Mainstreaming Adaptation to Climate Change in Agriculture and Natural Resources Management Projects

Climate Change Team
Environment Department

Guidance Notes
Mainstreaming Adaptation to Climate Change in Agriculture and Natural Resources Management Projects

This series presents eight guidance notes (GN1 - GN8) that provide lessons learned, best practices, recommendations, and useful resources for integrating climate risk management and adaptation to climate change in development projects, with a focus on the agriculture and natural resources management sectors. They are organized around a typical project cycle, starting from project identification, followed by project preparation, implementation, monitoring and evaluation. Each note focuses on specific technical, institutional, economic, or social aspects of adaptation.

Guidance Notes
While an enabling institutional environment is crucial in promoting efficient adaptation, the multifaceted nature of adaptation also exacerbates typical institutional challenges for at least three reasons: (i) adaptation is largely a context specific and locally driven process, requiring local communities to efficiently manage common resources; (ii) effective adaptation requires enabling policies and systems at the national level, as well as effective central–local coordinating mechanisms; and (iii) the multi-sectoral nature of impacts and adaptation to climate change calls for tackling impacts from different angles in a synergistic and coordinated way at various institutional levels. This note provides some guidance on how to deal with these three issues and includes examples from ongoing adaptation projects.
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**Introduction**

*Adaptation* is a local public good, whose provision requires public intervention. Even though the private sector will be decisive for financing and implementing climate change adaptation, particularly in the form of *autonomous adaptation*, government policies and incentives will play a crucial role. For example, in light of a greater frequency and severity of extreme weather events, governments might face pressures to increase their function as an insurer of last resort. In addition, more investments in research and development and more effective markets for technology innovation, which also require government intervention, will also be needed.

Beyond direct involvement in providing public goods and incentives for adaptation, institutions may also have to change their operating and decision-making procedures. The long-term nature of climate change calls for a long-term vision and for sectoral strategies that take into account future risks. Moreover, uncertainty regarding future climate change impacts requires flexibility, including the commitment to revise policies at pre-identified future times, in order to reassess available knowledge about current and future risks and to recalibrate legislation accordingly.

Furthering an enabling environment for climate change adaptation can move beyond the possibilities of a development project, which is generally very limited in duration and specific in scope. Hence, development professionals should consider establishing a dialogue with their counterpart that goes beyond project design and implementation, to support innovations in policy, decision-making processes and inter-institutional co-ordination arrangements. Only a macro-agenda and a long-term commitment with national institutions can achieve overcome the natural inertia of public bureaucracies to prepare them for tackling the adaptation challenge (see Chapter 8 of the forthcoming 2010 World Development Report). Significant and long-term adaptation measures promoted via development projects can only be undertaken if a conducive, institutional framework is in place.

Given that the impacts of climate change and adaptation are cross-cutting, different sectors and institutional levels—from national to local—should be involved. Bureaucracies must learn how to integrate adaptation considerations into their policy planning and institutional arrangements at all levels. Responsibility, accountability and coordination are key elements for enhancing an institutional environment capable of dealing with adaptation. Along these lines, this Guidance Note proposes three avenues for furthering an enabling institutional environment for climate change adaptation in agriculture and natural resource management (NRM): participatory and community-based NRM management; decentralization of NRM; and institutional coordination.

* For words in italics, please see Glossary for definition.
A. Participatory and community-based natural resource management

Participatory and community-based NRM is crucial for adaptation in rural areas and requires that community members appreciate the benefits of collective action to solve common problems, as well as have a good level of organizational preparedness in the districts or villages.

What are the main reasons for actively involving local communities in agriculture and NRM adaptation practices?

Agricultural practices, water management, and food and water storage are examples of key adaptation-relevant spheres, which are often decided and implemented by or in close collaboration with local communities. Hence, adaptation projects need to rely on community groups to identify and implement adaptation measures. As discussed in GN2, on community awareness of climate risks, participation in the identification and implementation of adaptation measures and project ownership are crucial in order to ensure that climate risk management and adaptation to climate change are successfully implemented at the grassroots level.

What are the main institutional challenges for communities in adopting adaptation practices?

Communities are social systems that need to find effective governing rules and compliance mechanisms in order to be able to buffer climate-driven risks and increase the climate resilience of community members. On the one hand, collective action is very often a key element for the success of adaptation efforts at the community level; on the other hand, managing common pool resources and sharing assets and risks within a community are often difficult processes. For example, water storage requires physical infrastructure, but it also depends on institutionalized monitoring and sanctioning in case of individual or collective infractions of rules governing storage (Argwal 2008). Other examples are provided below. Hence, in selecting the target area of pilot adaptation projects, the organizational preparedness of the villages and districts should be one of the most important selection criteria.
Examples from projects
In the experience of the Andhra Pradesh Drylands Adaptation Initiative (AP-DAI), the better organized villages and community groups have been most willing and able to pick up pilot initiatives and to seriously follow through with their implementation. This has been particularly evident regarding the management of common land and the collective use of groundwater.

Management of common land
The institutional systems governing common land use are very important for the design and implementation of a drought adaptation strategy in the pilot villages of Andhra Pradesh. The AP-DAI seeks to foster adaptation to drought for both farmers and landless people, who are very dependent on common land for their sustenance. Village institutions and elected bodies as well as other organizations, such as common interest groups and self-help groups, have a large influence on how such land is utilized and how its resources are allocated to different sub-communities in the village. The level of organization and efficiency of such formal and informal groups is therefore essential for the project’s success. In particular, the project has supported the strengthening of village organizations to improve the rights and security of landless women with respect to the use of common land.

Collective use of groundwater
The collective use of groundwater resources is an area where informal groups play a decisive role for the success or failure of adaptation strategies in the pilot villages of the AP-DAI. Groundwater is the only reliable source of water in the drylands of Andhra Pradesh. However, the lack of commonly agreed rules for drilling new bore wells and the amount of water withdrawn is resulting in unsustainable groundwater use so that many bore wells are drying up. In order to utilize the available groundwater resources in a sustainable manner in view of increasing drought periods, collective efforts are underway to organize groups of farmers (farmers who both own and do not own bore wells) and facilitate their mutual agreement on:

- limiting the drilling of new bore wells;
• limiting water withdrawal, i.e. by utilizing one well at a time;
• pooling water from all bore wells and building a distribution system to reach the totality of the land belonging to the farmer groups; and
• building storage facilities and adopting rules for the use of stored water in times of drought.

These informal groups generally require a long time to consolidate (i.e. one year for reaching an agreement within a group of five farmers mostly from the same family) and their success depends on a variety of personal issues and complex social dynamics.
B. Decentralized natural resource management

Effective adaptation requires: setting up enabling policies and systems at the national level (i.e. climate monitoring and forecasting, disaster risk management plans, food security programs, etc.); effective central–local coordination to reach the ultimate beneficiaries of the policies and systems at the national level; and a strong organizational capacity at the local level to implement adaptation on the ground. Decentralized national institutions, when they exist, may assure effective national-local coordination, assume a leading role in the adaptation process at the field level, and constitute an effective support to community-level initiatives. However, their efficiency must be carefully considered before relying on them. If such official channels are not functioning properly, other informal channels should be utilized.

What are the benefits of decentralization for adaptation?

Decentralization is a promising means of: (i) institutionalizing and scaling-up the principle of user participation that makes community-based NRM effective by establishing formal linkages between central governments and local institutions; (ii) enabling coordination between climate risk management services provided by central agencies and local needs; and (iii) fostering integration among line ministries at the local level. A recent review of watershed management projects (World Bank 2008), which are particularly suitable for mainstreaming adaptation given their explicit consideration of water and soil interlinkages and a spatial scale at the catchment level, provided some telling results. The review found that watershed management has been mostly successful where community responsibility for land and water management in the local micro-watershed was supported by a “front line” presence at the micro-watershed level of the public agency or agencies responsible for watershed management at the national level. The main reason was that the micro-watershed turned out to be the level at which cooperation and coordination among officials coming from different line ministries worked best.
What are the challenges of decentralization for adaptation?

Effective decentralization also has its challenges and requires a complex institutional and legislative process, whose outcomes can differ widely from case to case. For example, most current decentralization reforms are characterized by insufficient transfer of powers and/or resources to local institutions under tight central government oversight. Often, these local institutions do not represent and are not accountable to local communities (see Ribot 2002, for an analysis of the key requirements of decentralization in NRM that promote equity and efficiency, and Argawal 2008, for a comprehensive list of factors promoting better institutional performance for adaptation, derived from the common property and community-based NRM literature). In addition, possessing less fiscal power, subnational governments usually face a resources shortfall, which makes it difficult to invest in adaptation measures if resources are not specifically allocated from the central government for these purposes (see GN 4 on public expenditure reviews). In such circumstances, relying on decentralized agencies can prove very difficult, particularly when coordination among several government services at the local level is required.

Examples from projects

Depending on the local circumstances, World Bank adaptation projects in agriculture and NRM are using different approaches with respect to the role of decentralized institutions.

A. Relying on a decentralized service delivery structure

Adaptation projects rely on decentralized service delivery structures when existing efficient decentralized institutions can be used. For example, the China “Mainstreaming Adaptation to Climate Change into Water Resources Management and Rural Development” project is managed, monitored and supervised by the State Office of Comprehensive Agricultural Development, located under the Ministry of Finance. At the field level, local comprehensive agricultural development offices are responsible for project implementation, under the direction and coordination of the concerned Provincial Office of Comprehensive Agricultural Development and the leadership and guidance of the State Office (Annex 1).

The “Adaptation to Climate Change in Arid Lands” project in Kenya relies on a preexisting but enhanced decentralized service delivery structure, with good outreach at the community level and efficient coordination channels from the
district to the central level, put in place by the Arid Lands Resource Management Project, or ALRMP (Phase I and II) (Annex 2). The institutional arrangements of the ALRMP have multiple advantages (Implementation Completion Report of the ALRMP Phase I), including:

- a devolved system of implementation, set up with full participation, involvement and ownership by district governments, institutions and communities;

- routine monitoring of local communities (based on key socioeconomic indicators) by decentralized agencies, allowing adequate and timely information flows to the central level for proper scheduling of drought relief assistance; and

- primary impacts at the district level, such as: (i) establishment of functional local entities, such as the District Steering Groups; (ii) enhanced capacity of line ministries’ human resources involved in project implementation (Mobile Extension Teams); (iii) initiation of effective decentralized planning; and (iv) implementation and improved linkages between communities and their local institutions.

B. Adopting a “bottom up” approach to institutional development
Where decentralized agencies do not exist at the field level, or when the institutional structure is in place but does not work properly, a genuine “bottom up” approach to institutional development is the preferred solution. Priority is given to institution building needs at the local level (community organizations and front line public agencies). Once an efficient mechanism is in place at the local level, higher institutional levels are involved and government capacity is also strengthened based on needs at the regional and national levels.

For example, the Andhra Pradesh project takes place in an area where the local government lacks adequate outreach at the community level. When the project started, the support provided to the sample households by the government was limited and only 28 percent of households reported access to the Andhra Pradesh Rural Employment Guarantee Scheme (a system to employ rural people for constructing public infrastructure and providing public services). Hence,
the project began by working directly at the community level, supported by a local NGO. The local government was involved only at the second stage, i.e. once the most suitable adaptation measures that could be financed through the Rural Employment Guarantee Scheme had been identified and proved to be successful. Currently, all pilot initiatives identified at the community level are designed in a manner that can easily be “scaled up” in case they prove successful. The involvement of the local public agencies in scaling-up the pilots is being facilitated by the local NGO.

C. Institutional Coordination

Because of the multi-sectoral nature of impacts and adaptation to climate change, tackling the impacts from different angles in a synergistic and coordinated way is necessary. On the other hand, coordination among different institutional levels, and different sectors and/or actors, is a complex undertaking that may prove difficult to implement in many circumstances. The following sections exemplify different types of institutional coordination that may be required by adaptation projects and provide suggestions for overcoming some of the institutional obstacles to effectively mainstream climate risk management and adaptation.

Inter-sectoral coordination at the national level

In a survey to donors and national experts in Mozambique on barriers to adaptation, lack of inter-institutional coordination and communication was given the highest score by both types of respondents (see Table 1 below). This can be true within the same sector, i.e. in India, where water resource management falls within the purview of at least seven ministries. The situation is even more complex when different sectors are involved (i.e. agriculture, water and forestry), as should often be the case in adaptation interventions.
Table 1: Mozambique: Main barriers to mainstreaming adaptation into development planning perceived by donors and national experts

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Institutions</th>
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<tbody>
<tr>
<td></td>
<td>Donors</td>
<td>National</td>
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<tr>
<td>Institutional structures and culture</td>
<td>+++</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>Lack of inter-institutional coordination and communication</td>
<td>+++</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Gaps and overlaps in mandates of institutions</td>
<td>++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Erosion of institutional memory</td>
<td>+</td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td>Lack of communication with and participation of local communities</td>
<td>+</td>
<td>++</td>
<td>+</td>
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<tr>
<td>Lack of human resources</td>
<td>+</td>
<td>++</td>
<td>+</td>
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<tr>
<td>Higher priority given to short-term development goals</td>
<td>++</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Availability and management of data and information</td>
<td>++</td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td>Insufficient data and information availability</td>
<td>+</td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td>Weak data and information management</td>
<td>++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Inadequate data and information dissemination</td>
<td>++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Erosion of traditional/local knowledge</td>
<td>-</td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td>Financial resources</td>
<td>+</td>
<td>+++</td>
<td></td>
</tr>
<tr>
<td>Scarce sources of adaptation funding</td>
<td></td>
<td></td>
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<tr>
<td>Disaster risk management</td>
<td>++</td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td>Absence of a coordinated strategy for disaster risk management</td>
<td>+++</td>
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<tr>
<td>Predominant culture of emergency response</td>
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<td>+++</td>
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<tr>
<td>Lack of transparency in planning and implementation processes</td>
<td>++</td>
<td>+</td>
<td></td>
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<tr>
<td>Lack of disaster management at local and district levels</td>
<td>++</td>
<td>+</td>
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</table>

Level of perception: +++ high, ++ medium, + low, - not mentioned.

Options for facilitating coordination at the national level are described below.

1. **Assigning project or program coordination to a powerful central agency**

   The central agency would coordinate implementation of the program or project by sectoral ministries, review legislation, plans and programs, and hold implementation agencies responsible for results and fund management. Examples of central agencies are the Prime Minister’s Department, the Office of the President, the Ministry of Finance or other ministries/agencies with coordination mandates and a convening or decision making power over line ministries (i.e. the Minister of Finance with respect to funds allocation). For example, multi-sectoral and decentralized projects in China and Kenya are housed in central ministries. In China, both the Irrigated Agriculture
Intensification III Project and the related adaptation project are managed by the State Office for Comprehensive Agricultural Development in the Ministry of Finance (Annex 1). In Kenya, the Office of the President is responsible for managing the ALRMP and KACCAL projects (Annex 2). Should a project follow earlier adaptation initiatives housed in a line ministry (typically the Ministry of Environment), modifying previous institutional arrangements in some cases might still be recommended, although the transition process may be complex (see Annex 3 for the Kiribati experience in changing the institutional arrangements, and GN1 for a more detailed discussion on how to identify and engage key national institutions).

2. Extending the mandate of an existing intergovernmental coordination mechanism to climate risk management and adaptation

Under some circumstances, the creation of an *ad hoc* intergovernmental mechanism has been the preferred solution for coordinating regional efforts on climate risk management and adaptation (see Annex 4 on the Caribbean Community Climate Change Center). More often, coordination should preferably be done through a pre-existing inter-sectoral mechanism, i.e. for food security, disaster preparedness and management, sustainable land management (SLM), etc. This arrangement would allow better mainstreaming of climate change considerations in dealing with key social and economic issues. For example, under the Terrafrica Partnership, the government of Ethiopia made a formal decision to develop and implement a national framework for SLM, and has taken steps to establish an SLM platform at the federal level to engage and align contributions of all relevant stakeholders and to foster donor-government coordination. Such a mechanism is in an optimal position to coordinate climate risk management strategies related to SLM. In Kenya, the Food Security Meeting, consisting of key concerned sectoral ministries and external partners, plays a key role in overall drought management and, under the KACCAL project, will become more formally linked with government drought and disaster coordination mechanisms (Annex 2).
**Multi-sectoral and multi-agency coordination at the local level**

Figure 1 illustrates possible types of coordination needs between different institutional actors in the context of mainstreaming adaptation at the field level. For example, research-extension-farmer linkages are a general challenge for agricultural innovation systems and particularly relevant in the adaptation context. Indeed, agricultural research organizations (generally public and at the national level) are only likely to conduct relevant research if they link with advisory service agents (often private sector professionals at the district or provincial level) and, through them, to the communities (sub-district level).

**Figure 1: Adaptation-relevant projects and activities requiring inter-institutional coordination**

Source: Adapted from Agrawal A. (2008)
Promoting the creation of a well-organized interagency network will support project coordination at the local level. In many cases, inter-sectoral coordination is greatly facilitated at the local level by working together while implementing a project. The challenge is to ensure that the level of coordination is not lost at the end of the project, when people involved in implementation are shifted to other assignments. A network formed by personnel from various agencies, operating according to clearly defined roles and responsibilities, could be promoted to avoid this situation and would guarantee that the coordination system would last beyond project implementation. For example, the KACCAL project relies on a District Steering Group, composed of local leaders and technical staff of the different district and partner agencies, for planning, approval and coordination of all district and community-level interventions (Annex 2).
Readings


Policy note based on Arun Agrawal’s paper “The Role of Local Institutions in Adaptation to Climate Change.” Copies can be requested via email at socialdev@worldbank.org.


  In particular: Lessons Learned and Next Steps – Reducing climate-related risks requires multi-stakeholder coordination and communication (page 90).


*In Particular: 3.2 Public Institutions*


http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VFV-4R0CPWH-1&_user=486651&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&acct=C000023538&version=1&urlVersion=0&userid=486651&md5=9ca93eb47e746ef17492b16b61e2e1cc

**Experts**

For experts on furthering an enabling institutional environment, please contact the Climate Change Team at: climatehelp@worldbank.org.

**Project Examples**

– China: Mainstreaming Adaptation to Climate Change into Water Resources Management and Rural Development: Institutional Arrangements (Annex 1)

– Kenya: Adaptation to Climate Change in Arid Lands (Annex 2)

– Kiribati Adaptation Project: Implementation Phase (KAP II) (Annex 3)

– Caribbean: Implementation of Adaptation Measures in Coastal Zones (SPACC Project) (Annex 4)
**Glossary**

**Autonomous adaptation**
Adaptation that does not constitute a conscious response to climatic stimuli, but rather is triggered by ecological changes in natural systems and by market or welfare changes in human systems. Also referred to as spontaneous adaptation. (IPCC 2007)

**Climate risk management (CRM)**
Approach to climate-sensitive decision making that is increasingly seen as the way forward in dealing with climate variability and change and seeks to promote sustainable development by reducing the vulnerability associated with climate risk. CRM involves proactive ‘no regret’ strategies aimed at maximizing positive and minimizing negative outcomes for communities and societies in climate-sensitive areas such as agriculture, food security, water resources and health (please see definition of low-regret adaptation strategies below). The ‘no regrets’ aspect of CRM means taking climate-related decisions or actions that make sense in development terms, whether or not a specific climate threat actually materializes in the future. (IRI: Climate risk management in Africa: Learning from practice, 2007; pg. 10)
Climate Change for Development Professionals

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