs identified from the pilot phase experience include:

- Continuing the programme to provide training for other regions and expanding the training on data applications;
- Maintaining the regional network of individuals and institutions.

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5. WORLD FEDERATION OF ENGINEERING ORGANIZATIONS (WFEO)

BUILDING CAPACITY TO ADAPT INFRASTRUCTURE TO COPE WITH CLIMATE CHANGE IMPACTS.

Since 2005, Engineers Canada has been leading a project in Canada to complete a national engineering vulnerability assessment of existing and planned public infrastructure to the impacts of climate change. As part of this project, a formalized risk assessment tool, now referred to as the Engineers Canada Infrastructure Climate Risk Protocol (the protocol) was developed. A variety of capacity-building efforts have been carried out, both within Canada and internationally, to adapt civil infrastructure to climate change impacts through the application of the protocol.[12]

INTERIM RESULTS

To date, the project has:

- Developed a formalized risk assessment tool, the protocol;
- Developed a one-day workshop on the principles and applications of infrastructure climate risk assessment. The workshop targets engineers, planners and managers of civil infrastructure, and covers:
  - The theory and principles of risk assessment in the context of climate change;
  - The protocol and its various steps;
  - Hands-on exercises where participants in small groups define climate parameters, infrastructure components and climate risks;
  - Presentations on case studies illustrating the application of the protocol in the four infrastructure categories;
- Delivered 10 case studies in Canada to test the protocol; the three most recent ones concerned, respectively, the Fraser sewerage area stormwater and wastewater collection and treatment system in Metro Vancouver; two water control and retention dams managed by the Toronto and Region Conservation Authority; and the Coquihalla Highway managed by the British Columbia Ministry of Transportation and Infrastructure;[13]
- Delivered the workshop in six locations across Canada to over 200 people between November 2009 and June 2010;
- Delivered the first international version of the workshop through WFEO's Committee on Engineering and the Environment to 22 participants from nine Latin American and South American countries at the international conference Thinking the Americas, held on 24 March 2010 in Recife, Brazil;
- Held a two-hour side event on climate change mitigation and adaptation of infrastructure at the fifteenth session of the UNFCCC Conference of the Parties (COP 15) in Copenhagen, Denmark;
- Held a two-hour side event on infrastructure climate risk assessment at the UNFCCC climate change talks in Bonn, Germany, on 11 June 2010.

CHALLENGES

The protocol is the intellectual property of Engineers Canada. By virtue of its membership of WFEO, there is an opportunity to apply the same methodology for infrastructures located in newly developed and developing countries. The capacity to perform these assessments and to take remedial action does not generally exist; therefore, these case studies take the form of knowledge development and capacity-building tools to enable countries to undertake their own assessments in the future. The long-term goal is to successfully transfer the application of the protocol to newly developed and developing countries to provide a relatively low-cost assessment tool to plan the cost-effective adaptation of existing and planned infrastructure to the impacts of future climate change.

Another challenge is to secure funding to conduct pilot infrastructure climate risk assessment studies in newly developed and developing countries that would involve knowledge development and capacity-building in the country involved so that it could subsequently conduct its own risk assessments.

LESSONS LEARNED

Risk assessments of the adaptability of civil infrastructure to climate change require a multi-disciplinary approach. Therefore, it is important to build the capacity of other supporting disciplines and stakeholders, including meteorologists, climate change scientists, engineering and technology professionals as well as management, operations and maintenance personnel administering and operating the infrastructure. This could be achieved, for example, by encouraging the participation of personnel from other supporting disciplines and stakeholders in the training workshops on the protocol.

EMERGING NEEDS FOR FURTHER ACTION

Canadian case studies: Several new Canadian case studies are under way and will be completed over the next year. They are listed by owner and by category below:

(1) Government of northwest territories: rehabilitation of highway 3 infrastructure;
(2) District of Shelburne, Nova Scotia: design of a new sewage treatment plant;
(3) Ontario Realty Corporation: three public buildings with different uses in southwest Ontario;
(4) Town of Prescott, Ontario: stormwater management and treatment system;
(5) City of Toronto, Ontario: assessment of selected road culvert systems;
(6) City of Calgary, Alberta: potable water collection, treatment and Distribution system;
(7) City of Castlegar, British Colombia: stormwater management and treatment system.

The owners of these infrastructures come from different geographic regions in Canada, including small communities and large cities with populations from a few thousand to several million people, and include provincial and municipal levels of government. Additional case studies are needed to cover different geographic regions and climate zones in Canada to complete the development of a knowledge base that can be used in training workshops as well as recommendations for adjustments to infrastructure codes and standards to adapt to the changing climate.

International case studies: There is a need to develop this capacity and to identify and address infrastructure vulnerabilities through an international case study approach that matches Canadian engineers with infrastructure engineers, planners and decision-makers in these countries. The challenge is to identify and secure funding for these projects. Engineers Canada, through WFEO-CEE (Committee on Engineering and the Environment) has developed a concept proposal to conduct infrastructure climate risk assessments through a knowledge development and capacity-building approach that would be applied to newly developed and developing countries.

There is a need to develop local knowledge and build capacity to adapt infrastructure to climate change impacts at a community and regional level in developing countries. Tools are needed to develop solutions that adapt infrastructure in a cost-effective manner to address engineering vulnerabilities and risks. The first step is to assess the engineering vulnerabilities and risks. The first international case study to assess these risks is now under way and involves using the protocol in the assessment of a sewage treatment system in Costa Rica in cooperation with their Colegio de Ingenieros (College of Engineers). The project includes knowledge development and capacity-building and will commence in mid-2010.

More international training workshops: WFEO-CEE, through its chair Engineers Canada, intends to organize more training workshops in Latin America, South America, Africa and Asia to enhance capacity within these regions.

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[12] <www.pievc.ca>.
[13] The final reports of these case studies will be made available in mid-2010 on the WFEO website, available at <www.wfeo.net>.

6. WORLD METEOROLOGICAL ORGANIZATION (WMO)

IMPROVING CLIMATE MODELS AND PROJECTIONS.

The World Climate Research Programme (WCRP), sponsored by WMO, the International Council for Science (ICSU), and the Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational, Scientific and Cultural Organisation (UNESCO), has many ongoing activities to improve global climate models and prediction in support of the objectives of the Nairobi Work Programme. Specifically, the WCRP, through its research and capacity-building initiatives, aims to improve the provision of practical climate observations and model simulation products of regional and global relevance, which requires international commitment, coordination and collaboration.

As part of its research initiative, WCRP is coordinating the Coupled Model Intercomparison Project (CMIP5), which involves over 20 global modelling groups. CMIP5 includes two classes of models and experiments to address two time frames and two sets of science questions for the next round of coordinated experiments on future climate change. The near-term (2005–2030) "decadal prediction" experimental protocol provides an opportunity for the international coordination of research on the mechanisms associated with regions/modes of predictability. Demonstrations of the skills involved in projecting/predicting climate variability and change on decadal and longer timescales would be of great value to planners and decision-makers. The models use mitigation/adaptation scenarios with implicit policy actions to develop future adaptation, mitigation and risk management strategies. The results from these experiments will provide the basis for the fifth assessment report of the Intergovernmental Panel on Climate Change (IPCC AR5).

INTERIM RESULTS

To provide time-evolving regional climate change information to support adaptation decisions, the WCRP Task Force on Regional Climate Downscaling has developed the Coordinated Regional Climate Downscaling Experiment (CORDEX) to foster coordination between regional downscaling efforts around the world, and to assess and understand the sources of uncertainty in Regional Climate Downscaling (RCD) projections.[14] CORDEX will link closely with CMIP5 to deliver new global climate change projections in late 2010 and 2011. CORDEX intends to produce a framework valid for multiple domains across the world: since this task requires considerable time and resources, Africa has been designated an initial priority region. A first meeting was held in early 2009 to make an initial definition of the CORDEX plan, which was followed in April 2010 by an Africa-CORDEX meeting in South Africa, where initial results from downscaling tests over Africa were discussed and plans for the Africa-specific part of CORDEX were further developed. In June 2010, CORDEX was further discussed at a WCRP-sponsored workshop in Lille, France, where emphasis was placed on how best to facilitate the production of regional climate information and support its use in impact, adaptation and vulnerability studies.[15] In addition, the WCRP Working Groups on Seasonal to Interannual Prediction (WGSIP) and Coupled Modelling (WGCM) are cooperating to provide support in the area of decadal climate system prediction.

Further, the WCRP has been carrying out initiatives aimed at building capacity for climate research and applications. In 2009, several major training seminars, organized through the WCRP CLIVAR and Global Energy and Watercycle Experiment (GEWEX) projects, were held in South America on the hydroclimate of La Plata Basin. For the African continent and regions within Africa, WCRP has created the 'multi-model archive component' of the African Climate Atlas, an interactive web page providing a user-friendly and simple tool for plotting images and making available data subsets from the IPCC AR4 climate change model data set, for the required period and over definable regions. The project on Climate Risk Management for the Greater Horn of Africa was initiated in 2009 with the aim of assisting the developing and least developed countries of the Greater Horn of Africa (GHA) region to undertake and appropriately use climate projections in their adaptation planning. WCRP, together with local institutions, WMO, and the World Bank, is developing and implementing a programme of three inter-linked and hands-on training workshops. This project and the corresponding workshops will demonstrate the key elements of an effective climate risk management strategy for the region.[16]

CHALLENGES

Vast quantities of climate data are available from the environmental satellites and in situ networks already in place or planned. These and other data are being integrated under the framework of the Global Earth Observation System of Systems (GEOSS) in order to optimize information products and services. However, they must be converted into quality-controlled climate data sets, requiring sustained support, both in terms of observations and the continuous knowledge of their calibrations. Specific emphasis must be placed on the full implementation of the climate observation system and uniform international standards in maintaining and evolving the system.

Enhancements in the complexity and realism of climate models through high-resolution models that include detailed physical parameterizations, cloud-resolving capabilities, and other detailed representations of relevant climate processes are rapidly emerging. This requires greater engagement from a wide variety of disciplines and stakeholders. Attention must be paid to building two-way communication between the climate science community and the many and varied stakeholders and users of climate information. This communication is necessary both to ensure that progress in the scientific field is exploited for the benefit of society and the environment and to provide a greater focus for climate research.

As a result of the heightened attention to climate challenges and opportunities, an increasing number of experts and institutions around the world are engaging in the improvement of observations, understanding and predictions of the climate. This provides an opportunity for greater progress as well as a challenge in ensuring greater coordination and integration of these efforts to better serve the users of climate information.

LESSONS LEARNED

Through interactions with various user groups and stakeholders, WCRP modelling and prediction activities have become more focused on producing outcomes that are of use to a wide range of sectors. The need for a focus on regional modelling has become clear. Additionally, there is a requirement for better estimates and communication of the uncertainties inherent in climate predictions and projections. Recognition of the need to incorporate all components of the climate observation system in climate models has led to the creation of the CHFP and CMIP5 approaches described above.

EMERGING NEEDS FOR FURTHER ACTION

WCRP is taking the necessary steps to address the critical issues concerning the rapidly emerging societal need for climate services for adaptation and risk management. WCRP will play a fundamental role in generating quantitative climate information on a range of time and space scales, in particular in the establishment of a Global Framework for Climate Services (GFCS). In addition, WCRP will collaborate with WMO and other climate observation and research programmes to enhance the technical capacity for climate research, operational prediction, and communication, particularly in the developing regions/countries.

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[14] WMO. 2009. WMO Bulletin. 58 (3): pp.175–183.
[15] <http://wcrp.ipsl.jussieu.fr/Workshops/RegionalClimate/index.html>.
[16] The information reported by GCOS in this publication provides further details on the workshop programme.

7. WORLD METEOROLOGICAL ORGANIZATION (WMO)

CLIMATE INFORMATION, PRODUCTS AND SERVICES FOR ADAPTATION.

The activities under this project are carried out by WMO under the World Climate Applications and Services Programme (WCASP) and its Climate Information and Prediction Services (CLIPS) project, with a worldwide coverage. The activities essentially include development of operational mechanisms for the provision of climate information, products and services for climate adaptation and risk management at global, regional and national levels, with appropriate linkages to ensure a global to local flow of climate information. Efforts have also been made to promote climate applications, focusing on health, energy, tourism, and urban and building climatology.

INTERIM RESULTS

Under this project, several major initiatives have been carried out to put in place institutional structures as part of the framework for seasonal to inter-annual prediction, including the establishment of Regional Climate Centres (RCCs). A RCC is a Centre of Excellence that assists WMO member States in the given region to deliver better climate services and products, including regional long-range forecasts, and to strengthen their capacity to meet national climate information needs. WMO has established a formal designation process for RCCs as part of its Technical Regulations, and two RCCs in Asia were designated in June 2009. A RCC network is currently being piloted in Europe, and concerted efforts are being made to develop RCCs in other regions. WMO is implementing a project funded by the Korea International Cooperation Agency (KOICA) to develop a regional climate framework for the Greater Horn of Africa (GHA), using the RCC development as the core element.

WMO, along with international and national partner agencies, has developed Regional Climate Outlook Forums (RCOFs) to provide real-time seasonal climate outlooks for regions sharing a common climate, and to develop strategies on how the information can be used to support decision-making in climate-sensitive sectors. RCOFs in various forms and sizes are now in operation in more than 10 subregions around the world (covering Africa, South America, Asia, Central America and the Pacific Islands), and concerted efforts are being made to extend the concept to several other regions. Despite the challenges of resources and human and infrastructural capacities, some of the RCOFs have achieved remarkable progress in regional networking and user liaison, and have contributed substantially to capacity-building and user awareness. WMO initiated two new RCOFs in 2008–2009 in Southeastern Europe[17] and South Asia,[18] and proposed the concept of a Polar Climate Outlook Forum (PCOF),[19] which was recognized as a legacy of the International Polar Year (IPY). WMO also organized an international expert review of RCOFs.[20]

WMO, in collaboration with other agencies, organized CLIPS-related training workshops, to build the capacity of National Meteorological and Hydrological Services (NMHS) in providing climate information and prediction products relevant to user needs. WMO has been successfully issuing consensus-based El Niño/La Niña Updates, which have been well-received worldwide. With the support of the National Oceanic and Atmospheric Administration (NOAA), WMO organized a CLIPS workshop on El Niño/Southern Oscillation (ENSO) communication (8–10 April 2008, Honolulu, United States of America).

WMO co-sponsored several interregional workshops on Human Health Impacts from Climate Variability and Climate Change organized by the World Health Organization (WHO). These workshops focused on countries that are particularly climate-sensitive and vulnerable, raised awareness, and helped countries formulate strategies to address additional health risks posed by climate change. In addition, a WMO-WHO guidance document on Heat-Health Warning Systems (HHWS) is in final draft form for publication. WMO also co-sponsored the 18th International Congress of Biometeorology (26–28 September 2008, Tokyo, Japan).

In early 2008, the United Nations World Tourism Organization (UNWTO), the United Nations Environment Programme (UNEP) and WMO jointly published a new report entitled *Climate Change and Tourism: Responding to the Global Challenges.*[21] Together with UNEP, Oxford University and UNWTO, WMO co-sponsored an international seminar on Climate Change Adaptation and Mitigation in the Tourism Sector: Frameworks, Tools and Practices, focusing on developing countries and small island developing States, at Oxford University from 8–10 April 2008. The aim of the seminar was to discuss weather and climate information needs and utilization within the recreation and tourism sector and facilitate collaboration between tourism and meteorological professionals in NMHS. In association with this seminar, a UNEP/UNWTO/WMO/Oxford University joint publication has been produced as part of the series of UNEP *Manuals on Sustainable Tourism*.

WMO has an active partnership with the International Association for Urban Climate (IAUC), and the relationship is further strengthened by the Working Arrangement between WMO and IAUC approved by the governing bodies of both, as well as the WMO co-sponsorship of the 7th International Conference on Urban Climate (July 2009, Tokyo, Japan). WMO experts developed a bibliography on urban and *building climatology*, which is hosted and maintained by IAUC on their website with WMO support. A complete draft of the technical document on Building Climatology was finalized, and is currently under peer review and in the publication process.

CHALLENGES

The key challenges include consideration of, and cooperation with, the risk management community and decision-making bodies in climate-sensitive sectors in all their forms and at all levels, and the development of a comprehensive strategy to address them in a practical manner. This will involve tailoring and communicating climate information, including aspects of uncertainty, and building a framework for NMHS-user partnerships at the national level. Addressing the inadequate technical capacities at the national and regional levels, particularly in developing countries, is a major requirement in this context. Another major challenge is taking partnerships with sectoral agencies to the next level and integrating their own initiatives on climate issues into WCASP activities.

LESSONS LEARNED

Capacity-building, particularly at the national level, is still a major requirement to mainstream the provision of user-oriented climate information and prediction products. Mechanisms such as RCCs and RCOFs can greatly facilitate sustained capacity-building as well as operational activities. Close collaboration between research and operational activities as well as effective user interaction mechanisms are critical to improve the quality of climate services.

EMERGING NEEDS FOR FURTHER ACTION

The outcomes of the recent World Climate Conference-3 (WCC-3), especially the Global Framework for Climate Services (GFCS) could be considered the logical evolution of the WCASP/CLIPS project to foster operational climate services around the world and develop a Climate Services Information System that optimally utilizes and builds on the already established mechanisms such as Global Producing Centres (GPCs), RCCs, RCOFs and NMHS. The consensus-based products such as the WMO El Niño/La Niña Update need to be expanded to provide more comprehensive global seasonal climate updates. Sector-specific climate indices also need to be developed to provide tailored and actionable climate information.

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[17] <http://www.wmo.int/pages/prog/dra/eur/SEECOF-3.php>.
[18] <http://www.wmo.int/pages/prog/wcp/wcasp/seriespubs/documents/WCASP81_TD1535.pdf>; <http://www.imdpune.gov.in/sascof_meet.pdf>.
[19] <http://www.wmo.int/pages/prog/wcp/wcasp/seriespubs/documents/WCASP78_TD1509.pdf>.
[20] <http://www.wmo.int/pages/prog/wcp/wcasp/RCOFReview2008.html>.
[21] <http://pub.unwto.org/WebRoot/Store/Shops/Infoshop/488D/8160/A10F/4CE3/93D0/C0A8/0164/2C78/080725_climate_change_excerpt.pdf>.

A. ENHANCING THE ASSESSMENT AND UNDERSTANDING OF IMPACTS AND VULNERABILITY TO CLIMATE CHANGE

A.2 PROMOTING THE UNDERSTANDING AND AWARENESS OF IMPACTS AND VULNERABILITY TO CLIMATE CHANGE

8. BANGLADESH CENTRE FOR ADVANCED STUDIES (BCAS)

TRAINING PROGRAMME ON CLIMATE CHANGE AND WATER: VULNERABILITY AND ADAPTATION, HELD IN DHAKA, BANGLADESH, FROM 2 TO 9 AUGUST 2009 UNDER THE CROSSING BOUNDARIES PROJECT.

BCAS, in association with the South Asian Consortium for Interdisciplinary Water Resources Studies (SaciWATERs), organized a training programme on vulnerability and adaptation to climate change in the water sector. It focused mainly on climate change as a phenomenon, its manifestations and impacts on ecosystems, and its implications for water resources management in South Asia. In addition, it dealt vulnerabilities of livelihoods and the strategies for adaptation in the context of integrated water resources management.

The target groups of the training programme were the staff of the academic partner organizations in South Asia, including: the Bangladesh University of Engineering and Technology, Anna University (India), Peradenya University (Sri Lanka), and the Nepal Engineering College. The training was offered by SaciWATERs through BCAS.

The Crossing Boundaries project has proposed the inclusion of a course module on water and climate change in the curriculum of the Master's degree programmes of its partner institutions.

INTERIM RESULTS

It is expected that the participants in the training programme will be able to understand the concept of climate change and its impacts on water resources and society, and to prepare and introduce a module on water and climate change in their ongoing curricula. Some of the universities, such as the Bangladesh University of Engineering and Technology, have already initiated the course on climate change and water under their Master's degree programme as a result of the training programme, while other partners are in the process of initiating such a course.

CHALLENGES

- The lack of awareness among the academics of the partner institutions, most of whom were engineers, on climate change and its implications on water resources made it difficult to develop specific training materials that were suitable for the group;
- The process of mainstreaming climate change issues into academic curricula could be lengthy and challenging, partly due to a lack of understanding on climate change and its associated impacts on engineering/technological academic disciplines, and among academic policymakers, etc.;
- Macro- to micro-level evidence-based case studies and experiences were not adequate as learning tools.

LESSONS LEARNED

The interest and responses of the programme participants were significant: they were keen to learn more about climate change and its impacts, not only on water resources but also on all relevant sectors and subsectors. Enhancing academic research on climate change related issues is therefore very important: academics from all other relevant sectors should participate in a similar training programme to strengthen the knowledge base at individual and institutional levels. It was evident that incorporating climate change in the course curricula of tertiary education institutions may have positive impacts for the future in the areas adaptation and mitigation. This, in turn, will contribute to a more effective policy- and decision-making process, as the target groups will be expected to enhance their own capacities with time, and to share the lessons learned with students and colleagues.

EMERGING NEEDS FOR FURTHER ACTION

Developing similar training programmes to enhance the capacity of academics from different disciplines is essential in order to better understand the cross-cutting issues and to enable a multidisciplinary approach that is essential for mainstreaming adaptation.

Enhancing the development and strengthening the teaching of courses on climate change at both graduate and postgraduate levels is also necessary. The climate change module proposed by the project can be taught in many disciplines, especially in environmental, engineering and social disciplines, in order to develop better, and climate-resilient, structural and non-structural adaptation measures.

Seminars, dialogues and conferences on climate change issues should be organized in academic institutions to strengthen the capacity within their own environment and system.

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Image IIX-4. **The training workshop for the faculty members of the partner institutions of the South Asia Regional Crossing Boundaries project organized by BCAS and SaciWATERs**

9. GRADUATE SCHOOL OF GLOBAL ENVIRONMENTAL STUDIES, KYOTO UNIVERSITY

CLIMATE AND DISASTER RESILIENCE INITIATIVE.

Rapid urbanization poses significant challenges for national, and particularly local, governments to manage the urbanization process in a way that ensures and enhances development. The CDRI is an umbrella initiative of Kyoto University, funded by the Japanese Government through the Global Center of Excellence (GCOE) programme Human Security Engineering for Asian Megacities, which contains components on research, education, training and implementation.

Launched in 2008, the project is currently being implemented in four different phases, focusing on:

- The regional analysis of Asian cities;
- Country-level analysis;
- Cluster cities analysis;
- Neighbourhood analysis within cities.

Under the Initiative, the Climate and Disaster Resilience Index (CDRI) is used to measure climate disaster resilience by considering five dimensions: physical, social, economic, institutional, and natural. Each dimension has five parameters and each parameter in turn has five variables. The CDRI questionnaire therefore contains 125 questions. Respondents are requested to assign weights to the variables and parameters in order to reflect the priorities of the cities and the relevance of the indicators to the local situation. Using data collected from the questionnaires, the weighted mean index (WMI) and aggregate weighted mean index (AWMI) methods were used to compute the scores for each parameter and dimension, respectively. The CDRI value of the city (ranging from one to five) is the simple average of the indices of the five dimensions. Higher CDRI values indicate greater preparedness to cope with climate change and disasters. However, these results are not absolute values but serve predominantly as broad policy guidance. The quality of the results is highly dependent on the quality of the input data received from the survey respondents.

Based on the results, the strengths and weaknesses of the cities in each of the five dimensions are highlighted. Policy issues and recommendations are subsequently suggested in order to encourage local governments to engage in specific institution- and capacity-building. The outputs of the study are not only useful to local governments but also provide valuable knowledge and information to other local and national stakeholders with a similar target: the enhancement of community resilience. Figures IX-3 and IX-4 below illustrate the results of the analysis and to facilitate comparison between the dimensions (figure IX-3) and between the cities (figure IX-4).

INTERIM RESULTS

Since its launch, the CDRI has been applied to assess the existing level of climate disaster resilience in a total of 44 cities across Asia. This includes a range of assessments undertaken in 12 Indian cities of varying sizes and with different geographic features. These analyses have facilitated the comparison of resilience levels among cities within and across Asian countries.

Several training programmes for city managers have been organized in cooperation with CITYNET, the Tokyo Development Learning Center of the World Bank, the United Nations International Strategy for Disaster Reduction (UNISDR), the Sustainable Environment and Ecological Development Society, and other partners.

Between January to April 2010, a blended learning programme was organized over a three-month period, using online self-training resources, face-to-face workshops and video conferences.

CHALLENGES

The key challenge is to ensure that the cities remain motivated to take decisive actions to enhance resilience.

LESSONS LEARNED

Integrating climate change adaptation (CCA) activities into city operations and services such as water supply and solid waste management, is key to engage local governments in CCA actions. It is important to incorporate plans aimed at enhancing CDR into city development plans in order to effectively manage climate risks and strengthen resilience in urban areas. High-level commitment of key municipal stakeholders is essential to the sustainability of actions at city level. Regional organizations (e.g. CITYNET) play an important role in maintaining the motivation/momentum through periodic monitoring.

EMERGING NEEDS FOR FURTHER ACTION

Additional training programmes for city managers are needed to scale up awareness and capacity. High-level roundtables are required to further raise the awareness of city decision-makers about the issue, and to enhance their willingness and motivation to take decisive action. Additional momentum could be gained through the UNISDR's campaign for safer cities, My City is Getting Ready.

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Figure IX-3. **A typical five-dimensional climate disaster resilience index city analysis**

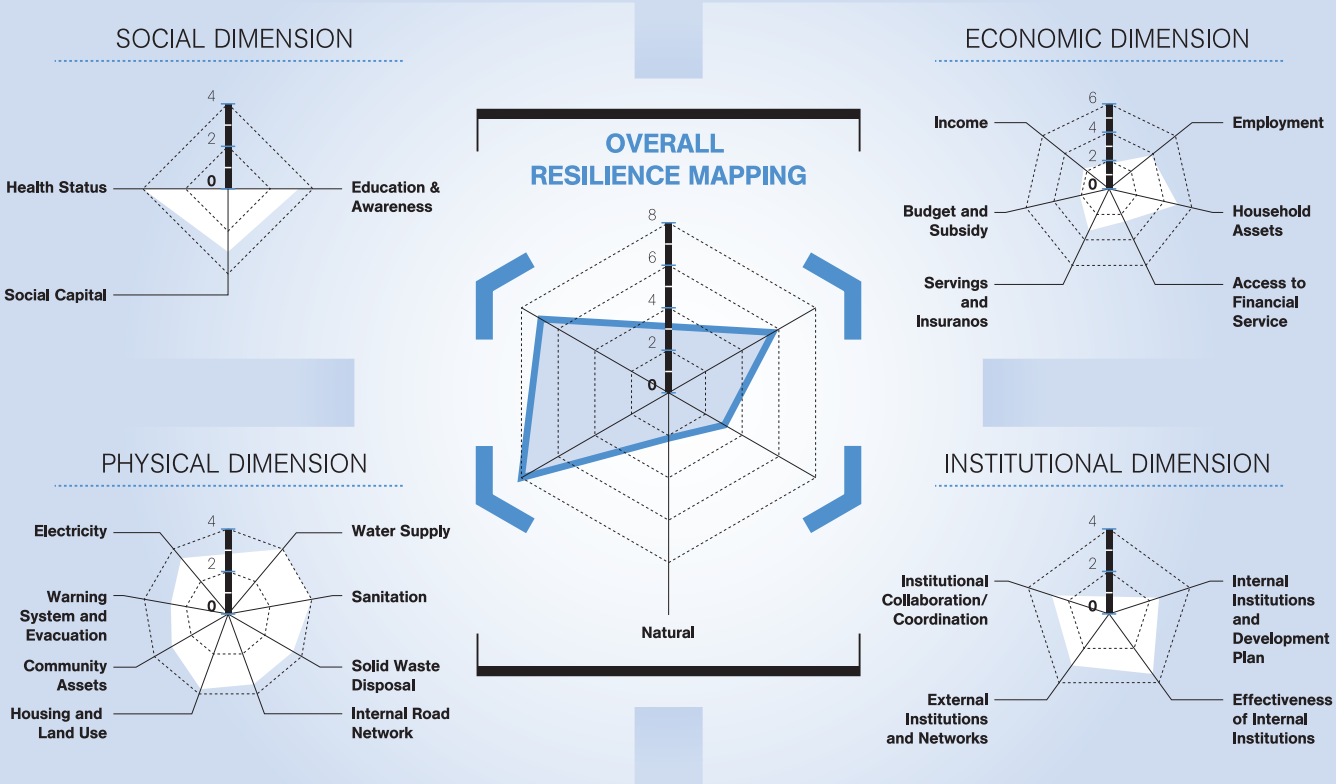
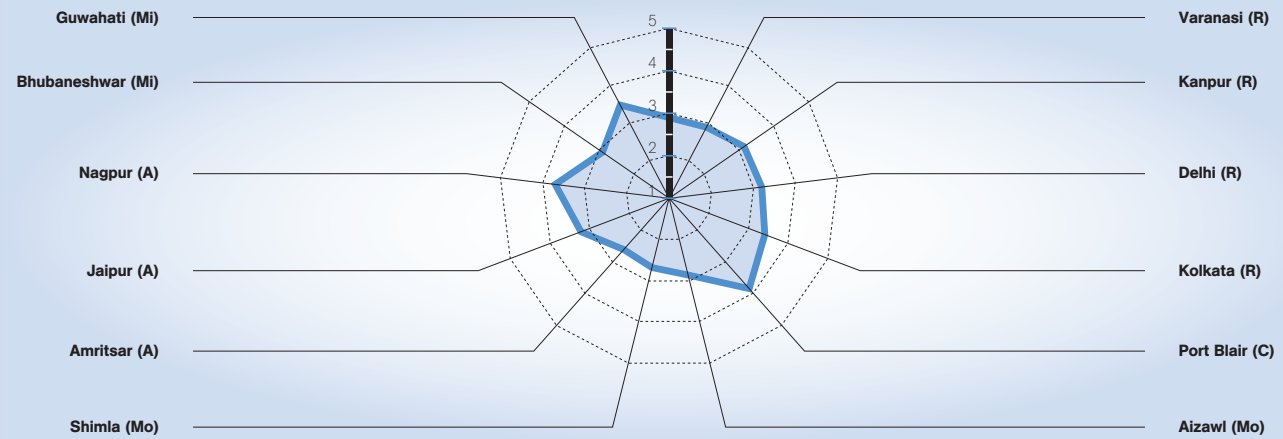


Figure IX-4. **A comparison of climate disaster resilience index scores among various cities in India**



10. SAHARA AND SAHEL OBSERVATORY (OBSERVATOIRE DU SAHARA ET DU SAHEL) (OSS)

UNLOCKING AFRICA'S CLIMATE SCIENCE: UNDERSTANDING THE FINDINGS OF THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC AR4).

Africa remains the most vulnerable region to the impacts of climate change: its vulnerability is attributed to the fact that development is strongly dependent on climate. Africa has limited technical capacity and expertise in climate change, and where the knowledge does exist, it is not easily accessible due to the lack of and/or limited coordination between knowledge-generators and end-users. This has resulted in the further widening of the gap between science and policy, thus limiting the integration of scientific facts into national policy processes. It is within this context that OSS, Climate Change Adaptation in Africa (CCAA) and the International Development Research Centre (IDRC) undertook to disseminate the key findings of the IPCC AR4 to African researchers through a workshop held from 29 to 30 April 2008 in Marrakech, Morocco. The workshop aimed to broaden the knowledge base of Africa's scientists on climate science and related aspects. Around 90 multidisciplinary researchers from different African subregions attended the workshop.

The workshop's two-day programme consisted of four technical sessions, which were structured around the work of the three working groups of the IPCC: climate science; impacts and adaptation; and mitigation. Each session was conducted by a group of relevant IPCC experts, and presentations of the main IPCC findings served as a basis for moderated discussions.

INTERIM RESULTS

The interim results include:

- A thorough review of the latest developments in climate science in Africa, including the opportunities and challenges arising from climate change from an African perspective;
- Enhanced awareness and outreach, in particular multidisciplinary collaboration, and the sharing of experiences on climate science across different areas;
- A better understanding of the IPCC assessment procedures, including participation in the process;
- Enhanced motivation of African researchers to be proactive in the forthcoming IPCC AR5 (to be completed in 2014) by, among other things, publishing peer-reviewed journal articles.

CHALLENGES

- Many researchers were not aware of the ways in which they could contribute to the IPCC process, hence the limited contributions of African researchers in the IPCC assessment reports;
- A wide knowledge gap exists and does not give due attention to Africa's diversity;
- The science-policy link is still weak, partly due to the dearth of reliable data and limited mechanisms available to mainstream climate change into development strategies and planning;
- The exorbitant cost of acquiring data and setting up a cluster of regional computing centres (centres de calcul);
- The workshop has identified several key questions for further action, including:
  - How could policy trigger a desirable market for mitigation and adaptation?
  - Given that forests constitute the rural poor's last resort when production systems fail due to land degradation, how could climate opportunities such as Reduced Emissions from Deforestation and Degradation (REDD) complement poverty reduction policies and strategies?

LESSONS LEARNED

- Africans cannot afford to be inactive and wait for others to provide them with scientific knowledge. The acquisition of knowledge by local scientists remains fundamental if Africa is to stay at the forefront of the work in this area; Africa's idiosyncrasies and diversity need to be taken into account;
- The gap between science and policy must be bridged through the effective communication of science;
- The importance of solidarity among the African scientific community, especially networking, to mobilise and maximise the limited existing expertise;

EMERGING NEEDS FOR FURTHER ACTION

Emerging needs for further action include:

- Putting the African scientific community on the map by mobilising additional resources to enhance the participation of African scientists in the IPCC and other international climate science processes. This could include enabling scientists to: participate in the preparation of national communications which are often reviewed in the IPCC assessment reports, and publish articles in peer-reviewed journals as well as other forms of literature such as websites, science cafés, etc.;
- Prioritizing science and research initiatives. The regional institutions should focus on comprehensive studies that are more solution-oriented in order to solve real development problems through sound scientific facts;
- Effective science communication in Africa needs to be advanced by training skilled audience-specific communicators. For example, policymakers require precise facts and complicated terminology-filled documents;
- Building and strengthening knowledge-sharing networks among regional research hubs through the 'hub and spoke' model, 'virtual globe', and teleconferencing moderated by experts.

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Image X-5. **African researchers and scientists during the IPCC dissemination workshop in Marrakech**

Image X-6. **African participants and IPCC keynote speakers during the dissemination outreach. On the photo are IPCC panelists (Dr. Youba Sokona, Executive Secretary of OSS Prof. Peter Bosch, IPCC technical working group III).**

11. GLOBAL CHANGE SYSTEM FOR ANALYSIS, RESEARCH AND TRAINING (START)

DEVELOPING ADAPTIVE CAPACITY FOR CLIMATE CHANGE IN ASIA'S COASTAL MEGACITIES.

Asia is experiencing unprecedented rates of urban growth. Large coastal cities are particularly at risk from climate change and associated impacts, including sea level rise. Often, physical risks and vulnerabilities are exacerbated by a deficit of adaptive capacity in affected cities. The Cities at Risk (CAR) initiative – a collaboration between START and several partners – includes a set of activities for developing urban adaptive capacities for managing climate risks in Asia's coastal megacities. The CAR initiative aims to facilitate coordinated action among scientists, policymakers and the public to support impact and vulnerability assessments, awareness-raising about climate change risks, and the integration of scientific information about impacts, vulnerabilities and adaptation into planning and policy for the affected areas.

INTERIM RESULTS

The CAR workshop, held in February 2009 in Bangkok, Thailand, brought together nearly 80 scientists, urban planners and officials, and representatives of disaster management and development agencies to review the most recent scientific findings and projections regarding climate-related risks for Asia's coastal megacities; examine potential vulnerabilities and current coping mechanisms in the cities; and discuss actions, in both the short and long term, that would enhance the capacity of cities to manage the risks and vulnerabilities. By bringing together key stakeholders under a common umbrella, the workshop contributed to the sharing of critical knowledge and experiences among participants and helped to lay a foundation for future communication and collaboration. Major workshop recommendations are summarized on the START website.[22] The workshop was organized by START in partnership with the East-West Center, Ibaraki University and SEA-START (Thailand), and was funded by the Asia-Pacific Network for Global Change Research (APN) and the International Council for Science (ICSU).

In June 2009, START collaborated with the World Bank Institute and other partners to facilitate 'training of trainers' sessions and adaptation visioning exercises in Bangkok. Training sessions introduced regional facilitators to the use of people-centred storylines that employ role-playing and group exercises to enable scenario-building and visioning in cities affected by climate change. A storyline-visioning exercise was then facilitated for the city of Bangkok, which engaged participants from city government, the private sector and civil society in activities with the aim of promoting the mainstreaming of climate change considerations into city planning and policy.

A CAR training workshop – to be held in August 2010 in Bangkok – will build the capacities of city teams to carry out integrated vulnerability assessments and apply them to urban development planning and governance. A CAR II conference is planned for early 2011.

CHALLENGES

There is currently an 'information disconnect' between the climate science and planning communities. The communication barrier between those who produce scientific knowledge and can inform adaptation and those who need that knowledge hinders action. Improved, multi-directional communication and information exchange will promote more effective integration of climate change into planning and development.

LESSONS LEARNED

Within urban planning, there is often uncertainty in understanding climate change versus shorter-term climate variability. Lessons learned from cities' practical experiences in managing current climate variability and stresses are an entry point, however, as they can inform planning for, and adaptation to, longer-term climate impacts and changes. Indeed, assessments of likely climate change impacts should begin with an analysis of current climate stresses followed by an investigation on how changes or shifts in the climate will magnify/moderate current vulnerability and/or create new ones.

It is also important to identify and encourage an 'entrepreneur' in urban government to help make climate change a priority. Experience shows that the presence of such an individual within city management is a catalyst for the integration of climate change concerns into city planning.

Additional capacity-building activities are needed, particularly those that raise awareness on aspects of urban management, including increased risks and vulnerabilities in Asian megacities.

EMERGING NEEDS FOR FURTHER ACTION

There is an urgent need to build capacity among individuals and institutions to respond to climate change in Asia's megacities. Enhancing local expertise in climate risk management for cities should be a priority. Effective governance is needed at all levels to integrate adaptation into development strategies.

Future activities, as part of coordinated programming and networking, are expected to include additional city-specific exercises (e.g. visioning/storyline activities, needs assessments, training exercises), development of resource materials, hands-on thematic training courses for young scientists and practitioners, and advanced workshops and institutes.

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[22] <www.manystrongvoices.org/library>.

12. UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)/ GLOBAL RESOURCE INFORMATION DATABASE (GRID)-ARENDAL

MANY STRONG VOICES (MSV)

MSV connects the Arctic and small island developing states (SIDS) – two of the regions most vulnerable to the effects of climate change. The goal of MSV is to promote the well-being, security and sustainability of coastal communities in the Arctic and SIDS by bringing these regions together to take action on climate change mitigation and adaptation, and to tell their stories to the world.

The Arctic and SIDS are barometers of global environmental change. They are considered critical testing grounds for the ideas and programmes that will strengthen the adaptive capacities of human societies confronting climate change.

MSV builds capacity and networks in the Arctic and SIDS to support the voices of people in these regions in international processes dealing with climate change. It raises awareness about the effects of climate change on vulnerable regions in general, and on the Arctic and SIDS in particular. It also works to understand regional needs and generate practical mitigation and adaptation solutions through innovative community-based research and knowledge exchange.

MSV supports the objective of the Nairobi work programme by helping to improve understanding and assessment of impacts, vulnerability and adaptation. It also helps partners to make informed decisions on practical adaptation actions and measures to respond to climate change.

As an action pledge, MSV has four interconnected and mutually reinforcing tracks:

- Working with local and regional partners, it conducts vulnerability and adaptation assessments in SIDS;
- It is developing new climate change networks to facilitate the sharing of knowledge and best practices between vulnerable regions, and within the regions themselves;
- It supports community efforts to devise concrete, community-relevant adaptation strategies; and
- It develops communications tools that will ensure that people's voices in the two regions are heard in international negotiations, and will inform people on a local level.

INTERIM RESULTS

Interim results identified include:

- Major planning workshops were held in Belize (2007) and Washington (2009) to develop strategies and plans, expand networks, share information, develop new project ideas, etc.;
- With its coordinating partner CICERO (Center for International Climate and Environmental Research), MSV expanded research initiatives and networks focused on vulnerability and adaptation assessments of SIDS communities. An ecosystem-based adaptation project was approved as part of the UNEP 2010–2011 Programme of Work;
- A 'virtual library' was developed with assistance from UNEP[23] as a resource for MSV partners;
- A report on the effects of climate change on food security in the Canadian Arctic was produced.[24] A second-stage project linking to SIDS is being developed;
- MSV messages were delivered at the United Nations General Assembly in 2009 by the Ambassador for the Seychelles. MSV spokespersons also participated at a high-level event hosted by Norway and chaired by Secretary-General Ban Ki-moon in Svalbard, Norway;
- The Portraits of Resilience[25] photography exhibition was launched at the National Museum of Denmark during the Conference of the Parties on its fifteenth session (COP 15) negotiations and provides an opportunity for young people in vulnerable communities to write about climate change and illustrate the changes they are witnessing through their own photography;
- MSV worked with many partners in the UNFCCC process on side events and other networking activities;
- MSV helped to develop a human rights language for SIDS governments during the COP 15 negotiations.

CHALLENGES

Challenges identified include:

- Coordinating efforts across multiple time zones remains a challenge, together with the ongoing need to fundraise for activities;
- Working with distant and often remote regions exerts pressure on programme budgets;
- Making sure SIDS and Arctic issues remain on the global agenda.

LESSONS LEARNED

Lessons learned include:

- Despite the differences in the Arctic and SIDS, the challenges faced as a result of climate change are remarkably similar, and each region has much to offer;
- The Arctic and SIDS have powerful stories to tell: combining them is an effective method of reinforcing the urgent need for action and attracts the attention of governments, funders and the media;
- People from these regions are quick to recognize common interests and the advantages of collaboration, and have developed into natural allies. This raises the possibility of expanding the programme to include other vulnerable regions;
- The best storytellers are the people who directly experience the effects of rapid climate change. The most effective among these are young people, who have an acute awareness of their personal stake in the future;
- The north has much to learn from the south when it comes to adaptation – the idea of "mainstreaming" adaptation is new in the Arctic, whereas it is common practice in many SIDS;
- The time required to accomplish activities is often longer than anticipated;
- The limited human and financial capacity in many organizations in the MSV network means that there is a need to look for ways to address issues from multiple perspectives;
- There is a need for innovative ways to communicate effectively across multiple time zones, which is important for holding together a very loose network;
- The current model of a loose network comprised of a variety of different organizations with different mandates, experience and capacity is probably the best way to organize collective initiatives.

EMERGING NEEDS FOR FURTHER ACTION

Emerging needs for further action include:

- Integrating the developing research knowledge base with communications and outreach activities;
- Broadening the network to include more SIDS and Arctic communities;
- Continuing to raise the project's profile in order to enhance the voices of people in the regions;
- Further engagement of young people in the overall programme;
- Coordinated and longer-term funding.

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Image XII-7. **A boy stands on remains of a sea wall on the island of Shishmaref, Alaska. Coastal erosion due to climate change could force the community relocate to the mainland.**
(Photo credit, Jordan Pootoogooluk)

Image XII-8. **A young girl in the Seychelles faces an uncertain future due to rising sea levels.**
(Photo credit, Dylan Nalletamby)

[23] <www.manystrongvoices.org/library>.
[24] <http://www.manystrongvoices.org/news/4196.aspx>.
[25] <www.manystrongvoices.org/portraits>.

13. UNITED NATIONS UNIVERSITY INSTITUTE FOR ENVIRONMENT AND HUMAN SECURITY (UNU-EHS)

STUDY ON CLIMATE CHANGE, HUMAN MIGRATION AND DISPLACEMENT.

The UNU-EHS is working with Georgetown University as a co-chair of the German Marshall Fund Study Group on Climate Change and Migration within the framework of ongoing research on environmentally induced migration.

The aim of the Study Group, supported by the German Marshall Fund, is to enhance the understanding of the interlinkages between climate change and migration, and to identify possible policy frameworks for addressing migration that may result from changing climate conditions. The Study Group was assembled to examine four channels through which the environment influences human migration and displacement:

- Increased frequency and magnitude of weather-related natural disasters, such as hurricanes and cyclones that destroy infrastructure and livelihoods and require people to relocate for shorter or longer periods;
- Changes in weather patterns that contribute to longer-term drying trends that affect access to essential resources such as water and negatively impact the sustainability of a variety of environment-related livelihoods including agriculture, forestry, fishing, etc.;
- Rising sea levels that render coastal and low-lying areas uninhabitable in the longer-term;
- Competition over natural resources that may exacerbate the pressures that contribute to conflict, which in turn precipitates displacement.

Case studies were carried out in Bangladesh, Mexico and Senegal.

INTERIM RESULTS

The Study Group outlined three scenarios applicable to many vulnerable countries:

- Sudden, large-scale forced displacement caused by sudden-onset disasters;
- Unplanned rural-urban migration into growing urban slums and other areas, possibly creating conflict and tensions over competition for land;
- More gradual migration to other destinations within a country and abroad, facilitated by sufficient economic assets, skills, etc., among out-migrants to support sustainable livelihoods at destination and remittance flows back to source communities.

Key findings from this study include:

- Environmentally induced migration has the potential to become an unprecedented threat in future;
- In the three countries studied, unsustainable development practices compound problems and pose more immediate challenges than global climate change. The Study Group observed the needed – but poorly planned and executed – risk management measures. The Study Group also observed the unintended impacts of inappropriate policy on soil salinization and land degradation, and inappropriate river basin management, all of which influence highly vulnerable local populations and their mobility decisions. The increased weather variability exacerbates the situation and may increase migration;
- Internal and international migration has been one of the mechanisms for people in certain areas, such as drylands, to cope with natural degradation. Vulnerable countries and regions where large parts of the population are directly involved in agriculture and fishing makes them more sensitive to environmental changes;
- The coming years are likely to witness continuous large-scale migration out of the agricultural sector, particularly in developing countries where farm incomes are significantly lower than non-farm incomes. Climate change, specifically global warming, is likely to accelerate this pace of migration;
- Several economic models project that global warming will have greater effects on the distribution of farm production than global farm output, with new areas becoming viable for farming as a result of higher temperatures. However, the study predicts that far more people are likely to be displaced by global warming compared to those who could probably find jobs in these new farming areas, which are often located in developed countries;
- The three countries differ significantly in the extent to which their populations will be likely to sustain themselves at home or will seek other options. Very high levels of vulnerability in Bangladesh and Senegal may mean that migration, particularly resulting from acute natural disasters, will occur with little forewarning and under emergency conditions threatening the livelihood of communities.

CHALLENGES

The Study Group identified several challenges that will influence human migration and displacement in the context of climate change:

- It is challenging to identify direct and determinative causal linkages between climate change and migration in a scientifically rigorous manner because of the presence of other factors;
- Emerging empirical research suggests that environmental change plays a role in human mobility, but more research is necessary to understand the dynamics and policy implications;
- While the parameters are still undefined, more empirical research and data will be needed in order to better understand the interactions between environmental factors and human mobility, as well as the intervening factors that affect migration or non-migration when environmental changes occur;
- Policymakers require better information, empirical data, and analysis of both the threats and the potential solutions for environmentally induced migration.

LESSONS LEARNED

Key lessons learned from the study include:

- An understanding of how climate change contributes to human movements. The study focused on migration resulting from: (i) intensified drought and desertification that adversely affect livelihoods; (ii) rising sea levels that inundate coastal areas and may prove particularly harmful to low-lying island countries; (iii) intensified acute natural disasters that lead to temporary and permanent displacement; and (iv) competition for natural resources that results in intensified conflict, which in turn causes mass displacement. The first two impacts of climate change are likely to cause "slow onset migration", in which people seek new homes and livelihoods over a lengthy period of time as conditions in their home communities worsen. The third and fourth impacts are more likely to create conditions that cause immediate movements, often in emergency situations;
- Understanding the history of migration for projecting future migration is essential to understanding the ways in which further desertification due to climate change may affect future movements;
- An understanding of factors that affect the propensity of people exposed to climate change impacts to migrate: a combination of factors affect people's ability to cope with the impact of climate change and the likelihood that they will turn to migration (or be forced to migrate), including household vulnerability, rates of population growth, availability of sustainable livelihood options, etc.

EMERGING NEEDS FOR FURTHER ACTION

As the expected impacts of climate change become more apparent in the future, research should focus on more rigorous multidisciplinary approaches. Methods and approaches that find ways to isolate the role of environmental variables in the migration decision are needed. Another way to help isolate environmental variables in the migration decision would be to test different typologies of environmentally induced migration.[26]

Policymakers need to make strategic investments – in dialogue, resources, and thinking – in the following four areas which would help address some of the challenges related to human migration and displacement in the context of climate change:

- *Science*. More support for in-depth qualitative and quantitative research in specific hotspot regions;
- *Dialogue*. Foster solutions-oriented policy dialogues that review existing experience and identify emerging good practices in areas such as designing alternative livelihoods, facilitating migration where appropriate, relocation and resettlement of populations;
- *Participatory policy planning.* Involve affected communities in policy planning and implementation of human mobility solutions;
- *Proactive approaches.* Create alternative livelihoods in situ, and options and opportunities in those cases where in situ adaptation may not be possible at some point in the future. Implement effective disaster risk reduction and conflict mediation policies to reduce the likelihood of emergency movements with accompanying humanitarian consequences.

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[26] See, for example, Renaud *et al.*, 2007 and 2009.

14. WORLD HEALTH ORGANIZATION (WHO)

EDUCATION, TRAINING AND AWARENESS-RAISING INITIATIVES ON CLIMATE CHANGE AND HEALTH.

WHO's action pledge to contribute to the Nairobi work programme corresponds to WHO's mandate from its 193 member States to:

- Advocate and raise awareness of the effects of climate change on health;
- Engage in partnerships with United Nations organizations and sectors other than the health sector at all levels to ensure that health protection and promotion are central to climate change adaptation and mitigation policies;
- Promote and support the generation of scientific evidence of the impacts and risks of climate change on health;
- Strengthen health systems to cope with the health threats posed by the climate.

INTERIM RESULTS

WHO, through its Regional and Country Offices, has conducted various education, training and awareness-raising activities on Climate Change and Human Health (CCHH), targeting various groups, including youth, health, environmental and disaster risk reduction professionals, researchers, and decision-makers at community, national, regional and global levels. The interim results achieved to date include:

At the global level:

- World Health Day 2008, a global campaign to raise awareness of the impacts of climate change on health launched worldwide;
- Publication of scientific studies, editorials, and technical publications to raise awareness and build capacity, with international media events for the launch of key studies;
- Increased dissemination of key technical, scientific, and advocacy-based information via the internet, social media, workshops and conferences;
- Establishment of regular consultation and information-sharing on health and social issues with UNFCCC negotiators;
- World Health Assembly (WHA) and ministerial-level declarations in each region endorse and take action on protecting health from climate risks;

At the regional level:

- Over 17 regional and subregional workshops to raise awareness, build partnerships and catalyse regional action, targeting health professionals and multisectoral stakeholders;
- Over 60 national workshops highlighting local climate risks to health and catalysing national action, targeting health professionals and multisectoral stakeholders;
- Development of training materials on how to create national heat-health action plans and multi-hazard disaster preparedness in Europe, targeting health and environment professionals and decision-makers;
- Mobilization of youth networks on climate protection in Southeast Asia;
- Multiple training courses on health and climate change for health and environment professionals and students (e.g. community health workers, researchers and decision-makers) developed and conducted in all regions;
- Nine national workshops and training seminars with multidisciplinary working groups on how to integrate health into adaptation strategies in Europe and Central Asia for focal points of the UNFCCC, ministries of the environment and ministries of health, public health institutions, the disaster community, and researchers;
- Subregional international training courses on vulnerability and adaptation assessments in Europe and Central Asia for health professionals (e.g. community health workers, researchers and decision-makers);
- Training manuals for schoolteachers on the effects of climate change and the promotion of mitigation measures in school settings have been developed. Training workshops for schoolteachers are ongoing in Southeast Asia (Timor-Leste);
- Six countries in Southeast Asia currently include topics and materials on climate change and its health impacts in their school curricula;
- A training package for city health officials has been developed by the WHO Kobe Centre in Asia for city health officials.

CHALLENGES

Challenges identified include:

- The health sector is not often represented in national and global climate policy forums. Despite health being one of the principle sectors affected by climate change, the representation of health issues and

health personnel within climate discussions remains low. Limited financial resources for adaptation are being specifically allocated for health protection, thereby maintaining low incentives for health sector engagement;
- New risk conditions require new thinking, new tools, and new training courses. Decision-makers have not broadly incorporated longer-term climate patterns into analyses of health determinants and longer-term planning and resource allocations;
- There is limited global technical capacity in assessing climate risks for health and programming adaptation;
- The translation and dissemination of key literature, tools, and resources from English into local languages need to be further enhanced. Key concepts and terminology used in the climate and health domains are similar but not always interchangeable;
- Skill-building for country-level health professionals requires significant customization. Significant time, resources, and the engagement of experts are required to customize training packages in order to reflect the wide range of health issues affected by the climate and to be appropriate for the level of health system capacity and health worker knowledge which exists across WHO regions.

LESSONS LEARNED

Lessons learned include:

- Political legitimacy and leadership is essential for action. WHO sought the endorsement of health protection from climate risks at the highest levels, achieving a WHA Resolution, regional declarations, and workplans signed by ministers of health worldwide. Providing health sector ownership of the issue establishes a mandate and entry point for more direct engagement of the health sector with climate issues and risk management;
- Better engagement of the health sector with climate issues is achieved when climate issues are not presented as a competing agenda to current priorities. It is important that training messages build on current practices and focus on how climate information can improve the decisions and preparedness measures already taken by health professionals. Best practices for adaptation can illustrate examples of positive, proactive, and proven public health interventions to reduce vulnerability and prepare for crises;
- Building evidence through a learning-by-doing approach also builds capacity. Advocacy and capacity-building in health protection from climate change requires a strengthened evidence base of the relationships between health outcomes and climate and meteorological conditions. WHO approached both challenges by encouraging vulnerability and adaptation assessments in a learning-by-doing approach, where workshops, studies, and dialogues simultaneously improve local knowledge and strengthen evidence;
- Climate risk management for health requires intense multisectoral collaboration and integrated capacity, training, and problem-solving. Data and understanding of important climatic and environmental variables generally lie outside the health sector and are not well integrated with disease surveillance. Integrated training on health, climate, and environmental conditions is needed to strengthen public health preparedness and improve the targeting of interventions to protect the populations most vulnerable to climate-related health risks.

EMERGING NEEDS FOR FURTHER ACTION

Emerging needs for further action identified include:

- Improved awareness of the health benefits of clean energy and environmentally sustainable development choices, and the negative health impacts of decisions made in other sectors;
- Improved awareness of officials and UNFCCC negotiators on the health implications of climate change, and understanding that health protection underlies the achievement of economic development and global well-being;
- Increased country and regional expertise in climate risk management of sensitive diseases;
- Climate variability and change included as an environmental health risk in medical and public health curricula;
- Increased capacity in environmental health, epidemiology, Geographic Information Systems (GIS), and integrated data decision skills;
- Increased capacity of economic analysis and cost estimation to the global climate change community;
- WHO training curricula adapted for diverse audiences, and recognized ‘trainers of trainers’ established to expand the available capacity.

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B. IMPROVING THE ABILITY TO MAKE INFORMED DECISIONS ON ADAPTATION PLANNING, MEASURES AND ACTIONS

B.1 PROMOTING THE DEVELOPMENT, DISSEMINATION AND APPLICATION OF METHODS AND TOOLS

15. INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA (ICES)

TRAINING BY ICES: ACTION PLAN 2009–2010.

ICES coordinates and promotes marine research on oceanography, the marine environment, the marine ecosystem, and living marine resources in the North Atlantic Ocean. ICES is a network of more than 1,600 scientists from 200 institutes linked by an intergovernmental agreement (the ICES Convention)[27] to add value to national research efforts. Scientists working through ICES gather information about the marine ecosystem. Besides filling gaps in existing knowledge, this information is developed into unbiased, non-political advice. The 20 member countries – Belgium, Canada, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Latvia, Lithuania, the Netherlands, Norway, Poland, Portugal, the Russian Federation, Spain, Sweden, the United Kingdom of Great Britain and Northern Ireland and the United States of America – use this advice to help them manage the North Atlantic Ocean and adjacent seas.

In response to the need for enhanced scientific capacity to give advice on human activities for the effective, integrated management of marine ecosystems, ICES has developed the following training courses led by high-profile scientists:

- Stock Assessment (Introduction);
- Stock Assessment (Advanced);
- Ecosystem Modelling for Fishery Management (Ecopath-Ecosim-Ecospace);
- Joint ICES-ICCAT (the International Commission for the Conservation of Atlantic Tunas) course on Management Strategy Evaluation;
- Bayesian Techniques for Stock Assessment (including communication of results);
- Opening the Box: Stock Assessment and Fishery Advice for Stakeholders, NGOs, and Policy-makers.

The Training in ICES: action plan 2009–2010 responds to the needs identified in the "Methods and tools" work area under the Nairobi work programme. The overall objective of the involvement of ICES in training is quality assurance in the advisory process for management of the marine ecosystem. ICES has an obligation to ensure the availability of training on the management of the North Atlantic Ocean and adjacent seas for its member countries as needed. However, the courses are also open to applicants from outside ICES member countries in accordance with its objective to disseminate knowledge inside and outside the ICES community. The ICES training programme aims to:

- Ensure that the scientists in ICES expert working groups and other parts of the advisory process have the skills needed to deliver high-quality advice;
- Ensure a common understanding of ICES advisory practice;
- Disseminate insights inside and outside the ICES community;
- Facilitate cooperation with organizations with other expertise to bring new disciplines and perspectives to ICES science and advice.

The ICES training programme identifies and provides national expertise on teaching (national institutes, universities) to enhance existing training programmes. It does not compete with existing programmes offered by national universities and institutions but rather fills the information gaps for marine scientists operating in the advisory process. The ICES training group understands the importance of examining course outlines and trainee skill levels carefully to ensure that the courses focus on the principles, advantages and limitations of various assessment techniques rather than being simple computer programming exercises.[28]

INTERIM RESULTS

Stock Assessment (Introduction): A total of 64 trainees have attended two courses. The trainees had diverse educational backgrounds and work experience, representing young ICES working group members, academic researchers, fishery organizations, and conservation groups from 19 countries.

An ambitious outline of topics was taught, from simple model fitting and biological production to commonly used stock assessment methods (e.g. the biomass dynamics model, virtual population analysis and statistical 'catch-at-age' model) as well as biological reference points through stochastic long-term projection.

Stock Assessment (Advanced): Thirty-two trainees from 14 countries attended one course. The students came from a variety of backgrounds; some came directly from the beginner's course, whereas many had several years' experience in modelling and analysis. The three primary topics covered were: (i) the stock synthesis assessment

programme; (ii) the introduction to separable models and graphical methods for investigating data patterns; and (iii) data investigation methods and the use of diagnostics for an age-based fish stock assessment method.

Ecosystem Modelling for Fishery Management (Ecopath-Ecosim-Ecospace): the course attracted 27 trainees representing 14 countries. Acknowledging the global move towards ecosystem-based management of marine resources, the course focused on the use of the Ecopath with Ecosim (EwE) approach and an ecosystem modelling software system that is adaptable, flexible and user-friendly.

CHALLENGES

The participants' diverse backgrounds and varying levels of knowledge presented a challenge with regard to finding an appropriate skill level for the courses: This was confirmed by the participants' responses to a course questionnaire. It is important to prepare the course materials and exercises so that they strike a balance between the more and the less experienced trainees: to ensure that the group with more experience is sufficiently challenged while the less-experienced group is equally engaged.

LESSONS LEARNED

As indicated in the course questionnaire responses, there was an issue regarding the teaching of trainees with varying levels of knowledge. When preparing similar training courses in future, the following should be taken into consideration in order to maximize the benefit to all participants:

- Details and guidance should be identified and communicated to applicants regarding the level of familiarity or experience required to participate in a particular course prior to the start of the course in order to ensure that it runs smoothly. The course participants should be carefully evaluated for the required experience and qualifications prior to their selection for any training programme, which will result in the participation of trainees with similar knowledge and experience;
- Good coordination between instructors and the level of the course content is required for the development of course materials and assignments that are suitable to the trainees' level of knowledge and experience and for the overall improvement of the training programme.

EMERGING NEEDS FOR FURTHER ACTION

As some of the issues are of a global nature, there is a need to expand the geographic scope of this type of training to include a greater number of participants from non-member countries, international and intergovernmental organizations and conventions. There is also a need for a broader range of scientific expertise in order to provide advice on 'ecosystem considerations'. As such, a future training programme in this area should further engage the marine science community as well as a wider range of experts from universities and ministries.

The ICES training programme is currently developing the following training courses in response to these emerging needs:

- Integrated Ecosystem Assessment;
- Communicating Science and Advice;
- Survey Design and Evaluation (survey harmonization and assimilating data);
- Fishery Management to Meet Biodiversity Conservation Needs;
- Climate Impacts on Marine Ecosystems.

ICES plans to enhance its role as a leader in the coordination of marine and environmental research in the North Atlantic Ocean, in particular on topics of relevance to 'sustainable fisheries' and the integrated management of marine activities.

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[27] <http://www.ices.dk/aboutus/convention.asp>.
[28] <www.ices.dk/icework/training/training.asp>.

16. IBERO-AMERICAN NETWORK OF CLIMATE CHANGE OFFICES (RIOCC)

TRAINING COURSES ON CLIMATE CHANGE ADAPTATION.

As part of a broader capacity-building initiative, the RIOCC launched a series of training courses on climate change adaptation during the course of 2008 and 2009, consisting of:

- *Course A: training on the use of the Eta CPTEC regional climate model (Modelo Eta, Centro de Previsão de Tempo e Estudos Climáticos).*

  This course was designed for meteorologists and climatologists as well as technical experts working in the field of climate change in all RIOCC member States. The aim of the training was to strengthen the regional capacity for regional climate modelling and its application to adaptation planning at a local, national and regional level;

- *Course B: training on the formulation of adaptation projects.*

  This training course was intended for participants from public sector offices, consultants and university staff, to improve their capabilities to develop and implement adaptation programmes and projects, and to facilitate access to financial resources through multilateral institutions;

- *Course C: online training seminars on the international climate change regime.*

  These seminars were designed to provide an overview and periodic updates on the status of international climate change negotiations and the post-2010 global climate regime, and, thus, to promote the capacity and exchange of knowledge between civil servants from relevant sectors within the national governments of the RIOCC member States.

INTERIM RESULTS

All training sessions have been delivered.

- *Course A: The training was delivered in two phases: the first was held in July 2008 and the second in September 2009, both in Cachoeira Paulista, Brazil.*

  During the first phase, participants were given lectures on the conceptual framework of the regional climate model Eta/CPTEC, its parameters and application within the national and regional context. Upon completion of the first phase, participants ran the Eta/CPTEC model in their home countries, analysed the model outputs and obtained knowledge on the potential applications of these outputs for sectoral vulnerability assessments and adaptation planning. During the second phase of the training, participants discussed the results of the work they had carried out in their respective countries during the intersessional period.

- *Course B: This course was delivered in September 2009 in Panama.*

  Participants gained knowledge on how to identify and formulate adaptation projects and select tools for implementation. In particular, participants learned how to present projects to different international funding windows.

- *Course C: The first edition of course C was delivered in October 2008 and the second in October 2009.*

  These online seminars are helpful tools in keeping key stakeholders in RIOCC countries and beyond up to date with the latest developments in international climate change discussions.

CHALLENGES

The main challenge was to follow up on the participants of courses A, B and C to discover whether they had been able to apply the knowledge achieved and/or disseminate and exchange relevant information within their respective organizations, so as to multiply the benefits of attending the seminars.

LESSONS LEARNED

- Participants from course A highlighted the urgent need to improve systematic observation in all countries as part of any adaptation strategy. They also recognized that training on regional climate modelling is a technically complex undertaking;
- The importance of case studies, sessions with practical examples and the incorporation of budgetary considerations within the project formulation process was acknowledged by the participants of course B;
- The delivery of course C revealed the need to develop single-topic seminars given the diverse range of subject matters to be covered.

EMERGING NEEDS FOR FURTHER ACTION

Needs for further action, which are generic to all capacity-building efforts, include:

- Follow-up activities post-training, for example, through the exchange of information and experiences using virtual platforms;
- Increased participation from other sectors, such as finance ministries and universities.

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Image XVI-9. **Adaptation workshop flyer for training on the formulation of adaptation projects held in September 2009 in Panama**

17. GLOBAL CHANGE SYSTEM FOR ANALYSIS, RESEARCH AND TRAINING (START)

EDUCATION AND TRAINING PROGRAMME ON CLIMATE CHANGE AND BIODIVERSITY CONSERVATION IN THE ALBERTINE RIFT.

START, in partnership with the Institute of Resource Assessment (IRA) at the University of Dar es Salaam, United Republic of Tanzania, and with funding from the MacArthur Foundation, has developed an education and training programme on Climate Change and Biodiversity Conservation that aims to build individual and institutional capacity to address new and additional risks from climate change in the biodiversity-rich Albertine Rift region of eastern Africa. The Albertine Rift region is a source of many vital ecoservices for local communities and is increasingly under threat from a changing climate and other local drivers such as human-induced landscape changes.

Phase one of the programme was successfully implemented during 2007–2008, while phase two began in early 2010. Under this initiative, conservation practitioners, graduate students and university teaching faculties from the Albertine Rift countries of Burundi, the Democratic Republic of Congo, Rwanda, Uganda and the United Republic of Tanzania participate in Master's degree-level courses at the University of Dar es Salaam that provide theoretical knowledge on climate change and biodiversity issues, methods and tools for risk assessment, and interactive case study exercises. Participants also develop and execute field-based externship projects in the Albertine Rift region through which they can apply the principles learned from the university degree course. Phase two offers an expanded programme comprising another cycle of the education and training activities at the University of Dar es Salaam together with a 'training of trainers' component for educators from other Albertine Rift institutions and online distance learning modules to broaden the programme's reach to a greater number of individuals and institutions. A regional science-policy dialogue to inform and engage decision-makers is also planned.

INTERIM RESULTS

A total of 20 Albertine Rift participants successfully undertook advanced courses and externships under the phase one programme in 2007 and 2008. Feedback from participants indicated that they had derived significant benefits from the programme, including enhancing their knowledge and skills in climate change and biodiversity conservation and a strong expectation of employing these capabilities in their work. Notable accomplishments include:

- The majority of participants have been able to apply the knowledge gained through their participation in the programme to their professional activities, either through continued engagement in related research, as advisors to government, NGOs and community initiatives, or as university educators;
- The effort has linked participating individuals and their home institutions in a regional collaborative network;
- The programme curriculum has been successfully integrated into the University of Dar es Salaam's Master of Science programme in Natural Resource Assessment and Management, thereby ensuring its continued applicability;
- Faculty and staff at the IRA were given a capacity-building opportunity through the design and execution of phase one activities;
- The success of phase one has paved the way for the phase two programme.

CHALLENGES

Challenges identified include:

- During the implementation of phase one externship research projects, resource constraints made it difficult to ensure continuous supervision of participants in remote field locations;
- Feedback from participants also indicated a need for more intensive training in methods and tools during the course sessions at the University of Dar es Salaam.

The recently initiated phase two includes provisions for addressing these challenges in order to better meet the needs of participants.

LESSONS LEARNED

A key lesson derived from phase one concerned the need to sustain the efforts at the University of Dar es Salaam and expand its reach to other universities in the Albertine Rift region and beyond in order to build a long-term, regionally based programme on biodiversity conservation and climate change. This was highlighted by the large number of applications to the education and training programme and by the participants' feedback about the need to facilitate access to travel to Dar es Salaam, particularly for African individuals. Phase two sets the stage for offering the curriculum as distance-learning modules and addresses this challenge by enabling wider access.

EMERGING NEEDS FOR FURTHER ACTION

Key emerging needs identified from the phase one experience include:

- Sustaining the programme and expanding its reach
- Updating and enhancing the programme content;
- Improving academic and research support for participants;
- Maintaining the regional network of individuals and institutions;
- Engaging policy- and decision-makers.

In responding to the needs identified from phase one, under phase two the curriculum will be updated, online distance-learning modules will be developed, training in methods and tools expanded, and provisions made for improving mentorships and guidance for participants. Participants under phase two will participate in a regional science-policy dialogue on biodiversity conservation and climate change to be held in conjunction with the project. The effectiveness of these activities and any new challenges that emerge will be evaluated with the implementation of phase two over the period 2010–2011.

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18. GLOBAL CHANGE SYSTEM FOR ANALYSIS, RESEARCH AND TRAINING (START)

TECHNICAL SUPPORT FOR ASSESSING INVESTMENT AND FINANCIAL FLOWS TO ADDRESS CLIMATE CHANGE IN DEVELOPING COUNTRIES.

The Pan African START Secretariat (PASS), in cooperation with the Stockholm Environmental Institute Africa Centre, the Economic Research Bureau of the University of Dar es Salaam, the Sahara and Sahel Observatory and the International START Secretariat, is providing technical backstopping on behalf of the United Nations Development Programme (UNDP) to country teams in Algeria, the Gambia, Namibia and the Niger that are assessing investment and financial flows to address climate change over the coming decades. As part of the project, countries are undertaking an assessment of the adaptation and/or mitigation measures – both current and planned – that will be required to address climate change in each key sector. Countries then assess the costs of these requirements against a baseline of current activities, and are able to develop mitigation and adaptation scenarios with an assessment of sector-specific investment and financial needs. This assessment will provide a better understanding of the magnitude and intensity of national efforts needed to tackle climate change, as well as more accurate estimates of the financial reallocations and additional funds needed to implement mitigation and adaptation actions.

INTERIM RESULTS

- User guides and training materials have been developed for assessing investments and financial flows to address climate change. These include:
  - Guidance on preparing national workplans;
  - Guidance on methodology;
  - Guidance on reporting procedures;
  - Training materials on investments and financial flows;
- Training sessions have been conducted on the assessment of investments and financial flows in the Gambia, Namibia and the Niger;
- The Gambia, Namibia and the Niger are currently working on their assessments of investments and financial flows in collaboration with the START Regional Centre of Excellence, PASS.

LESSONS LEARNED

Experiences from the National Inter-ministerial Dialogue and Training on Investments and Financial Flows are being used to inform and improve upcoming training programmes. Some useful lessons on using a working group structure for training programmes include:

- Working group format: Working groups proved very effective in engaging participants. For each discussion session, participants broke into four or five groups to discuss questions posed by the training team;
- Working group discussions: Substantive discussion on technology transfer and financing topics was found to be difficult since both these topics require an in-depth understanding of international climate change policy processes and are less grounded in the national context. Therefore, working groups now focus on mitigation and adaptation issues within the context of national priority sectors, while financing and technology are discussed in a plenary format.

EMERGING NEEDS FOR FURTHER ACTION

Many African countries have approached the UNDP for assistance in carrying out assessments of investments and financial flows to address climate change; this will require additional training and capacity-building.

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19. UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP)

CLIMATE RISK MANAGEMENT TECHNICAL ASSISTANCE SUPPORT PROJECT (CRM-TASP).

It is now widely acknowledged that, for efforts to effectively address the immediate adverse impacts of climate change, they must be integrated into long-term development and planning processes. UNDP is supporting a large number of countries to manage risks related to climate variability and change through CRM-TASP, jointly developed by the Bureau for Crisis Prevention and Recovery (BCPR) and the Bureau for Development Policy Energy and Environment Group (BDP/EEG). The project aims to build in-country capacity to analyse, prevent and manage risks related to climate variability and change and define risk management solutions. It entails working with national governments, recognizing their priorities, and helping them build the necessary capacity to manage climate risks over short- and longer-term time scales. The project aims to generate evidence-based climate risk management solutions and priorities for each country, drawing on information about current and future risks from three planning horizons: (i) historical and current patterns of climate-related hazards; (ii) emerging patterns of risks; and (iii) future risk trends derived from climate change scenarios. The analysis generated by the project is expected to contribute to greater coherence in national strategies for managing climate variability and change and to bring about a unified climate risk management effort within governments, United Nations agencies and the donor community.

It is likely that assumptions concerning the frequency and severity of climate-related hazards derived from historical experience may no longer be a reliable basis for evaluating near-future climate change risks. Despite growing awareness of climate risks, national institutions are often inadequately prepared to respond to and prevent risks related to multiple and new hazards across sectors. In addition, responsibilities for managing disaster risks, on the one hand, and climate change, on the other, may be distributed across various agencies and departments, with a lack of sufficient clarity on mandates and an unclear division of labour. UNDP's CRM approach takes into account both the risks triggered by current climate variability and the projected climate change trajectories. CRM focuses on climate-related development sectors that are sensitive to both climate variability and change, such as agriculture, water resources, food security, health, the environment and livelihoods.

In 2009, the first phase of the project was implemented in Armenia (Europe/CIS), Ecuador (Latin America and the Caribbean), Indonesia (Asia) and Mozambique (Africa) by the Asian Disaster Preparedness Center (ADPC), in collaboration with the UNDP Country Offices and national and regional partners. The second phase of the project includes an additional 22 countries in all regions and is currently being implemented by ADPC and the International Institute for Sustainable Development (IISD). The primary stakeholders of the project include representatives of governments, local and regional experts, representatives from the United Nations and UNDP Country Offices and other partners' agency staff working at regional and global levels.

INTERIM RESULTS

The first phase of the project has significantly contributed to strengthening the capacities of national meteorological services to undertake climate analysis, especially in using statistical tools for data quality control, analysis of extremes and statistical downscaling.

The first phase of the project has also been successful in identifying climate risks and risk management measures and solutions by linking together scientific data, institutional analysis and participatory approaches. In response to an identified need from sectoral and development agencies to enhance the incorporation of climate risk information, the project has also developed tools for factoring in extreme climate events into their development planning process. Further, country reports prepared in collaboration with national stakeholders have captured these findings for a wider audience.

LESSONS LEARNED

Good practices and lessons learned from the first phase of the project will be replicated in the second phase, including:

- Ensuring multi-stakeholder participation for relevance and ownership of results. Each country analysis involves active participation by staff from BCPR and BDP/EEG, the Country Office, government representatives and partner organizations at the national, regional and global levels (i.e. scientific and academic institutions, and civil society). Ensuring involvement of a wide and varied array of participants in project development is crucial for the validity of the analysis and ownership of the results;
- Drawing upon existing scientific expertise and knowledge products. The project engages regional and national organizations as a means of drawing upon local expertise and knowledge and building capacity for similar work in high-risk countries. It does not duplicate efforts to gather and analyse data, but rather aims to fill knowledge gaps or synthesize data where fully available. For instance, the project has close linkages with activities and resources related to other UNDP action pledges under the Nairobi Work Programme (NWP), such as outputs from the Developing Country-level Climate Profiles project;
- Ensuring linkages of project activities and results with other relevant national, regional and global climate risk management, disaster risk reduction and climate change adaptation initiatives. The design and development of the project take account of existing national, regional and global disaster/climate risk management programmes or projects in each country. The project builds on this inventory and aims to take stock of existing knowledge and experience and identify information needs and gaps. For instance, the project draws upon the pool of resources available through the Adaptation Learning Mechanism (ALM) global knowledge platform;
- Integrating project results into a comprehensive national-level climate risk management programme in each selected country. The centrepiece of the project's deliverables is a set of country reports that will inform the development or enhancement of comprehensive climate risk management programmes supported by UNDP and other partners in each selected country. The combined results are intended to advance the practice of climate and disaster risk management on a global level.

EMERGING NEEDS FOR FURTHER ACTION

Upon finalization of the first phase of the project and the recent launch of its second phase, a number of challenges and further needs must be acknowledged and addressed:

- Ensuring that the project is complemented by and synergistic with other initiatives related to disaster/climate risk management and climate change adaptation supported by other United Nations agencies and partners.
- Ensuring that the project is aligned with larger-scale development programmes and projects so that two objectives are met: (i) climate risk management considerations are mainstreamed into development programming; and (ii) partnerships are established to ensure strengthened donor commitment for development and adaptation programmes;
- Ensuring that the project actively contributes to capacity-building in each selected country and is not perceived as a top-down intervention whose results will not be fully endorsed and owned by the national counterparts.

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20. WETLANDS INTERNATIONAL

AFRICAN REGIONAL 'TRAINING OF TRAINERS' COURSE ON ECOSYSTEM- AND COMMUNITY-BASED ADAPTATION.

Wetlands International, the World Wildlife Fund-United States of America (WWF-US), Conservation International, the Co-operative Programme on Water and Climate Change, Wageningen University, the African Institute of Capacity Development and a host of other contributing organizations such as Oxfam America and the International Union for Conservation of Nature (IUCN) are contributing to the development of support systems to help developing countries build their capacity and work towards an appreciation and better understanding of adaptation from an ecosystem- and community-based perspective.

In practice, these support systems are underpinned by the organization of African regional 'training of trainers' courses focused on ecosystem-based adaptation, the first one of which was held in May 2010 at the African Institute of Capacity Development (AICAD), Jomo Kenyatta University, Juja, Nairobi, Kenya.

The key objective is to equip participants with the right tools and knowledge to address relevant issues on climate change from an ecosystem- and community-based perspective. By relating theory to practice, the course provides an understanding of, and the skills to deal with, climate change adaptation efforts to trainers and resource persons in Africa. It also provides cross-regional learning and experience sharing. The course was developed as a result of capacity-building needs expressed at various platforms by developing country Member States of the UNFCCC to strengthen national capacities to support the implementation of adaptation strategies in their respective countries. Some of the key capacity-building needs identified were: further training to help fill knowledge gaps; the provision of tools for climate change adaptive processes; and the need for cross-regional platforms for experience and knowledge-sharing, such as dialogues to develop policy.

INTERIM RESULTS

A total of 27 participants were invited from various organizations, cutting across relevant sectors and institutions, from the following countries: Benin, Burkina Faso, Ghana, Kenya, Malawi, Mali, Mozambique, the Niger, Nigeria, Senegal, and Uganda.

Two international participants from Panama and India were also invited as preparatory steps towards the rolling out of a similar training programme in Asia and the Americas in late 2010. The participants' institutions will be supported financially to roll out some national courses on the subjects included in the training programme and also in a policymakers' dialogue in the last quarter of 2010.

The course provided participants with relevant tools/skills and knowledge on ecosystem-based climate change adaptation. The participants were also given hands-on experience in the field, where they were able to interact with stakeholders and agencies that have undergone an adaptive process in their operations as a result of changes in their immediate environment. The participants were also given training, specifically on communication and training skills, towards ensuring the transfer of the knowledge gained during the training course to other relevant stakeholders in their respective countries. In order to support this, Wetlands International is offering grants to the national institutions where the trainees work, so that they, in turn, can host national training courses. The training course covered the following modules:

- An introduction to ecosystem- and community-based Climate Change Adaptation (CCA);
- Assessing vulnerability;
- The integration of ecosystems into infrastructure for CCA;
- Community-based adaptation approaches;
- Disaster risk reduction (DRR);
- Innovative financing for CCA.

CHALLENGES

Challenges identified include:

- The development of the training material was undertaken through a multi-stakeholder approach with the partner organizations, which proved to be a very rewarding experience. Although it did indeed take more time to arrive at a joint vision and agreement on the content of the course, this approach ensured that a spectrum of perspectives and existing learning material on adaptation could be incorporated. It is essential to avoid the duplication of resources and content of a course, and to look for synergies wherever possible;
- In addition, it is important to develop a syllabus that can adequately meet the current needs of the trainers following the 'training of trainers' workshops as well as those of local communities, while remaining responsive to emerging issues;

- Ensuring that the issue of gender has the appropriate entry point and place within the adaptation training programme and is not simply addressed in a superficial and tokenistic manner. Identifying explicit learning objectives for participants with the assistance of internal and external gender experts helped to meet this challenge.

LESSONS LEARNED

Working with an alliance of organizations provided a good basis for:

- A locally driven process that ensured that all information and relevant needs came from the networks of the partner organizations in the region;
- Multi-level perspectives: making a range of ideas and perspectives available that can be applied in regional economic/geographical areas and from grassroots to local levels;
- Better institutionalization potential: by combining organizational networks and enhancing the engagement of existing training centres and institutes within the African continent;
- Establishment of a more strategic, credible and generally more acceptable process to a wider network across Africa which is currently being extended into Asia and Latin America;
- An excellent opportunity for cross-learning and sharing of experiences across different organizations, networks and geographical regions.

EMERGING NEEDS FOR FURTHER ACTION

Aspects requiring further action include:

- Continuing to explore linkages between capacity-building adaptation programmes in Asia, the Pacific, Latin America and Africa as a result of this first step;
- Continuing to provide clearer examples of links between ecosystem management and climate change, particularly on maladaptation, which seems to be a concept that is still insufficiently understood;
- Contributing to a greater understanding of the tools required to help the current pool of trainers engage their own local communities in adaptation. There is still a role for traditional and community-based approaches, which need to be mainstreamed into scientific approaches wherever relevant and appropriate. According to a mapping of expectations carried out within the current pool of trainers, over 85 per cent saw capacity-building as the main vehicle for helping different scales and sectors gain a better understanding of adaptation, especially in local communities;
- Being innovative and effective in improving capacity to create the right linkages between policy development/formulation and adaptation approaches, especially at the local level.

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Image XX-10. **Community- and ecosystem-based climate change adaptation training of trainers held from 3–8 May, Kenya**

B. IMPROVING THE ABILITY TO MAKE INFORMED DECISIONS ON ADAPTATION PLANNING, MEASURES AND ACTIONS

B.2 FACILITATING COMMUNICATION, DIALOGUE AND COOPERATION AMONG DIFFERENT STAKEHOLDERS

21. BANGLADESH CENTRE FOR ADVANCED STUDIES (BCAS)

UNDERSTANDING THE FINDINGS OF THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC AR4), CLIMATE CHANGE 2007, THROUGH THE INTEGRATING CLIMATE CHANGE ADAPTATION AND MITIGATION IN DEVELOPMENT PLANNING PROJECT.

The European Commission and the United Nations Environment Programme (UNEP) made an award to the International SysTem for Analysis, Research and Training (START) Secretariat and their partner Centres of Excellence to execute a project entitled Integrating Climate Change Adaptation and Mitigation in Development Planning, the aim of which is to understand the findings of the IPCC AR4, Climate Change 2007. BCAS is responsible for implementing the project in the South Asia region. The project began on 1 March 2009 and will run for two and a half years, until 31 August 2011. The overall objectives of the project are to:

- Inform policy processes and decision-making in the targeted regions and countries with the best available scientific knowledge from the IPCC AR4 and other sources;
- Engage the scientific community and policymakers in the targeted regions to develop a shared vision of research and assessments to facilitate effective climate change decision-making.

The main activities under the project are to:

Activity 1: Design and implement regional knowledge-sharing strategies;
Activity 2: Convene national science-policy dialogues;
Activity 3: Conduct regional training seminars;
Activity 4: Undertake participatory regional knowledge assessments.

INTERIM RESULTS

As of April 2010, BCAS has executed the first two activities. A comprehensive knowledge-sharing strategy has been developed with a special focus on the ways in which the project will facilitate both the exchange of knowledge and the interaction between scientists and decision-makers in the region through participation in local and local/sectoral workshops, working groups and conferences (Activity 1).

A national-level science-policy dialogue took place in Dhaka, Bangladesh, from 9 to 11 February 2010 with the aim of building multi-stakeholder and multisectoral capacity so that decision-makers can integrate climate change mitigation and adaptation knowledge contained within the IPCC findings into national strategies for sustainable development and poverty reduction (Activity 2). A number of resource persons from the IPCC as well as IPCC AR4 lead authors facilitated the dialogue. A total of 85 senior policymakers from different ministries, government departments, institutes, development partners, United Nations bodies, local and international NGOs took part in the dialogue. Through this dialogue, the participants have enhanced their understanding of how to mainstream climate change issues into their development programmes and projects. Policymakers, in particular high-level government officials, have increased their awareness of the following issues:

- The IPCC findings and projections on climate change;
- The scientific basis of climate change;
- The sectoral and regional impacts of climate change;
- The impact of climate change on different environmental systems;
- Adaptation to and mitigation of climate change;
- Climate change and disaster linkage;
- The global, regional and national priorities on climate change;
- The process and group dynamics of negotiation under the UNFCCC.

CHALLENGES

The main challenges identified during the dialogue were as follows:

- Downscaling various projections on climate change to the country level;
- Making the science easily understandable for policymakers;
- Addressing uncertainty issues in climate change.

LESSONS LEARNED

Although the project is still in its implementation phase, the following lessons have been learned to date:

- It is essential to downscale the projections on different climate change indicators to the country level (e.g. temperature rise, variations in precipitation, sea level rise), due to the fact that there are no such studies or projections in Bangladesh. Policymakers have been developing policy documents based on existing data, information and future projections. However, due to the absence of such projections at the local level, a number of major policy decisions have been incorrect or unsustainable;
- It is also important to address the uncertainty surrounding the projection of any impact of climate change as this will enable the policymaking process to be easier and more authentic. For example, agriculture is one of the most critical sectors in terms of vulnerability to climate change. If scientists can address the uncertainty in any findings or projections on that sector, it would allow policymakers to set a more realistic strategy.

EMERGING NEEDS FOR FURTHER ACTION

The implementation of the project has identified the following emerging capacity-building needs for policymakers in the developing countries of the South Asia region:

- Strengthening in-depth country-level research in line with IPCC findings and projections;
- Enhancing the assessment of sectoral impacts and vulnerabilities at the micro level;
- Further developing knowledge transfer tools that are compatible with the needs of policymakers.

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Image XXI-11. **National level science-policy dialogue in Dhaka, Bangladesh (9 – 11 February 2010) towards integration of climate change mitigation and adaptation knowledge from IPCC findings**

22. INTERNATIONAL TRADE UNION CONFEDERATION (ITUC)[29]

INTEGRATING CLIMATE POLICY IN BROAD UNION POLICY LOBBYING DOCUMENTS AND MAINSTREAMING EMPLOYMENT INTO CLIMATE CHANGE POLICYMAKING.

As part of its commitment to support trade unions in understanding, committing and taking action on climate change, the ITUC has presented an action pledge to publicly commit to and gather support for undertaking studies, training sessions and information-sharing towards the objectives and expected outcomes of the Nairobi work programme. These actions have a global scope, as well as, in some cases, a regional focus.

INTERIM RESULTS

The activities implemented under the action pledge were aimed at enabling broad trade union participation at regional, national and local levels with the clear goal of disseminating information on adaptation, knowledge-sharing and good practices, raising awareness and promoting decent work opportunities as a tool to escape poverty and climate change vulnerability. Government officials, policymakers, NGOs, researchers and climate change experts were engaged in these activities.

Progress in achieving coherence within the international labour movement has been impressive. All major labour statements to the United Nations, Group of 8 (G-8) and Group of 20 (G-20) have included a prominent section on climate change, in which the need for commitment from developed countries and action from emerging economies on mitigation, as well as the need to increase public funding for adaptation, were highlighted. High-level bilateral union-government meetings were organized, underlining the importance of the socio-economic consequences of climate change as well as the need for better inclusion of employment and societal issues in adaptation policies. The achievements obtained under specific categories are highlighted below.

Training: in 2009, more than 186 trade union representatives from 77 trade union centres in 40 countries received training on climate change. These activities, organized and coordinated by Sustainlabour[30] with the support of the ITUC and its regional bodies, are considered a key first step in the consolidation of unions' understanding about climate change. Regional training sessions were held in Buenos Aires for the Latin American region, in Togo and Kenya for the African region, and in Baku for the Eastern European and Central Asian region. National training sessions were held in Nepal and Argentina, in which 34 young trade unionists below the age of 30 participated.

Research and workshops: a research workshop on Climate Change Impacts on Employment and the Labour Market was held within the framework of the ITUC action pledge, in Brussels, Belgium, from 25 to 26 February 2010, in cooperation with the Global Union Research Network. The meeting explored the social consequences and positive potential of adaptation and mitigation policies for labour, the linkages between the International Labour Organization's (ILO) Decent Work Agenda[31] and the need for reducing vulnerability vis-à-vis climate change. As a result of the research seminar, a growing corpus of knowledge on employment and climate change has been identified, and a number of researchers from universities in developed and developing countries have expressed support for building a research network to fill knowledge gaps. The papers on the outcomes of the workshop will be published in the International Journal of Labour Research. The ITUC will submit these papers to the NWP to feed discussions on socio-economic information, economic diversification and adaptation planning.

Debates: The first ITUC Women's Conference (October 2009), discussed the impacts of climate change on women workers, as well as options for developing green jobs for women as a means of diversifying economies. A publication entitled Green *Jobs and Women Workers*[32] was released for that occasion. In the context of the fifteenth session of the Conference of the Parties (COP 15) in Copenhagen, Denmark, the ITUC hosted the World of Work (WoW) Pavilion, where the linkages between the world of work and climate change were showcased. More than a thousand participants joined the unions in this initiative.

The ITUC assists these training and awareness-raising activities, and encourages the active participation of trade unions to reduce vulnerability and enhance resilience. Helping communities to adapt to climate change is a key aspect of these activities.

CHALLENGES

The challenges faced by the trade union movement regarding climate change are huge. First, there is still a need to raise awareness among the labour movement on the need for action on climate change and on the strong linkages this has with the WoW and the role of trade unions.

The second challenge involves the need for further research on this topic, in particular on specific initiatives, experiences and on-the-ground challenges for trade unions regarding climate change policies.

The third challenge is to integrate employment and trade unions in the debates about climate change, where social issues are rarely mentioned and, when they are mentioned, are only lightly touched upon.

LESSONS LEARNED

As part of a continuous evaluation of training and awareness-raising activities, some improvements have been made:

- With regard to training activities, an introductory section on sustainability has been included as a means of providing a framework for adaptation actions. The evaluation process has also helped to improve work methodologies, which now incorporate more group work rather than plenary sessions, as this clearly facilitates the exchange of information among unionists from the same region and enables a more interactive approach to tackling these issues. The importance of facilitating work in local languages has also been noted and will be prioritized in future activities;
- Awareness-raising materials will be adapted to harmonize with union traditions and local languages. This has been considered fundamental by many organizations as a way of conveying a global message while also making it more pertinent to each affiliate's situation.

EMERGING NEEDS FOR FURTHER ACTION

The ITUC believes that the fight against climate change should not necessarily be seen as a burden but as a real opportunity for changing production and consumption patterns, sustainably eradicating poverty and ensuring the decent livelihoods of all workers around the world. Actions that address these goals would help to build on the potential of the labour movement in a coherent manner to ensure social progress.

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Image XXII-12. **Photo by Courtesy of Sustainlabour**

[29] The ITUC represents 170 million workers around the world in 157 countries and territories and has 312 national affiliates. Its primary mission is the promotion and defence of workers' rights and interests, through international cooperation between trade unions, global campaigning and advocacy within the major global institutions.
[30] <www.sustainlabour.org>.
[31] Achieving 'decent work for all' is one of the main aims of the ILO. Decent work is captured in four strategic objectives: fundamental principles and rights at work, and international labour standards; employment and income opportunities; social protection and social security; and social dialogue and tripartism. Further information on the Decent Work Agenda is available at <http://www.ilo.org/global/About_the_ILO/Mainpillars/WhatisDecentWork/lang–en/index.htm>.
[32] Sustainlabour. 2009. Green Jobs and Women Workers. Available at <http://www.sustainlabour.org/dmdocuments/en255_2009.pdf>.

23. INTERNATIONAL UNION OF FOREST RESEARCH ORGANIZATIONS (IUFRO)

RAISING AWARENESS IN AFRICA THROUGH A REGIONAL POLICY BRIEF ENTITLED MAKING AFRICAN FORESTS FIT FOR CLIMATE CHANGE.

IUFRO has contributed to the objective of the Nairobi work programme by coordinating a global assessment of scientific information about the impacts of climate change on forests, their implications for human well-being, and options for adaptation. The assessment report, entitled Adaptation of Forests and People to Climate Change and a policy brief, Making Forests Fit for Climate Change, were published in April 2009.[33]

The global assessment presented clear scientific evidence about climate change impacts on forests and people globally and indicated regional variations of globally available scientific information, both qualitatively and quantitatively. It also drew the attention of policymakers to the need for adaptation. The impacts of climate change and the appropriate adaptive responses are location-specific; Africa, in particular, is expected to face significant climate change impacts. In this context, IUFRO prepared a regional policy brief in collaboration with the thematic group Forests and Climate Change of the Forestry Research Network of Sub-Saharan Africa (FORNESSA).[34] The policy brief is based on a detailed analysis of relevant information contained in the global assessment report and on more than 250 additional references to literature sources identified by the African experts. It aims to contribute to the development of effective adaptation strategies in Africa and facilitate related international efforts. The references to literature sources contained in the policy brief have been analysed in a separate scientific report, Climate Change Impacts on African Forests and People.

INTERIM RESULTS

The policy brief was formally presented at the 14th meeting of the Subsidiary Body on Scientific, Technical and Technological Advice of the Convention on Biological Diversity, held from 10 to 21 May 2010 in Nairobi, Kenya. The key messages of the policy brief and possible adaptation responses will also be discussed at a FORNESSA event during the 23rd IUFRO World Congress, to be held from 23 to 28 August 2010 in Seoul, the Democratic People's Republic of Korea. The IUFRO World Congress constitutes the largest gathering of scientists in forestry and related disciplines.

The policy brief also serves as an important reference for the project donors and their partners when designing and implementing forest-related adaptation activities in the African region.[35] As a specific follow-up activity, a Multi-Criteria Analysis (MCA) tool for forest landscape restoration is currently being developed by the FORNESSA thematic group Forests and Climate Change to guide and support stakeholders in sub-Saharan African countries in the design and implementation of restoration policies and on-the-ground projects.

CHALLENGES

Many studies of the potential impacts of climate change are available at global or continental levels, but their coarse resolution limits their usefulness for informing decisions on climate change adaptation measures at a local level. Vulnerability-based approaches that focus on current social systems and adaptive capacity are potentially more effective in facilitating adaptation, but more capacity and work are needed to assess local vulnerabilities and to integrate assessments at the national level. In addition, challenges encountered in preparing the policy brief include:

- Many recent studies have addressed climate change issues mainly in the context of forest rehabilitation, agroforestry, environmental services and livelihoods. Therefore, a wide range of publications needed to be reviewed in order to compile local research results on climate change;
- Locating the actual publication which, in many cases, only existed in hard copy, posed a challenge, particularly in scanning the document and/or requesting permission to use the graphs and images contained therein;
- Although a thematic group on forests and climate change existed within the FORNESSA network, composed of experts from all regions in sub-Saharan Africa, external funding was still required to produce the synthesis report. IUFRO's Global Forest Expert Panel Initiative, in cooperation with IUFRO's Special Programme for Developing Countries, provided funding from the Governments of Finland, Germany and the United States of America.

In southern Africa, baobab trees provide a variety of traditional products. The regeneration potential of baobab is limited by factors not related to climate, such as livestock grazing, and by climatic influences, such as those affecting the incidence and severity of fire (see IMAGE XXIII-13).

LESSONS LEARNED

The policy brief sets out seven key messages for consideration by policy- and decision-makers internationally and in the Africa region:

- Although climate change projections for Africa are highly variable, the average increase in temperature on the continent is likely to be higher than the average increase globally. There is a significant risk that the adaptive capacity of many African forest ecosystems to provide vital goods and services will be exceeded;
- Individuals, societies and institutions in Africa are highly dependent on forest goods and services; therefore, they should be made aware of the likely impacts of climate change on forests and forest-dependent people and put strategies in place to adapt to them;
- Improving the adaptive capacity of forest-dependent communities is important in order to reduce their vulnerability to the effects of climate change. Participatory approaches should be used to obtain a better understanding of local knowledge and perceptions of climate change and to raise awareness about the vulnerabilities and related adaptation measures for forest-dependent communities;
- Measures that reduce non-climatic pressures such as agricultural expansion and the overuse of forests can help to reduce the overall vulnerability of forest ecosystems. Such measures, including forest restoration and rehabilitation, can be implemented in an integrated manner as part of sustainable forest management;
- Reliable projections of regional and local impacts require investments in research and monitoring infrastructure and increased support for early warning systems and preparedness measures;
- Strategies for adapting forests to climate change should be coordinated with those of other sectors and integrated into national and regional development programmes and strategies;
- Forest-related regional scientific networking needs to be supported to help synthesize existing information and develop concrete follow-up activities, such as vulnerability assessments and decision support tools for forest stakeholders.

EMERGING NEEDS FOR FURTHER ACTION

Forests are an integral part of life for African people and it is impossible to ignore the impacts of climate change in the region. Despite the limitations of current knowledge in Africa, climate change is progressing too quickly to postpone adaptation measures pending the outcomes of future studies. Yet, there are still major gaps in knowledge about the impacts of climate change on forests and livelihoods in Africa and about how adaptation measures can be best tailored to local conditions. There is a need to develop and reorient educational systems and programmes. Enhancement of regional climate models to provide information at finer spatial and temporal scales is also necessary. Moreover, adaptation planning is hindered by a lack of data for modelling, a lack of technical capacity, and incomplete or inconsistent data regarding forests and forest products.

The development and implementation of adaptation measures as part of sustainable forest management need to be underpinned by appropriate governance, taking a broad view of community needs, and respond quickly to policy learning. Governance that enables effective stakeholder and community participation, transparent and accountable decision-making, secure land ownership and tenure, and the equitable sharing of benefits and responsibilities needs to be promoted.

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Image XXIII-13. **Baobab trees in southern Africa.**
Photo by: Mike Wingfield

[33] <http://www.iufro.org/science/gfep/adaptaion-panel/the-report/>.
[34] <http://www.fornis.net/>.
[35] Financial support and expert advice for the policy brief was kindly provided by *the German Federal Ministry for Economic Cooperation and Development though the* Gesellschaft für Technische Zusammenarbeit (GTZ), the United States Forest Service, and the Ministry of Foreign Affairs of Finland.

24. LOCAL INITIATIVES FOR BIODIVERSITY, RESEARCH AND DEVELOPMENT (LI-BIRD)

CIVIL SOCIETY MOVEMENT ON CLIMATE CHANGE IN NEPAL.

LI-BIRD is an NGO established in Nepal in 1995. It is committed to capitalizing on local initiatives for the sustainable management of renewable natural resources and to improving the livelihoods of resource-poor and marginalized people. LI-BIRD aims to strengthen the institutional capacity of NGOs to be more credible and effective in policy advocacy, and to build an active climate network at the national level with the aim of raising awareness, building capacity, and piloting and implementing climate-resilient projects and programmes in the most vulnerable communities of Nepal.

In 2007, LI-BIRD established a loose network of NGOs in Nepal entitled the NGO Group on Climate Change. The network aims to raise awareness among key development-related NGOs on the linkages between climate change and development issues. The network's activities focus on engaging civil society in the central and western development regions of Nepal to raise their awareness and build their capacity on climate change issues, as well as to enhance their knowledge management and collaborative research and development in order to encourage civil society movement through regional networking and cooperation. LI-BIRD, as the national secretariat of the NGO Group on Climate Change, has been regularly providing inputs both to the government to be used in international negotiations and to national initiatives such as the Climate Change Policy and the National Adaptation Programme of Action (NAPA).

The network's activities were initially supported by Capacity Strengthening of Least Developed Countries (LDCs) for Adaptation to Climate Change (CLACC)[36], part of the network of the International Institute for Environment and Development. Activities were further expanded to other regions of Nepal within the framework of the Strengthening Climate Network in Nepal[37] project with funding support from the Nordic Development Fund under the Environmental Movements in the South programme.[38] The network has now been expanded to all five development regions in Nepal.

INTERIM RESULTS

The establishment of the NGO Group on Climate Change has brought civil society organizations together into one network where they can share and discuss climate change information and issues at regular intervals. As of April 2010, 150 NGO members were affiliated in the network and a further 50 NGOs would like to become members. To coordinate climate change actions across all five development regions in Nepal, four network secretariats and four climate change information and resource centres were established. The Google NGO group discussion forum[39] is being piloted to keep members abreast of climate change issues around the world. The forum has 220 members representing civil society, with international NGOs, academics, donors and government officials as advisers.

The NGOs regularly meet to share updates on climate change issues, discuss local agendas and prepare action plans. The activities, which are supported by member organizations, help them to: build their capacity to deal with priority actions; assess vulnerability to climate change; find ways to respond to local impacts of climate change; and develop leadership skills in order to communicate climate change issues to local stakeholders. A number of publications, both in English and Nepali, were published during the project period (2008–2010) and were made available to 5,000 individuals and 300 organizations to encourage readership and contribute to raising awareness of regional issues. Climate awareness campaigns, a series of workshops and meetings, and capacity-building programmes contributed to sparking the interest of the government, the public and farmers on climate change. As part of the project, LI-BIRD, in collaboration with member NGOs, initiated research on environmental stress-tolerant crops (identifying drought-tolerant rice varieties as well as neglected and underutilized crops in home gardens), vulnerability assessments and adaptation planning at the local level.

CHALLENGES

There are a number of challenges involved in making the network functional and in engaging stakeholders to ensure that their development work is climate change resilient, including:

- The stakeholders working on different development sectors still have insufficient information and knowledge to initiate and integrate climate change issues into their development plans and policies. This is largely because of the complexity of the topics

and the inability to view their development work through the lens of climate change;

- The network's expansion and its collaboration with grassroots NGOs is a continuous process that requires further investment in order to widen the scope of the target groups. At present, the network hub is established and based in a development region of Nepal covering several districts. Many of the moderately and highly elevated areas of Nepal are still inaccessible, both by road and by communication technology. The network hub therefore needs to be clustered according to members' accessibility to adjoining districts to ensure that all civil society members can participate in the sharing and learning process;
- The process of generating information and sharing climate change mechanisms is currently not carried out in a participatory manner due to the slowness of the process, as many members are still acquiring knowledge on climate change issues and attempting to make their case heard.

LESSONS LEARNED

The key lessons learned include:

- Networking among civil society is an important approach to bridging the gaps on climate change information and knowledge among the various stakeholders (NGOs, communities, and government authorities);
- Access to information and knowledge on climate change for the local community and stakeholders is enhanced when the network expands and collaborates with civil society organizations in the region, which in turn enhances members' ability to generate regional- and local-level information on climate change;
- The sustainability of the network is the key component of advocacy from the local to the national level. A mechanism to integrate the network into the governmental system or process is therefore necessary to sustain the network and gain wider acceptance.

EMERGING NEEDS FOR FURTHER ACTION

In the future, climate change efforts need to be shifted from awareness-raising to more concrete actions in order to mainstream climate change research and the adaptation and mitigation agenda into development plans. Awareness-raising without scientific data or science-based groundwork would an unrealistic way of dealing with climate change issues. Our priority will be to develop and/or identify stress-tolerant crop varieties through on-farm participatory research and experiments. It is also essential to strengthen the capacity of civil society organizations on research, advocacy, and knowledge management, as well as adaptation and mitigation of climate change issues. This will ensure that the community-led process is based on communities' priorities, needs, knowledge and capacity and will enable them to plan for, and to cope and adapt to, the impacts of climate change. A National Adaptation Plan is currently being prepared in Nepal, with a vast array of opportunities and challenges to transform ideas into action, based on prioritised adaptation projects.

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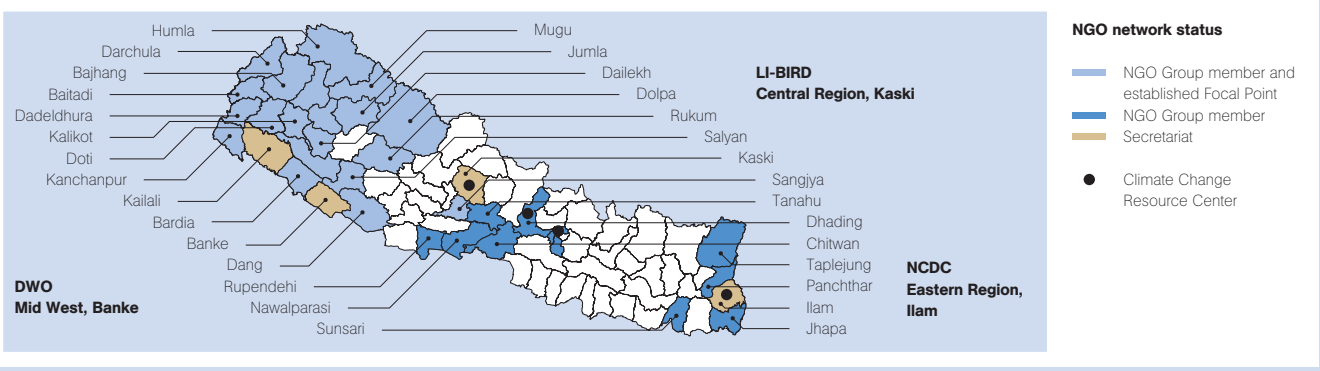
[36] <www.clacc.net>.
[37] <http://libird.org/index.php?option=com_content&task=view&id=330&Itemid=39>.
[38] <http://www.emis.no/>.
[39] <http://groups.google.com/group/ngogroups>.

Figure XXIV-5. **Map showing the coverage of the NGO group on climate change network as of April 2010**



25. MUNICH CLIMATE INSURANCE INITIATIVE (MCII)

DIALOGUE ON THE USE OF DISASTER RISK REDUCTION (DRR) AND INSURANCE-RELATED APPROACHES TO FACILITATE CLIMATE CHANGE ADAPTATION.

This initiative intends to inform delegates to the UNFCCC negotiations, experts, scholars and practitioners. It seeks to conceptualize ways of helping vulnerable countries and people adapt to and manage the effects of extreme weather events. MCII's objective is to facilitate the ongoing negotiation process by hosting events, workshops and informal meetings in order to bring together Parties with insurance experts, researchers and DRR practitioners. In addition, MCII strives to constantly provide Parties with innovative examples of how to combine DRR and insurance to improve adaptation as well as assistance on technical and institutional questions by publishing technical papers or policy briefings highlighting special areas of interest identified by delegates.

INTERIM RESULTS

Insurance approaches have been mentioned in the UNFCCC climate negotiations since the Convention was framed in the early 1990s. More recently, the issue has received renewed attention in the Kyoto Protocol, the Bali Action Plan, and in the draft negotiating text coming out of the COP 15 discussions held in Copenhagen, Denmark, in 2009.

As fast-track adaptation resources start to become available, Parties to the UNFCCC seek ideas on ways to invest these funds so as to create leverage for adaptation which can be implemented with country and regional buy-in. In this context, MCII aims to provide a platform highlighting innovative examples to Parties and assisting them in the evaluation and identification of potential forerunner projects.

CHALLENGES

Some of the specific challenges related to this initiative include:

- Constrained time schedules: working with the target group of negotiators requires flexible time management. Adaptation negotiators, in particular those from developing countries, are often overworked and have little time available for external meetings;
- Understanding areas of concern: it is crucial to understand the views of delegates and identify their questions and resulting constraints in order to deliver productive assistance;
- Political versus technical questions: technical issues, such as risk management and insurance, are often dependent upon larger political questions (e.g. the nature of the outcome, the scope and sources of finance, etc.) This requires the building of diverse scenarios and sensitivity towards both the macro issues of the negotiations and the general approach in order to provide positive stimulus to the negotiations process;
- The practitioners' sphere versus the negotiators' sphere: bringing together different views, experience and expertise is highly rewarding. However, practitioners are sometimes unaware of the political sensitivities of climate diplomacy limiting their political impact.

There is a need to understand the scope of DRR and insurance to determine which infrastructure needs to be established and how the proposed mechanism can fit into a wider risk management framework. In some instances, the attainment of a certain degree of "insurance literacy" has to be assured in order to effectively build on the outcomes of the dialogue with Parties.

LESSONS LEARNED

Some of the lessons learned include:

- Before they were able to discuss MCII's approach, delegates had to fully understand the nature of the mechanism. On occasions, it was necessary to take a step backwards and explain the underlying principles of DRR and insurance. Delegates had to understand that MCII's goal is not to establish new ways for the private sector to earn money in new markets, but to highlight the fact that the proposed risk management approaches are based on the solidarity principle and can bridge some of the existing deficiencies which hinder the ability to cope, on a sustainable basis, with the natural perils in developing countries;
- Bringing together on-the-ground practitioners, insurance experts and university scholars with negotiators and political decision-makers helped to create a technical understanding of the needs, feasibilities and opportunities of risk reduction and insurance solutions. Likewise, the exposure of practitioners and technical experts to the political negotiations made them receptive to countries' needs and concerns regarding adaptation. In this regard, a constant flow of information between negotiators and experts has to be assured – this is the only way to constantly improve the quality of information and foster a productive and fruitful dialogue;
- The format of the meetings needs to suit the requirements of the delegates. Evening sessions on less hectic negotiation days, in an informal setting and with sufficient time, space and catering were perceived as being the most productive;
- It is also useful to establish alternative channels to influence other political actors. It became clear that the successful buy-in of countries also requires the inclusion of alternative actors, such as bilateral and multilateral donors or eminent persons.

EMERGING NEEDS FOR FURTHER ACTION

Fast-tracking activities from negotiation to action means that the emphasis has to shift to implementation. This could involve risk fragmentation and activities that are counterproductive to the UNFCCC process. There is, therefore, a need to widen the scope of dialogue to allow for better coordination of activities, to showcase positive experiences to a global audience and to make the outside world aware of the needs of countries as they work towards a comprehensive outcome on adaptation under the UNFCCC in order to align fast-track activities with the political process.

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26. GLOBAL CHANGE SYSTEM FOR ANALYSIS, RESEARCH AND TRAINING (START)

INTEGRATING CLIMATE CHANGE MITIGATION AND ADAPTATION IN DEVELOPMENT PLANNING (CCMAP) PROJECT.

Although adaptation to climate change is an urgent issue for many developing countries, a lack of awareness of climate change and its risks, the difficulties in accessing and interpreting scientific information, a lack of location- and sector-specific knowledge that is needed to guide decisions, and a distrust of information from sources external to the region limit the effectiveness of adaptation actions.

In an effort to address these obstacles, under the CCMAP project, START and its partners, the World Meteorological Organization (WMO), the United Nations Environment Programme (UNEP), the Intergovernmental Panel on Climate Change (IPCC), the University of Ghana, the University of Dar es Salaam, and the Bangladesh Centre for Advanced Studies (BCAS), are engaging scientists and policymakers in nine countries across West Africa, East Africa and South Asia through a range of activities that aim to raise awareness on and improve access to scientific information, so that decision-makers can better integrate climate change concerns into development planning and poverty reduction measures. The activities of the CCMAP project include national science-policy dialogues, regional knowledge assessments, regional knowledge-sharing strategies, and regional training programmes. The project is funded by the European Commission with co-funding from UNEP.

INTERIM RESULTS

In 2009–2010, START organized national science-policy dialogues in Bangladesh, Ghana, Nigeria, Senegal, and the United Republic of Tanzania, with dialogues in Bhutan, Burundi, Nepal and Rwanda to follow later in 2010. The science-policy dialogues have brought together a wide range of stakeholders – scientists, policymakers, civil society, and private sector actors – to discuss climate change issues of national concern and to identify potential options for, as well as obstacles to, adaptation and mitigation. The science-policy dialogues feature presentations from the authors of the fourth assessment report of the IPCC (AR4) on issues related to agriculture, health, water, urbanization, biodiversity conservation, land-use change and energy.

Concurrently, regional knowledge-sharing strategies are being developed which aim to disseminate climate change information in a manner that is both relevant and meaningful for various stakeholder groups across the region and across countries. The strategies involve identifying knowledge gaps and needs, appropriate modes of communication and establishing programmes and actions that will enable continuity in accumulating and disseminating knowledge.

CHALLENGES

The project involves a wide range of stakeholders in awareness-raising and knowledge-sharing activities. One challenge will be to ensure the active long-term involvement of the full stakeholder base, largely due to insufficient institutional resources and capacity, and competing concerns.

Another challenge is maintaining the momentum built during the science-policy dialogues. The dialogues are an excellent forum for discussing issues of national and local importance and identifying priority areas in terms of policy implications. However, as participants do not always agree on a set of “next steps” that would ensure continued action, there is a danger that momentum will be lost until the next significant activity is implemented.

Yet another challenge pertains to the dissemination of scientific literature within the developing world. This is crucial in addressing the north-south knowledge imbalance. Despite the best intentions of any project to make scientific published literature and findings freely available to resource-constrained developing countries, copyright laws often prevent this from happening. It is imperative for the international scientific community to develop strategies for addressing this issue, especially as “knowledge transfer” and “knowledge-sharing” continue to become increasingly important elements of climate change programmes and projects.

LESSONS LEARNED

The project is still under implementation. To date, the science-policy dialogues have been effective in meeting the expectations of the host countries, as well as in raising awareness on key issues of local and national relevance.

EMERGING NEEDS FOR FURTHER ACTION

Representatives from the decision-making communities that were present at the science-policy dialogues were very interested in developing their own capacity to deal with climate change issues, and in having scientific findings communicated to them on a sustained basis to guide their policymaking. The needs they expressed will help shape the regional knowledge-sharing strategies, within which decision-makers are a key stakeholder group, as well as the regional knowledge assessments, which will take place in 2011 and are expected to contribute to the IPCC AR5.

Participants at the dialogues were also keen to build national research capacity to generate more information on local and national impacts. The CCMAP project will take a step towards addressing this need via regional trainings that will help build scientific and technical skills for climate change research.

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27. UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP)

CAPACITY DEVELOPMENT FOR POLICYMAKERS.

Under a USD 7.7 million UNDP global project, UNDP is supporting countries to assess the investment and financial flows (I&FF) needed to tackle climate change now and in the long term. The I&FF assessment aims to explain the following questions: from a development perspective, what does my country need to do to address climate change in selected key sectors, and what policy and regulatory framework, investment environment, and financial architecture is required to achieve that objective? For each sector, the I&FF are estimated for the baseline scenario and an adaptation or mitigation scenario. The additional cost to implement actions is the difference in flows for the two scenarios. Spending is disaggregated to government, corporations and households.

Launched in May 2008, the project aims to support key line ministries and includes outreach to parliamentarians, the private sector, NGOs and civil society. The goals of the project include:

- Increased capacity to coordinate ministerial and stakeholder views on climate change, leading to enhanced participation in the UNFCCC process;
- Support for long-term climate change planning, using I&FF assessments to better understand the financial and policy landscape needed to implement mitigation and/or adaptation actions.

National activities include inter-ministerial dialogues, I&FF assessments, preparation of sectoral issue papers, and capacity assessments.

A total of 20 countries are currently participating in the project: Algeria, Bangladesh, Bolivia (Plurinational State of), Colombia, Costa Rica, the Dominican Republic, Ecuador, the Gambia, Honduras, Liberia, Namibia, Nepal, Nicaragua, the Niger, Paraguay, Peru, Saint Lucia, Togo, Turkmenistan and Uruguay. In addition, a further nine countries (Argentina, Brazil, Chile, Cuba, El Salvador, Guatemala, Mexico, Panama and Venezuela (Bolivarian Republic of)) are participating in a USD 3.6 million sister project that replicates many of the global project activities but also includes targeted regional activities to facilitate discussions between finance, development and environment ministers and reinforce national budgetary planning to address climate change, such as annual regional meetings of national finance and climate focal points, publications, and side events at UNFCCC meetings.

Funding for the projects is provided by the Governments of Spain, Norway, Switzerland and Finland, the UNDP and the United Nations Foundation.

INTERIM RESULTS

Interim results include:

- A range of resource materials have been developed, including: a national inter-ministerial dialogue resource kit; a UNFCCC guidebook *Investment and Financial Flows to Address Climate Change;*[40] and a series on key issues of the Bali Road Map negotiations;
- Altogether, 56 sectoral issues papers were prepared by national experts in 20 countries, with a focus either on mitigation (energy, forestry, transport or agriculture) or on adaptation (agriculture, water, health, coastal zones, forestry, tourism, biodiversity, fisheries, commerce). The issues papers describe policy options to address climate change in the key sectors and outline potential barriers to the I&FF assessments;
- Twenty-one national inter-ministerial dialogues were held between September 2008 and April 2010, attended by more than 1,700 participants, with extensive media coverage;
- Provision of technical backstopping on I&FF assessments and training for 400 national experts in 13 countries between July 2009 and April 2010, was led by five Regional Centres of Excellence;
- A web 2.0 knowledge platform <www.undpcc.org> was launched in English, French, Spanish and Russian, with more than 1,250 site members and 20 national groups.

CHALLENGES

Ensuring adequate participation from ministries in the national dialogues has required significant outreach and engagement efforts on the part of the government organizers. UNDP Country Offices have played a key role in this respect. One solution has been to include high-level sessions to present the recommendations of the workshop to ministers and the media. For the final round of dialogues, parliamentarians will also be targeted at breakfast and lunch briefings.

When conducting I&FF assessments, countries faced a range of challenges, including:

- Data availability and quality remain an issue. Both public data for politically sensitive sectors and private sector data can be difficult to obtain, while household data is typically scarce;
- The discount rate exerts a strong influence on the estimate of longer-term investments; selecting an appropriate rate is therefore crucial. In sectors where private investment is limited, selection can be more difficult;
- Constructing scenarios requires a complex set of decisions and remains a major challenge. Political sensitivities also come into play; for example, if existing measures are included in the baseline but could be part of the climate change response, governments can feel as though their efforts have been penalized;
- Many uncertainties remain, particularly for adaptation. These are largely data and information gaps, as well as the absence of quantitative inputs for climate change scenarios;
- Building on national development policies, plans, and measures is critical; however, many plans are not sufficiently long-term to factor in climate change.

LESSONS LEARNED

The following have been observed during the course of supporting countries in their I&FF assessments:

- Making a conceptual distinction between "modified existing measures" and "new measures" can be useful when deciding if measures can be defined as baseline or as part of an adaptation/mitigation scenario. Furthermore, it is important to clearly document all assumptions, parameters, and the political, economic, social and environmental factors that underlie identified trends;
- Measures must be clearly defined if they are to be adequately costed and prioritized. This is especially true in sectors with higher uncertainty and fewer instances of public policies (e.g. biodiversity adaptation). Countries also need to balance their ambition against what is feasible given the available resources, capacity and data;
- Teams can face challenges in proposing technically sound measures if they are seen to be critical of existing policies (e.g. water tariffs if a government maintains a policy of free utilities). One solution is to highlight approaches undertaken in other countries as constructive input (rather than recommendations). It can also be useful to describe to policymakers how current plans may be at risk from climate change, and how adjustments to the planning process can also create opportunities. Regional Centres of Excellence can play a key role as neutral advisors.

EMERGING NEEDS FOR FURTHER ACTION

Capacity development and technical assistance on scenario construction is needed to support improved financial assessments. Support is needed to enhance the linkage between development plans and climate policy documents such as national communications and financial assessments.

Moving forward, many countries will also need support to match priority climate change actions with financing opportunities in a structured manner. The national I&FF assessments could be improved by more substantive analyses of cross-sectoral interactions and co-benefits. In this connection, a searchable repository of relevant policies and measures, along with barriers to implementation, would be a useful resource.

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[40] <http://unfccc.int/cooperation_and_support/financial_mechanism/items/4053.php>.

28. UNITED NATIONS INTERNATIONAL STRATEGY FOR DISASTER REDUCTION (UNISDR)

CAMPAIGNS ENTITLED DISASTER RISK REDUCTION BEGINS AT SCHOOL AND HOSPITALS SAFE FROM DISASTERS.

Since 2000, UNISDR has been leading international disaster risk reduction (DRR) campaigns to raise awareness of disaster risk and actions to reduce risk. Increasingly, its campaigns have been highlighting the worsening climate risks and the urgency of undertaking adaptation.

The Disaster Risk Reduction Begins at School campaign, as part of the World Disaster Reduction Campaign of 2006–2007 was conducted by the UNISDR Secretariat in collaboration with the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Children's Fund (UNICEF), ActionAid International, the International Federation of Red Cross and Red Crescent Societies (IFRC), and the ISDR Thematic Platform on Knowledge and Education. Its aim was to inform and mobilize governments and communities to ensure that DRR is fully integrated into school curricula in high-risk countries and that school buildings are built or retrofitted to withstand natural hazards.

The Hospitals Safe from Disasters campaign, as part of the World Disaster Reduction Campaign of 2008–2009, was led by UNISDR and the World Health Organization (WHO) to effect change that protects the lives of patients and health workers, ensures the availability of health facilities and health services at maximum capacity in the aftermath of disasters, and improves the risk reduction capacity of health workers and institutions, including emergency management. The campaign raised awareness through the establishment of multi-stakeholder health task forces, and through workshops, conferences, concerts, exhibitions and media events. It also developed and disseminated good practices, implemented projects to improve building codes, and trained hospital staff on disaster preparedness to enable hospitals to function in the aftermath of disasters.

INTERIM RESULTS

The Disaster Risk Reduction Begins at School campaign
Regional task forces were created for Latin America and the Caribbean, and the Asia-Pacific region, and continue to spearhead related programmes and collaboration. The results achieved include:

- A total of 55 countries reported their active participation in awareness-raising activities and 22 countries reported visible success in school-oriented DRR initiatives; Among those initiatives, some had an immediate impact, such as making schools safer (e.g. in districts in Gujarat, India), developing educational and training material, and introducing school drills and special education for teachers on DRR;
- Altogether, 96 case studies were collected in a publication entitled *Towards a Culture of Prevention: Disaster Risk Reduction Begins at School – Good Practices and Lessons Learned;* [41]
- The Inter-Agency Network for Education in Emergencies (INEE) and various partners produced a publication entitled *Guidance Notes on Safer School Construction;* [42]
- The UNISDR Secretariat produced, in cooperation with a number of experts and organizations, an online educational game called Stop Disasters [43] for students and children, to support the DRR learning process.

The Hospitals Safe from Disasters campaign
The success of the campaign is reflected in the myriad initiatives aimed at safer hospitals, such as the application of the revised Hospital Safety Index, a rapid, reliable and low-cost diagnostic tool created by WHO for assessing hospital preparedness. The index was applied by Anguilla, Barbados, Bolivia (Plurinational State of), Dominica, Ecuador, Grenada, Montserrat, Peru, Saint Kitts and Nevis, and Saint Vincent and the Grenadines. It has also been introduced in Europe and the Middle East. The campaign led to the Kathmandu Declaration on Protecting Health Facilities from Disasters by the Health Ministers of member States of the WHO South-East Asia region. Major long-term outcomes of the campaign include the establishment of the national platform on DRR for health. Other national initiatives engendered by the campaign include:

- Mexico's Civil Protection System launched a national Safe Hospitals Programme, which led to an initial analysis of the safety of complex or tertiary-level hospitals located in high-risk areas, and the rigorous training of a team of hospital safety evaluators. Based on the recommendations, eight hospitals are undertaking necessary improvements;

- Cuba was one of the first countries to apply the Hospital Safety Index, and the results obtained are consistent with the capacity of its hospitals to continue functioning immediately after Hurricanes Gustav and Ike;
- In Nairobi, Kenya, a disaster scenario, including a makeshift hospital with equipment and volunteers, was simulated and information and material on hospital safety was prepared;
- In Welkom, South Africa, the Government, with UNISDR support, held a symposium on Hospitals Safe from Disasters: Reduce Risk, Protect Health Facilities, Save Lives.

CHALLENGES

Challenges identified include:

- Ensuring the long-term sustainability of the initiatives launched by the campaigns and the proposed follow-up activities;
- Ensuring that initiatives are mainstreamed into educational and health agendas so that they are not dependent on outside funding and are systematically undertaken throughout the country;
- Reaching all disaster-prone countries and targeted stakeholders.

LESSONS LEARNED

Lessons learned include:

- Partnerships with collaborators that can broaden and deepen the campaign's reach have proved essential. Broad networks of national and regional offices of UNESCO and WHO enabled the campaigns to have a global reach. Partnerships are also crucial in reaching the intended targets and providing additional sectoral validation – in this case to education and health stakeholders;
- High-level support for the campaigns raises the profile of the endeavour. The speeches on hospital safety given by Secretary-General Ban Ki-moon and the Under-Secretary-General for Humanitarian Affairs during International Disaster Reduction Day were the culmination of that campaign;
- It is necessary to dedicate time at the technical and the highest policymaking levels to motivate governments and administrators to invest in initiatives such as implementing the Hospital Safety Index or retrofitting schools. Faced with competing priorities and limited resources, decision-makers must be convinced that the importance of the initiative will greatly outlast the campaign itself;
- The campaign must launch sustainable initiatives that can be supported in the long-term by implementing partners;
- Campaigns require implementation from global to local levels in order to be most effective. Advocacy at all levels is also crucial;
- Effective monitoring systems to measure the results of the campaigns throughout their life cycle are necessary, as the results themselves become important advocacy tools.

EMERGING NEEDS FOR FURTHER ACTION

Two campaigns identified the need for governments to consider undertaking national assessments of the safety of existing health facilities and schools and establishing a schedule for retrofitting the most critical and vulnerable ones by 2011. Comprehensive national multisectoral safe hospital policies and programmes should be adopted by 2015. Global and regional strategies among health, finance, building, infrastructure, academic and donor partners to achieve multisectoral, international support for national actions should be devised by 2015.

To assist governments in achieving these goals, UNISDR, with the collaboration of the Asian Development Bank, the European Commission, UNESCO, UNICEF, WHO, the World Bank and many other partners, launched the One Million Safe Schools and Hospitals campaign online in 2010. The campaign asks individuals or organizations to pledge to undertake specific actions on any of the three components that can make schools and hospitals safer: public awareness; emergency and disaster preparedness; and DRR. This global campaign is part of the 2010–2011 World Disaster Reduction campaign entitled Making Cities Resilient – My City is Getting Ready! whose objective is for mayors and city councils to pledge to "invest smarter" in their city infrastructure and social services to withstand disasters. Pledges to, and support for, these campaigns are priority needs for further action.

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[41] <http://www.preventionweb.net/english/professional/publications/v.php?id=761>.
[42] <http://www.preventionweb.net/english/professional/publications/v.php?id=11599>.
[43] <http://www.stopdisastersgame.org/en/home.html>.

B. IMPROVING THE ABILITY TO MAKE INFORMED DECISIONS ON ADAPTATION PLANNING, MEASURES AND ACTIONS

B.3 ENHANCING ADAPTIVE CAPACITY THROUGH TECHNICAL AND INSTITUTIONAL CAPACITY BUILDING

29. SECRETARIAT OF THE CONVENTION ON BIOLOGICAL DIVERSITY

ONLINE DATABASE OF EXAMPLES OF GOOD PRACTICE AND COUNTRY-SPECIFIC CASE STUDIES ON ECOSYSTEM-BASED ADAPTATION.

There is an urgent need to develop and implement adaptation plans which both consider the adaptation needs of biodiversity and take advantage of biodiversity and associated ecosystem services when planning for cross-sectoral adaptation. The database, created in response to paragraph 8 of decision UNEP/CBD/COP/DEC/VIII/30[44] and hosted by the Convention on Biological Diversity (CBD), provides web-based guidance on the integration of biodiversity within adaptation planning. It gathers assessments, tools, good practice examples and case studies from a number of Parties and partners. Its purpose is to improve understanding of the links between biodiversity and climate change and to support Parties as they continue to integrate climate change impacts and response activities through implementation of their activities under the CBD.

Some examples of ecosystem-based projects that the database showcases include: mangrove restoration to mitigate the impacts of storms and sea level rise effects; the establishment of marine-protected areas to limit the negative impacts of coral bleaching; and the selection of resistant crop varieties to adapt to drought and increased pest infestations. Input to the database was requested from the CBD Parties and relevant organizations. The database was supplemented by case studies compiled from surveys and other existing databases.

INTERIM RESULTS ACHIEVED

The database currently contains more than 600 case studies on ecosystem-based projects, 30 vulnerability studies, 17 studies on threat, 38 studies on adaptation options, 16 assessment tools and 15 monitoring tools. The database has been updated, with the relaunch planned for May 2010, in order to better reflect the variety of new and emerging case studies.

CHALLENGES

Although there is a plethora of case studies demonstrating the links between biodiversity and adaptation, assessing the effectiveness of the projects and programmes remains a challenge. This is partly due to the fact that many actions are still under implementation as well as the lack of a consistent monitoring and evaluation framework against which successes can be measured. Furthermore, given the large number of ongoing and upcoming activities, the maintenance and continued update of the database will be difficult and time-consuming. This challenge has been partially addressed through the development of a feature through which database users are able to upload their own case studies.

LESSONS LEARNED

Ecosystem-based adaptation is an emerging concept that involves increasing the resilience and reducing the vulnerability of ecosystems and people in the face of climate change. It identifies and implements a range of strategies for the management, conservation and restoration of ecosystems to provide services that enable people to adapt to the impacts of changing temperatures, precipitation patterns, sea level rise, CO_2 concentrations and exposure to extreme events. When integrated into an overall adaptation strategy, ecosystem-based adaptation can deliver a cost-effective contribution to adaptation in addition to generating societal benefits.

Through the implementation of this activity, it became clear that the dissemination of knowledge on biodiversity-adaptation links would benefit from clear, long-term and programmatic partnerships. In addition, in gathering information, the engagement of national partners proved critical in terms of capturing local-level actions, which form a significant contribution to the database.

Finally, an initial analysis of database users has revealed that a broad spectrum of stakeholders have accessed the case studies, including national and subnational governments, academic institutions and the general public. Developing a website that is accessible to all such user groups required: making case studies available in multiple languages (English, French and Spanish); featuring a variety of different search options including keyword searches, thematic searches and interactive map-based searches; and providing simple but clear background information on the concepts highlighted in the database (adaptation, vulnerability, biodiversity, etc.).

EMERGING NEEDS FOR FURTHER ACTION

The database needs to be updated on a regular basis to include the most recent studies and good practice examples. It will also be important to link this database with other adaptation-related databases in order to ensure synergies.

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[44] See <http://www.cbd.int/doc/decisions/cop-08/cop-08-dec-30-en.pdf> for the full text of the decision.

Image XXIX-5. **Climate change adaptation database**

30. UNITED NATIONS ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC (ESCAP)

IMPLEMENTING THE SOUTH ASIAN ASSOCIATION FOR REGIONAL COOPERATION (SAARC) ACTION PLAN ON CLIMATE CHANGE, ESPECIALLY ON THE ASPECTS RELATED TO DISASTER RISK REDUCTION (DRR).

The SAARC Ministerial Meeting on Climate Change held on 3 July 2008 at Dhaka, Bangladesh, signalled a new beginning through the adoption of the SAARC Action Plan on Climate Change, which has been appropriately aligned with the Nairobi work programme.[45]

The Action Plan prioritizes the building of regional cooperative mechanisms to address climate change risks, impacts and adaptation as well as the development of a conceptual framework integrating DRR strategies into Climate Change Adaptation (CCA). It comprises six thematic areas that incorporate several aspects of adaptation, including those related to mainstreaming DRR into various development sectors.[46]

Capacity-building and exchange of information on disaster preparedness, extreme events and climate change impacts have been identified as the priorities for implementing the Action Plan. National governments are the main bodies responsible for implementing the Action Plan, proposed for an initial period of three years. With regard to regional cooperation, a mechanism has been agreed upon to effectively use the existing institutional arrangements of SAARC by giving clear directions and guidance. To this end, the SAARC Disaster Management Centre (SDMC) has taken up the task of implementing the Action Plan, especially the aspects relating to DRR. SDMC has developed a road map, thereby ensuring that the integration of DRR into climate change adaptation is one of its priority areas of action.

INTERIM RESULTS

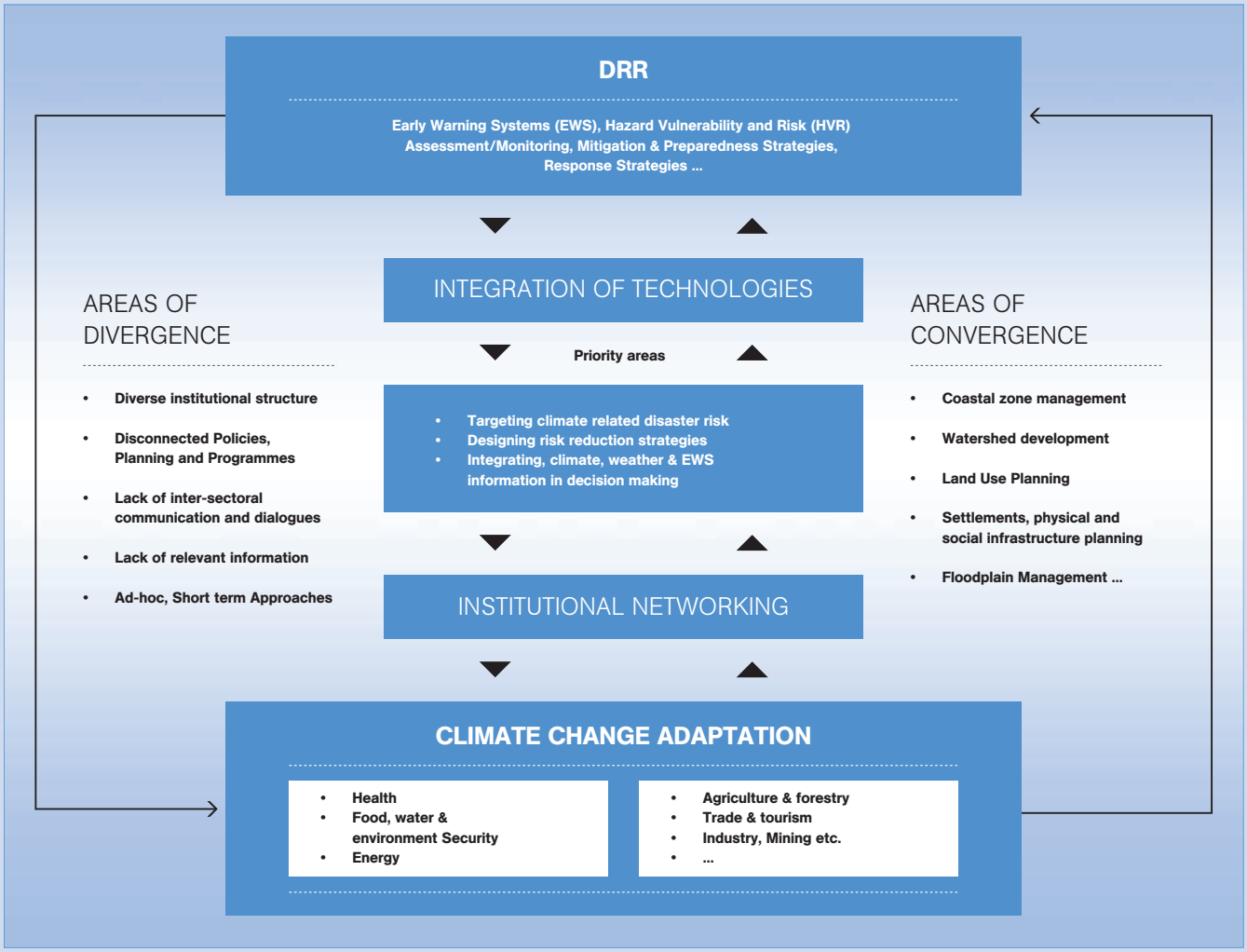
The road map developed by SDMC to integrate DRR into CCA contains the following strategies and implementation plan:

- CCA: efforts are focused on systematically integrating experiences gained and lessons learned from existing and past DRR initiatives across various countries in the region with CCA projects and vice versa. The centre is formulating appropriate process and programme guidelines for such integration in respect of four natural disasters, namely: floods; cyclones, including saline intrusion; droughts; and glacial lake outbursts;
- Technology transfer: SDMC has developed a concept paper on technology needs assessments (TNAs) for integrating adaptation to climate variability and change into DRR, especially those related to early warning systems (EWS) for droughts and floods, and will submit the paper to national governments and other relevant SAARC regional centres for their consideration;
- Finance and investment: SDMC is studying the potential application of microcredit, microinsurance and crop insurance for climate change adaptation in selected climate risk hotspots in the region;
- Education and awareness: SDMC is developing toolkits on climate risks and disasters to educate and raise awareness among the people of the region;
- Managing the impacts and risks due to climate change: SDMC, in collaboration with all relevant institutions, has developed training modules on climate risk assessments relevant to the context of the South Asia region and has conducted regional training programmes to build capacity on climate risk assessments.

CHALLENGES

Integrating DRR into CCA is one of the challenges of risk management in South Asia (see FIGURE XXX-6 below). The task is being addressed by identifying the areas that create divergence between DRR and CCA processes, as well as those that create convergence between the two. The diverse institutional structures that exist in South Asian countries as well as the disconnected DRR and CAA policies, planning and programmes, the lack of relevant information on DRR and the ad hoc short-term approaches that do not consider the risks to investments for the full life cycle of the project all create divergence.

Figure XXX-6. **Areas highlighting convergence and divergence on aspects of climate change adaptation and disaster risk reduction**



LESSONS LEARNED

The tools and techniques used for DRR, such as EWS, hazard, risk and vulnerability (HRV) analyses, risk assessments and monitoring, risk mitigation as well as response strategies, need to be integrated into CCA strategies in the critical sectors such as health, food, water and environmental security, agriculture, forestry, tourism, etc. The success stories and good practices demonstrating such integration should be replicated and further scaled up.

Enabling mechanisms currently exist to combine DRR and CCA through the integration of appropriate technologies such as information and communication technologies (ICTs), space, Automatic Weather Stations (AWS), Doppler Weather Radars (DWR), etc. Similarly, the networking of DRR and CCA institutions at national, regional and global levels, together with multi-stakeholder communication and dialogues as well as exchange of information and expertise, may catalyse such integration.

[45] <http://www.saarc-sec.org>.
[46] <saarc-sdmc.nic.in/pdf/publications/climate/chapter-2.pdf>.

EMERGING NEEDS FOR FURTHER ACTION

There are disconnects on the ground between development, CCA and DRR. The institutional mechanisms and capacity essential to create appropriate conditions to facilitate DRR and CCA integration have begun as a result of the Hyogo Framework for Action (HFA), the UNFCCC/IPCC frameworks and the SAARC Action Plan. Some of the initiatives undertaken at community and local levels are quite encouraging, although the focus has been on development with no explicit linkages to DRR and CCA. The following steps are suggested in order to integrate CCA and DRR:

Step I: targeting climate-related disaster risks. While the strategy calls for recasting HVR mapping efforts, such efforts enable closer integration of DRR and CCA in the operational domain of end-to-end project implementation.

Step II: designing risk reduction strategies. These strategies need to be based on climate risk information and be dynamic in order to reflect and respond to changing practices and conditions.

Step III: integrating climate, weather and EWS information into decision-making. It is equally important to utilize advanced weather forecast information in managing risks relating to existing climate variability and the results from climate change model experiments.

Concerted national efforts are necessary to support climate change adaptation and DRR in vulnerable regions such as South Asia. Indigenous coping strategies and community resilience have existed for a long time in South Asia. However, that heritage can be further enhanced in terms of technology and knowledge so as to withstand potential climatic shocks and their extremes. Further, given the growing risks of climate change, the adaptive capacity in South Asia needs to be further developed by providing the necessary financial resources and by enhancing institutional capacity.

The Thimphu Silver Jubilee Declaration "Towards a Green and Happy South Asia" was adopted at the 16th SAARC Summit in Thimphu, Bhutan, held on 28–29 April 2010. Commitments under the Declaration include: (i) reviewing the implementation of the Dhaka Declaration and SAARC Action Plan and ensuring their timely implementation; (ii) establishing an Intergovernmental Expert Group on Climate Change to develop clear policy direction and guidance for regional cooperation, as envisaged in the SAARC Action Plan; and (iii) commissioning a SAARC Intergovernmental Climate-related Disasters Initiative on the integration of CCA with DRR, to be supported by SDMC.

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31. IBERO-AMERICAN NETWORK OF CLIMATE CHANGE OFFICES (RIOCC) WITH THE FINANCIAL AND TECHNICAL SUPPORT OF THE SPANISH GOVERNMENT AND THE AMERICAN REGIONAL OFFICE OF THE UNITED NATIONS INTERNATIONAL STRATEGY FOR DISASTER REDUCTION (UNISDR)

CLIMATE CHANGE ADAPTATION AND DISASTER RISK REDUCTION (DRR) IN IBERO-AMERICA: SHARING A COMMON AGENDA.

The project, launched in January 2009, is being implemented by the American regional office of the UNISDR within the RIOCC framework. The project targets disaster reduction managers as well as members from climate change offices, especially adaptation experts, in the Ibero-American region. It supports the implementation of the Ibero-American Programme on Adaptation to Climate Change (PIACC) and promotes the exchange of knowledge and experiences in implementing the DRR developed by the ISDR Regional Office.

INTERIM RESULTS

Some of the interim results achieved by the project include:

- Climate change adaptation strategies with a special focus on DRR, developed in certain countries (e.g. Peru);
- Supporting DRR experts from Argentina, Colombia, Mexico and Peru to attend international climate change meetings in order to ensure that DRR is taken into consideration in climate change negotiations;
- Providing support to adaptation experts from climate change national offices to attend DRR meetings;
- Training a minimum of eight climate change national experts on how to evaluate and integrate DRR and adaptation to climate change into local sustainable development programmes;
- Increasing media and public awareness in the region on DRR issues and their linkages to climate change adaptation;
- Disseminating publications on PIACC and the Nairobi work programme around the region;
- Translating relevant climate change adaptation and DRR documents into Spanish and disseminating them in the Ibero-American region;
- Developing an information kit on local sustainable development, DRR and climate change adaptation.

CHALLENGES

One of the main challenges facing this project is the formulation of climate change adaptation projects from a participatory approach, since there are many actors involved, all of whom need to be coordinated.

LESSONS LEARNED

- Activities undertaken within the project have been helpful in putting climate change adaptation and DRR strategy at the forefront of political agendas and public opinion. The exposure of national experts to international meetings is important to enhance national capacity in designing national development policies which incorporate the issues of climate change adaptation and DRR.

EMERGING NEEDS FOR FURTHER ACTION

Needs for further action include:

- Continuing efforts to create national platforms to reduce disaster risk, in accordance with national circumstances and regulatory frameworks;
- Strengthening support to countries to increase their commitment to climate change and DRR, through capacity-building, projects, promotion of successful experiences and collaboration among countries;
- Facilitating discussions between DRR and climate change focal points, with a view to ensuring effective policy implementation and avoiding the duplication of efforts;
- Supporting local government initiatives on integrated DRR and climate change adaptation approaches to sustainable development;
- Enhancing the involvement of the academic community in capacity-building efforts at national and local levels, as well as in research for sustainable development;
- Producing a Best Practices Guide on impacts, vulnerability and adaptation to climate change in Ibero-America from a DRR perspective.

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32. STOCKHOLM ENVIRONMENT INSTITUTE (SEI)

MANAGEMENT OF KNOWLEDGE ON ADAPTATION TO CLIMATE CHANGE.

SEI has been working with various partners to further develop web tools designed to bring together different types of information relevant to adaptation decision-making, and to support the use of these tools for raising awareness and learning in a variety of contexts and socio-institutional networks. SEI's approach to building a knowledge base implements principles of the semantic web, where users can obtain networked information from a range of sources according to their interests and specific needs. This is critical in an area where the knowledge base is rapidly evolving. SEI has been working more extensively with stakeholders in Californian water management and Kenyan natural resources management to identify their knowledge networks and articulate their adaptation information needs. This has informed the development and testing of a tool within the weADAPT knowledge management system that enables users to share geo-referenced data and information mapped onto Google Earth satellite imagery that can be used to tell an adaptation story of varying complexity depending on the intended message and audience.

SEI continues to provide technical support to a number of adaptation programmes and pilot actions, including training activities on vulnerability assessment, climate risk communication, and adaptation decision support. It works with the following partners:

- The Climate Systems Analysis Group at the University of Cape Town to offer training on understanding, accessing and using climate science data and information;
- The United Nations Environment Programme (UNEP) Adaptation Unit to develop the scientific capacity in the Global Adaptation Network;
- The UNEP Regional Resource Centre for Asia and the Pacific to provide training and knowledge management services through the Regional Climate Change Adaptation Knowledge Platform for Asia.

Recognizing that the capacity to communicate scientific results from adaptation-related studies to an international academic audience is limited in many parts of the world, SEI, in collaboration with its partners, is developing training modules that can be used in 'writeshops'. This innovative idea brings together developing country authors of academic papers with mentors who will work together to ensure that their papers achieve international peer-review standards. The ultimate aim of the work is to get more developing country authors' papers available for Intergovernmental Panel on Climate Change (IPCC) and other assessments.

INTERIM RESULTS

Interim results include:

- The knowledge mapping workshop and training in the use of Google Earth, facilitated by SEI in Nairobi[47] led to the creation of a tour in Google Earth explaining and visualising the key issues pertaining to climate change and adaptation in Kenya, narrated by Professor Wangari Maathai and showcased at the fifteenth Conference of the parties (COP 15) in Copenhagen, Denmark;
- The Californian tour includes scenarios of future water availability and demand (from SEI's Water Evaluation And Planning model)[48] as well as information on competing water users, and current and proposed adaptation strategies, and is being used as a tool for working with State and local water decision-makers to explore possible climate change impacts and discuss appropriate adaptation measures;
- weADAPT Google Earth tool is increasingly being used by the practitioners and researchers working on community-based adaptation (CBA) as a way of sharing experiences and lessons and, ultimately, of distilling criteria for 'good enough' practice and further developing a core set of adaptation principles. SEI is providing training and support through the global initiative on CBA currently being established.

CHALLENGES

The main challenges include:

- Project, and even programmatic, training still tends to be 'delivered' through discrete events with limited ongoing support for the consolidation and application of learning;
- It is often the case that the people who attend the training opportunities are not the most appropriate staff members from the various project partner organizations, thereby limiting the extent of individual and institutional learning. In addition, opportunities for communicating training materials and lessons learned to a wider set of potential users

are often not taken advantage of. This is where web-based knowledge management and communication platforms can really make a contribution;

- Internet access is still limited in many parts of the world and computer literacy levels are low. Many of the tools and methods available to people in developing countries might be open-access, but even with training, additional expertise is often required to make use of the results and outputs.

LESSONS LEARNED

There are still many bridges to be built between the scientific and non-scientific communities, and between the natural and social science disciplines, in order to fully address many of the adaptation challenges.

The internet is a powerful medium for providing continuity and consistent support and engagement between face-to-face events. Some very effective tools are becoming available that can be harnessed and built on according to specific user needs in the field(s) of adaptation. The trend towards the 'intelligent' connecting of content, in different forms and from various sources (i.e. the transition from web 2.0 to web 3.0), is critical in the field of adaptation, which is so dynamic and diverse.

The development of effective and operational institutional partnerships that bring together complementary expertise on different aspects of adaptation is essential. This poses particular challenges and opportunities for training and education. In order for different users to effectively access information and knowledge, much of the language used by the adaptation and climate science research community, which is still considered to be too technical and specialist, needs to be tailored to a variety of users, including in communications with practitioners and policymakers.

EMERGING NEEDS FOR FURTHER ACTION

SEI keeps an eye to the future, working to explore knowledge frontiers and innovate to build new capacities where needs are likely to emerge. Two such dynamic areas of work in which SEI is currently active are: transformations of risk and the associated potential of reaching humanitarian tipping points; and the economics of climate change, particularly in Africa. This work is founded in empirical research, but explicitly aims at building a shared knowledge base between the variety of actors who are facing, or will face, critical decisions affected by and affecting these issues.

SEI recognizes the growing need for professional training and certification opportunities in adaptation, and is therefore working with existing partners and seeking new institutional partnerships to offer an Adaptation Academy,[49] (i.e. to design a cutting-edge curriculum, develop modules based on the latest research and practices, set up an online learning environment and run training events).

SEI has launched a spin-off, the Global Climate Adaptation Partnership (GCAP),[50] to manage the weADAPT platform and provide value added services to clients seeking sound advice on adaptation. These developments will ensure a professional and sustained contribution to the Nairobi work programme.

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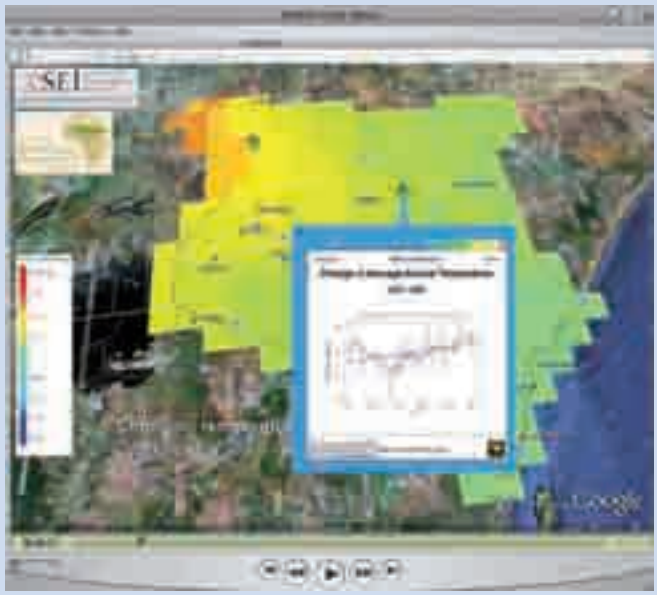
Image XXXII-6. **Screenshot from the Kenya climate adaptation tour in Google Earth showing temperature trends)**[51]



[47] <http://www.weadapt.org/wiki/Knowledge_mapping_of_climate_change_adaptation_actors_in_Kenya>.
[48] The Water Evaluation And Planning (WEAP) system is a user-friendly software tool that takes an integrated approach to water resources planning. Further information is available at <http://www.weap21.org/>.
[49] <http://climateadaptation.cc/careerstraining/training.html>.
[50] <http://www.climateadaptation.cc/>.
[51] The full Kenya adaptation tour can be downloaded at <http://www.upande.com/sei/tour/kenya-tour.kml>.

33. GLOBAL CHANGE SYSTEM FOR ANALYSIS, RESEARCH AND TRAINING (START)

AFRICAN CLIMATE CHANGE FELLOWSHIP PROGRAM (ACCFP).

The ACCFP offers experiential learning, education, research and training opportunities to African professionals, researchers and graduate students to build their capabilities for advancing and applying knowledge for climate change adaptation in Africa. Participating fellows receive small grants to undertake a policy fellowship, doctoral research fellowship, post-doctoral fellowship or teaching fellowship project.

The ACCFP is jointly administered by START, the Institute of Resource Assessment at the University of Dar es Salaam, United Republic of Tanzania, and the African Academy of Sciences (AAS), with financial support from the International Development Research Centre (IDRC), Canada and the United Kingdom's Department for International Development through the Climate Change Adaptation in Africa (CCAA) programme.

INTERIM RESULTS

In November 2008, the ACCFP selected its inaugural round of 45 fellows from 18 African countries. Fellows began implementing their fellowship projects in early 2009, and all projects will be completed by August 2010.

In April 2009, START and its partners hosted a 2009/2010 ACCFP Inception Meeting in conjunction with the Open Meeting of the International Human Dimensions Programme on Global Environmental Change (IHDP) in Bonn, Germany. Organizing the ACCFP Inception Meeting in conjunction with the IHDP Open Meeting enabled fellows to participate in a bigger event, to interact with the international global change community and to discuss their fellowship activities with other participants. Participation in the meeting also provided an opportunity for fellows to gain a perspective on how their individual fellowships can be part of a broader effort to address climate change adaptation challenges in Africa and throughout the world. Several fellows presented their research activities as part of the meeting programme. Examples of fellows' research topics include: Strengthening adaptive capacity to climate change: participatory infrastructure planning in Kibera-Silanga; The impact of agriculture-based climate change adaptation strategies on food security among smallholder farmers in southern Africa; and Improving drought early warning systems in Tanzania: a case of southwestern Tanzania.

CHALLENGES

Challenges identified include:

- Securing sustained, long-term funding: there are currently no plans for the CCAA parent programme to fund the ACCFP beyond one project cycle.
- Ensuring that the fellowships do not turn out to be single and isolated experiences for young African scientists: serious consideration needs to be given as to how to keep them engaged in global change research beyond their fellowships.

LESSONS LEARNED

The large number of applications received in response to the ACCFP Call for Proposals is a testament to the significant need for broader and more comprehensive programmes such as the ACCFP in Africa. Over the course of developing and implementing this inaugural programme cycle, START and its partners have gained valuable insights into the challenges and opportunities for designing and executing such a complex, continent-wide programme. Key lessons learned include:

- Subsequent programme cycles could benefit from:
  - An improved application form and process;
  - A periodic review and revision of available fellowship types to ensure that programme opportunities respond to regional needs and priorities;
  - Improved and expanded outreach to potential fellows and ACCFP partner institutions. In particular, ACCFP partners will seek out collaboration with established institutions in francophone Africa to increase programme outreach, awareness-raising and support for French-speaking researchers, educators, students and professionals;

- Increased media advertising about the programme through, for example, radio, newspaper and other non-academic networking channels, would also be useful. The current group of ACCFP fellows is a tremendous resource for the programme as they are its informal yet enthusiastic ambassadors.

EMERGING NEEDS FOR FURTHER ACTION

Emerging needs for further action identified include:

- Continued attention must be paid to efforts and future activities that strengthen partnerships and collaboration between ACCFP fellows and institutions, including activities that highlight the relevance of and roles for individual fellowship activities in the broader perspective of climate change adaptation challenges in Africa;
- A current challenge for many of the ACCFP fellows is how best to communicate and share their results. There is a need for knowledge-sharing between fellows and relevant policy- and decision-makers to generate critical science-policy linkages in order to convert knowledge into action. It is the expectation of programme partners that future ACCFP events (e.g. workshops and seminars) will include activities specifically targeted to the communication of fellowship results.

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34. UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP)

EDUCATION, TRAINING AND AWARENESS-RAISING IN SUPPORT OF CLIMATE CHANGE ADAPTATION: CASE STUDIES IN NAMIBIA AND ZIMBABWE.

Interventions, such as education, training and awareness-raising, to catalyse behavioural changes are common elements in adaptation projects. UNDP supports the implementation of 46 adaptation projects funded by the Least Developed Countries Fund (LDCF), the Special Climate Change Fund (SCCF) and the Government of Japan. Thirty-four of those projects (more than 70 per cent of the projects under implementation), have specific activities relating to education, training and/or awareness-raising. These activities range from awareness-raising on climate risks and adaptation, and establishing forums for information exchange and awareness-raising, to developing education programmes. This contribution synthesizes information from two ongoing projects which are at a relatively more advanced stage of implementation in Namibia and Zimbabwe, respectively.

The Namibian case study aims to enhance the adaptive capacities of farmers, pastoralists and natural resources managers in north-central Namibia, while the project in Zimbabwe aims to improve and sustain the livelihood strategies and resilience of farmers and pastoralists to cope with drought.

INTERIM RESULTS

The key education, training and awareness-raising activities being implemented in these two case studies are summarized below:

Namibia: Country Pilot Partnership Namibia – Adapting to Climate Change through the Improvement of Traditional Crops and Livestock Farming

- Raising awareness of the drought resilience of improved traditional crops and livestock breeds;
- Raising awareness of climate change adaptation strategies for livelihood improvements, including financial management options, safety nets, and diversification of the income base;
- Training field staff to establish and operationalize HIV/AIDS community outreach programmes as part of the capacity-building of service organizations;
- Targeted training of relevant government, NGO, and private sector organizations on adaptation and drought preparedness;
- Organizing workshops to support integration of climate change concerns into national drought policy and strategies.

Zimbabwe: Coping with Drought and Climate Change

- Community training on alternative food and income sources, including market development for dryland products;
- Training for government officials and NGOs on the use of climate and drought information;
- Community education and outreach programmes on the use of early warning systems in agricultural and pastoral systems;
- Participatory formulation of drought preparedness and mitigation plans;
- Disseminating climate policy briefs and other information materials to facilitate the integration of climate risk management into relevant sectoral plans;
- Learning tours for farmers and policymakers to facilitate the exchange of lessons learned and best practices.

CHALLENGES

- A substantial amount of time is required to internalize climate change and adaptation concepts in rural communities, especially at the initial stage of the project. However, due to the short time frame (typically about three years) of these projects, this is not always easily achievable (Namibia);
- The absence of nationally coordinated mechanisms for knowledge-sharing on adaptation impedes awareness-raising efforts (Zimbabwe);
- The lack of local-level climate change information and the limited knowledge among agencies supporting smallholder farmers are major barriers to mainstreaming climate change concerns into development programmes in Zimbabwe. Building the capacity of local actors to continue providing locally relevant information is critical to supporting climate change responses (Zimbabwe).

LESSONS LEARNED

Lessons learned from both case studies include:

- Conveying a tailored message to a specific audience is a critical element of a successful communication strategy;
- It is important to address the information needs both for short-term climate variability and long-term climate change;
- Finding ways to incorporate different local perceptions and interpretations of climate variability and change to build consensus on the science and evidence of, and the solutions to, climate change is important in stimulating an inclusive response.

The following lessons emerged from the implementation of the Zimbabwe project:

- Disseminating awareness messages in local languages will enhance understanding and response. However, there is currently limited capacity in Zimbabwe to do so;
- Enhancing local institutional capacity facilitates the implementation of sustainable adaptation strategies and actions. There is a need to establish functional coordination mechanisms between various agency activities, planning, communications and operations at field level;
- Awareness of adaptation can be increased by building upon the existing knowledge of communities, research and training institutes, and extension services on good agricultural practices and natural resources management by simply removing barriers to the replication of such good practices;
- Efforts to facilitate climate change education, training and awareness should employ a wide range of social, scientific, and private sector networks;
- Developing a working relationship with the mass media. The challenge is often that those with information are not willing to share that information with the media or, ultimately, with other stakeholders.
- There is a need to mobilize further resources to scale up efforts in other regions: the Omusati region covers a large area in terms of scale and a significant effort is needed to provide support to a large number of people in a short period of time.

The Namibia project also indicated that:

- It is critical to target the poor because of their limited access to resources: specific mechanisms should be developed to help poor households cope with climate change and vulnerability since their capacity to use established strategies and other diversification mechanisms is limited.

EMERGING NEEDS FOR FURTHER ACTION

- Local adaptation strategies and actions, including dynamic responses to specific events such as floods and droughts, need to be incorporated into national disaster risk reduction strategies and national disaster management policies. This requires building the capacity of local institutions and raising awareness among farmers (Namibia);
- Locally based research, specifically on the links between climate change adaptation and gender, is required in the Omusati region, which could also be carried out during the upscaling of the project to other regions (Namibia);
- Educational activities for young people need to be strengthened through open discussions, peer learning and training. There are plenty of opportunities to influence climate change education at the local level in order to mainstream climate change education (Zimbabwe);
- There is a need to further raise climate change awareness by integrating cultural activities, such as drama and singing, and using visual media (movies, short videos, documentaries, etc.) in a broader communication strategy (Zimbabwe).

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35. UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP)

DEVELOPING GLOBAL ENVIRONMENTAL CAPACITIES: NATIONAL CAPACITY SELF-ASSESSMENTS (NCSAS).

In 1999, the Global Environment Facility (GEF) and its implementing agencies recognized that achieving environmental sustainability required a more targeted focus on capacity development. In 2003, the GEF adopted the Strategic Approach to Enhance Capacity Building (the Strategic Approach) to provide clear programming pathways for country support, the first of which was a comprehensive assessment of countries' foundational capacities to meet global environmental objectives.

Under the Strategic Approach, the GEF provided each country with approximately USD 200,000 to undertake their NCSA, amounting to a total of USD 28.7 million and involving 146 countries (covering approximately 88 per cent of the total 166 eligible countries). UNDP implemented 111 country NCSAs, with the United Nations Environment Programme (UNEP) implementing 34, and the World Bank implementing one (Nigeria). By June 2010, 90 per cent of the 146 participating countries will have completed their NCSA. Through an iterative process, each NCSA takes stock of the institutional baseline to address commitments under the Rio Conventions, followed by an in-depth and consultative analysis of individual, organizational and systemic capacities. The NCSAs then take a cross-sectional analysis to assess the cross-cutting capacity development challenges and needs and, on that basis, countries develop their Final Report, Capacity Development Strategy and Action Plan.

In 2005, the Global Support Programme (GSP) was created and jointly implemented by UNDP and UNEP to provide technical support to countries undertaking their NCSAs. The GSP serves as a learning mechanism of the GEF on capacity development for environmental sustainability, conducting 13 regional and subregional workshops, and preparing a number of studies on lessons learned and best practices. A portal has also been developed to serve as a clearinghouse mechanism for accessing and sharing various knowledge materials.

With the conclusion of the GSP in June 2010, the GEF and partner agencies will continue to provide capacity development support to countries through a number of mechanisms, including the GEF Country Support Programme, the implementing agencies' corporate support programmes and projects, regional centres and other coordination units as well as Country Offices.

In early 2010, the GSP also finalized monitoring guidelines to assess the capacities developed, which can be found in the report *Monitoring Guidelines of Capacity Development in GEF Operations.*[52] Based on the underlying principles and approaches of capacity development, this report presents a set of criteria for developing capacities for environmental sustainability. The report also provides project teams with a scorecard to undertake a baseline assessment of the capacities needed to achieve environmental sustainability, indicators of which will be collected annually so that an assessment can be made of the capacities built by each project.

The GSP also drafted programming frameworks for the targeted implementation of priority cross-cutting capacity development interventions, otherwise known as CB2s. To date, a total of 23 countries have received support from the GEF to implement CB2 projects, leveraging co-financing at a ratio greater than 1:1.

INTERIM RESULTS

The key result of the NCSAs was creating or strengthening an in-country consultative process to determine the foundational capacities needed to meet and sustain global environmental objectives. This process was also successful in institutionalizing the learning-by-doing approach, with many countries finding the unique cross-thematic consultative and analytical arrangements both informative and catalytic to policy- and decision-makers.

As an assessment exercise, the NCSA programme updated and strategized future capacity development that had previously represented important gaps in development programming. Further details can be found in the NCSA Synthesis Report.

CHALLENGES

The NCSAs required countries to assess their most important environmental issues and identify capacity development needs to meet specific objectives related to these issues, such as combating deforestation, promoting sustainable land management or minimizing their vulnerabilities to the impacts of climate change. The analyses and consultative processes under the NCSAs were an important catalyst in helping decision-makers and other stakeholders gain a better appreciation of the important linkages between and among the conventions as well as the global and national environmental issues and objectives.

An analysis of the NCSAs revealed that the top five capacity development needs to achieve global environmental outcomes and achieve and sustain global environmental objectives were: public awareness and environmental education; information collection, management and exchange; development and enforcement of policy legislative and regulatory frameworks; strengthening institutional and organizational mandates, structures and frameworks; and economic instruments and sustainable financing mechanisms.

At the other end of the spectrum, the NCSA analysis showed that a low priority was given to development capacities to negotiate at the Conference of the Parties (COP) and to undertake integrated ecosystem management. In the first instance, this is in part due to the success of the GEF's Country Support Programme and National Dialogue Initiative. The low priority given to integrated ecosystem management could be due to a lack of understanding of the concept and its approaches, taking into account the high priority attributed to environmental education.

LESSONS LEARNED

A number of important lessons were learned from an analysis of the NCSAs, including:

- Achieving environmental sustainability necessitates the engagement of stakeholders, which in turn is predicated on their level of awareness and understanding as well as their skills to take action;
- Although not complete, environmental information exists. However, the capacities to access and manage this information, including coordination with other management information systems, remain weak;
- Many countries lack clarity in their organizational set-up to manage the environment and facilitate adequate levels of human and financial resources allocated to environmental management;
- Many countries continue to lack comprehensive and adequate environmental policy and legislative frameworks, which includes weak implementation;
- Countries are monitoring and evaluating their projects, but the knowledge generated is not being adequately used in decision-making processes.

EMERGING NEEDS FOR FURTHER ACTION

In GEF 5 (the fifth replenishment of the GEF), the follow-up to the NCSAs will be the new and additional financing for targeted cross-cutting capacity development in the amount of USD 44 million from the GEF, in order to leverage an additional equal share of co-financing. These capacity building (CB2) project interventions are designed to meet the following objectives:

- To enhance the capacities of stakeholders to engage throughout the consultative process;
- To generate, access and use information and knowledge;
- To strengthen capacities to develop policy and legislative frameworks;
- To strengthen capacities to implement and manage global convention guidelines;
- To enhance capacities to monitor and evaluate environmental impacts and trends.

The programming of CB2s will be developed alongside other strategic, priority cross-cutting programming by the implementing agencies, given the clear synergies and cost-effectiveness of this approach.

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[52] <http://ncsa.undp.org/report_detail.cfm?Projectid=207>.

36. WORLD METEOROLOGICAL ORGANIZATION (WMO)

REGIONAL FRAMEWORKS FOR ADAPTATION OF AGRICULTURE TO CLIMATE CHANGE.

The activities in this project were mainly undertaken in South Asia and West Africa through the organization of an International Symposium on Climate Change and Food Security in South Asia in Dhaka, Bangladesh (25–29 August 2008) and the International Workshop on Adaptation to Climate Change in West African Agriculture in Ouagadougou, Burkina Faso (27–30 April 2009). The main objective of these activities was to enhance the capacity of the participants from different countries in South Asia and West Africa to:

- Assess and understand impacts, vulnerability and adaptation;
- Identify and implement adaptation actions;
- Enhance cooperation among South Asian and West African countries to better manage climate risks;
- Enhance integration of climate change adaptation into sustainable agricultural development in South Asia and West Africa.

INTERIM RESULTS

The two workshops brought together experts from national meteorological/hydrological and agricultural departments, and international and regional organizations and institutions, as well as policymakers from national planning/financial departments to present state-of-the art papers, case studies and innovative techniques for coping with climate change and to offer recommendations for planning and implementing an effective Regional Framework for Adaptation of Agriculture to Climate Change. Both workshops provided a central forum to develop an improved understanding and assessment of climate change impacts on agriculture and the associated vulnerability in South Asia and West Africa. Draft Regional Frameworks for Adaptation of Agriculture to Climate Change were discussed and adopted at the two workshops.

The Symposium for South Asia identified the following key recommendations, knowledge gaps and opportunities to design programmes aimed at minimizing the short- and long-term vulnerability of the region to climate change:

- Creating a Climate Change and Food Security Network in South Asia, and a South Asia Climate Outlook Forum;
- Stimulating multi-disciplinary research in climate change and food security in South Asia and identifying effective mitigation and adaptation options, including carbon sequestration in different ecosystems;
- Initiating and strengthening cooperation among academic and research institutions, international organizations, and NGOs to provide opportunities for strengthening institutions, human resource development and capacity-building;
- Developing innovative financial mechanisms to scale up technical and financial support for adaptation efforts;
- Promoting the adoption of mitigation and adaptation options through payments for co-system services such as carbon trading;
- Strengthening regional institutional and policy mechanisms to promote and facilitate the implementation of location-specific adaptation and mitigation practices.

The West Africa Workshop identified the following key recommendations, knowledge gaps and opportunities for policymakers, researchers and extension systems, international organizations, and NGOs to implement programmes designed to minimize the short- and long-term vulnerability of the West African region to climate change:

- Integrating climate change adaptation and mitigation strategies into the national and regional development programmes;
- Emphasising the primordial role of weather and climate services and products in developing adaptation solutions to climate change in West African agriculture in national development policies;
- Assembling documents and disseminating a comprehensive and action-oriented database of adaptation options for different farming and livelihood systems and agroecological zones, including measures and policies, to serve the needs of smallholders;

- Initiating and strengthening cooperation among academic and research institutions, regional and international organizations, and NGOs to provide opportunities for strengthening institutions, human-resource development and capacity-building to deal with climate change impacts;
- Establishing a West and Central African Network on Climate Change and Food Security (ROCACCSA);
- Establishing, as a part of the implementation of the Economic Community Of West African States (ECOWAS) Subregional Action Programme on Climate Change, a Technical Secretariat comprising competent institutions at the national and regional levels in West Africa and international institutions and organizations such as WMO, the Food and Agriculture Organization of the United Nations (FAO), the Technical Centre for Agricultural and Rural Cooperation (CTA), the African Development Bank (AfDB), the Agencia Estatal de Meteorología (AEMET), the Rockefeller Foundation and the International Agricultural Research Institutes (IARCs), etc., in the spirit of implementation of the Regional Agricultural Policy (ECOWAP);
- Requesting ECOWAS, as the lead institution, assisted by the Comité permanent Inter-États de Lutte Contre la Sécheresse dans le Sahel (CILSS), to support the Technical Secretariat. At the national level, the ministry of agriculture, in coordination with the NMHS should support the Technical Secretariat.

LESSONS LEARNED

The two workshops highlighted the need for greater collaboration between the NMHS, the National Agricultural Research and Extension Services (NAREs) and the policymakers to develop and implement climate change adaptation strategies in the agriculture sector.

EMERGING NEEDS FOR FURTHER ACTION

In response to the recommendations from the workshops summarized above, the Climate Change and Food Security Network in South Asia and ROCACCSA need to be established. A Technical Secretariat comprising competent institutions at the national and regional levels in West Africa and international institutions and organizations such as WMO, FAO, CTA, AfDB, AEMET, the Rockefeller Foundation and the IARCs, etc., needs to be established in West Africa under the auspices of ECOWAS.

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37. THE WORLD RESOURCES INSTITUTE

NATIONAL ADAPTIVE CAPACITY (NAC) FRAMEWORK.

The World Resources Institute has developed the NAC framework,[53] which represents a new way of thinking about adaptation planning and evaluation. It assesses the capacity of national governments to respond to the effects of climate change within their country. An NAC assessment also helps to identify strengths and gaps in a country's "adaptation system" in order to understand where improvement may be needed or where strengths may enable rapid adaptation progress. It can be used to determine a baseline from which to begin planning for adaptation, or to review progress on adaptation after a period of implementation. Systematic progress reviews are part of the iterative nature of adaptability (see FIGURE XXXVII-7 below).

The NAC uses five key institutional functions: assessment, prioritization, coordination, information management, and climate risk reduction to understand a country's capacity in areas central to adaptation. This functions-based approach contrasts with many initiatives that have relied on assets as indicators of adaptive capacity. Assets-based indicators help answer the question: "What resources do I have that can help me adapt?", whereas the NAC functions-based approach asks: "What am I able to do that can help me adapt?" Under the NAC framework, adaptation is treated as an organic process that will inevitably grow and evolve in unexpected ways, since every country has a unique set of actors playing different roles.

INTERIM RESULTS

As of April 2010, the NAC framework is being used in Bolivia (Plurinational State of), Ireland and Nepal. Interim results include a preliminary NAC assessment for Bolivia (Plurinational State of) and Nepal. In both these countries, the NAC framework has been fully utilized and country teams are condensing and synthesizing the findings. Lessons learned to date include:

- The NAC framework can be used effectively to generate country-specific indicators of adaptive capacity for use in setting baselines and tracking adaptation progress;
- The NAC framework is most effective when used in the context of a participatory multi-stakeholder process;
- The countries studied so far have typically demonstrated stronger capacities for assessment of vulnerability and impacts than for coordination of policy and implementation, or implementation of risk reduction measures;
- All the countries examined have existing strengths upon which to build an adaptation programme.

Additionally, the NAC is being used as part of an international consortium helping Chinese partners plan for adaptation in the Adapting to Climate Change in China project.[54] One of the activities envisioned in the project is the application of a reworked NAC framework in three provinces in China during 2010 and 2011, in order to systematically assess adaptation.

CHALLENGES

The major challenge that has emerged through the course of the NAC work is the difficulty of adequately addressing local to national linkages. Assessing adaptive capacity at the national level needs to be done in a way that takes account of local-level actors and their corresponding connections to national institutions. This can be addressed through collaboration with groups working at the local level.

Another difficulty has been in tailoring the framework to the different countries in which the World Resources Institute is operating. This is closely related to the question of the balance between the NAC framework being too specific or too generic. If it is too generic, it makes it difficult for people on the ground to undertake an assessment because it does not accurately reflect the realities in a country. On the other hand, if it is too country-specific, there is a risk of losing the ability to apply the planning and implementation processes in a large number of countries and contexts. The point of the NAC framework is to have an integrated, long-term, system-oriented way of thinking about adaptation that is sufficiently flexible to be tailored to specific countries' widely varying circumstances and needs, while also providing a "shared language" at the global level. The World Resources Institute expects to develop specific instructions for tailoring the framework so as to address these complications.

The diversity of possible entry points into the country's decision-making and political processes is also a challenge. The adaptation policymaking process is very dynamic and rapidly shifting, as seen in both Bolivia (Plurinational State of) and Nepal. If, however, an NAC assessment can be conducted with the engagement of a sufficiently diverse set of actors, it could assist adaptation planning processes to weather these shifts and perhaps become more coherent overall.

LESSONS LEARNED

In Nepal, one of the most useful features of the NAC assessment will be the body of adaptation-relevant evidence collected by partner organizations. The NAC assessment assists in collecting and synthesizing a large base of climate change relevant information in one place. In Nepal, such information repositories do not yet exist and the information available is very fragmented; for example, the NAC assessment exposed the fact that, partly due to interagency disputes, data from a large number of functioning weather stations, going back at least 12 years, were not being entered in the central web portal. As a result, studies and projections produced for the country did not include this large, important data set.

Another key lesson learned in Nepal is the difficulty of prioritizing decisions and interventions around adaptation. While an NAC assessment seeks to understand the values and importance that governments assign to various factors in making prioritization decisions, many in-country actors think of prioritization as a narrow budgetary process in which the ministry of finance decides how its annual budget will be allocated. The NAC framework also helped to reveal that various international processes such as the National Adaptation Programmes of Action (NAPAs) and the Pilot Programme for Climate Resistance (PPCR) are driving different and potentially conflicting prioritization processes. It remains to be seen whether the decision-making structure used by Nepal in selecting its NAPA priorities will also meet the needs of the PPCR.

EMERGING NEEDS FOR FURTHER ACTION

An important next step involves developing indicators and metrics for national-level adaptive capacity. Quantitative metrics – such as growth in climate change budgets, number of adaptation staff in key ministries, number of agricultural extension agents, even usage rates of adaptation learning platforms – would facilitate the assessment of progress over time in building adaptive capacity, and would enable Parties and stakeholders to better target future activities. Indicators and metrics will need to be tailored closely to each country's specific context. The World Resources Institute is currently in the process of attempting to identify and pilot some useful indicators in Bolivia (Plurinational State of) and Nepal.

Secondly, continuing climate change may result in the overlapping of certain biophysical and social thresholds that could change the nature of adaptation actions. It will be necessary to understand how the overlapping of these thresholds may affect institutional capacities and the ability of formal and informal institutions to adapt. While an assessment of near-term capacities through the NAC framework can help to support investment in adaptive measures as currently understood, it is also important – unfortunately – to begin exploring the nature of institutional adaptive capacity in the context of a future that is potentially even more dangerous and uncertain.

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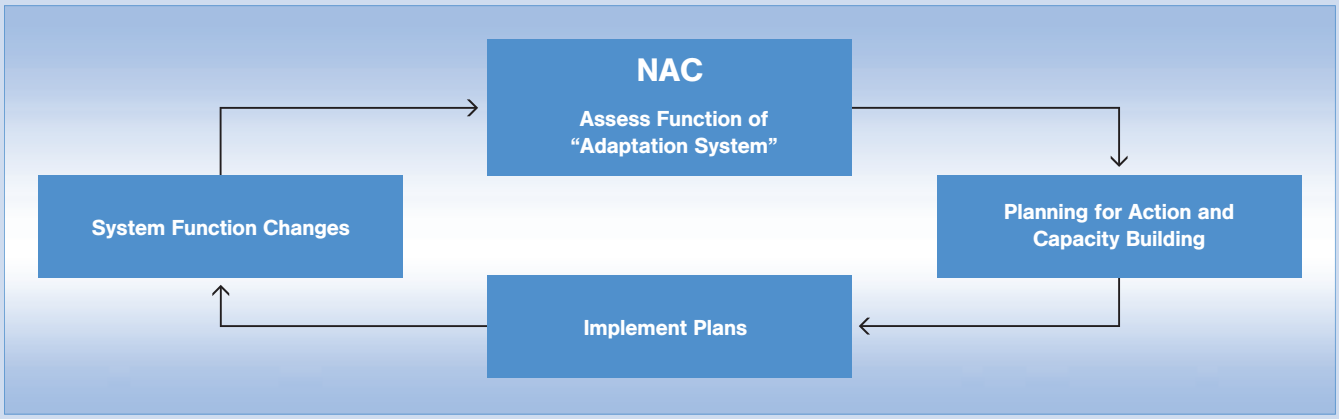
[53] <http://www.wri.org/project/vulnerability-and-adaptation/nac-framework>.
[54] <http://accc.ccchina.gov.cn/>.

Image XXXVII-7. **The adaptive planning cycle**



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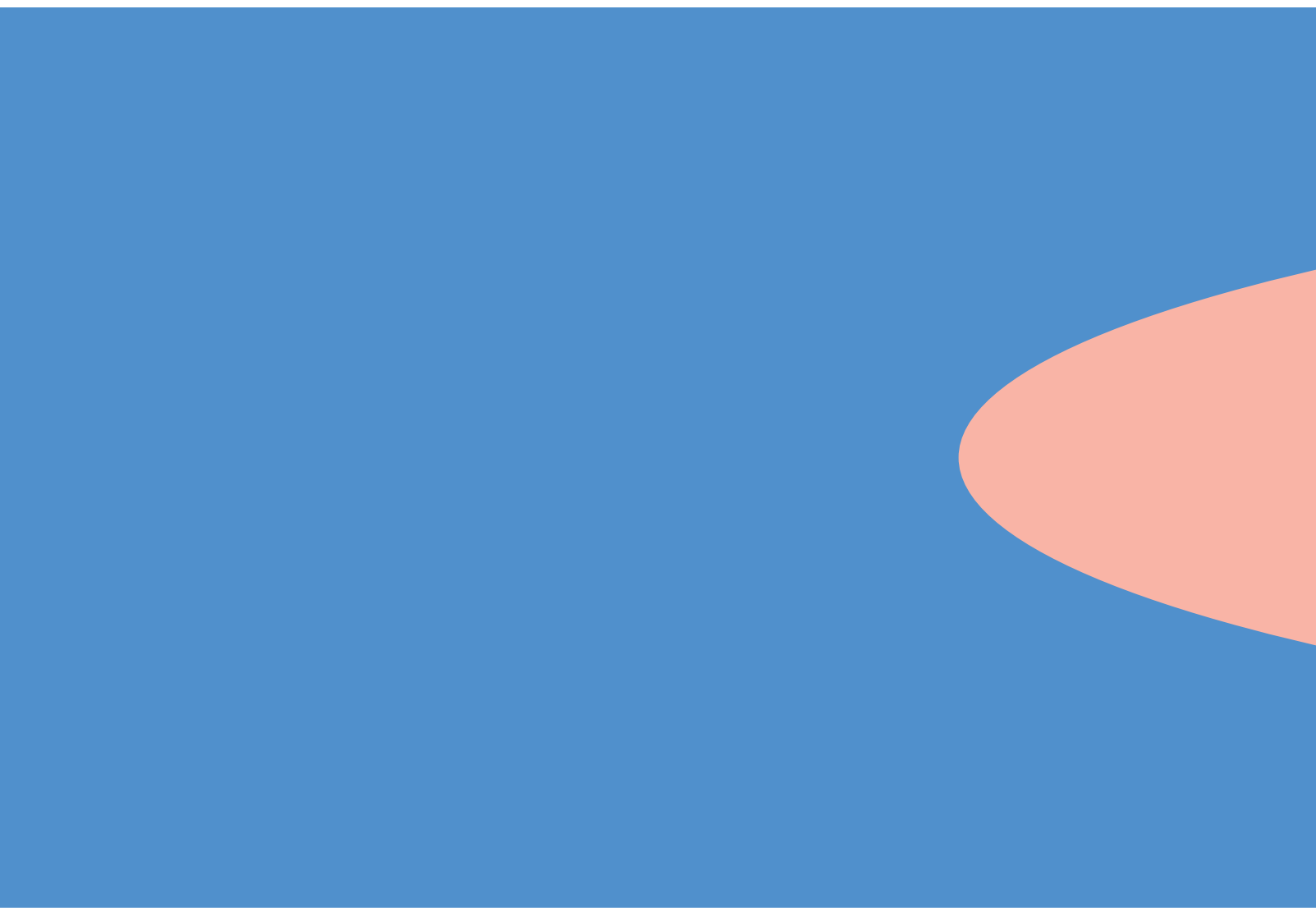

United Nations Framework Convention on Climate Change