



WORLD
RESOURCES
INSTITUTE

READY OR NOT

*Assessing Institutional Aspects of National
Capacity for Climate Change Adaptation*

AARJAN DIXIT, HEATHER MCGRAY, JAVIER GONZALES, AND MARGARET DESMOND

WRI.ORG



Design and layout by:
Nick Price
nprice@wri.org

Dave Cooper
dcooper@wri.org



TABLE OF CONTENTS

5	Executive Summary
9	Introduction
13	The National Adaptive Capacity Framework
19	Pilot Assessment Process and Findings
33	Lessons on Using the NAC Framework
39	Conclusions and Recommendations
42	Appendices
50	References
51	Acknowledgments



FOREWORD

Our climate is already changing. Rainy seasons are shifting, sea levels are rising, and the incidence of drought and floods around the world is increasing. These impacts are likely to get more severe in the future, even if the world meets existing targets to reduce greenhouse gas emissions. Developing countries will bear the brunt of these impending impacts, raising the prospect of widespread human suffering. We need to step up action now, both to reduce emissions and to begin adapting to climatic changes that cannot be prevented.

National governments can play an important role in helping their citizens adapt to these changes. In many cases, government action is critical to reducing climate risks faced by the most vulnerable people. For instance, governments are uniquely positioned to make emergency plans for reducing damages from weather disasters, they can provide resources to help communities diversify livelihoods, and they can establish programs for improving the management of natural resources. National governments can also put incentives in place to nudge individuals and the private sector to undertake actions that build climate resilience and avoid actions that undermine it. For example, governments can give tax breaks to prevent construction near coastal zones or around flood plains.

Around the world, many governments have already started crafting adaptation plans and policies to respond to climate change. However, many are still struggling to understand which policies, approaches, and timelines are required to prepare effectively for an uncertain and potentially dangerous climate future. Since governments are launching an endeavor that will continue for many decades, they are grappling with many questions. What are the critical roles that national institutions will play in adaptation? What existing capacities can they utilize? What are some of the key activities and sectors they need to invest in? What kinds of investments in institutional strengthening do they need to make?

The World Resources Institute's National Adaptive Capacity (NAC) framework provides a distinct and practical pathway for answering some of these

questions. The framework presents a set of institutional functions that are critical for adaptation and provides a means of assessing how well they are being performed by a country's national institutions. WRI and its partners have piloted this assessment in two developing countries (Bolivia and Nepal) and one developed country (Ireland). Each pilot emerged with country-specific recommendations for adaptation research, planning, policy, and action. For example, the assessment team in Bolivia distilled from its pilot findings a set of indicators to measure progress in adaptation implementation. The Irish NAC assessment contributed to a decision by the government to carry out a comprehensive national vulnerability assessment as a next step in the development of its national adaptation strategy.

This publication presents the results of these pilot studies in the hope and expectation that the NAC framework will make an important contribution to understanding the role of institutions in national climate change adaptation efforts. Given the immediacy of the climate challenge, the world's governments urgently need innovative and practical tools and approaches that move adaptation from sound planning to effective implementation. We think this publication offers a pragmatic approach to assessing the adaptive capacity of countries and can help governments establish solid foundations to decrease climate change vulnerabilities and increase resilience.



Manish Bapna
Interim President
World Resources Institute



Executive Summary

THE NATIONAL ADAPTIVE CAPACITY FRAMEWORK

- This report introduces the National Adaptive Capacity (NAC) framework, a tool to help governments bring institutional capacity development into their adaptation planning processes. The NAC framework enables its users to systematically assess institutional strengths and weaknesses that may help or hinder adaptation. National adaptation plans may then be better designed to make best use of strengths or remedy weaknesses. The report describes three pilot assessments conducted using the NAC framework in Bolivia, Ireland, and Nepal.
- Effective institutions are at the heart of our ability to respond to growing climate risks. Governments and other institutions at the national level can play a critical role in increasing society's capacity to adjust and readjust (i.e., "adaptive capacity") as conditions shift and as new climate change knowledge emerges.
- As national policymakers, United Nations Framework Convention on Climate Change (UNFCCC) negotiators, international funders, and others develop methods and guidelines for adaptation planning, it is critical that they include a focus on building national institutions that can support ongoing adaptation.
- The NAC framework provides a practical approach for understanding the institutional aspects of adaptive capacity. NAC assessments can support planning through the identification of specific gaps in capacity that can be filled through investment and action.
- The NAC framework evaluates national institutions' performance of five key functions critical to adaptation: assessment, prioritization, coordination, information management, and climate risk management. The NAC treats performance of these functions as an indication of a country's overall adaptive capacity.
- The pilot applications of the framework in Bolivia, Ireland, and Nepal suggest that the NAC framework is useful across a range of countries and that it can be tailored to specific country contexts. The pilots used the NAC framework in the following ways:
 - **AS A TOOL FOR MONITORING AND BASELINE SETTING.** The NAC assessment in Bolivia led to the development of country-specific indicators and metrics for use in adaptation policy.

- **AS A TOOL TO CATALYZE ACTION AND FILL KEY CAPACITY GAPS.** The Irish NAC assessment identified gaps in capacity, helping to build an evidence base for targeting new research and development efforts. It also inspired the Irish Environmental Protection Agency to commission a national vulnerability assessment.
- **AS A TOOL TO GATHER AND SYNTHESIZE RESOURCES.** The NAC framework can provide a practical structure for organizing a diverse and often scattered body of adaptation-relevant information and resources. This proved particularly useful in Nepal and Bolivia.
- The country teams that applied the NAC framework in Bolivia, Ireland, and Nepal used distinctly different approaches to completing their assessments and also formatted their findings differently. This indicates that the NAC framework can be tailored for use in a variety of different planning or evaluation processes.

“ *The NAC framework evaluates national institutions’ performance of five key functions critical to adaptation: assessment, prioritization, coordination, information management, and climate risk management.* ”





Section I

INTRODUCTION

Human settlements in Bolivia are increasingly affected by the impacts of climate change. The two major cities—La Paz-El Alto in the west and Santa Cruz in the east, with different geographies and economic bases—will face climate change in very different ways. La Paz-El Alto, located in the Bolivian Altiplano, will have to contend with increased glacier withdrawal, water supply shortages, heavy rains, and increased risk of landslides as the climate changes. Santa Cruz in the eastern plains will face increasing flooding risk and outbreaks of diseases like dengue.

According to Bolivia's new Autonomic Law, municipal and provincial bodies, including La Paz-El Alto and Santa Cruz, must create local plans detailing their rules and regulations for managing local resources. These plans could be logical policy vehicles for adapting to the climate risks noted above. However, cities like La Paz-El Alto and Santa Cruz have limited resources and experience in resource management planning, and climate change complicates their planning. Will these cities be able to address adaptation in their local planning?

Ideally, La Paz-El Alto and Santa Cruz will get help to adapt from their national government. That help might include vulnerability

or impacts assessment findings; tools for prioritizing adaptation options; guidance from the finance, transportation, and housing ministries (ideally in a coordinated manner); and a range of environmental and socio-economic information with which to design effective municipal actions.

From this perspective, Bolivia's national government has several essential roles to play in helping its municipalities adapt. For example, the national government can create rules and regulations, in coordination with municipal bodies, that mandate or create incentives for communities or businesses to undertake adaptation actions. The government can also provide much-needed resources and leadership to help communities adapt. At the same time, inappropriate national policy and institutional arrangements can create several barriers to adaptation or worse, even lead to maladaptation.¹ Especially as a growing amount of international finance for adaptation

1. The Intergovernmental Panel on Climate Change (2007a) defines maladaptation as "any changes in natural or human systems that inadvertently increase vulnerability to climate stimuli; an adaptation that does not succeed in reducing vulnerability but increases it instead." For example, an irrigation canal built to help farmers deal with an increasingly variable climate may provide short-term benefits but could prove maladaptive in the long run if it promotes unsustainable water use in a region facing a drier future climate.

flows to developing countries through their national institutions, adaptive capacity at the national level will increasingly affect whether and how communities are able to take action.

Are Bolivia's national institutions up to the challenge?

In 2010, Nur University in Bolivia conducted a National Adaptive Capacity (NAC) assessment to answer this question. Using a new framework to review the performance of key institutions, the NAC assessment pinpointed specific areas of focus for the government, including building the capacity to use and interpret climate information, developing appropriate means to improve coordination of adaptation activities, and developing a system to prioritize adaptation interventions and readjust them over time. Today, several initiatives in Bolivia are working on improving the ability of national institutions to help deliver adaptation support to cities like La Paz and Santa Cruz.

Institutions are at the heart of society's ability to respond to growing climate stresses and risks (Maganan 2010, Adger et al. 2007, Agrawal and Perrin 2008). For the purposes of this paper, we consider institutions to be the formal entities designed to perform a set of functions related to decision making and implementation. They can be classified according to their status (e.g., private, public, non-

governmental, bilateral, multilateral, humanitarian, financial, etc.) or function.

In a changing climate, the process of institutional change represents an important aspect of building adaptive capacity. Adaptive capacity is the ability to design and implement effective adaptation strategies or to react to negative climatic stresses (Brooks and Adger 2004). Among climate change adaptation practitioners, a growing emphasis on adaptive capacity reflects the recognition that adaptation will be an iterative process as the climate changes over the long term. The capacity to adjust and readjust as conditions shift and as new global and local climate change knowledge emerges may be more important than any one effort to address a particular climate risk.

One of several ways in which building adaptive capacity may require governments to adjust institutions is the need to create better systems for meeting the needs of the most vulnerable people. In many places, the most vulnerable people tend to be the poor or marginalized who have few resources with which to adapt and little say in public decision-making processes that influence how climate change will affect them. A critical part of helping such individuals adapt is finding ways to address the underlying factors that make some people vastly more vulnerable to climate change than others (Schneider et al.

“ The capacity to adjust and readjust as conditions shift and as new global and local climate change knowledge emerges may be more important than any one effort to address a particular climate risk. ”

2007). This means changes in access to resources, information, and decision-making processes, all of which are mediated by institutions.

Despite the important role that institutions have to play in adaptation, there are currently no practical approaches for understanding the institutional aspects of adaptive capacity at the national level. Much work on adaptive capacity has focused on how a strong asset base—such as economic wealth, social capital, or high levels of human development—can provide a foundation for responding to emerging climate challenges (Kelly and Adger 2000, Turner et al. 2003). Common indicators of adaptive capacity at the national level include gross national product per capita, the percentage of population with access to clean drinking water and sanitation, or literacy rates (Brooks and Adger 2004, Moss, et al. 2002). Agrawal and Perrin (2008) have focused on institutions, alongside other assets, as important elements of adaptive capacity at the local level. However, the role of national institutions in adaptive capacity has been explored only in general. As a result, national adaptation planning efforts may easily leave out steps that would strengthen institutions critical to helping countries adapt to climate change.

Our Objective

The aim of this paper is to introduce a practical framework, the National Adaptive Capacity framework, for understanding institutional aspects of adaptive capacity at the national level (see Appendix 1) and present the results of its application in three countries. This framework is designed to be used to conduct assessments of adaptive capacity, which can support the development of indicators and targets for tracking national adaptation progress, and the identification of capacity gaps that can be filled through investment and action.

As such, the NAC framework is intended primarily to support national adaptation planning. It also may assist global funding agencies, civil society organizations, and researchers in making investment decisions or tracking the results of capacity-



building initiatives for climate change. This paper introduces the NAC framework and its pilot applications as follows:

- The NAC framework identifies a set of important functions, detailed in Section II, that relevant institutions will need to perform for successful adaptation to climate change at the national level.
- Section III presents the major results from the three pilots of the NAC framework in Bolivia, Ireland, and Nepal.
- Section IV presents the lessons learned from the piloting of this framework.
- Section V provides conclusions and recommendations to support effective development of institutional capacity in national adaptation planning.



Section II

THE NATIONAL ADAPTIVE CAPACITY FRAMEWORK

Toward the end of 2008, the World Resources Institute (WRI) launched a project to explore the institutional aspects of adaptive capacity with an emphasis on national-level governance. An important milestone was a four-day workshop at the Rockefeller Foundation's Bellagio Conference Center, which produced "The Bellagio Framework" (WRI 2009a), a typology of institutional functions that underpin adaptation at the national level. Through a consultation process that engaged more than 60 global adaptation experts and practitioners, "The Bellagio Framework" became the National Adaptive Capacity framework (WRI 2009b).²

The NAC framework provides a straightforward way to assess how well national institutions are performing a core set of critical functions that underpin adaptation. Table 1 introduces these functions and provides an example of each.

For each function listed in Table 1, the NAC framework provides a number of detailed questions that guide users in assessing whether and how well national institutions are performing each function. Appendix 1 provides the full list of these questions. Responses to the questions are recorded in the NAC Answer Worksheet.³ For each question, the Answer Worksheet asks users to make a color-coded (red, yellow, and green) assessment of the adequacy of performance on elements of an institutional function. The worksheet also asks users to record the institution(s) responsible for each function, provide a narrative about institutional strengths and weaknesses, and document evidence used in making each assessment. Users are also asked to identify country-specific indicators with which to track changes in performance. In addition, the NAC Context Worksheet helps users gather an overview of the political and policymaking context in the country before diving into the detailed assessment.

2. "The Bellagio Framework" and the list of participants from the Bellagio workshop can be found here: http://pdf.wri.org/working_papers/bellagio_framework_for_adaptation.pdf. A longer list of contributors to the NAC framework, including those involved in consultation workshops held in Bangkok and Washington, D.C., is listed here: http://pdf.wri.org/nac_list_of_contributors_010410.pdf.

3. The NAC Answer Worksheet and Context Worksheet can be found at <http://www.wri.org/project/vulnerability-and-adaptation/nac-framework>, together with a downloadable version of the NAC pilot framework.

The NAC framework evaluation system relies heavily upon expert judgment. Because good practice in adaptation is still emerging, and may vary significantly depending upon the country context, the framework provides limited guidance as to what constitutes good or poor performance of an institutional function. Users must decide, based on their own expertise, whether and how to score the country using the “traffic light” color scheme. As experience accumulates regarding good practice in adaptation at the national level, more detailed guidance may be added to the NAC (see Section IV below). At least for the time being, though, a NAC framework assessment will benefit from a multistakeholder approach because it is largely driven by the skills, knowledge, and values that its users bring to the assessment process. Ideally, a NAC assessment team will have at least one person with expertise in adaptation and one with expertise in the politics and governance of the country being assessed.

Using the NAC framework provides a snapshot of institutional aspects of national adaptive capacity at a single point in time. Periodic NAC assessments, however, could allow for tracking changes in capacity over time. In this way, the NAC framework can play a role in both the planning and monitoring phases of an adaptation cycle. Figure 1 illustrates how findings from the NAC framework assessment can contribute to each of the three phases of a typical planning cycle: evaluation, planning, and implementation.

As an input to a planning process, the NAC framework has the added benefit of being relevant across countries (see Box 1). Different countries’ institutions may perform the NAC assessment functions in very different ways, but they will all need to perform them one way or another. This makes the NAC framework potentially relevant to planning processes or guidelines that may be developed

Figure 1 | **NAC Framework Contribution to Phases of an Adaptation Planning Cycle**

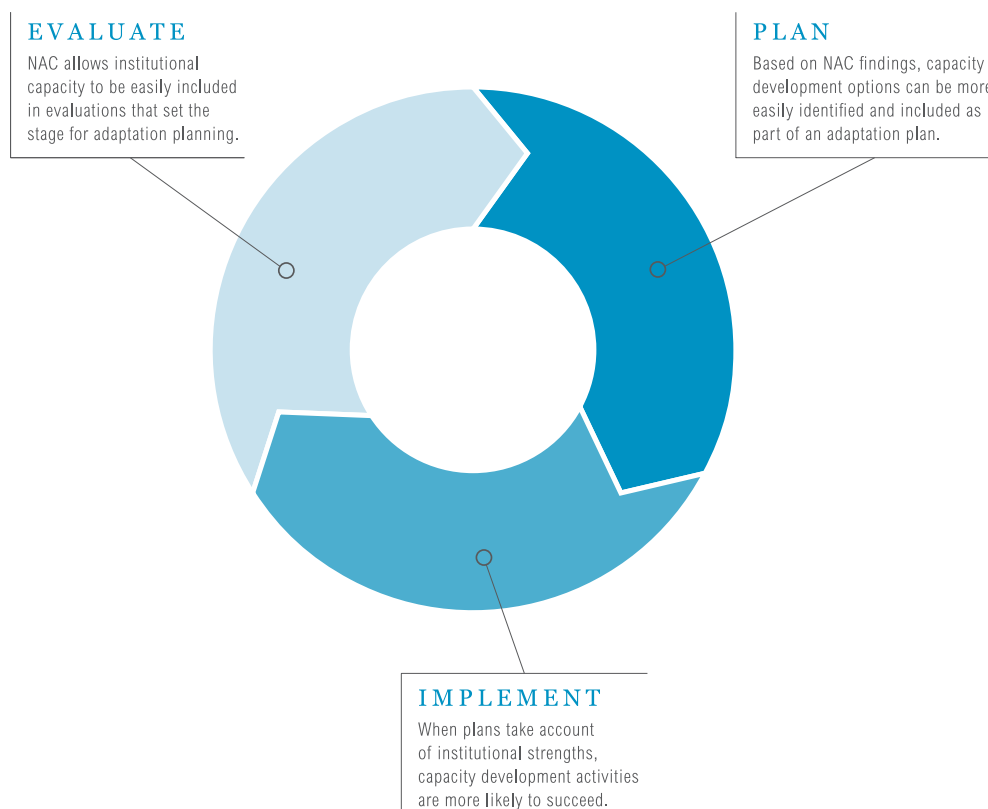


Table 1 | **Institutional Functions for Adaptation**

ASSESSMENT	<p>Assessment is the process of examining available information to guide decision making. Adaptation is likely to require iterative assessments over time, including assessments of a country's vulnerability, climate change impacts, adaptation practices, and the climate sensitivity of development activities.</p> <p>Example: In India, a regional vulnerability assessment of the northeast of the country was conducted to inform investment in adaptation under the Indo-German Northeast Climate Change Adaptation Program. It assessed projected climate change, poverty metrics, and ecosystem health, among other vulnerability factors, and enabled comparison of vulnerability among different districts (Ravindranath et al. 2011).</p>
PRIORITIZATION	<p>Prioritization means assigning special importance to particular issues, areas, sectors, or populations. For adaptation, prioritization at the national level usually takes into account where climate impacts will be most severe and who among the country's population is the most vulnerable. Effective prioritization will engage a wide range of stakeholders, will be made transparent to the public, and will enable review and adjustment of priorities as circumstances change. Countries can have different approaches for setting priorities and may incorporate a wide range of values and concerns in this prioritization process.</p> <p>Example: In Bangladesh's 2008 national climate change strategy, six "pillars" were identified as national priorities: 1. food security, social protection, and health 2. comprehensive disaster management 3. infrastructure 4. research/knowledge management 5. mitigation and low-carbon development 6. capacity building/institutional strengthening (Government of the People's Republic of Bangladesh 2009).</p>
COORDINATION	<p>Adaptation requires action by disparate actors at multiple levels, both within and outside of government. Coordination of their activities helps avoid duplication or gaps and can create economies of scale in responding to challenges. Coordination may begin as a process of establishing relationships, sharing information, and raising awareness but may move toward the management of joint decision making and action. It may be horizontal (e.g., among ministries), vertical (e.g., among national, global, and subnational actors), or among stakeholders (e.g., between government and business).</p> <p>Example: In Nepal, the Ministry of Environment has taken the lead in coordinating all climate change-related activities. The National Adaptation Program of Action (NAPA) was created with the help of six thematic working groups that each coordinated a particular issue area, with representatives from several ministries in each group (Government of Nepal 2010). Building on this NAPA process, the government has recently established the Multi-Stakeholder Climate Change Initiatives Coordination Committee (MCCICC), under the Secretary of the Ministry of Environment. The committee aims to foster a unified and coordinated climate change response in Nepal.</p>
INFORMATION MANAGEMENT	<p>Information management consists of collecting, analyzing, and disseminating information in support of adaptive activities. Relevant information will vary across sectors, countries, and climate-change impacts but, at a minimum, typically covers climate variables, the status of natural and human systems, and existing coping strategies. Providing or accessing existing information for conducting vulnerability assessments is critical for most adaptation activities. Good information management will ensure that information is useful and accessible to stakeholders. It may also involve general awareness-raising or building the capacity of stakeholders to use information for adaptation.</p> <p>Example: In the United Kingdom, a quasi-governmental organization known as the United Kingdom Climate Impacts Program (UKCIP) published climate change scenarios and associated adaptation decision tools on behalf of the government. These scenarios were widely used to research the possible impacts of climate change to support adaptation decision making. Since October 2011, the Environment Agency has taken over the management of UKCIP.</p>
CLIMATE RISK MANAGEMENT	<p>The four functions above assess aspects of adaptive capacity relevant to a broad range of climate-related challenges in a country. However, most countries face specific climate risks that loom larger than others. The Climate Risk Management function provides an opportunity to examine institutional aspects of the specific capacities needed to address such risks. Addressing climate risks requires a process of identifying the specific risks to a given priority, evaluating the full range of options for addressing the risks, then selecting and implementing risk reduction measures. Countries typically treat risk management on a sector-by-sector or issue-specific basis. For example, many countries have highly climate-sensitive agriculture and water sectors and may focus adaptation investments on building the capacity for managing climate risks in these sectors. In other cases, a country may prioritize treatment of climate risks to a particularly vulnerable group, such as the elderly.</p> <p>Example: In Vietnam, sea level rise in the Mekong River delta has put significant amounts of agricultural land at risk, threatening the livelihoods of farmers. The government has initiated large-scale restoration and rehabilitation of mangroves, as well as the construction of dikes, to prevent saline water from inundating agricultural lands. (WRI, 2011).</p>

under the UNFCCC or other multinational fora, and could help support learning or lesson-sharing across countries.

The NAC framework's focus on institutional functions contrasts somewhat with other frameworks for thinking about adaptive capacity, which have tended to focus mostly on assets as indicators of adaptive capacity. For example, measures of wealth, social capital, and information availability are commonly used to understand adaptive capacity (United Kingdom Department for International Development 1999, 2000, 2001). Assets-based indicators help answer the question, "What resources do I have that can help me adapt?" The NAC framework's functions-based approach, on the other

hand, asks, "What am I able to do that can help me adapt?" These two approaches to understanding adaptive capacity can and should complement each other.

The following sections provide more details about findings from pilot NAC framework assessments undertaken in 2010 in three countries: Ireland, Bolivia, and Nepal.⁴

4. Pilot countries were selected primarily based on availability of funding and interest of research partners. Large countries were avoided, and the Pilot Program for Climate Resilience (PPCR) countries prioritized. The Irish Environmental Protection Agency initiated and funded the Irish assessment independently of WRI's research but volunteered to share findings and serve as a pilot.



BOX 1 | APPLYING THE NAC FRAMEWORK TO NATIONAL ADAPTATION PLANNING

The NAC framework can help national adaptation planners take account of institutional aspects of adaptive capacity. It is designed to be applicable in a range of countries and, as such, takes a flexible approach to several dimensions of the planning process:

SEQUENCE: The adaptation planning and implementation contexts in each country can be very different. Most of the Least Developed Countries already have NAPAs; others are working on comprehensive national adaptation strategies. The NAC framework recognizes that different countries are at different stages of their adaptation planning processes.

INSTITUTIONAL CHOICE: The NAC framework recognizes that each country will craft a unique process for adaptation planning and implementation to suit its needs and circumstances. Some countries will choose to integrate climate risks into existing national plans and policies. Still others will call for important planning to be done at state, provincial, or district levels, rather than producing a national plan.

STARTING POINT: By systematically documenting existing policies and plans, the NAC framework provides a basis for developing new adaptation policies that complement, build on, or reform existing policies. Some countries will start adapting based on a national top-down political mandate; others will begin from

the bottom up, based on a diversity of local projects. In some places, particular sectors or regions will move forward more rapidly than others, depending on their needs and strengths. The NAC framework recognizes that any of these starting points can provide a good basis on which to build an effective approach to adaptation. The framework also helps identify potential synergies and trade-offs with other existing activities and policies.

IMPACTS AND SECTORS: Because the NAC framework looks at institutional functions relevant to a broad range of adaptation activities, it is potentially relevant to various climate change impacts and the many sectors that may be influenced by them. For example, the framework can be used to assess management of information that can support responses to both drought and flood. The climate risk management function of the NAC framework also is structured so that users may tailor the framework to different sectors or themes.



Section III

PILOT ASSESSMENT PROCESS AND FINDINGS

The NAC framework assessment teams in each country undertook distinct processes, summarized in Table 2.

In Bolivia, Nur University researchers led a NAC framework assessment that included a diverse set of stakeholders, with consultation taking place in stages throughout the assessment process. The assessment team actively worked with existing country platforms for discussion and decision making, such as the preparatory meetings of the Cochabamba People's Conference on Climate Change, the UN Working Group on Humanitarian Organizations, the National Climate Change Program, and the Donor Coordination Working Group for Climate Change. Among the three pilots conducted, the Nur University team most thoroughly embraced the idea of using the NAC framework to generate measurable indicators and quantitative metrics. This culminated in a multistakeholder meeting, hosted by the UN Development Programme (UNDP) with participation of representatives from the Ministry of Environment, the Ministry of Foreign Affairs, and other experts in climate change and risk reduction that identified a set of indicators and metrics that could guide adaptation policy (see Table 3, page 35).

The NAC framework assessment in Ireland, conducted by the Irish Environmental Protection Agency (EPA) and the University College Cork, had the most formal linkage to the national policymaking process among the three NAC framework pilot assessments. Consultation focused on engaging technical expertise from the academic sphere, decision makers and the NGO community. The Irish assessment team indicated that participants in the initial review workshops considered whether to dispense with the color-coded rating system called for in the NAC answer sheet, as well as the question of whether performance of a function was “adequate.” In the end, they included both of these rating systems in their assessments; although they recognized that many of the ratings were subjective and depended on “who was in the room.” However, they also noted that having to select a rating prompted a deeper, more detailed conversation about the status of key capacities and their importance.

In Nepal, a team of researchers from the Institute for Social and Environmental Transitions-Nepal, the International Institute for Environment and Development, and WRI conducted the assessment in 10 days.

Stakeholder engagement was limited to a one-day workshop at which initial findings were reviewed.

The Nepali assessment team, in contrast to the Irish and Bolivian teams, chose not to use the color-coded rating system or the adequacy characterization in filling out the NAC answer sheet. The team emphasized, instead, the narrative description of strengths and weaknesses and provided a final evaluation that summarized the major strengths and weaknesses in lieu of a color rating. Team members saw this approach as less political, more informative, and more positive. Given their short time frame and limited stakeholder engagement, the Nepali team members feared that assigning color scores to the functions or calling performance “inadequate or adequate” could lead audiences to mistrust the assessment and feel unmotivated to take action.

All three countries have emerging climate change policies, and their respective national governments are actively working on adaptation. Both Nepal and Bolivia are developing, landlocked, mountainous countries and face a similar set of climate change stresses (World Bank 2009; Nepal Climate Vulnerability Study Team 2009). Despite these similarities, the NAC framework pilots showed that the institutional landscape for adaptation in the two countries was very different. Meanwhile, as a much more developed island nation and member of the European Union, Ireland faces even greater differences in economic, institutional, and climatic circumstances. However, the application of the assessment in Ireland suggests that the function-based assessment of institutional capacity at the national level also has utility in a developed country, and some of the lessons from the Irish pilot were similar to the others. General lessons from the NAC pilots are presented in Section IV.

The following subsection summarizes assessment findings according to the function categories of the NAC framework. Appendix 2 provides an update of the adaptation planning process to date in Bolivia, Ireland, and Nepal. Appendix 3 provides more detailed results from each of the three country pilots.

NAC Function 1: Assessment⁵

Adaptation will require iterative studies and investigations over time, including assessments of climate change impacts, vulnerability, risks, coping strategies, and adaptation practices. Such assessments are often an early step in identifying activities and options that help a country adapt to future challenges. At the time of the NAC pilots, several vulnerability and risk assessments already existed or were ongoing in Bolivia and Ireland, while Nepal was launching both a national impacts assessment and an inventory of local coping strategies. The NAC pilot teams found that these provided a basis to begin work in adaptation. However, their evaluations also revealed that important information and knowledge was often lacking, indicating a need for additional research.

In all three countries, assessment processes lacked geographic and sectoral comprehensiveness. Nepal and Bolivia had a number of community-based and other small-scale vulnerability assessments, but these did not themselves provide a national picture of vulnerability. During the time of the NAC pilot in Nepal, the Ministry of Environment was thinking of undertaking a national climate vulnerability assessment as a first step in identifying appropriate adaptation actions under the NAPA planning process. Several working groups led by the Ministry of Environment conducted detailed local studies throughout Nepal to first identify current household coping strategies and then to identify future vulnerabilities to climate change. Meanwhile, local and community-based adaptation projects in Bolivia had helped build an initial understanding in both the government and civil society of local communities’ climate change vulnerabilities. The National Climate Change Program (PNCC) of the government, together with the UNDP, are working to draw these findings together into a national vulnerability assessment.

Similarly, in Ireland, a State of Knowledge report had summarized existing and expected climate

5. The term “assessment” is used in two distinct ways in this report. A “NAC assessment” refers to the process of using the NAC framework to evaluate the adaptive capacity of a country. The “assessment function” is one of the five institutional functions that constitute the NAC framework. Inclusion of this function reflects emerging good practice around using vulnerability, risk, impact, and adaptation assessments as an important input to adaptation decision making.

Table 2 | **NAC Framework Pilot Assessment Processes**

	BOLIVIA	IRELAND	NEPAL
Assessment Time	6 months	6 months	10 days
Responsible Institutions	Nur University, La Paz	Irish Environment Protection Agency (EPA) and University College Cork (UCC)	Institute for Social and Environmental Transitions–Nepal, International Institute for Environment and Development, World Resources Institute
Methods	<ul style="list-style-type: none"> ■ literature and documentation search ■ interviews with key national stakeholders, including government officials, donors, NGOs, and academics 	<ul style="list-style-type: none"> ■ literature and documentation search ■ in-person and telephone interviews with government departments and agencies, academics/ researchers, and NGOs 	<ul style="list-style-type: none"> ■ literature and documentation search
Workshops	three workshops: February 2010 initial inception workshop; April 2010; July 2010	three workshops: April 2010 for academics and researchers; May 2010 for members of the national research impacts and adaptation steering group; August 2010 for NGOs	one workshop in March 2010 to review and validate findings with NGOs and government officials
Priority Areas Assessed	<ul style="list-style-type: none"> ■ food sovereignty, food security, agriculture, and rural issues ■ risk management in human settlements 	<ul style="list-style-type: none"> ■ planning ■ water ■ critical infrastructure 	<ul style="list-style-type: none"> ■ water and energy ■ agriculture ■ forests and biodiversity ■ public health ■ urban settlements ■ disaster risk reduction
Major Outputs	<ul style="list-style-type: none"> ■ recommendations for adaptation policy development ■ set of indicators, metrics, and targets for tracking development of capacity over time 	<ul style="list-style-type: none"> ■ recommendations for adaptation policy development ■ detailed identification of entry points for integrating climate change risks into existing sectoral plans and policies 	<ul style="list-style-type: none"> ■ a description of strengths and gaps for each function category of the NAC framework



change impacts (Desmond, M, O'Brien, P and McGovern, F, 2009).⁶ This report and the NAC pilot revealed a small number of other studies and assessments, and concluded that a lack of information was not fundamentally a barrier to adaptation action. However, these studies did not add up to a national climate change vulnerability assessment that could inform comprehensive adaptation policy development. This NAC pilot finding was cited by the Ireland Environmental Protection Agency in recommending that the Ministry of Environment support such a national vulnerability assessment. It was commissioned in late 2010 and is now being undertaken by the National University of Maynooth (see Box 2).

The NAC pilot team found that Ireland has the capacity to conduct complex adaptation studies and assessments. However, they also identified the need for regular climate risk studies of existing and proposed sectoral policies, plans, programs, and projects. They identified several existing policy tools in the country that could be used toward this purpose, such as environmental impact assessments, strategic environmental assessments, and regulatory impact assessments.

In both Bolivia and Ireland, as in Nepal, information exists that provides an adequate basis for some type of action either at the community, or sector level. This information represents an important strength on which to build. However, coverage of existing studies and assessments is somewhat ad hoc and incomplete from the perspective of developing national policy and strong enabling environments. Building more comprehensive, long-term assessment capacity will require the roles and responsibilities of specific agencies and other stakeholders to be clearly spelled out in national plans and policies. In Ireland, the national strategy currently under development is likely to spell out these roles and responsibilities.

6. This work was based on work carried out by Met Éireann/University College Dublin (McGrath and Lynch 2008), the National University of Ireland Maynooth (Sweeney, Donnelly, McElwain, and Jones 2002; McElwain and Sweeney 2007), and material from the Fourth Assessment Report of the IPCC (IPCC 2007b).

NAC Function 2: Prioritization

Prioritization means assigning special importance to particular issues, areas, sectors, or populations. Prioritization processes are highly political and vary across countries, incorporating a wide range of values and concerns depending on political processes and power arrangements. At the same time, prioritization typically draws, to one degree or another, on an evidence base. For adaptation, prioritization at the national level should, at a minimum, take into account where climate impacts will likely be most severe and who among the country's population is most vulnerable. As such, adaptation-related assessments (above) form the evidence base through which prioritization of activities can occur in a country. In addition, prioritization processes should engage a wide range of stakeholders, be made transparent to the public, and enable review and adjustment of priorities as circumstances change.

The NAC framework pilots revealed that, although prioritization of activities for adaptation had started to occur, they were in their infancy in all three countries. The National Mechanism on Adaptation (MNACC) was the principal prioritization instrument for the government of Bolivia, and it aimed to integrate climate change risks into different sectors. The NAC team found that the MNACC was transparent, with participation from a wide cross section of Bolivian society, the team also found that the MNACC lacked several important things: a strong mandate, an effective monitoring and evaluation framework, and the ability to channel and allocate public funds. Key ministries like the Ministry of Economy and Public Finance and the Ministry of Planning were only marginally represented in the MNACC, making it weak for the setting of adaptation priorities.

In Ireland, national priorities for adaptation had yet to be identified at the time of the NAC assessment. The ongoing national vulnerability assessment is expected to help create broad national priorities for action on adaptation when completed. The NAC framework assessment revealed the lack of a review system for adjusting priorities over time and recommended that such a system be put in place. The assessment team also believed that this was a key element of a prioritization process and should be supported in upcoming climate legislation.



Box 2 | National Vulnerability Assessment in Ireland

The impacts of climate change will be felt differently by different groups of people. Developing countries are especially at risk, with their poor and marginalized groups, like women and children, for example, on the front lines of climate change impacts (United Nations Development Programme 2007; WRI, United Nations Environment Programme, World Bank, and United Nations Development Programme 2011).

Vulnerability assessments sit at the heart of efforts to prioritize and execute investments in adaptation in ways that address different groups' different experiences of climate change. These assessments can help guide policy makers to target and implement effective adaptation initiatives by identifying—

- the places, particular groups of people, and sectors where those impacts are likely to cause the greatest harm, and
- the nonclimatic factors that help make climate change harmful (such as environmental degradation, lack of mobility, and weak social safety nets).

However, vulnerability assessments are not just for developing countries. Ireland is currently undertaking a national-level assessment of current and future vulnerability to climate change. Ireland's Environmental Protection Agency's (EPA) Climate Change Research Program (CCRP) is coordinating the study, which is being undertaken by researchers at the National University of Ireland Maynooth. The impacts and adaptation steering group of the CCRP identified the need for a national vulnerability

assessment, and the EPA used the NAC pilot's findings regarding the missing assessment to present a convincing case for the study.

This national vulnerability assessment aims to provide a broad picture of climate change vulnerability and identify the people, places, and economic activities most vulnerable to climate change in relation to likely impacts, sensitivity, and adaptive capacity. The study will build on the national State of Knowledge Report (Desmond, et al. 2009) to identify an initial list of critical sources of vulnerability that require adaptive responses.

Anticipating a reporting requirement to the European Union on impacts and adaptation, the EPA also wanted to undertake a vulnerability assessment that was methodologically comparable to vulnerability assessments in other European countries. The assessment has the following objectives:

- to understand the current and future vulnerabilities to climate change of natural systems, economic and social groups, and major infrastructure; and
- to help prioritize key topics for future further analysis based on this initial study.

This assessment will be used to further inform the development of national policy on adaptation. It will also assist in sectoral and local-level decision making by identifying issues and areas for which to conduct more detailed climate risk assessments. The CCRP research is also developing methodologies to support these detailed risk assessments and the costing of adaptation options.

The Ministry of Environment in Nepal has established the Climate Change Knowledge Management Centre under the Nepal Academy of Science and Technology (NAST) and a Web-based information portal using funds from the NAPA process (www.climatenepal.org.np). This center aims to be a repository of climate-change documents and reports pertaining to Nepal, and there are plans to create a mobile library to increase awareness about climate-change impacts in the country. The center also aims to enhance public access to climate change-related information in order to build capacities and facilitate the interface between scientific research and policymaking.

As part of the NAPA development process, an online information portal was also created to gather all information pertaining to climate change in the country in one place. The portal has created profiles of the various country-specific databases and inventories kept by other organizations in one searchable database. The portal also has created an Internet-based catalogue of reports, maps, and publications about climate change and its impacts on Nepal. Currently, the portal is organized around six themes: science, adaptation planning (tools, methodologies, case studies, and best practices), policy and actions, international climate policy, financing, and technology transfer.

Ultimately, the Irish NAC team concluded that these national priorities for responding to climate risks had to be integrated into sectoral priorities identified by regional and local bodies.

A key lesson learned from the NAC framework assessment in Nepal was the diversity of prioritization processes that may affect climate change adaptation. Although the NAC framework assessment can most easily be used to examine strategy-level government prioritization processes, many Nepali stakeholders viewed prioritization as a budgetary allocation process within the Ministry of Finance or as a project selection process under the NAPAs. International funding processes, such as the World Bank-administered Pilot Program on Climate Resilience (PPCR), contributed to this diversity of prioritization efforts. During the time of the NAC assessment, the government of Nepal was in the process of prioritizing urgent and immediate projects for the NAPA funded by the Global Environmental Facility's LDC Fund.⁷ The government initially wanted the PPCR to use the same government systems and processes that were being used in the NAPA process. However, the politics surrounding the NAPA and the PPCR processes, as well as the resources involved in them, made for different prioritization needs. Ultimately, the government of Nepal and its international partners failed to reconcile the prioritization needs of these two separate processes, and they were not integrated.

While the prioritization of adaptation activities had begun in both Bolivia and Nepal in response to specific international mandates or programs (for example the NAPA process in Nepal or the PPCR), by contrast the Irish government is undertaking a prioritization process in response to its own perceived needs. Vulnerability and risk assessments often form the basis for beginning such prioritization processes for climate change adaptation, and all three countries were beginning to use such assessments as an input to prioritization. Importantly, prioritization was limited to broad strategic themes and, in the case of the Nepali NAPA, a handful of high-profile projects. None of the three

7. The UK government's Department of International Development (DFID) and the Dutch government's DANIDA had supplemented funds from the LDCF to turn the NAPA in Nepal into a "NAPA-plus" process that included more activities than the creation of a NAPA document alone.

“ *Adaptation requires action by disparate actors at multiple levels, both within and outside of government.* ”

countries had yet developed methods for including climate adaptation considerations in the development of national budgets or in the prioritization of annual activities.

NAC Function 3: Coordination

Adaptation requires action by disparate actors at multiple levels, both within and outside of government. Coordination of their activities helps avoid duplication or omissions and can create economies of scale in responding to challenges. Coordination may be horizontal (e.g., among ministries), vertical (e.g., among national, global, and subnational actors), or among stakeholders (e.g., between government and business). Political dynamics can significantly affect coordination; the NAC therefore evaluates whether the coordination function is located in a relatively authoritative institution. This assists, in particular, with the convening of disparate actors, which is often an important starting point for coordination.

Horizontal and vertical coordination through the government remains a challenge in all three of the NAC assessment pilot countries. While the MNACC in Bolivia helped enhance horizontal coordination between the Ministry of Environment and other sector ministries, the vice minister of environment was officially reviewing other coordination mechanisms in the Ministry of Finance and Planning with the aim of strengthening them. The NAC framework assessment revealed that there were a number of different institutions created to coordinate activities for climate change in Bolivia. The government

created a special platform to engage indigenous peoples' organizations and allied groups. This platform has helped enhance government coordination as well as helped strengthen the country's international negotiations positions. However, the NAC revealed that several coordination tasks are not effectively implemented by the government: A national mechanism does not exist to help the national government coordinate with provincial and municipal bodies, and there is no explicit mandate for the Ministry of Planning to work together with the Ministry of Environment.

The NAC framework assessment in Nepal revealed that, although there were several plans from the government to conduct coordination activities for climate change, the operational aspects of coordination could be substantially improved. The Ministry of Environment was the lead coordinating agency and a Climate Change Department was being established within it. In developing its NAPA, the government also established thematic working groups with representation of staff from relevant ministries for each of the priority areas in the NAPA (see Table 2). The National Planning Commission also had a role in this coordination, and the Ministry of Finance set up a foreign aid coordination division. However, the government had yet to make clear the sustainability of these institutions and the roles of these institutions (especially of the National Planning Commission and the Ministry of Finance) in climate change adaptation, and the sustainability of their engagement was uncertain.

In Bolivia, the World People's Conference on Climate Change and the Rights of Mother Earth in

Cochabamba in April 2010 increased awareness and provided a very strong impetus for official bodies to coordinate and develop an implementation structure for climate change adaptation. The Ministry of Planning, for example, received the mandate to take the lead in the implementation of the action points of the Cochabamba Conference, mainly of integrating climate change issues in the new National Planning Instrument. The vice minister of environment was also tasked with the preparation of a high-level council chaired by the president to deal with climate change policy issues. Overall, the NAC framework assessment here revealed that the government was focused on developing strong positions for the UNFCCC negotiations. However, there was still a lack of coordination between the process of developing foreign policy positions and the domestic coordination of adaptation activities.

In Ireland, among actors currently taking the lead on climate change adaptation activities, the NAC framework assessment found high levels of awareness that coordination was critical and that appropriate processes needed to be put in place to enable both horizontal and vertical coordination. The NAC assessment team thought that existing institutional arrangements within the government of Ireland could provide a good basis on which to establish effective coordination processes. They identified

the need to establish or mandate a national high-level group to coordinate action on climate change adaptation and strengthen institutional capacity by drawing on a pool of relevant expertise. The steering group on impacts and adaptation of the CCRP, for example, already has participation from numerous sectors and could be a means to coordinate a broader climate change adaptation agenda.

NAC Function 4: Information Management

Information management consists of collecting, analyzing, and disseminating information in support of adaptation activities. Relevant information will vary across sectors, countries, and climate change impacts but, at a minimum, typically covers climate variables, the status of natural and human systems, local knowledge, and existing coping strategies. Good information management will ensure that information is useful and accessible to stakeholders. It may also involve general awareness-raising or building the capacity of stakeholders to use information for adaptation.

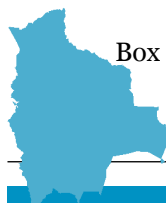
In the three pilot assessments, countries were beginning to pay more attention to the various types of information needed for climate change



adaptation. Adequate information and analysis was available to enable climate change adaptation planning and implementation to begin in earnest in Ireland, for example. Improvements could still be made to strengthen and build a more sustainable climate observation system and to better communicate data and analysis to the public and decision makers in Ireland. Stakeholders involved in data collection and analysis supported the provision of open access to environmental and research data, although efforts to make information publicly available had been ad hoc and uncoordinated to date.

The NAC framework assessment in Ireland identified existing capacity in the country to gather and analyze relevant information. The country, however, lacked a lead organization to manage all climate information and strong political commitment to sustain data gathering and monitoring systems. Systems for information analysis were well developed; however, the NAC assessment identified the need for further system development to support a shift from project-based approaches to a more sustainable programmatic approach to information management for adaptation. The Irish NAC assessment team identified a need for a national climate information platform. The CCRP is now supporting the development of a pilot national information system, which could fulfil many of the needed information management functions.

The NAC assessments in Nepal and Bolivia revealed that there were also several efforts under way to improve weather and climate-change information availability and access. In Bolivia, a number of national studies analyzed the difficulties of gathering and processing climate data in the country. Both countries suffered from limited capacity to understand and use climate science, although there have been recent attempts to build future climate-change scenarios and conduct climate impact analysis. The NAC assessment found that new types of information and communication technologies were already simplifying data gathering as well as making it easier for users to access and analyze relevant information. Internet-based platforms were playing a significant role in making information freely accessible. Bolivia has already put in place a number of different programs for providing information relevant to adaptation, including a public meteorological observation network through



Box 4 | **Climate Change Risk Management in Human Settlements in Bolivia**

Although Bolivia is currently the least urbanized country in South America, it has experienced rapid urbanization. New and rapidly growing settlements are concentrating in areas that may face significant risks associated with climate change in the future, especially a rise in disease vectors and losses from extreme events (Gonzales and Zalles 2010a). The NAC assessment team found a general lack of consistent policies and programs to regulate the growth of such settlements and housing in the country.

Several ongoing activities, however, could provide opportunities to integrate climate-change risks and adaptation measures to make these areas more resilient to climate-change impacts. The Hyogo Framework for Action and its implementation platform in Bolivia,⁸ for example, have created a working group on human settlements as a means of further coordinating the disparate work that is ongoing on urban areas, disaster risk reduction, and climate change.

Researchers and practitioners of different Bolivian and international NGOs are also working together to get local and municipal authorities involved in the integration of climate-change risks in their daily work. Specific activities that are currently ongoing include training in the use and dissemination of methodologies for assessing vulnerability and risk and mainstreaming climate change into planning efforts.

8. The Hyogo Framework for Action is a 10-year plan adopted by 168 member states of the United Nations to make the world safer from natural disasters. Adopted in 2005, it identifies key priority areas and offers the principles and means for decreasing disaster risks.

the government meteorological office called Servicio Nacional de Meteorología e Hidrología and a system to monitor the Millennium Development Goals through the government of Bolivia's policy analysis unit (Unidad de Análisis de Políticas Sociales y Económicas-UDAPE) and UNDP. UNDP and the vice minister of environment collaborated to create the Bolivian Climate Change Platform (www.cambioclimatico-pnud.org.bo), with participation from a broad section of civil society, academia, and the private sector. This platform aims to increase awareness about climate change and disseminate key climate change information. In Nepal, the government was in the process of establishing a climate-change knowledge management platform and an information portal (see Box 3), and various civil society organizations and international nonprofit organizations are establishing climate change-related networks and platforms.

Data gathering, along with analysis and dissemination, continues to be a challenge in countries like Nepal. Most weather stations in the country are in areas that are more populated and easily accessible. The density of weather stations in the Himalayas and the higher hills of Nepal, for example, is much

lower than in the urban centers like Kathmandu or in the southern plains. Differences in altitude can create dramatic variability in the current climate and have an effect on how climate change impacts will manifest themselves in the region. The capacity to manage and monitor these stations, as well as to ensure the quality of the observed data, is as important as the resources needed to establish new stations. The NAC assessment revealed that a lack of resources and institutional capacity had hindered the systematic analysis, review, and dissemination of climate change-related information and research in Nepal so far. Ensuring data collection standards for manual and remote stations and developing methods to centralize data collection and analysis are needed to improve general information management.

Many stakeholders in all three countries were already creating demands for climate information, and a few projects were providing information at the local level. Ensuring that accurate and authoritative information reaches key stakeholders continues to remain a challenge. The NAC assessment revealed that countries need to pay special attention to the needs of information users at multiple levels, as well as work to increase public awareness of



climate change risks, vulnerabilities, and opportunities for reducing them.

NAC Function 5: Climate Risk Management

The previously discussed four functions in the NAC framework assess aspects of adaptive capacity relevant to a broad range of climate-related challenges. However, most countries face specific climate risks that loom larger than others. For example, in a country where coastal tourism is important economically, risks associated with storm surge and sea level rise may require particular attention. In another country, priority may be placed on risks to food security or to a particularly vulnerable group, such as children. The climate risk management function of the NAC provides its users with an opportunity to examine institutional aspects of the specific capacities needed to address such risks. Analysis of this function needs to draw on national information and assessment processes addressed in the functions discussed earlier but may also require additional sector- or issue-specific research or assessment not captured by those NAC function questions. Identifying and analyzing coun-

tries' capacities to manage specific climate risks is a critical part of tailoring the NAC assessment to a country's climate change context and of linking the assessment to national development priorities.

To use the assessment questions for the climate risk management function, NAC users identify a set of "priority areas" (vulnerable groups, climate-sensitive sectors, at-risk regions, vulnerable ecosystems, etc.) for adaptation in the country. The capacity questions for the climate risk management function are then answered separately for each priority area, since different priority areas typically involve different institutions. For example, a NAC assessment that examines the country's capacity to address climate risks to food security may need to look at the agricultural ministry, the rural development ministry, and institutions involved in crisis response. Taking water resources as a priority area might involve examination of river basin authorities, hydropower agencies, and water user associations.

In each priority area, NAC users will evaluate the performance of national institutions at:

- establishing a process of identifying the specific risks to a given sector or issue,



- evaluating the full range of options for addressing the risks, and
- selecting and implementing risk reduction measures.

The NAC framework pilot assessments found that key institutions for some priority areas had begun exploring climate risks and vulnerabilities. However, the identification and the implementation of risk reduction activities had not yet begun in many relevant sectors.

In Bolivia, the NAC assessment of climate risk management focused on human settlements and agriculture, nutrition, and food sovereignty. The assessment found some comprehensive studies that address climate risks in these two areas but only limited actual implementation of activities. The World Bank and World Food Program have conducted assessments of public-service water delivery in urban areas and vulnerability assessments of food systems respectively, applying a climate lens. Although adaptation options were not identified for human settlements, several promising initiatives for integrating climate-change risks in municipal and urban areas were ongoing (see Box 4). Options identified for agriculture and food sovereignty included the conservation of genetic resources, improved irrigation, and the use of existing financial mechanisms like the National Agriculture Security Fund (FONASAG in Spanish) for reducing climate risks. Performance on the implementation of these options was found to be quite weak, however, and dependent on external project funding.

The climate risk management function in Ireland was assessed for three priority areas of water, planning, and critical infrastructure. Momentum from existing EU directives for integrating climate-change risks and also local-level initiatives were helping to move forward the integration of climate risks in all three areas. In the water sector, there was a readiness to assess climate risks among stakeholders working in water resource management, water supply, water quality, and marine and coastal resource management. Under the Planning and Development Acts 2000–2010, for example, development plans are required to contain objectives for the promotion of sustainable settlement and transportation strategies in urban and rural areas, including measures to reduce greenhouse

gas emissions and address climate-change adaptation. The NAC assessment concluded that an important next step for building adaptive capacity would be development of guidance on how to specifically address adaptation within the spatial planning system for regional and local-level plans. Some recent studies provided a good template to integrate climate risks into some sectors, but the NAC framework assessment team thought that more studies were needed to fill the remaining knowledge gaps, for example on social and green infrastructure. The actual identification of adaptation options and their implementation has not yet been systematically undertaken by the concerned sectoral agencies.

The NAC assessment in Ireland identified significant scope for developing an effective approach to climate risk management by building on existing legislation, tools, and mechanisms, especially for spatial planning. The assessment team’s recommendations took into account the risk of delay through overemphasizing the development of new tools and procedures; hence, they believed the focus should be on integrating climate risk into environmental decision making using existing statutory tools such as environmental impact assessments.

All six of the major priority areas identified under the Nepali NAPA—disaster risk reduction, agriculture, water and energy, health, urban settlements, and forests and biodiversity—were assessed by the Nepali NAC assessment team under the climate risk-management function. The team found no national climate risk and vulnerability assessments for these sectors. Smaller and more context-specific assessments of climate risks and vulnerabilities did exist, but a lot more work needed to be completed on impacts, risks, and vulnerability assessments in all these sectors.

There was rarely any explicit mention of adaptation options for these areas in existing sector documents in Nepal. In some cases and sectors (like agriculture and disaster risk reduction), policy options have been evaluated more thoroughly than in others using environmental impact assessments and cost-benefit analyses. Because no adaptation options were identified in many of these sectors, the implementation of such adaptation options has not occurred.





Section IV

LESSONS ON USING THE NAC FRAMEWORK

The primary purpose of the pilots was to test the utility of the NAC framework for assessing adaptive capacity and to identify changes that would enable the framework to become a useful tool for adaptation planning. The NAC framework and its pilots were intended to help policymakers integrate institutional capacity development into planning for climate-change adaptation by developing country-specific institutional indicators for adaptive capacity, helping set a baseline for those indicators, and highlighting institutional capacity gaps for future adaptation action to fill.

Pilot teams also emerged with a set of important recommendations from their assessments for improving adaptive capacity in their respective countries. Findings from the pilots indicate that the NAC framework can be useful for the following activities:

Developing Indicators for Baseline Setting and Monitoring

The Bolivia assessment provides the best example of using the NAC framework to set a baseline for institutional aspects of adaptive capacity. Nur University and UNDP convened a workshop of Bolivian stakeholders from

government, academia, NGOs, the donor community, and the UN system to review the NAC assessment findings and identify a set of priority indicators to track over time. The group also developed specific metrics with which to measure these indicators for the national level. The indicators were derived from selected NAC framework assessment questions, chosen because of their particular relevance to capacities needed for development of Bolivian adaptation policy (see Table 3). The NAC assessment team also independently developed a separate list of targets for human settlements and food sovereignty, two areas of focus under the climate risk-management function in the Bolivian NAC assessment.

The Bolivian team's concrete metrics paint a picture of Bolivian institutions' performance of key adaptation functions. They provide the basis for broad, strategic recommendations for the development of adaptation policy. The Ireland and Nepal teams did not go as far in developing metrics and indicators to measure progress.

Catalyzing Action to Fill Performance Gaps

The Irish use of the NAC framework best illustrates its ability to identify gaps in the



performance of important functions that support adaptation. The Irish team completed a comprehensive assessment and identified performance gaps and processes to move adaptation planning forward. Stakeholders valued the NAC assessment process for its early identification of these needs and gaps. For example, the NAC framework pilot identified the lack of a national vulnerability assessment and presented the evidence base to support such an assessment (see Box 2). The Nepal and Bolivia NAC framework pilots also identified numerous gaps in national institutions' performance of adaptation functions. In contrast to the Irish assessment, their recommendations and next steps generally focused on broader strategic issues like creating appropriate institutional arrangements and engaging with the correct set of stakeholders.

Gathering and Synthesizing Evidence

Both the Bolivia and Nepal teams observed how helpful the NAC framework assessment was for gathering in one place a wealth of diverse studies and material relevant to adaptation. In many developing countries where several activities are ongoing but rarely documented, the NAC framework provides an organizing frame to systematically collect a wide variety of adaptation-related data and studies from across institutional boundaries. By facilitating the consolidation and synthesis of dis-

parate information, the NAC framework assessment could serve as a foundation for a range of possible future activities. For example, based on the fact that adaptation is such a new field of inquiry and on the misconception that adaptation is only about climate science and climate models, the Nepal team originally assumed that adaptation-related analyses were very limited in the country. The NAC assessment, however, revealed that several local-scale climate change vulnerability studies had already been carried out and that there were efforts under way to conduct more detailed studies.

Similarly, the review workshop for the NAC framework results in Nepal revealed that, because of interagency disputes over control of funds and projects, rainfall and temperature data from a large number of existing weather stations going back at least a dozen years were not being entered in the central data repository run by the Department of Hydrology and Meteorology. As a result, historical analyses and climate projections for the country do not yet include this data set.

Meeting Needs of Different Users

The country teams that applied the NAC framework in Bolivia, Ireland, and Nepal used distinctly different approaches to completing the assessment, as detailed in Section III. The three pilots also emphasized different evaluative options offered by the NAC framework. Some assessment teams chose to use the NAC as a scorecard, assigning color codes to each function; others elected to describe strengths and weaknesses qualitatively, rather than rating performance.

The process followed in completing the assessment and the membership of the assessment team play a significant part in ensuring the legitimacy of the assessment findings. A longer and more detailed multistakeholder assessment may be more trusted by stakeholders than a shorter NAC assessment conducted by researchers alone. In addition to the pilots described in this paper, WRI and its partners are also piloting advocacy-oriented applications of the NAC framework, undertaken by national civil society coalitions through a project called ARIA. ARIA assessments are conducted as a vehicle through which civil society can engage more effectively in national adaptation planning and in advocating for improvements in policy for adaptation (see Box 5).

Table 3 | **Indicators and Metrics for Measuring Improvements in Adaptive Capacity in Bolivia**

NAC FUNCTIONS	BOLIVIAN INDICATORS	PROPOSED METRICS
Assessment	There is a clear mandate to include climate risks in local development and other types of plans.	Availability of methodologies and guidelines to assist local planners
Coordination	An institution has been tasked to coordinate adaptation efforts in the country.	Mandated institution has clear authority and resources for coordinating other actors
Climate Risk Management	A set of economic incentives for risk reduction has been tested and applied by local, regional, and national investments.	Percentage of total funds provided by the central government to local, regional, and national investment projects for “climate risk mitigation”

Adapted from Gonzales and Zalles 2010b.

Options for Further Development

The pilot assessments identified the following options for further development of the NAC framework and associated tools and guidance:

Multiple Tool Format

The NAC framework could be developed into multiple assessment tools to help in adaptation planning and program development, recognizing that users tend to emphasize different aspects of the framework.

Several reviewers of the NAC framework and its pilots suggested using the framework to develop a simple checklist-style diagnostic of capacity to perform adaptation functions. This checklist approach would require all NAC function questions to be framed so that they had clear, categorical answers. Other reviewers suggested the opposite of the checklist approach in which the current NAC framework would be fleshed out with more detail and guidance. Significantly more guidance could potentially move the NAC framework toward a standardization approach, rather than leaving a high degree of discretion with the user. Another set of options concerns the form of the NAC assessment output.

Specialized tools could guide users to produce either qualitative narratives about institutional capacities or a more quantitative set of indicators and metrics derived from the NAC framework.

Further Development of NAC Function Questions

The pilot assessments produced several clear lessons regarding improvements to the NAC framework function questions in their next iteration. Findings from the pilots indicated, for example, that prioritization questions could be elaborated further, often because there were multiple prioritization processes occurring in a country at the same time. Questions about the coordination function of the NAC sometimes may need more flexibility to account for the large diversity of institutional arrangements for coordination in different countries.

The pilots also confirmed that the climate risk-management function was operationally different from the rest of the NAC functions. Guidance on how to pick priority areas for this function could assist users in understanding its distinctiveness and applying its questions effectively. Greater clarity also is needed regarding how the first four functions of the NAC framework relate to the management of specific climate risks. This assessment may be

assisted by detailed issue-specific guidance on gauging the performance of national institutions for managing climate risks in specific issue areas like agriculture or urban development.

Menu of Capacity-Development Resources

Sometimes users seek to move rapidly past the diagnostic process of assessing existing capacity and into the process of building new capacity. In the Irish application of the NAC framework, for example, the project coordinators requested advice on tools and resources for filling known capacity gaps long before a full capacity assessment was completed. One way to meet this demand might be through a resource guide (perhaps in the form of a Wiki or other online medium) that used the NAC framework as an organizing framework for helping users navigate other adaptive capacity-development tools. Another way could be to develop a series of minimum standards or a good practice guide derived from the NAC framework for the effective delivery of adaptation across national institutions.

Analysis across Geographic Scales

NAC framework users and reviewers frequently commented on the need to explore linkages between national-level institutional functions and adaptation action at subnational or international

levels. For example, several possible analyses could be undertaken to test in greater detail a country's performance of institutional functions through the lens of whether and how they enable adaptation action or capacity development at the local level. Alternatively, specific functions not examined through the NAC framework may prove critical for channeling finance, technology, knowledge, or political commitments from the international level into strong country capacity for adaptation. This may require attention to national budget processes or coordination with donors or to the structure and resources of new climate finance institutions, none of which are explicitly examined through the NAC framework as currently structured.

Several prospective NAC framework users have also asked whether the framework could be used to examine institutions at the local level. Although the framework was designed explicitly with national institutions in mind, it seems likely there would be some overlap in key functions needed for adaptation at national and local levels. The African Climate Change Resilience Alliance, for example, used the NAC framework as a reference in the development of a local adaptive capacity evaluation framework (African Climate Change Resilience Alliance 2011).



BOX 5 | PROMOTING CIVIL SOCIETY ADVOCACY FOR NATIONAL ADAPTATION ACTION THROUGH ARIA

Although the NAC framework was designed for use in government-led national policymaking, it is not owned solely by government stakeholders and can be used in a bottom-up way by civil society. In parallel with the pilots described in this paper, WRI worked with civil society partners from four continents to combine the NAC framework functions set with the evidence-based advocacy approach developed under the Access Initiative (www.accessinitiative.org). The resulting ARIA toolkit provides detailed research guidelines to assist civil society organizations in building advocacy agendas for changes in governance that would promote effective adaptation. The toolkit guides civil society coalitions through a process of assessing the comprehensiveness of national action; accountability of national institutions; and access to information, public participation, and justice in key adaptation-related decisions. ARIA has the following objectives:

- **BUILD CAPACITY FOR CIVIL SOCIETY ORGANIZATIONS (CSOS).** ARIA helps CSO advocates for the poor, the environment, and vulnerable communities build their capacity to analyze existing policies around adaptation. Such analysis provides a basis for structuring an advocacy agenda and engaging government officials.

- **DEMAND GOVERNMENT ACTION ON ADAPTATION.** Thus far, much national adaptation planning has been top-down, spurred by global processes. ARIA aims to promote adaptation planning from the bottom up through civil society organizations that work closely with vulnerable communities.
- **MONITOR ADAPTATION POLICY IMPLEMENTATION.** By providing a bottom-up, nongovernmental perspective on institutional readiness for adaptation, ARIA can help triangulate results from international and governmental analyses of capacity development progress.

The ARIA toolkit has so far been piloted by advocacy coalitions in Bolivia and Ghana (Foti et al. 2010). Efforts are under way to pilot the toolkit by civil society organizations in Ethiopia and Sri Lanka.



Section V

CONCLUSIONS AND RECOMMENDATIONS

Adaptation planning should focus on institutional strengthening... | National governments need to produce plans for adaptation to help decrease climate vulnerability of their communities, economies, and ecosystems. Meanwhile, at the global level, the international community is working to develop shared expectations around national adaptation planning, as a basis for the flow of funds to support adaptation. It is critical that planning initiatives at both the national and international levels include a focus on strengthening the institutions that are central to building adaptive capacity.

...and the NAC framework offers an analytic approach that can help. | The NAC framework pilots illustrate one way that an “adaptation lens” can be brought to institutional strengthening initiatives. By providing an adaptation-specific typology of institutional functions, the NAC framework offers a way to move general discussions of institutional capacity building toward a more concrete agenda of specific capabilities that can support national action on adaptation. The pilot applications of the framework suggest that the NAC functions apply across a diversity of countries and that they can be tailored to specific country contexts.

The NAC framework can help national planners develop indicators of adaptive capacity, accommodating country- and sector-specific factors that enable tracking and measurement. Such a process provides countries with the flexibility they need for planning processes, monitoring frameworks, and ensuring that the resulting adaptation actions are domestically “owned” and effectively implemented.

A National Adaptive Capacity assessment can help planners work... | Nearly all countries have strengths with which to begin adapting, but these may not be obvious at the start of planning, given the diversity of institutions that may be involved. Institutional functions can provide a practical organizing frame for sorting a diverse and often scattered body of adaptation-relevant information and resources. This was particularly useful in the Bolivia and Nepal pilots because national adaptation activities there were just beginning.

...and promote long-term thinking. | A national assessment such as those piloted using the NAC framework can provide a comprehensive snapshot of ongoing adaptation processes and the full set of stakeholders involved in them. As illustrated by the Bolivian case, this

snapshot can help planners, funders, and other decision makers identify both key activities to track over time and the critical players to engage. The NAC framework can be used to focus on the gradual, iterative process of institutional strengthening and may help to move adaptation planning from a project orientation to more programmatic and systems-oriented approaches.

There is a need to explore how national adaptive capacity translates to local adaptation... | There is a need to delve deeper into how an assessment of national-level capacity translates to actual implementation of adaptation activities at local and community levels. For example, as gaps in performance at the national level are filled, do community members notice a difference in the resources available to support their adaptation? These questions cannot be answered well by national capacity assessment tools like the NAC framework alone. As adaptation practices evolve and new lessons are learned, “ground-truthing” the NAC against adaptation outcomes at the local level could ensure that the tool targets the

most relevant national-level functions. Ground-truthing also would help tailor assessments to specific countries and to communicate the resulting findings to policymakers.

...but at the national level, win-win’s are likely. | Responding to climate change can require institutions to perform unique functions, such as the ability to support adaptation-specific assessment processes and climate-specific information products. However, other key roles of institutions that have been explored by the NAC framework in this report—cross-sector coordination, management of basic environmental data, and climate risk management—have broad application as well. In this way, improving institutional aspects of adaptive capacity also supports the development of core capacities for better governance more generally. Moreover, there is often significant overlap between good adaptation and good development. For example, in Bolivian cities, a reduction of flood and erosion risks to urban settlements could support safer, healthier, more streamlined overall patterns of urbanization.

“ *The pilot applications of the framework suggest that the NAC functions apply across a diversity of countries and can be tailored to specific country contexts.* ”



APPENDIX 1

National Adaptive Capacity Framework

NAC Function 1: Assessment

CAPACITY QUESTIONS	ELEMENTS TO LOOK FOR
To what extent has a national vulnerability and impacts assessment been conducted?	<ul style="list-style-type: none">■ Assessment(s) include(s) exposure to climate impacts.■ Assessment(s) include(s) socioeconomic drivers of vulnerability.■ Assessment(s) take(s) into account community-level assessments.■ The methodology of the assessment(s) is made transparent.■ A broad set of stakeholders were engaged in the development of assessment(s).■ Assessment(s) cover(s) all sectors and regions.
To what extent have existing adaptation efforts been systematically inventoried?	<ul style="list-style-type: none">■ Community-based activities have been inventoried.■ Academic studies have been reviewed.■ Activities in a large number of sectors have been reviewed.
Is there an assessment of climate risks to priorities in major existing national planning documents?	<ul style="list-style-type: none">■ Key documents explicitly address climate change.■ Key documents have been reviewed for climate sensitivity and resilience.■ Assessment(s) is (are) available freely in the public domain.
Is there a system in place for regularly updating the above assessments in the future?	<ul style="list-style-type: none">■ An institution (or institutions) has (or institutions have) a mandate to produce the above assessments iteratively over time.■ Sufficient budget is provided for ongoing assessment(s).■ The mandated institution coordinates appropriately with other institutions.

NAC Function 2: Prioritization

CAPACITY QUESTIONS	ELEMENTS TO LOOK FOR
To what extent have national priorities for adaptation been identified?	<ul style="list-style-type: none">■ Prioritization processes take into account key documents (e.g., 5-year plans, PRSPs, key sector policies, etc.) that reflect existing national development priorities.■ Prioritization processes take into account input from local-level institutions.■ Prioritization processes are transparent and publicly documented.■ Prioritization involves a range of stakeholders, including vulnerable and marginalized groups, in order to assure that priorities are informed by a broad range of perspectives.
To what extent is there a system in place for reviewing and adjusting priorities over time?	<ul style="list-style-type: none">■ A time period and process have been set for revisiting priorities.■ The institution that leads prioritization reports to an appropriate authority.■ Prioritization decisions can be enforced by officials and members of the public.■ Resources have been allocated to support convening and other prioritization costs.

NAC Function 3: Coordination

CAPACITY QUESTIONS	ELEMENTS TO LOOK FOR
Have key services, sectors, or activities been identified where coordination may be needed for successful adaptation?	<ul style="list-style-type: none">■ Vertical coordination needs have been considered.■ Needs for coordination across sectors and ministries have been considered.■ Coordination needs are clearly articulated in a public document.
Has an authoritative body been tasked with adaptation coordination?	<ul style="list-style-type: none">■ A coordination body has been established.■ The coordination body has a clear mandate.■ The coordination body has appropriate membership.■ Staff serving the coordination body have appropriate skills and knowledge.■ The coordination body regularly reports to an appropriate authority.■ Sufficient resources have been provided for coordination activities.
To what extent have clear coordination processes been established?	<ul style="list-style-type: none">■ A description of the coordination process is available in a public document.■ There is a system for monitoring and review of the coordination mechanism.■ There is a process for managing conflicts that may arise during coordination.■ Participants in coordination have sufficient flexibility to participate constructively.
To what extent do conditions allow coordination to improve over time?	<ul style="list-style-type: none">■ A process and time period have been set for reviewing coordination activities.■ A process and time period have been set for revisiting coordination needs and priorities.■ Resources have been provided for the review of coordination activities.
To what extent is the coordination mechanism functioning effectively?	<ul style="list-style-type: none">■ The coordinating body meets regularly.■ Participants in coordination report regularly to the organizations they represent.■ Coordination participants and their stakeholders report positively on the body's activities.■ Findings from coordination reviews are taken on board.

NAC Function 4: Information Management

CAPACITY QUESTIONS

ELEMENTS TO LOOK FOR

To what extent are there appropriate systems for data gathering?

- The country has climate observation/monitoring systems that are regularly maintained and updated.
- The country has demographic information systems that are regularly maintained and updated.
- Environmental monitoring/observation systems are regularly maintained and updated.
- Methods for data gathering are transparent and publicly available.
- Raw data is readily available publicly and undergoes regular review.
- Sufficient budget is provided for ongoing data gathering.

To what extent are there appropriate systems for information analysis?

- There is a process for updating key climate-related definitions, such as (but not limited to) 'normal precipitation levels', 'drought', and important system 'thresholds'.
- Consolidation and analysis of historical climate information occurs.
- The status of vulnerable ecosystems is periodically analyzed.
- The status of vulnerable human systems is periodically analyzed.
- Climate scenarios are developed using all available projections and their uncertainty estimates.
- Analysis is made publicly available and undergoes regular review.
- Sufficient budget is provided for ongoing information analysis and for improving skills and knowledge.
- The analysis produced is easily available to the public.

Has an appropriate national platform (or network) for public information sharing on adaptation been identified (or created)?

- An institution(s) has a mandate to disseminate information broadly.
- The mandated institution(s) coordinate(s) appropriately with other institutions.
- A diversity of information users has access to the platform.
- There is a system for monitoring and evaluation of information dissemination.
- Monitoring and evaluation findings are taken on board.
- Sufficient budget is provided for ongoing information dissemination.

To what extent is relevant information reaching key stakeholders who need it?

- Representatives of key government agencies say they have the information they need.
- Representatives of lower levels of government say they have the information they need.
- Representatives of the public (including vulnerable populations) report that they have access to this information.
- Key stakeholders are using information in decision making and project implementation.
- Key information is publicly available via a variety of channels.

NAC Function 5: Climate Risk Management

CAPACITY QUESTIONS

ELEMENTS TO LOOK FOR

To what extent has climate risk been assessed for the priority area?

- A systematic risk assessment has been conducted.
- Risk assessment takes into account biophysical, socioeconomic, and policy factors.
- Risk assessment considers infrastructure, natural resources management, and social protection programs, as appropriate.
- Assessment methodology is made transparent and readily available to public and other agencies.
- An institution has a mandate to conduct risk assessment iteratively over time.

Have adaptation options for the given priority area been thoroughly considered?

- Consideration of options included an appropriate breadth of possible solutions: “Soft” and “hard” options.
- Infrastructure-based, ecologically-based, and social protection-based options.
- Existing adaptation and/or risk reduction projects were reviewed for appropriate replicable options.
- Cost analysis, including total costs and cost effectiveness, was conducted.
- Environmental implications of options were considered.
- Social implications of options were considered, including implications for women and marginalized groups.
- Options were evaluated for their short-, medium-, and long-term efficacy.
- A broad set of stakeholders was engaged in consideration and selection of options.
- Processes exist for reviewing options selected based on new risk assessments over time.
- Authorities make publicly available a process description and justification of options selection.

To what extent are selected adaptation options implemented on the ground?

- Projects/programs/policies are developed to implement selection option(s), as appropriate.
- Appropriate authority is tasked with implementation.
- Sufficient budget is provided in support of implementation.
- A system exists for reviewing effectiveness of implementation.
- Projects/programs/policies are achieving stated objectives and timelines.
- Mechanisms exist for adjusting nonperforming projects/programs/policies.
- Mechanisms exist for integrating new risk assessment information into projects/programs/policies over time.

APPENDIX 2

Recent Updates on Adaptation Planning

The results of the NAC framework pilot assessments only provide a snapshot of the national policymaking space during the time of the assessment. A lot of work has occurred since the completion of the NAC assessments in each of these countries, moving adaptation planning in new directions. This section provides an update on progress in adaptation planning since the pilot NAC assessments were completed in the three countries.

Bolivia

Since the completion of the NAC assessment by Nur University in 2010, Bolivia's National Climate Change Program has begun to integrate climate risks in a select number of prioritized sector plans and policies through the National Adaptation Mechanism. The vice minister for the environment and UNDP, through the National Climate Change Platform, have contributed to this process by establishing and implementing two inter-institutional fora—one on water and climate change, and a second forum on food security and climate change. These fora are officially sponsored by the Bolivian government, the UN system, and other international cooperation agencies.

The Bolivian government has decided to prioritize the water sector and a watershed approach in its Pilot Program on Climate Resilience (PPCR), which is still under preparation. The process of creating the PPCR has brought to the forefront the challenges of intersectoral coordination for integrated watershed management. Although the PPCR development process recognized that agriculture extension, risk reduction, ecosystem services, and strengthening of local bodies through decentralization required special coordination, it proved difficult to achieve.

Finally, integrating climate change and risk reduction into the working of local bodies has begun within the government and its partners. Bolivia's new Autonomic Law has created a new mandate for municipal and provincial bodies to create local rules and regulations. Such a mandate could provide valuable entry points for climate risk management if appropriate planning tools and relevant information are made available to local governments.

Ireland

The main drivers of policy development in Ireland for climate change adaptation are the international climate change process led by the UNFCCC, a number of relevant directives from the EU, and observable impacts of climate change itself. For example, in the water sector, the EU's flood directive provides a comprehensive mechanism for assessing and monitoring increased risks of flooding caused by climate change and for developing appropriate adaptation measures.

At the national level, the overarching climate change policy document is the National Climate Change Strategy (DEHLG 2007). Through it, the Irish government has committed to developing a National Adaptation Strategy that will provide a framework for integrating adaptation issues into decision making at both national and local levels. This framework is currently under preparation.

Activities are also occurring in some sectors that will be affected by climate change such as water, biodiversity, and spatial planning. Other sectors, such as agriculture, coastal protection, and transportation, have seen less activity to date, though opportunities for integration of adaptation in these sectors are promising (Desmond and Shine 2011). At the local level, authorities have started to integrate adaptation into their planning activities. Such work is happening through spatial development plans and, in some instances, through specific local climate-change strategies.

Research in impacts and adaptation continues to progress through mainly the CCRP. Research activities include observations, modeling, impact and vulnerability assessment, risk, and cost-benefit assessment of adaptation options. An important element of the CCRP is to widely disseminate research findings and analysis with a view to informing adaptation policy.

Nepal

Since the completion of the NAC framework assessment, a number of separate developments have moved the formal adaptation planning process forward in Nepal. The Nepali cabinet approved the country's NAPA, produced through a broad consultative process, in September 2010. A national vulnerability assessment using existing studies and a prioritization process for identifying proposed priority projects were completed under this planning process. The adaptation options identified in the NAPA include both urgent and long-term adaptation strategies in key vulnerable sectors. The total cost to implement these urgent adaptation measures was estimated at US\$350 million.

The government of Nepal also approved a climate change policy in January 2011, recommending the establishment of a climate change center to undertake research, monitor climate change activities, and provide policy support. Other proposals include the implementation of community-based local adaptation actions and the development of a reliable forecasting system. The government of Nepal also formed the Multi-Stakeholder Climate Change Initiatives Coordination Committee (MCCICC) in April 2010 under the chairmanship of the secretary of the Ministry of Environment. The committee aims to foster a unified and coordinated climate change response in Nepal. The MCCICC comprises a broad group of stakeholders and builds on the inclusive approach initiated by the NAPA process. The recently established Climate Change Management Division at the Ministry of Environment serves as the Secretariat of the committee, which meets at least once every quarter.

Finally, the Strategic Program for Climate Resilience under the PPCR was approved in June 2011 for the World Bank's PPCR. A separate national climate risk assessment was carried out for the SPCR, and five major programs were identified to integrate climate risks into the workings of the government and to create transformational changes. The total cost of the five programs in the PPCR was US\$110 million with US\$50 million as grants and US\$60 million as concessionary loans to the country.

APPENDIX 3

Summary of NAC Pilot Assessment Findings by Country

Table 5 | **Bolivia: Key Strengths and Gaps for Institutional Capacity for Adaptation**

NAC FUNCTIONS	STRENGTHS	GAPS
Assessment	Assessments at different levels exist and are slowly being consolidated.	No national assessments. Limited treatment of social vulnerabilities, mostly impact-focused. Limited ability to conduct and understand future scenarios.
Prioritization	5 broad priorities have been identified for adaptation within the adaptation planning instrument (MNACC). Local bodies can also define own priorities.	Limited synergies with existing priorities. Limited use of evidence. No review process. Line ministries involved but not finance and planning ministries.
Coordination	Cochabamba Conference 2010 played an important role. Strong coordination for international negotiations and horizontally among agencies.	Limited vertical coordination. Sometimes different agencies working at cross purposes.
Information Management	Climate change data gathering slowly developing. Other economic and social data gathering occurring.	But meteorological data gathering and analysis is limited and irregular. Limited budget and institutional weakness of SENAMHI. Dissemination is weak.
Climate Risk Management (Human Settlements and Food Sovereignty)	Some vulnerability and impact assessments for urban areas and food sovereignty.	Some project-based implementation. Adaptation options that have been identified may need to be reviewed. The involvement of local authorities is currently under review by the Autonomic Law. The food sovereignty agenda is on hold at the national level.

Table 6 | Ireland: Key Strengths and Gaps for Institutional Capacity for Adaptation

NAC FUNCTIONS	STRENGTHS	GAPS
Assessment	Assessments have been ongoing for some time. Sufficient information exists to plan for and implement adaptation.	There is not as yet a full systematic assessment of vulnerability at the national level.
Prioritization	There is awareness of the need to prioritize actions at the national level.	A system needs to be put in place for reviewing and adjusting priorities over time and to clarify responsibilities.
Coordination	Existing structures provide a good basis on which to establish effective coordination.	A high-level national group to coordinate action on climate change adaptation and strengthen institutional capacity should be mandated..
Information Management	Well-established systems for data gathering and analysis for key areas exist. Their use to support climate change adaptation planning is being advanced. Pilot projects are providing information to local stakeholders.	There is a need to improve information systems and communication of data and analysis to the public and decision makers. The need for a national climate information platform that provides these services has been identified and its development launched.
Climate Risk Management (Water, Planning, and Critical Infrastructure)	<p>Water: EU Directives are drivers for integrating climate change concerns into water resource management (quality and quantity).</p> <p>Planning: Existing tools and guidelines related to planning are starting to address climate risk.</p> <p>Critical infrastructure: Assessments have been conducted</p>	<p>Water: Some adaptation relevant activities have been pursued, but without adaptation as the motivation.</p> <p>Planning: Limited climate change assessments and implementation of climate activities have happened.</p> <p>Critical Infrastructure: Responsibility for assessing and minimizing climate related risks needs to be enhanced</p>

Table 7 | **Nepal: Key Strengths and Gaps for Institutional Capacity for Adaptation**

NAC FUNCTIONS	STRENGTHS	GAPS
Assessment	Some subnational and local studies exist.	Limited resources and institutional capacities for comprehensive national assessments. More work on methodologies for assessing vulnerability needed. Limited inventories.
Prioritization	Other government programming processes use occasional prioritization that may include periodic reviews, local needs, and stakeholder participation.	Limited prioritization for CCA. No system exists for reviewing priorities over time. Limited programmatic resources for prioritization.
Coordination	Coordination mechanisms for climate change that exist in the country include NAPA TWGs, NPC, Climate Change Division, Donor Compact, and Prime Minister's Council on Climate Change.	Operational aspects remain weak. No initiative for revisiting coordination needs or for monitoring coordination. Limited clarity on role of existing institutions currently mandated to coordinate.
Information Management	Plans under way to establish knowledge platform. Data collection and analysis exist. Analysis under way through various government and NGO-led studies.	Data collection is weak. Limited number of weather stations in the country. Lack of resources, capacities, and institutional abilities hinder systematic analysis, review, and easy availability of information. Dissemination efforts have been very weak.
Climate Risk Management (Agriculture, Water, Human Health, Urban, Biodiversity and Forests, Disaster Risk Reduction)	Some pre-disaster hazard assessments have been carried out in all sectors. Wide stakeholder consultations exist in many sectors.	Hard infrastructure options often given primacy in most priority areas. Limited climate change risk and vulnerability assessments exist for these priority areas and sectors.

REFERENCES

- Adger, W.N., S. Agrawala, M.M.Q. Mirza, C. Conde, K. O'Brien, J. Pulhin, R. Pulwarty, B. Smit and K. Takahashi. 2007. "Assessment of adaptation practices, options, constraints and capacity." *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press: Cambridge, UK, 717-743.
- African Climate Change Resilience Alliance (ACCRA). 2011. "The ACCRA Local Adaptive Capacity Framework". ACCRA Briefs. Online at http://community.eldis.org/.59d669a7/ACCRA%20Local_Adaptive%20Policy_new.pdf.
- Agrawal, A., and N. Perrin. 2008. "Climate Adaptation, Local Institutions, and Rural Livelihoods." IFRI working paper. School of Natural Resources and Environment, University of Michigan. Online at http://sitemaker.umich.edu/ifri/files/w08i6_agrawal_perrin.pdf.
- Brooks, N., and N. Adger. 2004. "Assessing and Enhancing Adaptive Capacity: Technical Paper 7." New York: UNDP (<http://ncsp.undp.org/docs/717.pdf>).
- Department of the Environment Heritage and Local Government (DEHLG). 2007. Ireland's National Climate Change Strategy 2007–2012. Dublin: Government of Ireland.
- Desmond, M., O'Brien, P and F. McGovern 2009. "A Summary of the State of Knowledge on Climate Change Impacts for Ireland." Climate Change Research Programme-CCRP Report. Online at <http://www.epa.ie/downloads/pubs/research/climate/naime,27091,en.html>.
- Desmond, M., and T. Shine. 2011. "Integrating Climate Change Adaptation into Sectoral Policies in Ireland." Climate Change Research Programme (CCRP) 2007-2013 Report Series No. 10. Environmental Protection Agency: Wexford, Ireland.
- Foti J, T Flores-Bedregal, and A-R Saeed. 2010. "Civil Society Demand for Climate Change Governance: An Approach with Case Studies from Ghana and Bolivia". 2nd UNITAR-Yale Conference on Environmental Governance and Democracy. New Haven, USA. Online at http://conference.unitar.org/yale/sites/conference.unitar.org/yale/files/Paper_Foti_1.pdf.
- Gonzales J., and H. Zalles. 2010a. "Climate Change Vulnerability Reduction in Bolivia: MDG 7, Target: Achieve Significant Improvement in Lives of at Least Half a Million Slum Dwellers in Bolivia by 2020." La Paz: The Netherlands Climate Assistance Programme.
- Gonzales J., and H. Zalles. 2010b. "Bolivia Adapting to Climate Change: Piloting the National Adaptive Capacity Framework (NAC)." Universidad Nur, La Paz, Bolivia. Unpublished.
- Government of Nepal. 2010. "National Adaptation Programme of Action to Climate Change". Ministry of Environment. Kathmandu, Nepal. Online at: http://www.napanepal.gov.np/pdf_reports/NAPA_Report.pdf.
- Government of the People's Republic of Bangladesh. 2009. Bangladesh Climate Change Strategy and Action Plan 2009. Ministry of Environment and Forests, Dhaka, Bangladesh. Online at: http://www.moef.gov.bd/climate_change_strategy2009.pdf.
- Intergovernmental Panel on Climate Change (IPCC). 2007a. "Climate Change 2001: Working Group II: Impacts, Adaptation and Vulnerability." Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller, eds. Cambridge University Press, Cambridge, UK. Online at <http://observatory.ph/resources/IPCC/TAR/wg2/fig2-2.htm>.
- IPCC. 2007b. "Summary for Policymakers," in Climate Change 2007: The Physical Basis. Contribution of WGI to the 4th Assessment Report of the IPCC. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller, eds. Cambridge University Press, Cambridge, UK.
- Kelly, P., and W.N. Adger. 2000. "Theory and Practice in Assessing Vulnerability to Climate Change and Facilitating Adaptation." Online at <http://nome.colorado.edu/HARC/Readings/Kelly.pdf>.
- Magnan, A. 2010. "For a Better Understanding of Adaptive Capacity to Climate Change: A Research Framework." No 02. IDDRI. SciencesPo. Online at http://www.iddri.org/Publications/Collections/Analyses/AN_1002_Magnan_framework%20adaptive%20capacity.pdf.
- McElwain, L., and J. Sweeney. 2007. *Key Meteorological Indicators of Climate Change in Ireland*. Wexford, Ireland: Environmental Research Centre. Environmental Protection Agency, Johnstown Castle Estate.
- McGrath, R., and P. Lynch, eds. 2008. "Community Climate Change Consortium for Ireland (C4I)." *Ireland in a Warmer World: Scientific Predictions of the Irish Climate*. Department of the Environment, Heritage and Local Government, Dublin, Ireland.
- Moss R.H., E.L. Malone, and A.L. Brenkert. 2002. "Vulnerability to Climate Change: A Quantitative Approach." Online at http://www.globalchange.umd.edu/data/publications/Vulnerability_to_Climate_Change.pdf.
- Nepal Climate Vulnerability Study Team (NCVST). 2009. *Vulnerability through the Eyes of the Vulnerable: Climate Change-Induced Uncertainties and Nepal's Development Predicaments*. Institute for Social and Environmental Transition-Nepal (ISET-N, Kathmandu) and Institute for Social and Environmental Transition (ISET, Boulder, Colorado) for Nepal Climate Vulnerability Study Team (NCVST) Kathmandu. Online at [http://i-s-e-t.org/images/pdfs/Climate%20Scenarios%20Report%20\(Low\)_10%20November%2009.pdf](http://i-s-e-t.org/images/pdfs/Climate%20Scenarios%20Report%20(Low)_10%20November%2009.pdf).
- Ravindranath, N.H. S. Rao, N. Sharma, M. Nair, R. Gopalakrishnan, A. S. Rao, S. Malaviya, R. Tiwari, A. Sagadevan, M. Munsri, N. Krishna and G. Bala. 2011. "Climate Change Vulnerability Profiles for Northeast India." *Current Science*. Vol. 101, No 3 (August 2011). Online at: http://eprints.iisc.ernet.in/40552/1/Climate_change_vulnerability.pdf.

Schneider, S.H., S. Semenov, A. Patwardhan, I. Burton, C.H.D. Magadza, M. Oppenheimer, A.B. Pittock, A. Rahman, J.B. Smith, A. Suarez and F. Yamin. 2007. "Assessing key vulnerabilities and the risk from climate change." *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 779-810.

Sweeney, J., A. Donnelly, L. McElwain, and M. Jones. 2002. *Climate Change: Indicators for Ireland*. Wexford, Ireland: Environmental Protection Agency, Johnstown Castle.

Turner, B.L., R.E. Kasperson, and P.A. Matson, J.J. McCarthy, R.W. Corell, L. Christensen, N. Eckley, J.X. Kasperson, A. Luers, M.L. Martello, C. Polsky, A. Pulsipher and A. Schiller.. 2003. "A Framework for Vulnerability Analysis in Sustainability Science." *Proceedings of the National Academies of Science USA*. 100: 8074-8079.

United Kingdom Department for International Development (DFID). 1999, 2000, 2001. "Sustainable Livelihoods Guidance Sheets, Numbers 1-8." London: Department for International Development. Online at www.livelihoods.org.

United Nations Development Programme (UNDP). 2007. *Human Development Report: Fighting Climate Change: Human Solidarity in a Divided World*. New York: United Nations Development Programme. Online at <http://hdr.undp.org/en/reports/global/hdr2007-8/>.

World Bank. 2009. "Bolivia—Country Note on Climate Change Aspects in Agriculture." *Latin America Agriculture and Climate Change Notes*. Washington DC: The World Bank. Online at http://siteresources.worldbank.org/INTLAC/Resources/Climate_BoliviaWeb.pdf.

World Resources Institute (WRI). 2009a. "Bellagio Framework for Adaptation Assessment and Prioritization." *World Resources Institute Working Paper*. Washington DC.: World Resources Institute. Online at http://pdf.wri.org/working_papers/bellagio_framework_for_adaptation.pdf.

WRI. 2009b. *National Adaptive Capacity Framework*. Washington DC.: World Resources Institute. Online at <http://www.wri.org/project/vulnerability-and-adaptation/nac-framework>.

WRI, United Nations Environment Programme, World Bank, and United Nations Development Programme. 2011. *World Resources Report 2010-2011: Decision Making in a Changing Climate—Adaptation Challenges and Choices*. Washington DC.: World Resources Institute. Online at <http://www.worldresourcesreport.org>.

ACKNOWLEDGMENTS

The authors gratefully acknowledge the assistance of Beth Lavender, Juan Hoffmaister, Lindsey Jones, and Michelle Winthrop in reviewing an earlier draft of this paper. We also thank the following colleagues at WRI for serving as internal reviewers: Edward Cameron, David Tomberlin, Kelly Levin, Lars Laestadius, Joseph Foti, and Ashleigh Rich. Particular thanks to Maggie Barron and Ayesha Dinshaw for their last-minute editing help. Hyacinth Billings provided much needed production support, and Nick Price and David Cooper designed the report.

In Bolivia, the authors would also like to thank the Bolivian authorities, in particular the Vice-Ministry of Environment, the National Climate Change Program, and the Ministry of Foreign Affairs; the United Nations system, in particular the United Nations Development Programme and the World Food Program; and civil society groups, in particular the farmer association CSUTCB, the network of organizations active in the area of human health (PROCOSI), and the National Network of Human Settlements (Renaseh) for providing information, review, and advice during the assessment process.

We would like to thank the Institute of Social and Environmental Transitions-Nepal (ISET-N) and its researchers for help with the NAC framework assessment in Nepal as well as helping organize the review workshop. Nanki Kaur from the International Institute for Environment and Development also provided input and support during the Nepal NAC assessment.

In Ireland, we would like to thank Tara Shine with the Mary Robinson Foundation—Climate Justice who worked on the NAC study, as well as Frank McGovern and Phillip O'Brien of the Irish Environmental Protection Agency. Finally, we are grateful to various participants of the NAC framework assessment study for their valuable feedback.

WRI's development and testing of the NAC framework was supported by grants from the United Kingdom Department of International Development and the Rockefeller Foundation. While completing this work, the authors also benefited from institutional support to WRI from Irish Aid, the Swedish International Development Agency (SIDA), the Danish International Development Agency (DANIDA), and the Ministry of Foreign Affairs of the Netherlands.

ABOUT THE AUTHORS

Aarjan Dixit is a research analyst with the Vulnerability and Adaptation Initiative at the World Resources Institute.
Contact: adixit@wri.org

Heather McGray is codirector of the Vulnerability and Adaptation Initiative at the World Resources Institute.
Contact: hmcgray@wri.org

Javier Gonzales is a research associate at Nur University in Bolivia and is also associated with the Stockholm Environment Institute.
Contact: jgonziw@gmail.com

Margaret Desmond is a climate change research specialist working in the Irish Environmental Protection Agency's (EPA) Climate Change Research Programme (CCRP).
Contact: m.desmond@epa.ie

SUGGESTED CITATION

Dixit, Aarjan, Heather McGray, Javier Gonzales, and Margaret Desmond. 2012. "Ready or Not: Assessing Institutional Aspects of National Capacity for Climate Change Adaptation." WRI Report. World Resources Institute, Washington DC. Available online at <http://www.wri.org/publication/ready-or-not>.

PHOTO CREDITS

Cover photo Vagelis Kanaridis; table of contents Amir Jina; pg. 2 Niko Guido; pg. 4 dachalan; pg. 7 Bartosz Hadyniak; pg. 8 Florence.S; pg. 11 Alistair Howard; pg. 12 Curtis Perry; pgs. 16, 21, 26 Bioversity International; pgs. 18, 34 Gavin Golden; pg. 28 (left) Ryan Greenberg; pg. 28 (center) David Hegarty; pg. 29 (right) suzienewshoes; pg. 31 Veni; pg. 32 The Advocacy Project; pg. 36 Diana; pg. 38 Ethan Tremblay; pg. 41 Dennis Jarvis.

ABOUT WRI

The World Resources Institute is a global environmental think tank that goes beyond research to put ideas into action. We work with governments, companies, and civil society to build solutions to urgent environmental challenges. WRI's transformative ideas protect the Earth and promote development because sustainability is essential to meeting human needs and fulfilling human aspirations in the future.

WRI spurs progress by providing practical strategies for change and effective tools to implement them. We measure our success in the form of new policies, products, and practices that shift the ways governments work, companies operate, and people act.

We operate globally because today's problems know no boundaries. We are avid communicators because people everywhere are inspired by ideas, empowered by knowledge, and moved to change by greater understanding. We provide innovative paths to a sustainable planet through work that is accurate, fair, and independent.

WRI organizes its work around four key goals:

People & Ecosystems: Reverse rapid degradation of ecosystems and assure their capacity to provide humans with needed goods and services.

Governance: Empower people and strengthen institutions to foster environmentally sound and socially equitable decision-making.

Climate Protection: Protect the global climate system from further harm due to emissions of greenhouse gases and help humanity and the natural world adapt to unavoidable climate change.

Markets & Enterprise: Harness markets and enterprise to expand economic opportunity and protect the environment.

In all its policy research and work with institutions, WRI tries to build bridges between ideas and action, meshing the insights of scientific research, economic and institutional analyses, and practical experience with the need for open and participatory decision-making.

Each World Resources Institute report represents a timely, scholarly treatment of a subject of public concern. WRI takes responsibility for choosing the study topics and guaranteeing its authors and researchers freedom of inquiry. It also solicits and responds to the guidance of advisory panels and expert reviewers. Unless otherwise stated, however, all the interpretation and findings set forth in WRI publications are those of the authors.



Copyright 2012 World Resources Institute. This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivative Works 3.0 License. To view a copy of the license, visit <http://creativecommons.org/licenses/by-nc-nd/3.0/>



WORLD
RESOURCES
INSTITUTE

10 G STREET NE
SUITE 800
WASHINGTON, DC 20002, USA
+1 (202) 729-7600
WWW.WRI.ORG

ISBN 978-1-56973-786-6