

Local Institutions and Climate Change Adaptation

This note examines the relationships between climate-related vulnerabilities, adaptation practices, institutions, and external interventions to show the role and importance of local institutions in climate change. It proposes an analytical framework to classify adaptation practices based on their relationship to different forms of environmental risks. It examines past adaptation responses to climate change, their impacts on the livelihoods of the rural poor, and the role of institutions in facilitating external support for adaptation. The discussion uses evidence from two sets of cases – those in the UNFCCC coping strategies database, and in the National Adaptation Programs of Action (NAPAs) – to comparatively assess the role of local rural institutions in facilitating adaptation. Focusing on three types of institutions - public, private, and civic, a review of case studies indicates that local institutions play a crucial role in shaping adaptation to climate change: they connect households to local resources and collective action; determine flows of external support to different social groups, and link local populations to national interventions. The lessons from this review are finally used to make recommendations about the operational significance of local institutions and institutional analysis in the context of climate change.

Why is it important to understand the role of local institutions in adaptation?

Poor, natural resource-dependent rural households will bear a disproportionate burden of adverse impacts of climate change¹. Local institutions have shaped how rural residents responded to environmental challenges in the past. They are also the mechanisms that will translate the impact of future external interventions to facilitate adaptation to climate change. Because adaptation to climate change is local, it is critically important to understand better the role of local institutions in shaping adaptation and improving capacities of the most vulnerable social groups.

What do we mean by local institutions?

Three types of local institutions relevant to adaptation can be defined: civic, public, and private in their formal and informal forms. They shape the livelihoods impacts of climate hazards through a range of indispensable **functions** they perform in rural contexts: information gathering and dissemination, resource mobilization and allocation, skills development and capacity building, providing leadership, and networking with other decision makers and institutions.

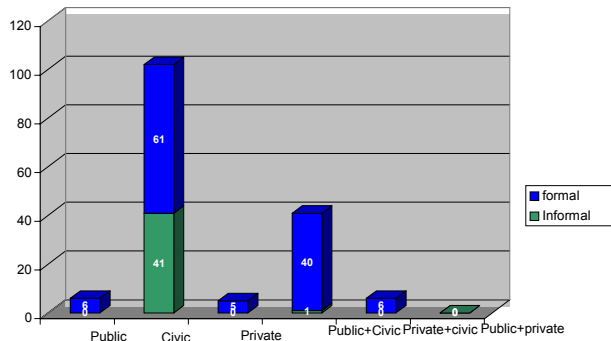
- **Local public institutions:** local governments, local agencies (eg extension services and other arms of higher levels of government operating at local levels).
- **Civil society institutions:** rural producer organizations, cooperatives, savings and loan groups etc.
- **Private institutions:** service organizations such as NGOs and charities, private businesses that provide insurance or loans.

¹ Kates, R. 2000. Cautionary tales: Adaptation and the global poor, *Climatic Change* 45 (2000) (1), pp. 5–17. Mendelsohn, R., A. Basist, P. Kurukulasuriya, and A. Dinar. 2007. Climate and rural income. *Climatic Change* 81(1): 101-18. Thomas, David S. G. and Chasca Twyman. 2006. Adaptation and equity in resource dependent societies. In *Fairness in Adaptation to Climate Change*. W. Neil Adger, Jouni Paavola, Saleemul Huq, and M. J. Mace (eds). Pp. 223-37. Cambridge: The MIT Press.

- **Informal institutions**

A review of 118 cases of adaptation in 46 countries in the UNFCCC database on adaptation shows that most local civil society institutions involved in climate adaptation tend to be **informal** institutions. Examples of informal institutions are those around labor sharing, indigenous information exchanges, savings societies, commons institutions, and indigenous knowledge institutions around migration and storage.

Figure 1: Formal vs Informal Institutions in Adaptation



Households and communities have developed strategies to adapt to climate variability. Rural communities in different parts of the world have already experienced many forms of extreme climate events². Over time, they have developed a range of adaptive responses to cope with environmental risks to livelihoods. Such responses by women, indigenous, and local peoples typically help safeguard livelihoods, and thus have a strong economic character. Local adaptation responses to climate variability can be classified into **five categories**:

- **Mobility** denotes movements of various types in response to risks and scarcities. It is a common adaptation strategy used by households and communities, particularly in drier parts of the world. Niamir-Fuller describes many different examples of mobility among agropastoralists in Sub-Saharan Africa³.
- **Storage** of past surpluses is an effective measure against future livelihood failures.

Agricultural households, especially in dry areas, have created indigenous storage infrastructure for seeds and harvested crops and have developed time-tested procedures for drying fruits and meats for storage.

- **Diversification** can occur in relation to on and off farm employment opportunities, productive and non-productive assets and consumption strategies. Scattering of fields in areas where rainfall is unreliable, diversification into different farm management practices and crop cultivars, and using a combination of occupations such as wage labor, animal rearing, and farming are common diversification responses in risky environments.
- **Communal pooling** refers to adaptation responses involving joint ownership and sharing of wealth, labor, or incomes across households, or mobilization of resources held collectively during times of scarcity. Communities in dryland areas, for example, increase water rationing and/or often prohibit the consumption of certain foods and forest products, except during times of famine or long-term rainfall failure.
- **Market exchange** is perhaps the most versatile mechanism for adaptation. To be fair and effective, it requires well developed markets, exchange instruments, and widespread access. Weather-related insurance schemes for agricultural or pastoralist populations (although very scarce) are an example of market-based adaptation to climate change.

All adaptation practices discussed above depend for their success on specific institutional arrangements -- adaptation never occurs in an institutional vacuum. Institutional and social factors also play a key role in shaping the extent to which rural households and communities are vulnerable to different environmental risks. This highlights the importance of mainstreaming adaptation at and across institutional levels.

How do local institutions affect livelihoods impacts of climate change?

Broadly speaking, local institutions shape the effects of climate hazards in three important ways: they influence how households are affected by climate impacts; they shape the ability of households to respond to climate impacts and

² Mortimore, M. and W. M. Adams. 2001. Farmer adaptation, change, and crisis in the Sahel. *Global Environmental Change* 11: 49-57. Scoones, Ian. (ed). 2001. *Dynamics and Diversity: Soil Fertility and Farming Livelihoods in Africa*. London: Earthscan.

³ Niamir, M. 1995. Indigenous systems of natural resource management among pastoralists of arid and semi-arid Africa. London: Intermediate Technology Publications Ltd.

pursue different adaptation practices; and they mediate the flow of external interventions in the context of adaptation.

i.) Local institutions shape the impact of climate change on communities.

Institutional and social factors play a key role in shaping vulnerability: the same climate phenomenon will have very different effects on the livelihoods of residents in the region, depending on the nature of local governance and local institutional arrangements. For example, reduced precipitation in a region by 20 percent in a given year will have a less negative impact on farmers who have access to irrigation versus those who rely on rainfed agriculture. The negative effect of crop failure is likely to be reduced if farmers have more equitable access to livelihoods-related institutions governing distribution of benefits from communal forests or pastures coupled with transparent communication, as opposed to where institutional access is stratified and information is monopolized by a small group. In large areas of western India, for example, lower caste households have limited access to communal pastures, and richer, upper caste households appropriate much of the available forage from the grazing commons.⁴

ii.) Local institutions shape the way communities respond to climate change.

Institutions link individuals with collectives and provide the framework within which households and collectives choose adaptation practices. For example, strong institutional norms around labor sharing will reduce the ability of households to adapt by migrating or diversifying. Social groups that do not have secure rights to land will find it more difficult to diversify asset portfolios or engage in exchange. Closely knit social networks make it easier to undertake communal pooling of resources. Communities that lack access to capital and infrastructure may be unable to use storage or exchange to cope with environmental risks. Without access to markets, communities may be forced to adopt storage of harvests as an adaptation response and invest resources into storage infrastructure.

⁴ Agrawal, A. 1999. *Greener Pastures*. Durham: Duke University Press.

iii.) Local institutions are the intermediaries for external support to adaptation.

Institutions are the media through which external interventions reinforce or undermine existing adaptation practices, as described in Box 1 below. Indeed, all external interventions, to be effective, need local institutional collaborations to leverage the impact of interventions. Willing involvement of local institutional partners greatly strengthens the effectiveness of external interventions.

Despite the central role of local *informal* institutions in rural communities' adaptation, they are rarely supported by government and external interventions. When external support is provided, it is channeled through formal institutions. When external **public institutions** get involved in adaptation practices, their relationships are more often with **formal local civic institutions**.

Box 1: The mediating role of institutions in the context of climate impacts - NGOs in the Philippines

Local institutions play a key role in recovery after disasters by shaping the direction, effectiveness, and allocation of external assistance. An example of their critical role can be found among the work of NGOs in the Philippines. Between 1995 and 2000, more than 75 percent of the disasters and 95 percent of disaster-related deaths in the Philippines were because of climate hazards: typhoons and tornadoes, flooding, and landslides being the most prominent hazards.

After the Marcos regime, many development NGOs in the Philippines integrated relief and rehabilitation strategies into their action program. These strategies include socio-economic projects to reduce local vulnerability, mediation of the flow of government and international assistance, community-based disaster management, small scale infrastructure development, and training for capacity building. In one interesting case, NGOs staff focused on vulnerable communities to identify local leaders, conducted hazard and vulnerability analysis, initiated training related to disaster management, and established village level committees to foster effective disaster responses. Other NGOs have provided financial and technical assistance to help in community-based disaster management activities. These examples show the critical role of local institutions in any area-based effort to undertake adaptation measures.

(Source: Luna, E. 2001 Disaster mitigation and preparedness: the case of NGOs in the Philippines. *Disasters* 2001, 25 (3) 216-226).

Mainstreaming adaptation and enhancing adaptive capacity could be increased by **encouraging partnerships between informal processes** and formal interventions to facilitate adaptation. An

example of the interaction between formal and informal institutions can be seen in the Shinyanga region in northern Tanzania (see Box 2 below). The formation of an informal collective group and initiation of small acts of joint action led to a more thoroughgoing effort for the adaptation process.

Different forms of adaptation and the role of institutions in facilitating adaptation can formally be examined through the *Adaptation, Institutions and Livelihoods (AIL) Framework* (see Figure 2 below). The AIL framework shows the central role of institutions in thinking about climate change and adaptation.

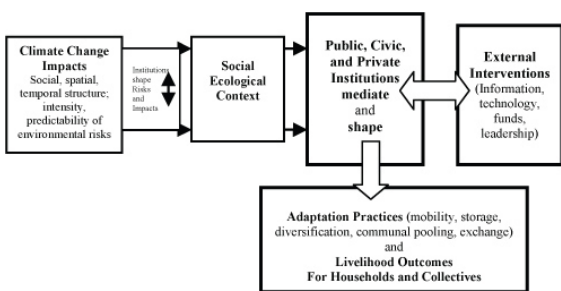


Figure 2: Adaptation, Institutions, and Livelihoods Framework

Box 2: Role of informal local institutions in adaptation in Tanzania

The Shinyanga region in northern Tanzania is occupied mainly by the agropastoral Sukuma people. The region used to be extensively forested, but relocation schemes, drought, over-grazing, cash crop cultivation, destruction of forests to wipe out tsetse fly and increased demand for firewood have reduced productivity and increased soil erosion.

Using indigenous knowledge, the Sukuma people practice a natural resource management system called *ngitili* - a Sukuma word meaning enclosure. Working closely with **traditional institutions** at the local level, a project under the Ministry of Natural Resources and Tourism has revived the Sukuma people's traditional conservation practices. The Shinyanga landscape is now changing. Working through local institutions, farmers are engaging in agroforestry using degraded croplands and rangelands, employing traditional village guards, and conserving vegetation by closing off *ngitilis* for regeneration. Through planting activities and community involvement, *ngitili* today provides livelihoods resources for communities in the region when environmental conditions deteriorate.

Source: UNFCCC Coping strategies database

Key factors that promote local capacity for adaptation

Many of the local institutions that promote adaptation and help improve livelihoods do so through better and more sustainable governance of local resources. Box 3 draws on the literature on common property and decentralization of environmental governance to identify some of the major factors promoting better institutional performance for adaptation.

Role of institutional linkages and networks in adaptive capacity

The capacity of particular institutions is important

Box 3: Factors promoting better local institutional performance for adaptation

i.) Characteristics of Institutions

- Organizational rules are simple and easy to understand
- Broad local involvement in organization and its rules
- Fairness in resource allocation
- Clear mechanisms for enforcing rules
- Clear, broadly acceptable mechanisms for sanctioning rule infractions
- Availability of low cost adjudication
- Accountability of decision makers and other officials

ii.) Characteristics of the Context of Institutions

- Mechanisms for dissemination of new technologies and training in their use
- Favorable returns for products sold in markets
- Central governments facilitate the functioning of local institutions by
 - Creating effective support for sanctions used by local institutions
 - Provide necessary support in terms of information, finances, and skill development
 - Develop indicators of performance against which institutions can be assessed over time
- The network of institutions present in a context and their links with different social groups

iii.) Characteristics of groups served by the Institutions

- Clearly defined boundaries of the group
- History of successful shared experiences; existence of social capital\
- Appropriate leadership that changes periodically— young, familiar with changing external environments, connected to local traditional elite
- Interdependence among group members
- Heterogeneity of endowments among group members, homogeneity of identities and interests

iv.) Characteristics of the Ecological Context

- Match between demands on ecological system and its output
- Information availability about the ecological system
- Possibility of storing benefits from the system
- Group dependence on resources available from the ecological system

in how they affect adaptation. But equally important are the linkages and interconnections they have with each other and rural households; these affect flow of resources and decision-making power among social groups, and thus their capacity to adapt. Two types of linkages relevant to adaptation capacity and outcomes can be identified:

- 1) **Linkages to institutions:** as described in Box 4 below, the degree to which different households are linked to various institutions in their locality impacts their access to resources and decision-making, and thereby their capacity to adapt. Institutional connections provide households and communities greater flexibility in their choice of diversification and adaptation strategies. For example, households that are better linked to credit groups and irrigation institutions will benefit more from external support for adaptation, if it is channeled through these existing institutions.

Box 4: The role of institutional linkages in shaping local adaptation in Mexico

Local institutions and their linkages play a crucial role in influencing the adaptive capacity of communities and their adaptation choices. A study of three different communities in **Mexico** shows a range of adaptive responses across the communities. These variations are in large measure the result of the differences in institutional linkages within and outside the locality.

- In one community, households engaged in a more diverse set of productive activities, intensified their involvement in non-farm work including public works programs, and emergency food distribution campaigns.
- In a second community, household primarily engaged in wage-labor based migration within Mexico, and selling livestock to buy maize.
- In a third, extensive labor demands and high investments in irrigated agriculture led many households to accept the migration of some members to the United States.

In the first community, institutions facilitated connections between officials in public works programs and local households; lacking such linkages, households in the second and third communities migrated. But the character and scale of migration differed again as a result of institutional connections. Informal relationships between households, cemented over decades of interactions, helped migration to the United States in the third community. In the second community, in contrast, migration took place within national boundaries.

- 2) **Linkages between institutions:** the effectiveness of a particular institution in coordinating and responding to climate change is shaped by its connections with other local and external institutions. Connections between local and higher level institutions allow residents of a given locality to leverage their membership of local institutions for gains from outside the locality.

General findings on the role local institutions play in facilitating adaptation

To comparatively assess the role of local institutions in facilitating adaptation, it is useful to look at actual cases of adaptation. A review of 118 cases of adaptation from 46 countries drawn from the UNFCCC database on adaptation and coping strategies provides importance evidence for analysis and shows interesting patterns about the role of institutions.

Local institutions are central to local adaptations

to climate risks; they will continue to be so over the next several decades as rural societies strive to adapt to climate change. Without local institutions, rural poor groups will find it far costlier to pursue the adoption of effective adaptation practices relevant to their local needs, as well as difficult to increase their information knowledge on adaptation options. The UNFCCC data show that local institutions are necessary to enable households and social groups to deploy specific adaptation practices. Institutions were relevant to adaptation in all the 118 cases. In 77 cases, local institutions were the primary structuring influence for adaptation, in all the others they facilitated adaptation together with external support.

The most common classes of adaptation responses are diversification and communal pooling on their own, and diversification and exchange as a pair. There is a nearly complete absence of mobility in the examined cases (see table 1).

Table 1: Frequency Distribution of Different Classes of Adaptation Practices

Class of Adaptation	Corresponding Adaptation strategies	Frequency*
Mobility	1. agropastoral migration; 2. wage labor migration; 3. involuntary migration; 4. Remittances (joint with exchange)	2
Storage	1. water storage; 2. food storage (crops, seeds, forest products); 3. animal/live storage; 4. pest control	11
Diversification	1. asset portfolio diversification; 2. skills and occupational training; 3. occupational diversification; 4. crop choices; 5. production technologies; 6. consumption choices; 7. animal breeding	33
Communal pooling	1. forestry; 2. infrastructure development; 3. information gathering; 4. disaster preparation	29
Exchange	1. improved market access; 2. insurance provision; 3. new product sales; 4. seeds, animal, and other input purchases; remittances (joint with mobility)	1 -

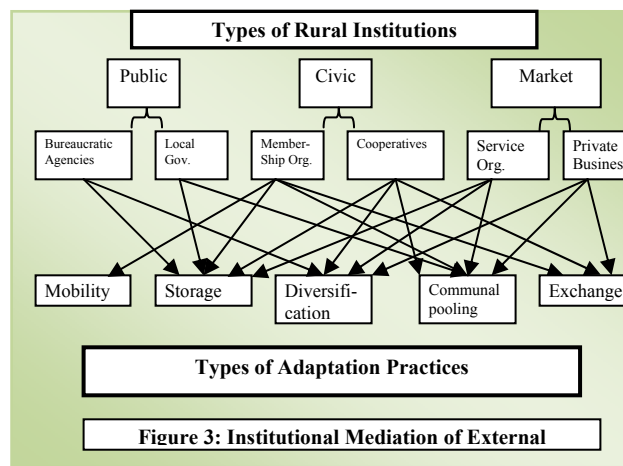
Civil society-based informal institutions are central in adaptation to climate risk management – both on their own, and in conjunction with external interventions. A combination of civic, and public and civic institutions are the ones most commonly involved in facilitating adaptation to climate change. Civil society institutions and partnerships between civic and public institutions seem to occur more frequently to promote diversification and communal pooling.

Private market based institutions have, until now, been relatively marginal to adaptation except in a few cases where they promote exchange-based adaptation strategies. Private and market institutions have played a relatively small role in facilitating or reinforcing adaptation. When involved, private sector and market institutions (alone and in partnership with civil society) seem to focus on the promotion of diversification and exchange. This finding creates a challenge and an opportunity to identify ways to create additional incentives and partnerships involving the private sector and market actors to facilitate the adaptation process.

Public sector institutions are more likely to facilitate adaptation strategies related to communal pooling and diversification, due to their command over authoritative action, and their ability to channel technical and financial inputs into rural areas. Public institutions are only infrequently associated with market exchange processes promoting adaptation.

External support to local adaptation efforts has been typically in the form of information and financial support. In the UNFCCC database, there are almost no cases in which external support was provided to improve leadership or to improve local institutional capacity for adaptation. A closer look at the data explains these patterns. The vast majority of cases of information provision and financial support concern adaptation practices related to disaster preparedness, early warning systems about failure of rains, and private or public infrastructure that could withstand climate hazards such as floods and storms. Many more forms of support could be provided to reinforce adaptation and support institutions that are shaping, facilitating, and reinforcing local institutions-based adaptation efforts. It is reasonable to conclude that external support for adaptation focuses on a relatively small range of the adaptation responses used by local communities and institutions to cope with climate change.

Figure 3 below presents the **four main forms of external interventions** to reinforce adaptation practices: information and training, technological innovation, financial investment, and leadership and institutional changes that reduce costs of collective action.



Given the importance of local institutions to community adaptation, what role do existing National Adaptation Plans recognize for them?

Despite the critical importance of rural institutions in shaping adaptive responses to climate change, existing work on adaptation responses focuses primarily on technological and infrastructure options. There has been little attention to local institutions. For example, the **Fourth Assessment Report of the Intergovernmental Panel on Climate Change** identifies a number of institutional obstacles to adaptation such as social resistance to change, weak governance, ineffective institutional arrangements and lack of information on key vulnerability indicators. But when it comes to adaptation options, despite some attention to land management issues the report focuses primarily on technology and infrastructure for future adaptation: embankments, dykes, flood proof buildings, new crops, sand dune replanting, levees, and sea walls!

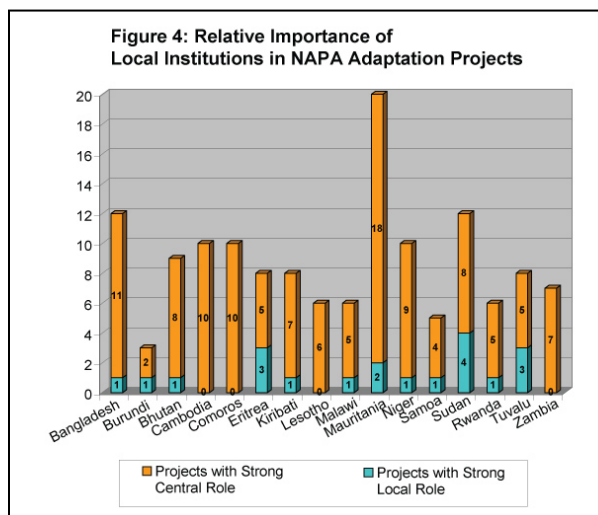
A review of the **National Adaptation Plans of Action (NAPAs)** also indicates that most of them do not incorporate local communities and institutions in adaptation plans: only 20 of the 173 projects described in the NAPA identify local level institutions as partners in facilitating adaptation, and around 20 percent of the projects in the NAPA documents incorporate local institutions as the focus. Even for projects that are focused on agriculture, water, forest management, fisheries, small-scale infrastructure and capacity building, for which local institutions are basic components of an adaptation strategy, minimal attention is given to local institutions.

The graph below (see Figure 4) provides information on the extent to which selected projects focus local level institutions.

Categorising World Bank projects that support adaptation

Bank projects aiming to build adaptive capacity can be classified along four dimensions, according to the **timing** of the intervention (reactive or proactive), and the **comprehensiveness** of the intervention – i.e., whether it supports a specific adaptation practice or one that is tied into other aspects of livelihoods (targeted or comprehensive).

	Targeted	Integrated
Reactive	Post-disaster emergency support - few Bank projects fall into this category	Disaster response and vulnerability reduction projects in the wake of climate-related disasters Seek to improve local and national capacity to adapt and manage risk through institutional development and capacity building at local and national levels, eg Nicaragua Natural Disaster Vulnerability Reduction Project
Proactive	Sector-specific projects to enhance resilience, vulnerability reduction and preparedness, eg Sahel Integrated Lowland Ecosystem Management project	Integrated projects that support livelihoods and production possibilities, strengthen institutional capacity for adaptation, improved coordination of responses and policy initiatives to support adaptation, eg Kenya Adaptation to Climate Change in Arid Lands project (KACCAL)



Recommendations

This review of adaptation from two sets of cases (those in the UNFCCC coping strategies database, and in the NAPAs) allows several conclusions and recommendations about the operational significance of institutional analysis in the context of climate change. Greater capacity to adapt locally and nationally should focus on:

1. A greater role for institutional partnerships in facilitating adaptation is needed.

Institutional partnerships are crucial to local adaptation practices. Support for such partnerships can greatly enhance informal institutional processes

through which adaptation occurs. Partnerships among local public and civil society institutions are associated more closely with adaptation practices related to diversification and communal pooling. Partnerships between private and civil society institutions are relatively uncommon and need encouragement. They tend to be more closely associated with exchange and storage-based adaptation practices.

2. Enhancing the capacity of local institutions is critical

Although local institutions play a critical role in supporting adaptation, the intensity of adverse future climate impacts is likely to increase – thereby also increasing current climate vulnerability and reducing existing adaptive capacity. External interventions in the form of new information and technology aimed at improving effective coping capacities, institutional coordination for better articulation (connections among institutions) and improved access (connections of institutions with social groups), and inflows of financial support for local leadership will be critical.

3. Before providing resources and external support, the role of local institutions and their linkages must be understood. Vulnerable groups in general have lower institutional access than do those who are more powerful or better off. Before external support for greater adaptive capacity is made available, an analysis of the nature of institutional linkages and access for different social groups is critical. Such analysis can help target adaptation investments better.

4. Institutional coordination across scales, for better planning and implementation must be improved. National plans for adaptation need to involve local institutions more centrally in

planning for and implementing adaptation policies and projects (the concept of mainstreaming at different levels is crucial). If adaptation is inevitably local, there is a great need to involve local institutions more centrally in planning for and implementing adaptation policies and projects. At the very least, there must be far greater coordination between adaptation policies and measures adopted by institutions and decision makers at the national level, and their counterparts at the local level.

5. Focus on territorial development strategies taking both vulnerabilities and capacities into account is necessary. Interventions for improving adaptive capacity in the context of development projects need to attend better to adaptation practices facilitated by different forms of external support. The multiple linkages among external interventions and local adaptations can only be understood through a focus on the mediating role of different institutions in a given territory, and their influence on production and adaptation possibilities.

6. An adaptive perspective on institutional development must be adopted. Because the state of knowledge is sparse about the most effective ways in which institutions can facilitate local adaptation, no blueprints can be advanced for planning adaptive development. The development of greater adaptive capacity will require a willingness to experiment, tolerate mistakes, and promote social learning and behavioral change in terms of increasing risk management. Adaptive development will require a greater role for local institutions in both planning and implementation of development projects.

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