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The Role of Local Institutions in Adaptation to Climate Change

Arun Agrawal, Minna Kononen and Nicolas Perrin

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Introduction

Poor, natural resource-dependent households will bear a disproportionate burden of adverse impacts of climate change¹. Particularly for poor and marginal groups, local institutions (both formal and informal) play a pivotal role in building resilience and reducing vulnerability to climate change. This is through the range of indispensable functions they perform, including provision of physical infrastructure and services, disaster response planning, regulation of property rights, information dissemination, coordination with decision-makers at other levels, and organizing social action. In contexts of dispersed populations and low state capacity, populations rely on local institutions (local governments, farmer's groups, community-based organizations, local associations and NGOs etc) to mediate collective responses for adaptation.

Local institutions are also the principal vehicle through which external support for adaptation (eg training and capacity building, information and technology for higher crop productivity etc.) is and will increasingly be delivered. Local institutions are increasingly challenged to respond to increased exposure to risk and vulnerability under climate change (desertification, floods, climate related hazards, mass migration, etc). Effective local adaptation requires local institutions that are responsive, flexible and able to adapt to the uncertainties associated with climate change. However, responsive local governance for climate adaptation is constrained by weak technical and managerial capacity, poor linkages with other institutions at different levels, weak systems for gathering and disseminating information, and unclear mandates and conflicting priorities between levels and agencies of government. This has particularly serious implications for the poorest and most vulnerable groups that are frequently the most adversely impacted by climate stresses.

Existing academic work has typically attempted either to develop insights at the global level in an effort to mimic the scholarship on mitigation and climate modeling or been concerned with localized and specific case studies of vulnerability and responses to climate. In focusing on local institutions, the article fills two glaring gaps in existing understandings about institutions and climate change: (i) the lack of middle-range theories of adaptation practices to help frame policy debates, and (ii) the absence of comparative empirical studies of adaptation to support policy interventions.

This paper 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. The increasing attention to adaptation to climate change has not come with sufficient emphasis on the local nature of climate adaptation and on the role of local institutions and local governance in shaping adaptation practices. This paper presents two research projects on adaptation and institutions at the World Bank which aim to illuminate precisely these existing lacunae in theoretical and practical knowledge about adaptation. Focusing on the linkages between adaptation strategies and institutions, the

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.

first study shows the critical role institutions play in determining the nature and outcomes of adaptation strategies in a territorial development context and will try to demonstrate how past decentralized and area-based approaches on local development could be used to strengthen local adaptive capacity and resilience to climate change related risks. The second study focuses on an assessment of the relative costs and benefits of different adaptation responses related to a subset of climate hazards (particularly droughts and erratic rainfall), and the role of institutions in reducing the costs of adaptation.

Those studies will aim to show that local institutions play a crucial role in shaping adaptation to climate change by (1) connecting households to local resources and collective action; (2) linking local populations to national interventions, and (3) determining flows of external support to different social groups.

1. Climate Impacts, Vulnerability and Adaptation are Highly Variables across Space and Social Groups

CLIMATE IMPACTS ACROSS SPACE

Changes in temperatures and precipitation, more extreme events, and greater variability in them mean that agriculture-based livelihoods in drier parts of the world will likely require major technological inputs as well as significant institutional adjustments. As the variability of rainfall and mean temperatures increase, semi-arid regions will experience higher levels of land degradation, crop damage and failure, livestock deaths, and wildfires. Increased water and heat stress will also lead to greater risks of food and water shortage, malnutrition, health problems, and forced migration.

Low-lying coastal areas, especially islands are similarly exposed to significantly greater threats. These include more intense storms and coastal flooding, and higher risks of coastal erosion and inundation. With sea-level rise it is likely that there will be more frequent devastating storm surges. These phenomena are projected to lead to a loss of more than a third of coastal wetlands around the globe, greater erosion of beaches, higher levels of coral bleaching, and the possibility of greater salinity in coastal freshwater systems. Collectively, millions of households in coastal areas may be devastated because of damage to infrastructure, settlements, and facilities necessary for life and livelihoods. Since many coastal areas support very high densities of human population, permanent relocation of human settlements may prove generally infeasible.

Changes in climate will also affect the depth of the mountains snowpacks and glaciers. Regions dependent on the fresh-water supply from major mountain ranges will suffer from widespread mass losses from glaciers and reductions in snow cover that significantly affect water availability for human consumption, agriculture and hydropower potential.

VULNERABILITY ACROSS SOCIAL GROUPS: CONNECTING HOUSEHOLDS TO COLLECTIVE ACTION

Most recent studies on climate change have drawn on earlier work on vulnerability (Bohle et al. 1994, Cutter 1996, Watts and Bohle 1993) and highlighted the fact that vulnerability to climate change is a function not just of biophysical outcomes related to variations and changes in temperature, precipitation, topography and soils, but also of socio-political and institutional factors that can vary significantly at a relatively fine scale (Adger 2006). Structural and group characteristics such as gender, caste, race, ethnic affiliation, indigeneity, and age, even when they are not consistent predictors are often closely related with vulnerability. The degree to which they are associated with vulnerability tends to depend on location- and culture-specific factors -- thus although climate change is a global phenomenon, adaptation to climate impacts is inevitably and unavoidably local (Blaikie et al. 1994, Ribot 1995).

Vulnerability can be viewed as susceptibility of an agent/system to harm that impairs function as a result of the experience of stress. Stress can have deep structural causes – such as poverty and its determinants, or result from proximate causes such as a hurricanes or droughts. The conceptual framework for climate vulnerability focuses on how different climate hazards affect agents and systems, and has three

constituent elements: exposure, sensitivity, and adaptive capacity. Exposure and sensitivity stand respectively for the physical frequency, distribution, and magnitude of hazards experienced by agents/systems, and the effect of the hazard on agents (Adger 1999, IPCC TAR, Yohe and Tol 2002).

Exposure to risk and vulnerability also encourage household's membership in the formal and informal groups and networks. Households quantify the returns to membership in producer based and credit groups but participation in less economically oriented groups such as religious, civic, and insurance groups is less closely associated with initial wealth and expected gains from membership.

Adaptive capacity, particularly in the context of social systems, denotes the ability to return to or exceed functional capacity that existed prior to exposure to a hazard. Indicators of vulnerability typically couple exposure information with that on impacts of hazards, and the resources – material or institutional – that allow households, communities, and regions to overcome the adverse effects of impacts. Aspects of social capital should also be considered in this equation to assess how vulnerable groups can mobilize their social assets to develop optimal adaptation strategy and strengthen their resilience.

DIVERSITY OF IMPACTS WILL JUSTIFY DIFFERENT TYPE OF INSTITUTIONAL INTERMEDIATION FOR ADAPTATION AND RESILIENCE

It is not surprising that climate change and variability hide a diversity of impacts across regions, localities, and social groups within localities. This is because even if different areas within a region are exposed to the same climate risks, the sensitivity and vulnerability of different groups and individuals to climate impacts varies enormously depending on their material endowments, occupational patterns and asset portfolios, institutional links, and social networks. Especially important in this context is the role of institutions. They have the ability to affect the impacts of climate-related phenomena, shape the access of individuals and groups to assets and services, and allocate available and external resources by structuring impacts of actions and decisions.

Much of the current work on options for adaptation has tended to devote far greater attention to technological and infrastructure alternatives for reducing vulnerabilities and enhancing adaptive capacity at the expense of attending to social or institutional alternatives. Take as an example the IPCC Fourth Assessment Report (AR4) which examines adaptation options in coastal regions and their costs. Even as it locates impediments to adaptation in such factors as social resistance to change, weak governance, fragmented and ineffective institutional arrangements, inadequate knowledge of coastal conditions, etc., it goes on to talk about embankments, dykes, flood proof buildings, sand dune replanting, levees, and sea walls as the measures needed for adaptation (Nicholls et al 2007: 340-44). However, such infrastructure enhancement measures may prove both more costly and less effective than efforts which combine governance and institutional interventions with technical and capital improvements.

What is also important from an adaptive development perspective is that without adequate attention to the institutional and social contexts of technical or infrastructure interventions, the likelihood is very high that richer, more powerful agents will appropriate the benefits of such interventions.²

² The history of development interventions for the past half century suggests that even when development projects are specifically designed with the poor in mind; better-off groups often end up benefiting disproportionately.

2. THE ROLE OF LOCAL INSTITUTIONS: Linking Local Populations to National Interventions

In examining the role of rural institutions in adaptation, it is necessary to pay attention to three sets of factors: (i) their nature and goals, (ii) patterns in how specific types of institutions facilitate particular types of adaptation strategies, and (iii) their linkages with each other and with different rural households. An understanding of the above three aspects helps to identify the characteristic features of institutions relevant to successful adaptation outcomes.

Although households and communities have historically adapted to climate variability through many different strategies, their capacity to adapt depends in significant measures on the ways institutions regulate and structure their interactions: both amongst themselves and with external actors. In general adaptation practices depend for their success on specific institutional arrangements -- adaptation never occurs in an institutional vacuum.

CLASSIFYING LOCAL INSTITUTIONS RELEVANT TO ADAPTATION

In examining the role of local institutions in facilitating adaptation, this paper focuses on three types of institutions: *civic, public, and private*, primarily in their formal but where relevant, also informal form. Analytical approaches have generally focused, among other dimensions, on the degree to which rural institutions are formal or informal, whether they are sector-specific or multi-sectoral/general purpose, and on their hierarchical nature (IFAD 2003). In this paper, the analytical focus is on the three broad domains of social action - market/private, public/government, and civic/community - to cover the range of institutions relevant to adaptation to climate change and addressing the different forms of vulnerability that the rural poor are likely to suffer as a result of climate variability and change.

Within these three broad domains, it is possible to recognize additional relevant distinctions. Focusing mainly on organizations because of their formal and concrete nature, Uphoff and Buck 2006 highlight two important types of local public institutions: local governments (organizations accountable to a local constituency through elections or some other mechanisms) and local agencies (agencies or arms of higher levels of government operating at local levels). They similarly identify two types of civic institutions (membership organizations that function in a manner analogous to companies and advance some common interest of their members; and cooperatives which function more like partnership and help members pool resources for improved economic outcomes), and two types of private institutions (service organizations including such as NGOs and charities and private businesses). Their typology is summarized below in table 1.

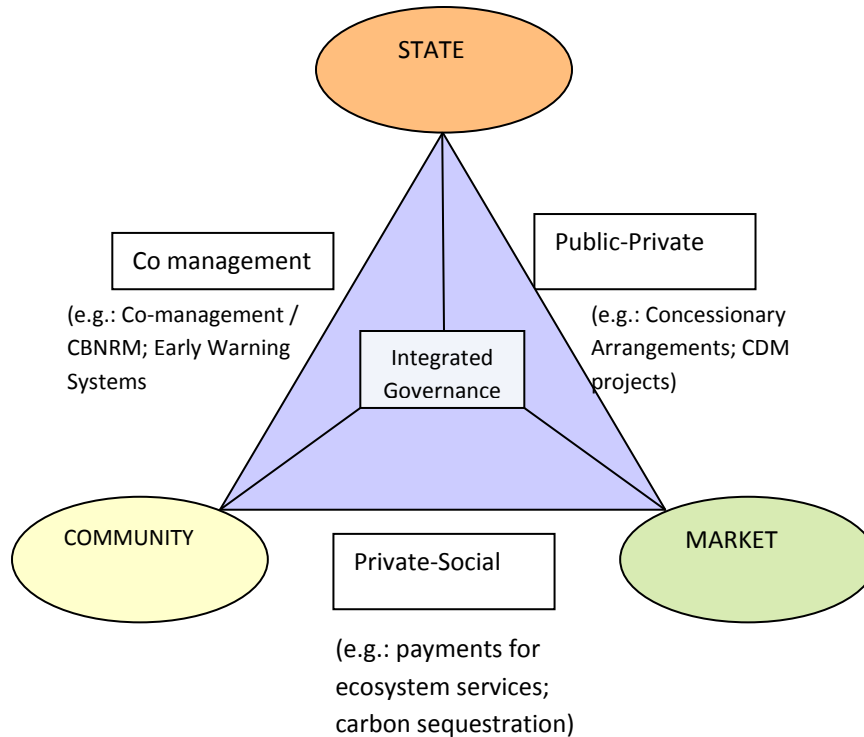
Table 1: A Proposed Typology of Local Rural Organizations

	Public (state)	Private (market)	Civic (civil society)
Types of institutions	Local agencies Local governments	Service organizations Private businesses	Membership organizations, cooperatives

It is worth pointing out that in many contexts, formal local institutions and organizations work in ways that promote informal processes, and these interactions can be critical to adaptation. Further, although the analytical distinctions among these different types of organizations are important to bear in mind, in

their functioning these organizations often enter into partner relationships, promoting cross-domain collaborations.

Figure 1: A Schema of Collaborative Institutional Arrangements for Environmental Action in the Context of Climate Change (Agrawal and Lemos 2006)



Indeed, there are strong reasons to believe that such partnerships between public, civic, and private organizations can prove extremely important in addressing climate hazards related adaptation across scales. Figure 1 above proposes a schematic representation of such partnerships and collaborative arrangements as a first step in analyzing how institutions across the public, civic, and private boundaries can work jointly to help facilitate adaptation.

The basic motivation for such collaborative arrangements stems from the specific limitations of institutions and organizations within the private, public, or civic domains. With their main focus on regulating socioeconomic interactions (public), promoting voluntary/social relationships (civil society), or generating profits (market), organizations within these three domains may not have sufficient capacity or expertise to facilitate adaptation which, depending upon the context, may require the pursuit of a mix of objectives through flexible operational strategies. But in collaboration, each type of organization may be able to overcome the weaknesses of its partners. The success of such partnerships obviously depends significantly on common or complementary perceptions about the problem to be addressed, and coordination of organizational strategies to achieve adaptation-related goals. Such partnerships have become especially common in the environmental arena as well as in the context of development projects. It is clear that adaptation to climate change will require the concerted efforts of decision makers in diverse institutions across multiple scales.

HOW DO LOCAL INSTITUTIONS AND ORGANIZATIONS AFFECT ADAPTATION AND LIVELIHOODS?

Broadly speaking, different local institutions shape the effect of climate hazards on livelihoods in three important ways.

1. **They structure environmental risks and variability** and thereby the nature of climate impacts and vulnerability. Depending on the nature of governance and institutional configurations, the same phenomenon – say, reduced precipitation in a region by 20% in a given year – will have very different effects on the livelihoods of residents in the region. More equitable access to livelihoods-related institutions and their resources, coupled with transparent communication and governance is likely to reduce the ill effects of rainfall failure in contrast to a situation where institutional access is highly stratified and information about institutional capacities is monopolized by a small group.
2. **Institutions create the incentive framework** within which outcomes of individual and collective action unfold. It is within such incentive frameworks that households and collectives choose specific upon adaptation practices. Strong institutional norms around labor sharing may, thus, reduce the ability of households to migrate or diversify.
3. **Institutions are the media through which external interventions reinforce or undermine existing adaptation practices.** In this context, greater attention to the reasons why households and collectives opt for one type of adaptation practice vs. another is necessary if external interventions are to reinforce the adaptive capacity of the rural poor. It is important to attend to empirical evidence because reliance on particular adaptation practices can have lasting implications for the extent to which the rural poor can adapt either successfully or sustainably to future risks (see Box 1).

As the case description in Box 1 illustrates, local institutions play a crucial role in influencing the adaptive capacity of communities ex ante, and the adaptation choices made by community members ex post. This example also shows the importance of close connections between local and higher level institutions, and the extent to which such connections allow rural residents to leverage their membership in local institutions for gains from outside the locality. Indeed, the critical role of institutions is underscored in study after study of adaptive capacity and adaptation choices (Adger 1999, 2000b, Berkes and Jolly 2001, Ivey et al. 2004).

Box 1: How Institutions Structure Climate Impacts, Adaptation Choices, and Outcomes

Households' management of climatic risk is a function of education, wealth, natural resources, social organization, local knowledge, and institutional relationships among other factors (see, e.g. Mortimore, 1989). In examining the responses of households from three different communities in Mexico, Eakin found that a wide range of adaptive responses to climate variability and change. 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 migration and selling livestock to buy maize. And 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.

These differences in household responses across the three communities are indicative of resource endowments but also of institutional support at the local level, and market integration and institutional linkages at higher levels. Depending on institutional access to land, markets, and social networks, households intensify agricultural production, diversify into livestock or new crops and engage in market exchanges, or invest in education and migration to manage changing patterns of climate and other risks. Institutional connections provide households and communities greater flexibility in their choice of diversification and adaptation strategies.

This case also points to the difficulties inherent in attempting to gain a generalized picture of vulnerability and adaptive capacity based on a list of indicators and quantitative measurements (but see Brooks et al. 2005: 157). As much as the presence of formal and informal institutions, it is their linkages with each other and rural households that affect how climate change and variability produce their effects.

(Source: Eakin 2005).

Local institutions structure livelihoods impacts of climate hazards through a range of indispensable functions they perform in rural contexts. Institutional functions include information gathering and dissemination, resource mobilization and allocation, skills development and capacity building, providing leadership, and relating to other decision makers and institutions. Each of these functions can be disaggregated further, but the extent to which any given institution performs the above functions depends greatly on the objectives with which the institution was formed, and the problems it has come to address over the course of its existence.

3. LOCAL INSTITUTIONS AND CLIMATE CHANGE:

Determining flows of external support to different social groups

Despite recognition of the critical role of local institutions in facilitating adaptation of populations to climate change, little systematic analysis has been done to identify the factors that strengthen climate resilience, the roles of different local institutions in climate adaptation, the features of institutions that are important for successful adaptation, and the external support they require to enhance their role in facilitating adaptation.

The World Bank's Social Development Department, together with the Agriculture and Rural Development Department (ARD), has initiated two activities to address this gap. Supported by the Bank-Netherlands Partnership Program, and the Trust Fund for Environmentally and Socially Sustainable Development, a two-year program of activities (described in detail below) is under course, in partnership with the Bank's regional departments. External partnerships have been established with the University of Michigan, the Stockholm Environment Institute (SEI) and the Centro Latinoamericano para el Desarrollo Rural (RIMISP) and the Royal Haskoning.

AREA BASED DEVELOPMENT AND CLIMATE CHANGE ADAPTATION

Information is currently lacking on how and under which conditions territorial development approaches can help reduce climate change-related vulnerability, enhance adaptive capacity, and promote sustainable livelihoods. For instance, in West Africa and the poorer regions of Latin America, climate change poses an imminent threat to rural livelihoods and agriculture³. In several countries in Francophone West Africa and Latin America, decentralization reforms have been accompanied by territorial and area-based approaches to local development (Aménagement territorial in West Africa and Desarrollo Territorial in Latin America)⁴. These offer the opportunity to strengthen the responsiveness and adaptive capacity of local institutions, by providing autonomy of decision-making at local level and improving the participation of local populations in decision-making. However, they also pose challenges that can hamper the development of climate adaptive local governance.

The study aims to understand and document the interface between territorial development and climate change adaptation in selected countries in Francophone West Africa (Senegal, Burkina-Faso and Niger) and Latin America (Mexico, Peru and Dominican Republic) by (1) developing and applying a methodology to identify operational recommendations on how to strengthen local adaptive capacity and resilience to climate change related risks through decentralized and area-based approaches;(2) and, creating a community of practice within countries and at the regional levels for area based development and climate change adaptation.

The approach is based on (a) a series of case studies on Area Based Development and Climate Change Adaptation linked to the World Bank's lending operations (on areas such as irrigation, community driven development, agriculture, decentralization, disaster risk management) including a review of the

³ WDR (World Development Report) 2008. Agriculture for Development Policy Brief.

⁴ "Linking Community Empowerment, Decentralized Governance, and Public Service Provision Through a Local Development Framework." March 2005. Washington, DC: World Bank.

proposed National Action Plans for Adaptation and their articulation with the policy and institutional environment for area based development; and (b) a series of practitioners and policy makers dialogue events to raise national awareness and facilitate the emergence of a community of practice (nationally and regionally) on the relationship between climate change, disaster management, livelihood opportunities and area-based development.

The study and the methodological framework have been developed together with partners from the ARD and the University of Michigan and it has recently initiated its planning phase with regional research partners: SEI for West Africa and RIMISP for Latin America.

What is Area Based Development/territorial Development?

Territorial development is an approach aimed at improving regional and national cohesion, by unlocking the specific potential of the different territories of a country, thanks to more efficient and sustainable development strategies⁵. This is due to: i) ownership of local strategies, due to broader participation of public and private stakeholders; ii) subsidiarity, allowing for more locally adapted strategies; and iii) integration of, and hence synergies between, sectoral policies at territorial scale. It seeks to build on endogenous territorial assets (people, economic activities, natural resources, culture), to identify the territory's comparative advantages, and a specific development strategy. To ensure real participation, area based development seeks to actively encourage social inclusion and empowerment, building capacity in particular of more marginal local actors. Local authorities have key roles of providing the legal and political enabling environment for area based development to be successful, of basic service providers, of stimulating dialogue among local actors, and of engaging in public-private and public-civil society partnerships. A key feature of area based development is its holistic approach, notably integrating sectoral policies at territorial scale, promoting parallel economic and institutional transformation, and strengthening linkages within the territory (notably urban - rural), and outside (with broader markets, institutions). TD complements national and sectoral development policies, which remain essential framework to provide a supportive policy and economic context.

Focusing on micro and meso linkages across sectors and spatial dimensions of different assets and endowments, the approach seeks to deploy the advantages of local governance and decentralization to unlock the development potential of a territory. Because development in a climate challenged world will need to take into account the relevant climate impacts and responses in a region, the territorial development approach highlights the linkages of the local spatial, governance, and political economic context in multiple sectors, among different actors and across levels (public, collective and private). As no single territorial level can promote development on its own, Area Based Development must include multilevel governance that facilitates coherence between policies at different territorial levels. Improving the articulation of the different territorial levels of government (local, regional, national) to support climate change resilience and adaptation is essential.

⁵ European Commission "Towards an EU approach to democratic local governance, decentralization and territorial development"

The Importance of Territory

For the proposed work, we follow Schejtman and Berdegué (2004) to define a territory as “a geographic space with a socially constructed identity.” A territory is therefore a functional unit. Territorial identity can be constructed around different axes. The alignment of the different axes and how they come together to constitute a territory will depend on the political economy of the territory, and includes:

- Ethnicity and other cultural factors,
- Social and political conflicts or a shared history,
- Major infrastructure works (e.g., a major road or a major dam),
- Flow of people, goods and services (seen to be present in many cases),
- A shared economic base – e.g. through a dominant product, or a value chain,
- Ecosystems and watersheds,
- And, sometimes, administrative units

For the proposed study, administrative units where there is a WB project and which vary by climatic and wealth indicators can serve as a starting point. Interviews with a range of stakeholders, including representatives of marginalized social groups, using semi-structured questions to seek respondents’ perspectives on the seven factors listed above can allow the identification of the relevant factors and the territorial boundaries, particularly where a strong territorial identity exists.

(Burkina Faso) *The Local Resource Management Project in the Bam region of Burkina Faso demonstrates the participatory and inclusive requirements of defining a territory. The territory is centered on the Goada forest, not in terms of geography but rather by use of the forest. The project was initiated by the villagers of Yalka who had previously failed to protect the forest through exclusive land management. In defining the territory by users, all stakeholders who used or relied on the forest were brought together, including migrant herders and people from neighboring villages. With external support from the provincial department for the environment, rivers and forests (SPEEF) and the German aid program PATECORE, agreements were reached to place a moratorium on conversion of bushland to farmland and harvesting of wood for commercial purposes for a period of 15 years. The migrant herders also agreed to cease cutting of trees and bush for fodder for five years but would still be allowed to graze cattle in the bushland. The inclusive and participatory definition of the territory led to the successful outcome of the project. Because each group was involved early on in the process there was broader social acceptance and alignment of goals, groups were willing to compromise and conflicts were effectively resolved.*

In a territorial development approach the precise definition of the territory is less important than an analysis of the capacities and gaps within the territory, and the ways in which different assets, social groups, and institutions in the territory are linked to each other and to resources and institutions outside the territory. The relationships among institutions and social groups, uncovered through institutional network analysis will be particularly important to the proposed work.

Implementation of a territorial development approach in the context of climate change and attendant vulnerabilities will require analysis and strategic planning in relation to three integral components:

1. Analysis of the available resources, assets, political economic relationships, local governance framework and its formal and informal linkages in a given territory (Territorial Inputs);

2. An assessment of the strategies through which stakeholder adaptive capacities, their adaptation practices, their participation in relevant institutions and local governance, and capacities of existing institutions can be enhanced (Territorial Processes);
3. Recommendations regarding the major human, information, and financial resources that will be necessary for building greater resilience and institutional linkages, and improving the effectiveness, equity, and sustainability of territorial outcomes (Territorial Outcomes).

The process of defining a territory needs to be participatory, inclusive and involve all relevant stakeholders to define a territory that is recognized by the local community (FAO 2003). The goal in defining a territory is social cohesion and the alignment of economic interests among parties. External support is often required to ensure all stakeholders are involved and to aid in resolving any conflicts that arise between and among stakeholder groups. An effective territory may be defined along administrative boundaries, particularly in the initial stages, but flexibility is crucial to encourage involvement from all stakeholder groups, adapt to changing circumstances resulting from group dynamics, or climate change. As the territory develops, prospers and matures the boundaries and identification of the territory may become less important as the economy becomes more diversified and stable.

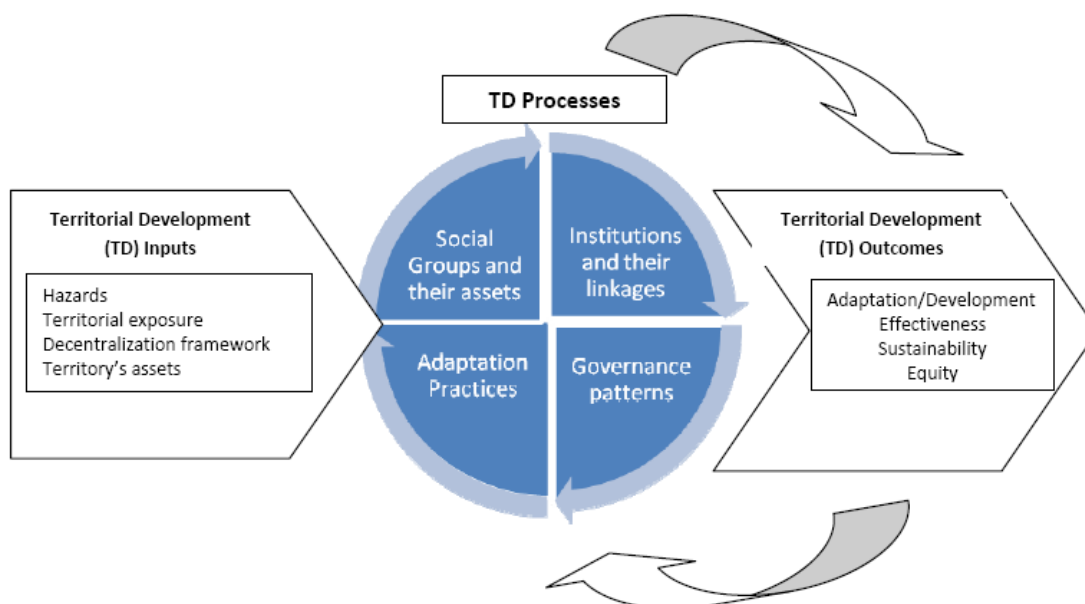
Research Strategy

Two major areas of emphasis distinguish the proposed research from existing work on adaptation and development: (i) a focus on the political economy of territorial development with special emphasis on how local institutions articulate with existing policy frameworks and external institutions relevant to development outcomes in specific territorial units; and (ii) a focus on local institutions and institutional relationships with different social groups and external actors and institutions as being central mechanisms to facilitate adaptation. Four areas are of significant interest for the proposed project:

- *The nature and impact of climate hazards relevant to particular territorial units;*
- *Assets, capacities, and vulnerabilities of the territory, with particular emphasis on marginalized social groups and their relationships to local and external institutions;*
- *Role of local institutions in supporting adaptive capacity, including how and for what reasons they channel external support to different social groups so as to improve adaptive capacity of the groups, and the territory.*
- *The political economy of the larger governance and policy framework within which institutions play a role in facilitating local development and adaptation to climate variability and change.*

The figure below summarizes the integral components of Territorial Development. It suggests that exogenous factors influencing what happens in a territory should be viewed as input factors that can be influenced by territorial actors only to a small extent. These include climate hazards and their manifestations (droughts, floods, storms), levels of exposure, the decentralized regulatory and policy framework, and territorial physical and natural assets. The relationships among the territory's social groups, institutional arrangements, adaptation practices, and local institutions constitute the interlinked set of territorial development processes. The outcomes of these interactions and adaptations create the features of territorial development outcomes. The monitoring of these outcomes leads to external interventions. These interventions can influence the characteristics of social groups, local institutions, governance features, and adaptation practices. In a continuing cycle, these interactions then reconfigure the nature of territorial development outcomes.

Figure 2: Building Blocks of Territorial Development and Adaptation



The study is currently under way in the 6 countries, data collection happening in the field, the first results should be available in the fall 2009 to provide some repository of adaptation practices and territorial development practices. The findings will provide some concrete recommendations for ongoing projects working on community driven development, local governance, disaster risk management, rural development and sustainable land management on how to mobilize the local stakeholders in joint participatory assessment of their territorial assets, and how to plan collectively between different scale of actors to prepare to climate threats and support efficient accountable adaptation strategies. Wider dissemination of the final results and success stories for internal World Bank partners and client countries is being designed in collaboration with the World Bank Institution.

COSTING ADAPTATION THROUGH LOCAL INSTITUTIONS

The primary objective of this activity is to undertake an assessment of the costs and benefits of ongoing adaptation strategies, and provide client countries⁶ with Assessment tools for Costing Adaptation through Local Institutions (CALI). These tools will help support poverty reduction and adaptation to climate change by providing a means to analyze perceived adaptation costs and options for local institutions at local to national scales in semi-arid and highland areas in Mali, Ethiopia and Yemen.

The proposed research aims to yield specific cost estimates for adaptation options and the role of institutions in facilitating different types of adaptation, and thereby provide decision makers with practical recommendations in three areas:

- *strategies for local capacity building* through different kinds of institutions, and adoption of appropriate adaptation strategies;

⁶ Local and central governments, local organizations leaders, donors and local research/academic centers, project team leaders.

- *recommendations related to hard vs. soft adaptation options*, and cost benefit estimates at the household level for such interventions; and
- *suggestions for addressing institutional and social relationships* that can provide a better coupling between adaptation options and local development

Research Strategy

The CALI methodology aims to provide a basis for understanding how adaptation interventions need to be structured so as to benefit the most vulnerable types of households and communities within a vulnerable region and how specifically local institutions can be mobilized to this end. In some respect, the methodology is built around Participatory Rural Appraisal (PRA)/Poverty and Social Impact Analysis (PSIA) approaches, utilizing historical data to understand adaptation to climate hazards.

The assessment will be based on (a) a review of the proposed National Action Plans for Adaptation and their articulation with vulnerability assessment and the range of adaptation options; (b) development of a methodological framework for costing adaptation strategies for local institutions; (c) a series of case studies on local institutions and climate change adaptation options; and (d) a series of practitioner and policy maker dialogues and dissemination events to raise national awareness and facilitate the emergence of a national community of practice on the costing of adaptation options for local institutions. Ultimately, it is expected that the assessment will help in identifying windows of opportunity to advance the climate change agenda in these countries, and provide detailed adaptation cost-benefit estimates for the local institutions identified in the case studies. These specific cost-benefit estimates will help provide operational recommendations for the Bank, government agencies, and civil society organizations by helping to define priorities among the menu of local and macro level adaptation strategies.

In light of the scarcity of existing research and information on the role of local institutions in adaptation, enhancement of adaptive capacity, and costing of adaptation options, it is necessary to focus on the following areas of interest for the BNPP project:

- What is the nature and impact of climate hazards relevant to particular agro-ecological zones?
- What are the specific adaptation practices used by households, social groups, and communities located in different socio-economic and ecological contexts to respond to different climate hazards?
- How do households and community members rank the effectiveness of different adaptation strategies and assess the costs and benefits of the selected strategies?
- How are different adaptation practices associated with different social group? In particular, what are the most common adaptation practices used by more vulnerable social groups in the studied locations?
- What are the most common vulnerability and adaptation profiles for households in the studied locations?
- What is the distributive nature of current adaptation strategies?
- What explains the past effectiveness (or non-effectiveness) of adaptation responses by households, social groups, and communities to climate hazards? (the same factors will also be responsible for understanding the adaptive capacity of local populations)
- What role do local institutions and networks play in adaptive capacity?
- What external forms of support are available to facilitate local adaptation? How do local institutions channel such support for improvements in adaptive capacity?

- What do local stakeholders view as the most effective local institutions/mechanisms for channeling external support? What kinds of external support do they view as being most important?
- What policy and operational recommendations for costing approaches can be derived on the basis of answers to the foregoing questions?

Costing Framework

The costing framework indicates costs to implement the different adaptation options. CALI study focuses on costs related to agriculture and water management techniques, diversification of livelihoods (temporal/permanent migration to urban areas, increasing market sales, handicrafts etc) and communal pooling. With costs we refer to

- monetary costs that have to be made by the household;
- household labor requirements;
- household training requirements;
- required help from the community;
- required help from institutions like authorities or NGOs; and
- monetary needs by institutions, necessary to implement their work.

For the monetary costs related to the adaptation options we use participatory appraisal method to estimate households' perception of the monetary costs, where market prices are not available. For the households, the study will assess ranges of costs households have made in the past to adapt their strategies to (climate related) hazards. Furthermore, it will be analyzed whether these costs and the options adopted differ per social group.

For the institutions, it will be assessed how much money and resources they use in order to perform their tasks to assist households in the process to adapt to particular hazards. These estimates will serve as a basis for judging how much investments or aid would be needed from governments or donors to promote particular adaptation interventions in the rural areas. This will also show which entry points can be selected in order to promote particular strategies.

The following table illustrates different costs related to agricultural techniques and communal pooling in response to climate hazards borne by households:

Cost Adaptation Options	Input	Time	Training needs
Seed selection: select drought resistant/tolerant seeds	Costs of improved or different seeds		Training on cultivation methods
Adapt planting dates		Changes in labour allocation	Training on cultivation methods
Adapt cropping densities / mixed cropping	Changing input costs	Additional labour time related to intensification	Training on cultivation methods
Restore and preserve homestead or mountain forests to reduce erosion and peak-flows from intense rainfall	Costs of reforestation	Labour for replanting	Training on reforestation
Soil erosion prevention programmes of farming land	Costs for erosion prevention works	Labour for erosion measures	

The study is currently being implemented in the 3 countries. Results should be available in the fall describing vulnerability profiles, adaptation options and costing those through the local support of existing organizations. It is hoped that the recommendations from those studies will provide options of possible operational support to local institutions for the World Bank projects they have been working with and to a larger extent will provide the local and national stakeholders with some costs for local adaptation options and indications of potential bottlenecks and opportunities to support them.

4. Conclusions

Climate change will have three main impacts on rural poor and their livelihoods: *increase environmental risks, reduce livelihoods opportunities, and in consequence, stress existing social institutions*. Its effect will occur through hazards and mechanisms that may be historically familiar, and for which the rural poor have often developed a rich repertoire of strategies and adaptation practices. To strengthen the adaptive capacity of the rural poor, therefore, governments and other external actors need to strengthen and take advantage of already existing strategies that many households and social groups use collectively or singly. Examining the environmental risks that populations have historically faced, their cultural responses to these risks, and the institutional configurations that facilitate individual and collective adaptation strategies is therefore a fruitful area of inquiry and policy analysis for generating effective coordination with external interventions.

There is a need in the current debate on climate change adaptation to better take into account historical knowledge and local capacities. Communities in the high risk and climate change prone areas which have encountered many episodes of climate hazards have, over time, accumulated considerable experience and knowledge of the causes and nature of the recurrent climate threats in their areas.

Local level organizations and institutions have the following advantages in climate change adaptation compared to higher level institutions: (a) represent local perspectives in policy making and climate change planning fora, (b) bridge and promote two-way communication between higher and local policy levels, (c) assist and guide locally the implementation of climate change adaptation activities, (d) mobilize local participation; and finally (e) handle at the local level the full adaptation & resilience cycle, better linking, in particular, climate change prevention and rehabilitation activities based on an anticipatory (as opposed to reactive) mind set.

Mainstreaming climate change adaptation with development policy is a key challenge, which requires development and strengthening of institutional and organizational frameworks at all levels of government.

The current studies tend to show that climate change adaptation and response coordination benefit from centralized command during extreme events but most of the adaptation and resilience related functions require appropriate decentralization of functions, devolution of authority and community participation to complement the centralized system. This is particularly true for regions exposed to recurrent /chronic events progressively increasing local communities' vulnerability. Local level community response is the most important factor enabling people to reduce and cope with climate risks especially in the most remote areas/marginalized groups. However, informal networks can be eroded in the long-term from exposure to stress and resources for mitigation measures are often lacking.

To ensure greater capacity to adapt locally and nationally, support to local institutions should focus on vulnerability and coping capacities (for which local institutions are crucial) and not on the hazard. It is important to also articulate different scales: institutional – local/national/regional- but also temporal – short/medium/long term- to be realistic on the implementation and representation capacity of the local institutions. It is thus important to understand how to prevent recurrent events and chronic processes to gradually increase the resilience and reduce the vulnerability of livelihood systems.

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