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**BUILDING RESILIENCE:
INTEGRATING CLIMATE CHANGE INTO A LOCAL NGO AGENDA**

A Thesis in
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by
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ABSTRACT

Can NGOs build community resilience more effectively by explicitly addressing adaptation to climate change, or by couching climate change within the context of building adaptive capacity to multiple disturbances? In this thesis, I examine three NGOs in the Arusha region of Tanzania that use these two different approaches and compare their success at building adaptive capacity by evaluating their ability to foster opportunities for collective and anticipatory learning, a key aspect of resilient systems. I explain how each NGO understands climate change and adaptation, how this understanding shapes the NGO's agenda, and how this agenda translates to concrete projects at the community level. Finally, I assess the effectiveness of these projects in fostering spaces for collective and anticipatory learning within communities, and explore the implications of these findings for the ways that local organizations can effectively incorporate climate change adaptation into resilience-building agendas.

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ABBREVIATIONS USED

ANGONET	Arusha NGO Network
CDM	Clean Development Mechanism
CEEST	Centre for Energy, Environment, Science and Technology
CCM	Chama Cha Mapinduzi
CMP	Meeting of the Parties to the Kyoto Protocol
COP	Conference of the Parties
CUF	Civic United Front
GAS	Green Arusha Society
GCM	General Circulation Model
IPCC	Intergovernmental Panel on Climate Change
ITCZ	Inter Tropical Convergence Zone
MMD	Multi-Model Data Sets
MWEDO	Maasai Women Development Organization
NCAP	Netherlands Climate Assistance Programme
NGO	Non-Governmental Organization
OECD	Organization for Economic Co-operation and Development
PACCAD	Pastoralists' Alliance for Climate Change, Adaptation and Development
SIT	School of International Training
TOT	Trainers of Trainees
TPHDR	Tanzania Poverty and Human Development Report
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

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CHAPTER 1

INTRODUCTION

1.1 ACADEMIC CONTEXT AND THESIS GOALS

Adapting to changing climate conditions is already a necessity in many parts of the world, and this necessity will spread in the coming decades. Researchers and policy makers are currently struggling to create a framework for facilitating adaptation. However, the majority of the proposed approaches rely on vulnerability and adaptation assessments that measure or estimate the outcome of actual or hypothetical responses. Most proposed approaches to adaptation are therefore responses to changes that have already occurred, or to changes that are perceived as “likely” in the future. These assessments leave little room for proactive and anticipatory engagement with the issue of adaptation under circumstances of uncertainty and increasing variability and extreme climate events.

In order to move beyond these retrospective or outcome-oriented analyses, it has been shown that the focus must be on building adaptive capacity, defined as the ability of a system to adjust itself in response to current or future changes (Füssel and Klein 2006). Systems with high adaptive capacity will be more resilient in the face of uncertainty and increasing variability in the climate system. Resilient systems are those with the ability to absorb disturbance and reorganize themselves in the face of change, while still retaining essentially the same functions, structures, and identity (Berkes 2007, citing Walker et al. 2004). Building adaptive capacity, and thereby increasing resilience, can be

accomplished by facilitating collective learning, integrating knowledge systems between communities and across scales, and building flexibility into governance, institutions, and organizations (Folke 2006). NGOs (non-governmental organizations) are in a key position to help communities build adaptive capacity by creating opportunities for collective learning and building linkages between knowledge systems. Moreover, by building flexibility into their own institutional structure, NGOs can increase their own adaptive capacity, as well as that of the communities with which they work. However, research on specific and practical ways that NGOs address climate change by facilitating adaptive capacity is scarce.

My thesis seeks to fill this research gap by identifying the ways that NGOs in rural Tanzania facilitate or constrain adaptive capacity and resilience building. Rural Tanzanians are highly vulnerable to the negative impacts of climate change. This has piqued the interest of many international institutions and organizations (Agrawala et al. 2003, CEEST 1999, Ehrhart and Twena 2006, IPPC 2007, Kejo 2008). It is less clear if



Map 1.1 Map of Africa, Tanzania highlighted in red box.
Source: www.nationsonline.org.

and how local non-governmental organizations are addressing climate change. This thesis focuses on three local NGOs in the north central region of Arusha, Tanzania. By examining how these NGOs understand climate change, how this understanding impacts their agendas, and how these agendas translate to projects on the ground, I reveal how certain characteristics of NGO agendas and projects create space for collective and

anticipatory learning, facilitate flow between knowledge systems, and promote institutional flexibility, thereby building adaptive capacity both within communities and within the organizations themselves.

1.2 BROADER IMPACTS: LINKING GLOBAL FUNDING MECHANISMS TO LOCAL ADAPTATION

In the last few years, human-induced climate change has been legitimized in many global arenas, most notably through the Intergovernmental Panel on Climate Change (IPCC) reports and the granting of the 2007 Nobel Peace prize to the IPCC and Al Gore. In part because of this, policy makers are prepared to fund climate change adaptation projects. Interest in adaptation has also been motivated by frustration with the fact that climate change mitigation, the reduction of greenhouse gas emissions, has not happened as quickly as anticipated and desired.

At the global scale, there are currently three functional mechanisms for funding adaptation projects: the Global Environmental Facility (GEF) Trust Fund, the Least Developed Countries Fund (LCDF), and the Special Climate Change Fund. Finishing touches were put on a fourth mechanism, the Adaptation Fund, at the fourteenth United Nations Framework Convention on Climate Change Conference of the Parties (UNFCCC COP 14) in December 2008. The Adaptation Fund will be fully operational sometime in 2009.

In spite of these mechanisms, the distribution of funds for adaptation remains problematic (Klein and Möhner 2008). Those in charge of deciding how funds will be allocated are constrained by a lack of knowledge about how adaptation works as a

process, what adaptation strategies might be most effective, and how these strategies should be implemented. Global or regional climate change initiatives may not translate easily to complex local contexts, and an effective initiative in one location may not translate successfully to another (Reid and Vogel 2006). Furthermore, organizations on the ground, including NGOs, want to tackle this issue, but often lack the information and resources necessary to make informed decisions about local adaptation strategies. Sometimes, this is because localized environmental assessments have not rigorously evaluated the potential consequences of climate change (Young and Lipton 2006). More often, it is because at the local scale, even scientists are unable to predict exactly what changes will occur.

Downscaled climate model projections at the local and regional level, despite best efforts, are fraught with uncertainty. While useful projections can be made about general trends over decades, it is currently impossible to know how temperature and precipitation will vary from day-to-day, month-to-month, or year-to-year within a localized context. Although the general direction of change may be known, the magnitude and variation that will be encountered along the way is less certain. Thus, climate change adaptation at a local level is constrained by a lack of knowledge, which prevents NGOs and communities from knowing what to expect and what strategies to implement. It also prevents policy makers from deciding how to allocate funds for adaptation. Since the only thing certain is uncertainty, the question becomes not what *specific* adaptation strategies should be implemented, such as building a dam or modifying agricultural practices, but how communities can build the *capacity* to adapt to any kind of change, and hence, build resilience.

A resilience perspective, according to Carl Folke, “shifts policies from those that aspire to control change in systems...to managing the capacity of social-ecological systems to cope with, adapt to, and shape change” (2006, 254). Part of creating a resilient system is increasing the system’s capacity for continuous learning, adaptation, flexibility, and collective action. The challenge here is determining how to incorporate these elements into institutions and organizations for governance (Folke 2006). This thesis takes on the aforementioned challenge. The concrete outcomes of my research include a typology of organizational characteristics that promote adaptive capacity, as well as opportunities for incorporating them into local NGOs as a way of building resilient communities and organizations in the face of uncertain future climate change. These findings can inform policy decisions made by global funding mechanisms, as well as institutional decisions of local organizations tackling climate change adaptation.

1.3 THESIS ORGANIZATION

This thesis is organized into six chapters. The first chapter is this introduction. Chapter 2 contains a review of the literature on climate change adaptation and vulnerability, the role of institutions and organizations in preparing for and responding to climate change, and social learning theory. Chapter 3 details my research design, including research questions, setting, methods, and mode of analysis. My results are presented in Chapter 4, and are divided into three subsections that thematically correspond with my three research questions: NGO agendas and projects, information flow and learning across scales, and spaces for collective and anticipatory learning. In Chapter 5, I discuss the broader implications of my research findings for NGOs

integrating climate change adaptation into their agendas, with a specific focus on boundary organizations. Chapter 6 contains a summary and the conclusion of my thesis.

CHAPTER 2

LITERATURE REVIEW

While climate change mitigation seeks to reduce greenhouse gas emissions in order to limit human-induced changes to the climate, a climate change adaptation approach attempts to minimize the negative impacts of these changes (Smit and Wandel 2006). It is too late for mitigative strategies alone to prevent the negative impacts of global warming in the near future. Even if carbon emissions were drastically and immediately reduced, global warming as a result of past emissions would be unavoidable (IPCC 2007). Adaptation is necessary.

Some human activity to adapt to the changing climate is already taking place, however “more extensive adaptation than is currently occurring is required to reduce vulnerability to future climate change” (IPCC 2007, 19). Identifying and assessing vulnerability provided the framework for much early research on climate change impacts and adaptation, followed by a shift toward the assessment of specific adaptation options and strategies (Füssel and Klein 2006). Recently, there has been a greater focus on adaptive capacity, or the ability of a given system or community to modify itself in response to existing or anticipated stressors (Brooks 2003). An adaptive capacity perspective acknowledges that vulnerability is dynamic. Neither are the internal and external factors that shape vulnerability static, nor can we be certain of the future conditions to which a system or community will have to respond.

The first part of this literature review will examine the ways that the terms vulnerability, adaptation, and adaptive capacity are defined and used. Different definitions and usages of these terms produce different ways of addressing adaptation to climate change. The second section of this literature review follows the historical progression of adaptation research. Increasingly, this research has taken the form of discussions of how adaptation can be formally implemented in management and decision-making. The third section looks at the role of institutions and organizations in adaptation. Attention is paid to the ways that institutions and organizations facilitate the building of adaptive capacity in systems or communities, as well as the internal adaptive capacity of institutions and organizations themselves. In the fourth portion of the review, I examine collective and anticipatory learning as both tools for institutions and organizations to facilitate external adaptive capacity, and as a route to building their own adaptive capacity. I end this chapter with a brief summary.

2.1 VULNERABILITY, ADAPTATION, AND ADAPTIVE CAPACITY: DEFINITIONS AND USAGE

The multiple usages and understandings of the term vulnerability broadly fit into two categories, the risk-hazard framework (typically used in the risk and disaster management literature) and the social-constructivist framework (normally used in geography and political economy) (Füssel and Klein 2006); I will refer to these as biophysical vulnerability and social vulnerability, after Brooks (2003). Biophysical vulnerability is a function of exposure and sensitivity, or the amount of damage a system expects to experience from a specific climate-related event or hazard. Social

vulnerability is the degree to which the characteristics of the system itself make it susceptible to damage. The social vulnerability of a given community, for example, might be a measure of non-climatic factors such as poverty, inequality, education, and resource access. Biophysical vulnerability is ultimately an indicator of the outcome of a specific event whereas social vulnerability is a measure of the state of a system prior to an event (Brooks 2003). A third understanding of vulnerability is provided by the IPCC Third and Fourth Assessment Reports, which define vulnerability as a function of both external factors (“character, magnitude, and rate of climate variation”) and internal factors (“sensitivity” and “adaptive capacity”) (Füssel and Klein 2006, 306).

There are important implications for choosing either a biophysical or social vulnerability approach in climate change adaptation research. Because biophysical vulnerability measures the outcome of climate-related events or hazards, it leaves little room for discussion of proactive adaptation, which could reduce vulnerability before damage occurs. Social vulnerability, on the other hand, is a measure of the system prior to and independent of a risk or hazard, which means that this type of system vulnerability can be reduced through the implementation of proactive adaptations. Adaptations (or adaptation strategies) are system modifications in response to existing or anticipated stressors. Adaptations are concrete realizations of adaptive capacity, the ability of a system to modify itself in response to existing or anticipated stressors (Brooks 2003).

Adaptation, in this sense, is nothing new; societies have always responded to changing stressors by adapting. However, there are aspects of current and anticipated human-induced climate change that societies have not faced before. These include climate conditions and rates of change that are unprecedented in modern history, more

access to higher-quality information than previous societies have had, the challenge of climate change as a “global problem” needing “global solutions”, the influence of current climate change in management sectors that previously did not explicitly consider their climatic backdrop, and a variety of new technological options for responding to climate change (Füssel 2007, 268). These new circumstances provide both opportunities and challenges for building the capacity to adapt not only to climate change, but to multiple types of stressors. Because vulnerability to climate change is shaped by broader contextual characteristics such as poverty and health issues, adaptation cannot and should not be addressed separately from a reduction of the other underlying causes of vulnerability (Schipper 2007). Building adaptive capacity, rather than simply implementing adaptation strategies, is a way of responding to climate change and, at the same time, addressing the underlying causes of vulnerability to multiple types of stressors. Adaptive capacity is therefore closely related to the idea of development, in that it essentially aims to enhance system resilience to every kind of disturbance.

Enhancing system resilience means improving a system’s “ability to absorb perturbations without being undermined or becoming unable to adapt and learn” (Tompkins and Adger 2004, 10). Adaptive capacity is closely linked with the notion of resilience (Smit and Wandel 2006). The capacity of a system to adapt directly impacts its ability to absorb perturbations and reorganize—in other words, its system resilience. Systems with high adaptive capacity are more resilient in the face of uncertainty and increasing variability in the climate system.

Governance and institutional organization have both been identified as forces that shape adaptive capacity and system resilience (Eakin 2005, Folke 2006, Reid and Vogel

2006, Tompkins and Adger 2004). A resilience perspective in governance and decision-making, according to Carl Folke, “shifts policies from those that aspire to control change in systems...to managing the capacity of social-ecological systems to cope with, adapt to, and shape change” (2006, 254). Part of creating a resilient system is increasing the system’s capacity for continuous learning, adaptation, flexibility, and collective action. The challenge here is incorporating these elements into institutions and organizations for governance (Folke 2006). Fabricius et al. (2007) suggest that communities that have both high internal adaptive capacity and high governance capacity (defined as the ability to manage environmental resources) are able to make decisions that impact resilience over the long term. These types of communities are characterized by strong leadership and clear vision, knowledge networks linking stakeholders across levels and scales, polycentric institutions that synchronize goals and policies across scales, broader-level enabling policies, and highly motivated stakeholders (ibid.).

2.2 VULNERABILITY AND ADAPTATION RESEARCH

Research on the practical application of climate change adaptation has been approached from a variety of angles that rely on the concepts of vulnerability, adaptation, and adaptive capacity in different ways. Smit and Wandel (2006) identify several practical applications for addressing climate change adaptation, including impact assessments, evaluations of specific adaptation options, vulnerability indices, participatory vulnerability assessments, and practical adaptation initiatives. Impact assessments include a calculation of the costs and benefits of hypothetical adaptation strategies, relative to the calculated impacts of the expected climate changes (Smit and

Wandel 2006). Evaluations of specific adaptation options usually measure the costs and benefits of a range of possible adaptation strategies as measured against each other (ibid.). Vulnerability indices and, to a certain extent, participatory vulnerability assessments involve a comparative evaluation of the vulnerability of particular geographic areas, often for the purpose of targeting funds or resources (ibid.). Adaptation initiatives focus on the practical implementation of specific localized adaptation strategies (ibid.).

Adger (2006) presents a series of challenges for vulnerability research that can also be applied to the above list of adaptation applications. First, measuring vulnerability (or adaptation options) focuses primarily on outcomes, without considering the complex and difficult-to-measure social processes necessary to achieve these outcomes (Adger 2006). Second, practical vulnerability and adaptation research does not take into account the inherent unpredictability of environmental change, or the ways that people's perceptions of possible change may impact their perceived options (ibid.). Third, this research often fails to consider the inequalities of representation and participation in governance, or the ways that institutions reinforce the vulnerability of certain groups (ibid.).

Reid and Vogel (2006) present a South African case study as an example of the difficulties encountered by a practical approach to climate change adaptation. They demonstrate, in particular, the ways that institutional organization, access to information, and governance can undermine adaptive capacity, naming them key elements that desperately need to be researched further if a successful approach to climate change adaptation is to be found (Reid and Vogel 2006). Institutional organization can impose

constraints on perceived or actual adaptation options (ibid. Limited information constrains opportunities for innovation and change (ibid.). Power structures in governance and decision-making can limit certain individual's and communities' access to information and resources, undermining their adaptive capacity (ibid.). Thus, system complexity and context must be taken into account when implementing local adaptation strategies and adaptive capacity building.

Schipper (2007) likewise emphasizes that climate change adaptation should not be addressed independently from the contextual characteristics that create vulnerability in the first place. Linked to this is one of the major challenges for many households and communities: adapting to multiple changes (climatic and non-climatic) at the same time. Because many people face the challenges of changing market structure and globalization, climate risk may not always be a priority for them. Eakin (2005) therefore argues that adaptive capacity is dependent upon a household's or community's ability to participate in livelihood activities that neither intensify their vulnerability, nor limit their options and flexibility.

The historical trajectory of the conceptual ideas underpinning assessments of vulnerability to climate change has seen a shift from measuring expected negative outcomes of climate change to attempting to reduce them (Füssel and Klein 2006). The "final" evolutionary stage in these vulnerability assessments, adaptation policy assessment, differs from the previous stages in the importance it places on facilitating adaptive capacity, rather than simply assessing the impacts of change (ibid.). A discussion of what this facilitation might look like is unfortunately limited to a very general list including research, awareness raising, capacity building, and other similar

activities. The next section in this literature review expands upon the idea of facilitating adaptive capacity through institutions and organizations, highlighting both potential problems and their solutions.

2.3 THE ROLE OF INSTITUTIONS AND ORGANIZATIONS IN CLIMATE CHANGE ADAPTATION

Although the meaning of the terms *institution* and *organization* is fluid and context-dependant, my usage will follow the definitions provided by Agrawal (2008): institutions are “the formal and informal mechanisms that shape social and individual expectations, interactions and behavior,” and organizations are “concrete manifestations of institutions with an identifiable location, personnel, and rule structure” (5).

Increasingly, attention is paid to the role of institutions and organizations in facilitating adaptation and adaptive capacity, and a number of publications have specifically recommended that institutional and organizational structure be both a focus of further research, and a priority for building adaptive capacity (Berkes 2007; Cash et al. 2006; Leary et al. 2007; Eakin 2005; Reid and Vogel 2006). Recently, a comprehensive study of the role of local institutions in adaptation to climate change was prepared for the World Bank (Agrawal 2008). Reasons for this attention are that institutions and organizations may be particularly well-situated to mediate between stakeholders at different scales and to channel and control access to external resources for adaptation (Agrawal 2008; Leary et al. 2007). Furthermore, the ways that households and communities respond to institutional structures and changes determines their adaptive capacity and shapes their sensitivity to climatic risk (Agrawal 2008; Eakin 2005).

Institutions and organizations can create an environment that enables actors to flexibly adjust to changing climatic stressors, or can create an environment that leaves actors with few options or opportunities to adapt.

One way that institutions and organizations can help build adaptive capacity is by facilitating cross-scale interactions and by addressing environmental management issues at multiple scales (Adger 2003; Adger et al. 2003; Agrawal 2008; Berkes 2007; Cash et al. 2006; Folke 2006; Naess et al. 2005; Naess et al. 2006; Reid and Vogel 2006; Tompkins et al. 2002; Vogel et al. 2007). Scale, like many terms in this thesis, is defined differently in different contexts. Often, cross-scale interactions are discussed as occurring either vertically (for example, between local and regional governments) or horizontally (between local governments and local civic organizations). My usage of scale will depart from this convention to follow Cash et al. (2006), who make use of a handy nomenclature to more clearly distinguish between types of interactions.

Scale, as defined by Cash et al. (2006), is the “spatial, temporal, quantitative, or analytical dimensions used to measure and study any phenomenon” (6). This differs from the more conventional usage of “scale” to differentiate between domain boundaries in a given dimension, e.g. “local scale” versus “global scale” in a geographical spatial context. Cash et al. (2006) label the geographical spatial context itself a “scale,” and the various boundary domains or “units of analysis” positioned within the scale are “levels”. Examples of scales and levels can be seen in Figure 2.1, in which axes A through G represent seven different scales, and the nodes along each axis represent levels within a given scale. This nomenclature allows useful distinctions to be made between interactions that are cross-scale (e.g. between jurisdictional bodies [C] and institutional

rules [D]), cross-level (between provincial [C] and national jurisdictional administrations [C]), or both cross-scale and cross-level (between provincial jurisdictional

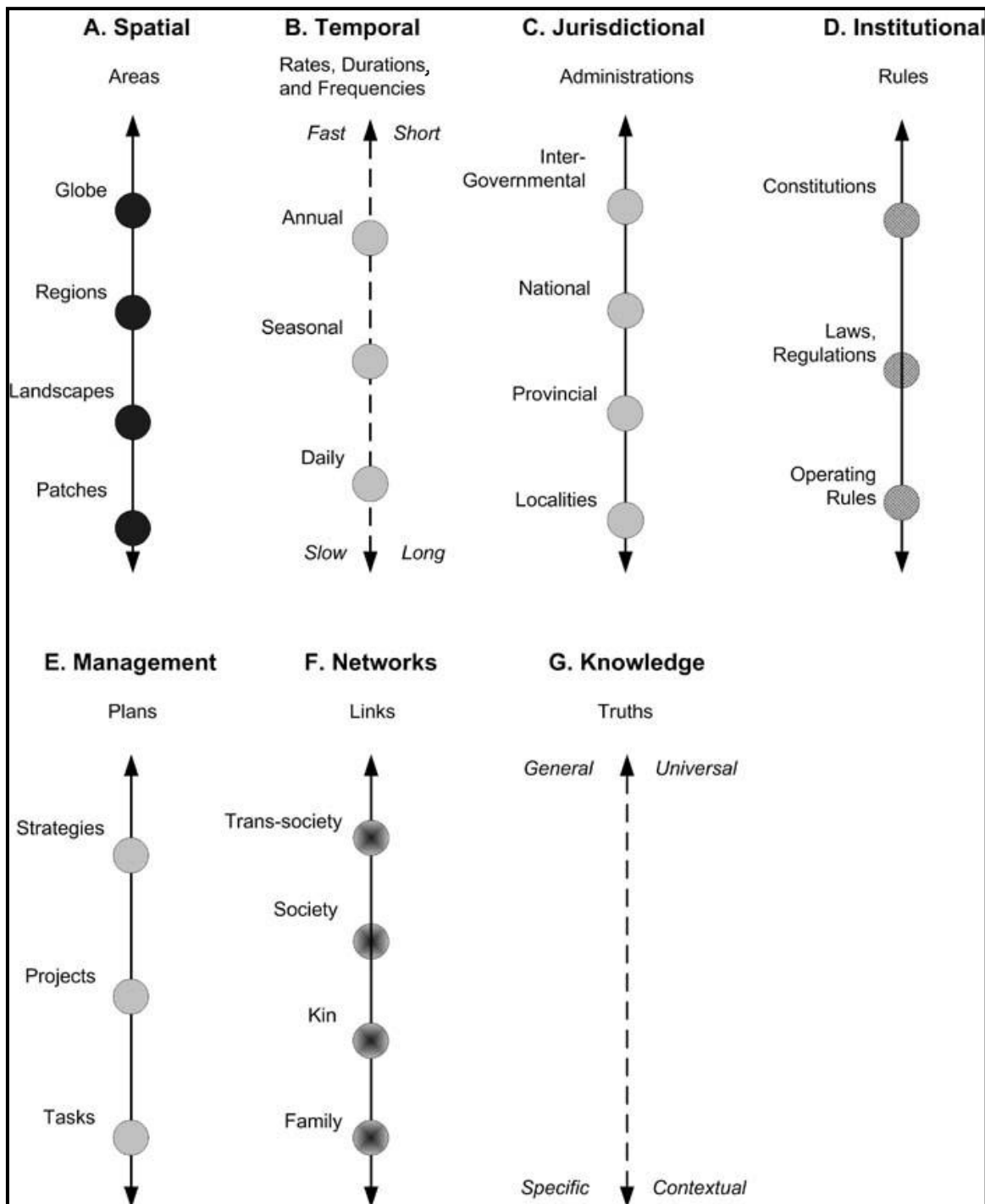


Figure 2.1 Schematic illustrations of different scales and levels that are critical in understanding and responding to Human-Environment interactions. Source: Cash et al. (2006).

administrations [C], national jurisdictional administrations [C], and institutional rules [D]).

While it is generally agreed upon that sharing knowledge across scales and levels can help build institutional and organizational adaptive capacity, uncertainty remains as to how goals, approaches, and knowledge at different scales and levels can be integrated (Adger et al. 2003). One way of bridging the gap is through a dialectic approach in which a two-way flow of information and resources allows stakeholders at multiple scales and levels to mutually benefit from each other, although unequal power distribution can be a roadblock in this scenario if one party stands to benefit by controlling the flow (Naess et al. 2006). When new perspectives are at odds with prevailing political or economic interests, the new information may be hampered by or filtered through the existing power structures (Naess et al. 2005). Bassett and Zuéli (2003) present a good example of this in their description of environmental change in the West African savanna. In spite of their research, which suggest that desertification is not occurring in northern Côte d'Ivoire, the narrative of land degradation and desertification caused by irresponsible land managers still shapes policy interventions of institutions such as the World Bank. Because of the political and economic power they hold, these institutions are able to shape the definition of the problem by filtering information to governments, civil society, and other stakeholders. Naturally, they shape the problems in such a way that they themselves are perceived to possess the only solution (in the case of Côte d'Ivoire, this is through land privatization) (Bassett and Zuéli 2003).

The greatest problem, however, may not be creating pathways and linkages across scales and levels. Cash et al. (2006) identify three “scale challenges”, or situations in

which imprudent cross-scale and cross-level interactions actually undermine adaptive capacity. These include “ignorance,” or the failure to recognize when cross-scale or cross-level interactions are occurring, leading to actions or policies at one scale or level that constrain adaptive capacities at another; “mismatch,” when institutions function at a different scale or level from the resource they are intended to manage, or when knowledge of a resource is at a different scale or level from that at which decisions are made; and “plurality,” when scales and levels are perceived and valued differently by different actors (Cash et al. 2006).

Institutional interplay, co-management, and boundary or bridging organizations are three possible ways of solving scale challenges (ibid.). Institutional interplay occurs when institutions at multiple scales or levels develop mechanisms to function cooperatively. Co-management involves the sharing of power and responsibility between governments and communities. Boundary or bridging organizations are organizations that function as intermediaries or facilitators between stakeholders at different scales or levels.

Vogel et al. (2007) suggest that boundary organizations can function not only across levels in a management or decision-making context, but at the science/practice interface. Boundary organizations can facilitate the sharing of knowledge across scales and levels by providing spaces for interaction and coordination, but important factors for success are trust, interactive analysis (involving stakeholders from multiple scales or levels), and long-term commitment on the part of the boundary organization (ibid.). Ollson et al. (2004) provide an example of a successful boundary organization in their case study of adaptive co-management of Swedish wetlands. They suggest that the

organization functioned as facilitator because it had no actual authority. Thus, instead of making and enforcing rules, it relied on creating incentives for the participation of stakeholders, which led to a process of self-organization (ibid.).

If boundary organizations facilitate cross-scale and cross-level interaction, what kind of interaction do they typically facilitate, and where does this interaction occur? Agrawal (2008) categorizes four types of external resources that institutions mediate to facilitate adaptation: information, technical advances, financial and investment support, and leadership. What kinds of spaces are used to mediate these resources, and how are they created? Tompkins et al. (2002) identify two types of spaces that institutions rely on in participatory environmental management. “Spaces of dependence” are local level spaces that are necessary for the basic realization of institutional interests (ibid., 1099.). They allow the continuation of a given institution. “Spaces of exchange” are non-local networks that provide opportunities for social learning across scales or levels (ibid., 1099). Spaces of exchange require institutions to be flexible, and allow them to adapt. Both types of space depend on external contextual conditions, which shape or limit the existence of the spaces. By formally enshrining the existence of such spaces in legislation (for example, by instituting a mechanism to encourage public participation in decision making), the existence of these spaces can be ensured.

However, some useful spaces for building adaptive capacity are not formal, nor would it be advantageous to formalize them. Townsend et al. (2004) provided a typology of spaces created specifically at NGO sites. First, formal spaces can be created by an NGO in order to explicitly support the NGO’s official agenda. Second, formal or informal spaces can be created by an NGO to support a secondary, alternative, or

unofficial agenda. Third, informal “spaces of resistance” can be created by local community members to support their own agendas, distinct from the NGO’s. Because spaces of resistance are specifically characterized by the utilization of resources for unintended purposes, these spaces are sites of innovation and creativity. Similarly, “shadow spaces” are informal spaces within institutions or organizations that enable opportunities for internal dissent as a force for driving innovation, adaptation, and positive change (Pelling et al. 2008). Unofficially sanctioned shadow spaces that challenge institutional norms can provide a “bounded instability” from which novelty and self-organization can emerge (ibid., 869). Shadow spaces, spaces of resistance, or other spaces that are characterized by conventions and social relations that are different from official organizational institutions and norms can all at times be usefully characterized as “heterotopian spaces”. Heterotopias, as defined by Foucault, are places characterized by conventions and social relations that differ from their surrounding contexts (Foucault 1986, cited in Jones and SPEECH 2001). Jones and SPEECH (2001) argue that heterotopian spaces can promote change external to themselves by “pushing-out-on” normalized social relations by disturbing convention and stimulating the questioning of social norms (5). By condoning or even promoting spaces of resistance, shadow spaces, and heterotopian spaces, institutions and organizations can foster beneficial emerging properties that bolster their adaptive capacity.

Sections 2.1 and 2.2 traced the historical progression of research on vulnerability and climate change adaptation. The majority of this research focuses on assessments of current vulnerability, reactive adaptation strategies, and identifying the difficulties of adaptation approaches. Noticeably absent from early research was a focus on proactive

adaptation in the face of uncertainty and variability, although recent interest in adaptive capacity and resilience demonstrates a shift in this direction. Section 2.3 provides examples of this shift in a discussion of institutional and organizational adaptation and adaptive capacity. However, these discussions generally provide broad theoretical recommendations for creating resilient institutions or organizations, and few case studies demonstrating these recommendations exist. Those case studies that do exist tend to be focused on institutions and organizations in the global North, primarily in Europe. An important question that still needs to be asked is whether institutions and organizations in the global South face similar problems and can benefit from similar recommendations. A second question that arises out of this literature is how institutions and organizations not only can build their own adaptive capacity and resilience through the creation of spaces for cross-scale and cross-level interactions, emergent behavior, and challenging the status quo, but how they can foster the growth of adaptive capacity and resilience in the communities and populations with whom they work.

2.4 COLLECTIVE AND ANTICIPATORY LEARNING

This section will link the discussion of adaptive capacity in sections 2.1 and 2.2 with that of institutions and organizations in 2.3 to explore the ways that organizations can facilitate adaptive capacity through collective and anticipatory learning. I begin by examining different types of collective learning, and move on to discuss how organizations both promote learning among others, and how they learn themselves.

Collective or collaborative learning involves a group of people collaborating to actively and systematically think through a given issue, and can be particularly beneficial

in situations characterized by complexity and controversy (Petts 2007). Armitage et al. (2008) present a three-fold typology of learning theories that are commonly used in collective learning that addresses environmental management issues: experiential learning, transformative learning, and social learning. Each of these learning theories can include either instrumental learning, when new skills, information, or knowledge are acquired, or communicative learning, when new points of view, values, or approaches are learned (Petts 2007).

Experiential learning, or learning-by-doing, begins with concrete experience, followed by reflection, reconceptualization, and experimentation. In a transformative learning process, importance is placed on both developing the learner's ability to reflexively examine his or her experiences, and developing the ability to transform this critical reflexivity into action. Finally, social learning is a process of iterative reflexivity in which ideas and experiences are shared in a communal setting, and learners learn from each other. Social learning can be single-, double-, or triple-loop. Single-loop social learning involves fixing specific errors that occur within routine practice. Double-loop learning implies correcting errors by examining the underlying process that causes the errors. Triple-loop learning entails challenging underlying values and beliefs that determine routine and process.

A fourth type of learning, not discussed in the otherwise comprehensive Armitage et al. (2008) typology, is anticipatory learning. Anticipatory learning is unique from the others because it specifically aims to avoid "learning by shock" by proactively thinking about the future and addressing future problems (Deshler 1988, 11). Communicative learning is central to anticipatory learning. Questioning value systems, worldviews and

underlying assumptions can help the learner avoid obstructive patterns of thinking (ibid.). Unlike the other theories of learning, anticipatory learning promotes using communicative learning to dictate the direction of instrumental learning that takes place. Experiential, transformative, and social learning involve either initial instrumental learning followed by critical reflexivity and communicative learning, or concomitant instrumental and communicative learning.

In her *Personal Philosophy of Anticipatory Learning*, Kelleher (2005) identifies ten values that are beneficial for the anticipatory learning process: participation (of multiple stakeholders), insightful questioning (of assumptions and beliefs), systems thinking (recognizing and understanding complexity), foresight (attempting to spot developments and patterns before they take shape), creativity, synergy (creating something greater than the sum of its parts, through collaboration), openness and trust, a focus on learning, emergence (allowing things to happen without forcing them into your own mold), and organizational resilience (creating institutions that are constantly exploring alternative ways of being).

The discussion of organizational resilience in Kelleher (2005) brings the issue of empowerment to the table. Anticipatory learning, in the end, is about building “[the] capacity to create one’s own future....Resilience captures the essence of an adaptive, generative organization where strategy is no longer about a linear process...but an emergent process that empowers people to anticipate, adapt and create....A resilient organization would be better equipped to respond, adapt to and survive sudden changes in its environment...” (87). I include this quotation to point out that Kelleher views resilient

organizations as both promoting adaptive capacity in others, and as having high adaptive capacity themselves.

In order to facilitate adaptive capacity building for external stakeholders, organizations must be resilient themselves. Flexible institutions, constant and iterative learning, trust-building, transparency, experimentation, and participation of diverse stakeholders have all been identified as characteristics that facilitate organizational adaptive capacity (Armitage et al. 2008; Berkes 2007; Folke 2006; Petts 2007). Pelling et al. (2008) examine how informal social learning in organizations promotes adaptive capacity to climate change. They suggest that instead of completely formalizing the social learning process within an organization, organizations should simply provide space for both formal and informal social learning interactions. This involves questioning routines and incentive systems within organizations to determine how they support or undermine social learning and adaptive capacity (ibid.). This also avoids the problem that formalizing innovation may unnecessarily solidify the process, limit flexibility, and constrain creativity.

2.5 CONCLUSION

While literature exists on the general ways that adaptive capacity can be built, and the role of institutions and organizations in this process, there is a noticeable gap in the literature about the practical ways this can be accomplished. Furthermore, research specifically focused on institutions and organizations in the context of climate change adaptation is sparse, although the little that exists suggests that adaptation is inherently a local process, and that local institutions and organizations are integral to adaptation

(Agrawal 2008). This thesis seeks to fill these gaps by presenting specific case studies of how local organizations provide space for collective and anticipatory learning.

CHAPTER 3

RESEARCH DESIGN

This study seeks to examine how NGOs facilitate or constrain community-based adaptation strategies and adaptive capacity. To do this, I investigate the role of three local NGOs in the Arusha region of Tanzania in fostering spaces for collective and anticipatory learning. Specifically, I identify how the NGOs are explicitly addressing climate change adaptation, whether they function in the capacity of boundary organizations, and what kind of spaces they foster for collective and anticipatory learning, both in general, and in the context of climate change.

In the first part of this chapter, I present my research questions. In the second section, I describe Arusha, Tanzania, the setting for the research project, and provide descriptions of the three NGOs that are the focus of my case study. The following section presents a discussion and justification of my research methods. I end with a brief description of my notation process and analytic methods.

3.1 RESEARCH QUESTIONS

First, how do NGOs in rural Tanzania address climate change adaptation? It may be explicitly written into an NGO's agenda, or it may be indirectly addressed within the context of building adaptive capacity to multiple potential stressors. This question takes into account whether or not NGOs make use of climate change discourse, how they

incorporate knowledge generated at multiple scales and levels (local, academic, and political), and how this knowledge translates to specific projects “on the ground.”

Second, how do NGOs facilitate information flow and learning across scales? This question addresses the ways that NGOs play the part of boundary organizations, including both how they provide communication links between researchers and practitioners, and how they connect communities and policy makers across scales and levels. These links and connections occur when NGOs function as conduits themselves, or when they provide opportunities for interaction between stakeholders.

Third, what spaces for collective and anticipatory learning are created by NGOs and local communities? These may be formal opportunities for planning and strategizing, or informal interactions and sharing of information. They may be undertaken locally (spaces of dependence) or at broader scales (spaces of exchange). Such spaces are likely to increase a community’s opportunities for coping with, adapting to, and shaping change, and thus, increase their ability to be resilient in the face of the uncertainty afforded by climate change. By identifying the types of spaces created, who has access to them, and how they are created, I can determine the degree to which an NGO has provided opportunities for building adaptive capacity and bolstering resilience in a community.

3.2 RESEARCH SETTING

Tanzania is identified as both a climate change hotspot and a global leader in responding to climate change, and there are a range of NGOs working in the country. Perhaps because of the number of national parks with unique ecosystems which benefit

both biodiversity and the tourism industry, concern over the potential detrimental environmental effects of climate change has been particularly strong in Tanzania, and there are a number of NGOs that work on the combined problems of environmental management and economic development. Global attention turned to northern Tanzania when the Organization for Economic Co-operation and Development (OECD) published a thorough report on the relationship between climate change and development on Mount Kilimanjaro, regionally adjacent to Arusha (Agrawala et al. 2003). Environmental



Map 3.1 Map of Tanzanian administrative regions. Arusha region circled in red. Source: www.ttcl.co.tz

changes on Mount Kilimanjaro were also highlighted in the IPCC Fourth Assessment Report (Boko et al. 2007). Furthermore, there is evidence that local-level knowledge of climate change and natural disasters exists, and that adaptation strategies are being shared between communities, outside of the “official” arena of policy making or NGO initiatives (Wisner 2004; Wisner 2008). For all of these reasons, Tanzania represents a unique opportunity for research on the role of local organizations in climate change adaptation. In this section, I examine the environmental and social characteristics of northern Tanzania and the Arusha region to provide a broad context for my research. I follow this with a more detailed description of each of the three NGOs that provided a localized context for my study.

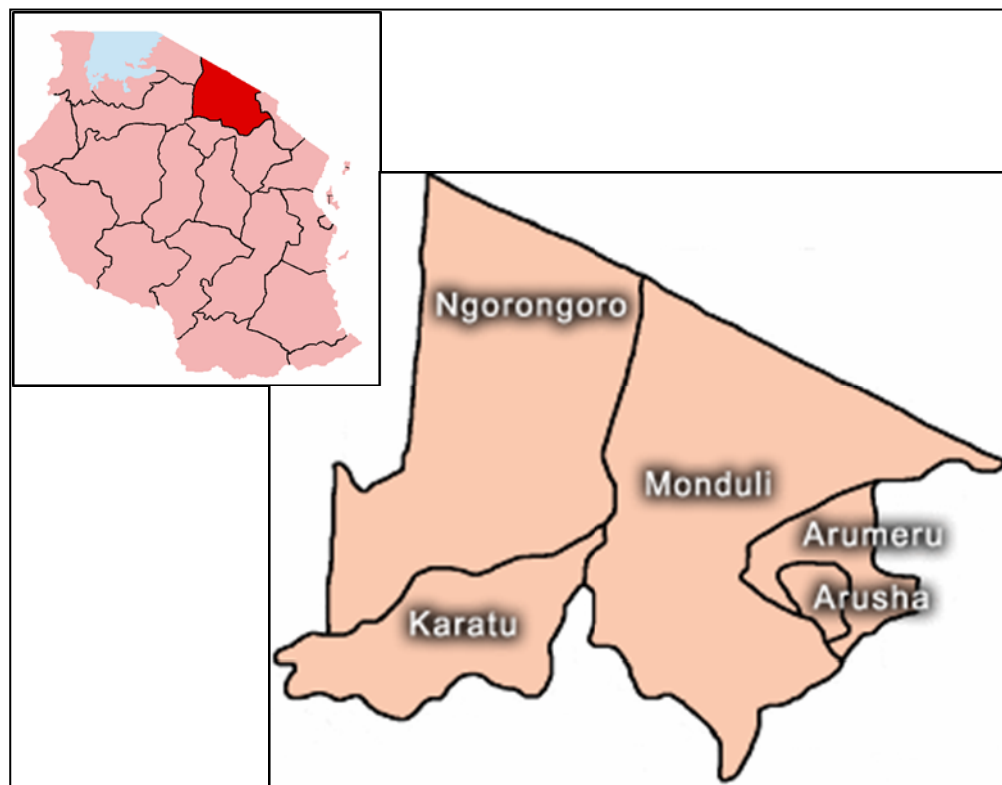
3.2.1 The Arusha Region: Social and Environmental Characteristics

In 1964, mainland Tanzania (formerly known as Tanganyika) and the Zanzibar Archipelago joined together to form the United Republic of Tanzania. Previously, both had been under rule of the British government, from whom Tanganyika gained independence in 1961 and Zanzibar in 1964. Prior to British control, mainland Tanganyika was part of German East Africa, remaining under direct German control from 1891 until the end of the First World War

The United Republic of Tanzania emerged as a socialist state under the tutelage of the nation’s first president, Julius Nyerere. To subdue political unrest within the new republic, Nyerere pushed for the merger of the two most popular political parties to form the Chama Cha Mapinduzi (CCM) party, effectively making Tanzania a one-party state. Only in 1995 were opposition parties legalized, leading to the country’s first multi-party

elections in decades. Since then, CCM and its opposition, the Civic United Front (CUF), have worked to minimize conflict generated by the multi-party system, which mainly manifests itself as tension between the mainland and the Zanzibar Archipelago. Although elections incited violent protests in 1995 and 2001 on Zanzibar, mainland Tanzania including the Arusha region has experienced relative political stability.

The Arusha region is divided into five administrative districts: Monduli, Arumeru, Karatu, Ngorongoro, and Arusha (see Map 3.2). The total population living in the Arusha region is approximately 1,293,000, compared with the total Tanzanian population of 34.5 million (Tanzanian Government Census 2002). Arusha, as the only urban district in the region, is the smallest and most densely populated of the five districts. It also has the lowest percent of its population below the poverty line (at 12 per



Map 3.2 The five districts of the Arusha region (region highlighted in red in inset): Ngorongoro, Karatu, Monduli, Arumeru, and Arusha.

cent). The other districts have much higher rates of poverty, with Arumeru at 18 per cent, Monduli and Ngorongoro both at 24 per cent, and Karatu at 39 per cent (TPHDR 2005). About 87 per cent of Tanzania's rural population relies on farming, raising livestock, and fishing for their livelihoods (TPHDR 2007). The Arusha region's rural districts have adult literacy rates ranging from 28 per cent in the Ngorongoro region to 79 per cent in the Arumeru region (TPHDR 2005). Population with access to safe drinking water is at 31 per cent in Ngorongoro, 39 per cent in Monduli, 61 per cent in Karatu, and 82 per cent in Arumeru (ibid.).

The Rift Valley cuts through northern Tanzania, creating a terrain characterized by a wide range of elevations. Much of the Arusha region lies between 900 and 1,600 meters, although Arusha is home to Tanzania's second highest mountain, Mount Meru which peaks at 4,655 meters. While the Inter Tropical Convergence Zone (ITCZ) is responsible for creating a general bimodal precipitation pattern in Arusha, rainfall and temperature vary throughout the region depending on the altitude, and the highlands generally experience cooler and wetter conditions than the semi-arid lowlands. Average annual temperatures in the highlands are 21 degrees Celsius and 24 degrees Celsius in the lowlands (Arusha Regional Secretariat 2008). Temperatures peak in February, with the coolest months between May and August (see Figure 3.1). The bimodal rainfall pattern is characterized by short rains running from October to December and the longer monsoon season lasting from February to June (see Figure 3.2).

The landscape of the Arusha region can be divided into three distinct agro-economic zone types: the Highlands Zone, the Rift Valley Highlands, and the Maasai Steppes (Arusha Regional Secretariat 2008). The Highland Zone lies on the slopes of

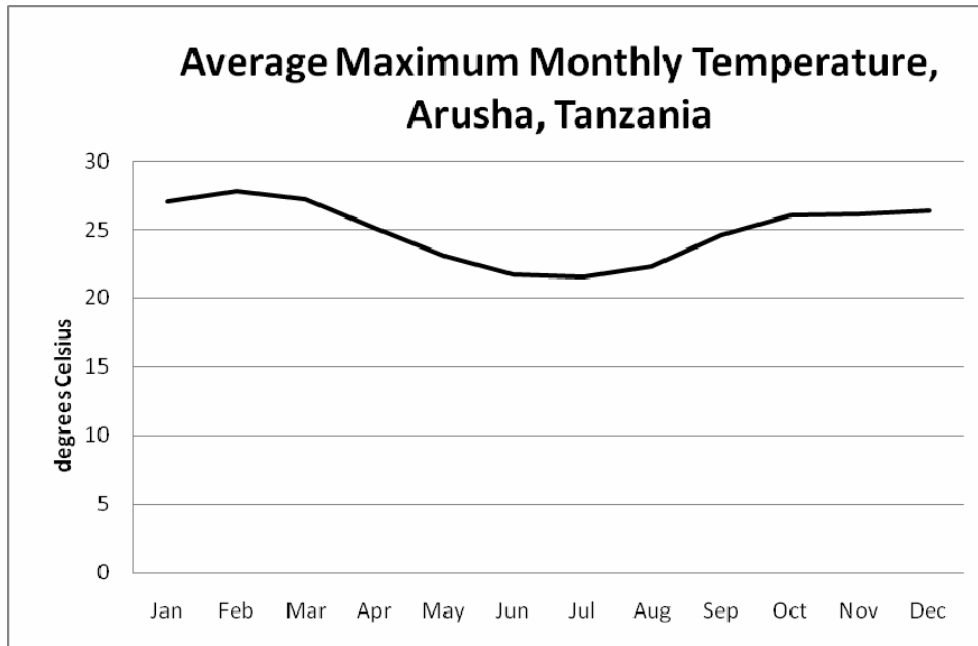


Figure 3.1 Average maximum monthly temperature for Arusha, Tanzania, 1975-2005.

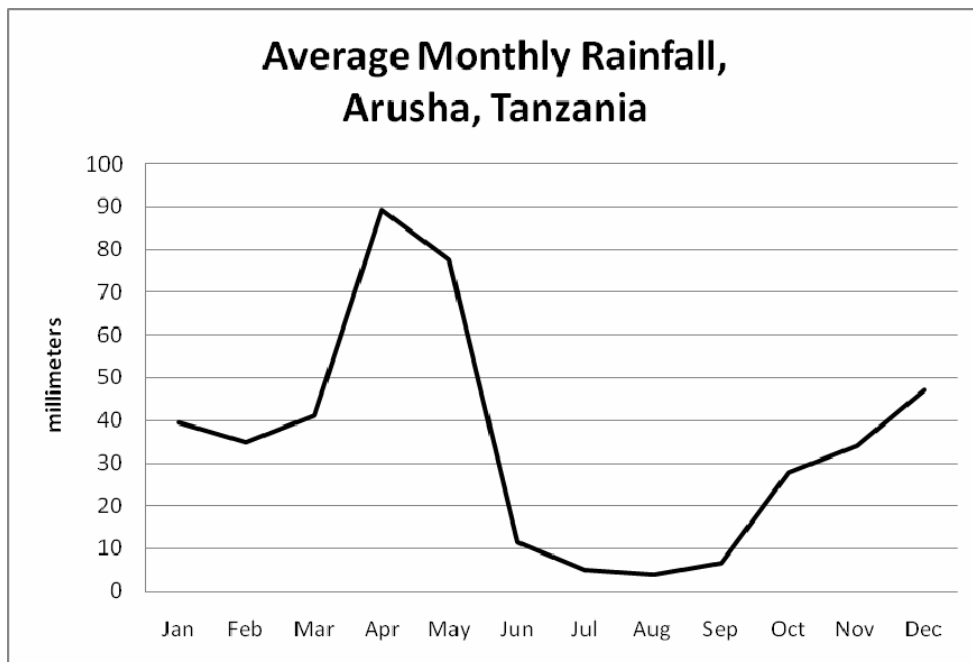


Figure 3.2 Average monthly rainfall in Arusha, Tanzania, 1975-2005. The bimodal rain pattern with peak rainfalls in April and December can be clearly seen in this graph.

Mount Meru in the Arusha and Arumeru districts of the Arusha region. Sedentary small-scale farmers and large-scale agriculturalists take advantage of the rich volcanic soil and wet climate by growing coffee, bananas, flowers, and raising dairy cattle in the highlands.

The Highland Zone houses 60 per cent of the Arusha region's population, and subsistence food crops such as bananas, potatoes, maize, and beans are also commonly grown here.

The north central and northwestern districts of the Arusha region make up the Rift Valley Highlands, characterized by hot temperatures and sand clay soils. Cereal and legumes are the primary crops in this zone, and indigenous grazing cattle are more prevalent than in the Highland Zone. The Maasai Steppe in the western districts of Monduli, Karatu, and Ngorongoro has the lowest population density of the three agro-economic zones in the region. This semi-arid zone is characterized by high temperatures (25 to 30 degrees Celsius) and long dry seasons. Fewer crops are grown in this region and pastoralism is common.

The website of the Tanzanian government points out some of the unique environmental problems experienced in the Maasai Steppe zone, including overgrazing as a result of the high density of pastoralists' cattle, and problems with "intermingling" livestock and wild animals (Arusha Regional Secretariat 2008). This is in part due to the adjacent national parklands. Protected areas and parklands encompassed an estimated 38 per cent of Tanzania's total land area as of 2005 (UNEP 2008). Land conservation and protection has a long, controversial, and often violent history in the country, and the Arusha region in particular has been the site of conflict as land access was limited by the establishment of Serengeti, Arusha, Tarangire, Lake Manyara, and Ngorongoro National Parks (Homewood et al. 2006; Neumann 1998; Neumann 2003; Neumann 2004). Sedentary agriculturalists adjacent to conservation areas have experienced problems with nebulous park boundaries that are sometimes shifted without warning, protected park animals trampling their crops, and accusations of poaching (Neumann 1998). Conflict

has also stemmed from land use limitations based on perceived “cultural appropriateness” of certain land-tenure practices, such as sedentary agriculture among pastoralists (McCabe 2003). Alongside environmental conservation and protection, increased privatization has lead to even more limitations on land access for pastoralists in northern Tanzania (Homewood et al. 2006).

Conflicting interests in land use and population pressure are not the only causes of environmental and economic stress in the Arusha region. Total annual rainfall has been in steady decline for at least the last thirty years, and extreme rainfall and drought events are increasing in both frequency and magnitude (see Figure 3.3). The El Niño of 1998 event brought five times the normal amount of precipitation, but was followed by a year of record drought in 1999 (Galvin et al. 2004). The record was broken in 2005 when precipitation in the region reached an all time low.

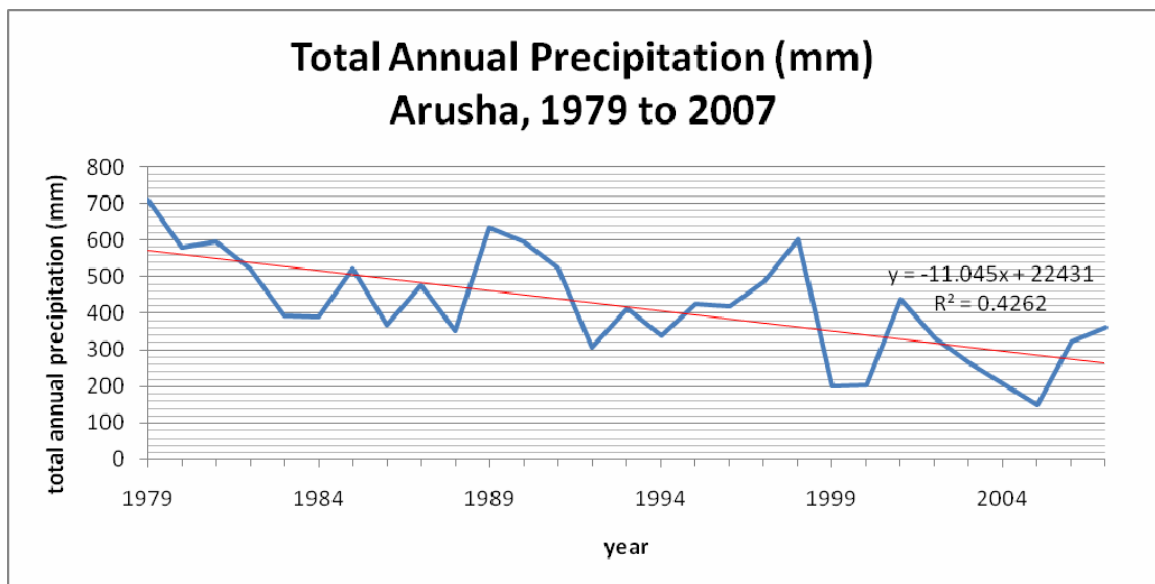


Figure 3.3 Total annual precipitation in Arusha, Tanzania, 1979 to 2007. The trend line shows clear drying over the 28-year period, and an increase in variability (both frequency and magnitude of extreme events) is also apparent.

The multi-model data sets (MMD) of the IPCC Fourth Assessment Report suggests that general warming trends throughout Africa are likely during the next century, as is a general trend toward increased amounts of annual rainfall in much of East Africa (Christiansen et al. 2007). Figure 3.4 shows projected changes in temperature and precipitation in Africa based on averages from 21 models (ibid.). The top row of images represents annual mean, December/January/February, and June/July/August projected temperature changes between 1980 to 1999 and 2080 to 2099. The prevalence of orange and red over most of Tanzania indicate a general warming trend. The second row indicates precipitation changes (time frames are the same). The projection indicates that

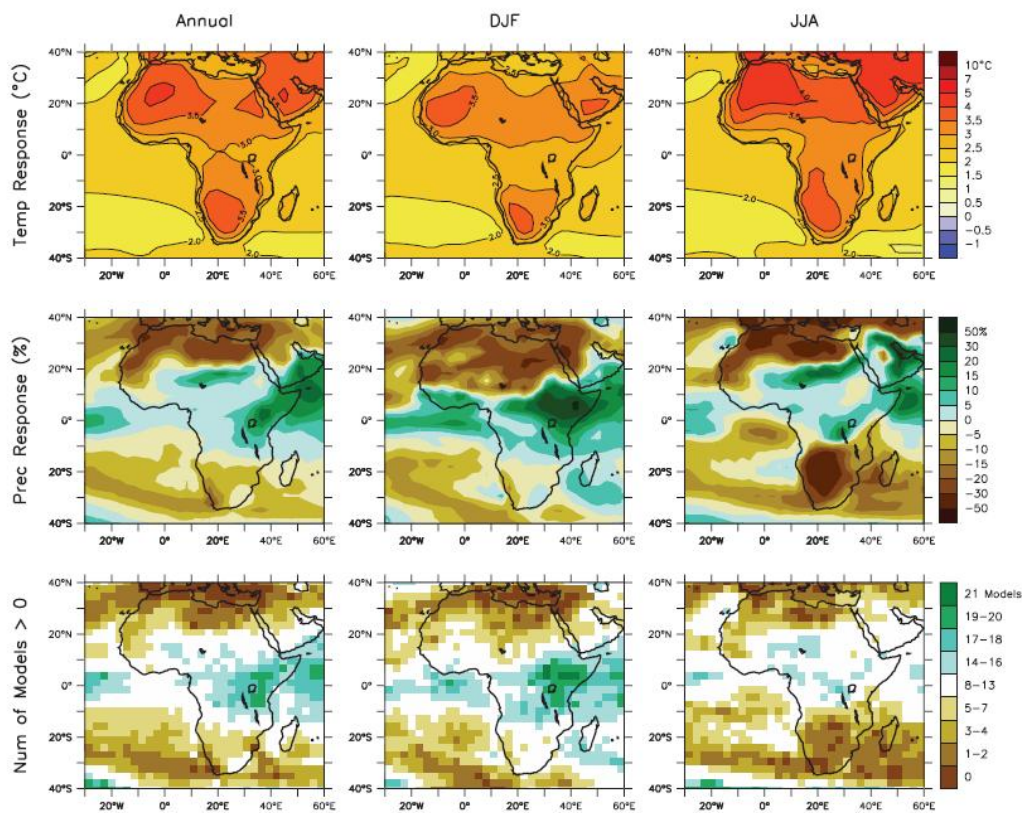


Figure 3.4 Temperature and precipitation changes over Africa averaged from 21 model simulations of the IPCC Fourth Assessment Report. Top row: annual mean, DJF and JJA temperature change between 1980 to 1999 and 2080 to 2099. Middle row: change in precipitation. Bottom row: number of models out of 21 that project an increase in precipitations. Source: Christiansen et al. (2007).

most of northern Tanzania will become wetter (green). However, downscaled models of projected change between 2070 and 2099 (Figure 3.5) consistently show an increase in precipitation anomalies in northern Tanzania, which means that the region will likely be characterized by an increase in extreme events and interannual climate variation, even as it experiences a general trend toward higher levels of mean annual precipitation.

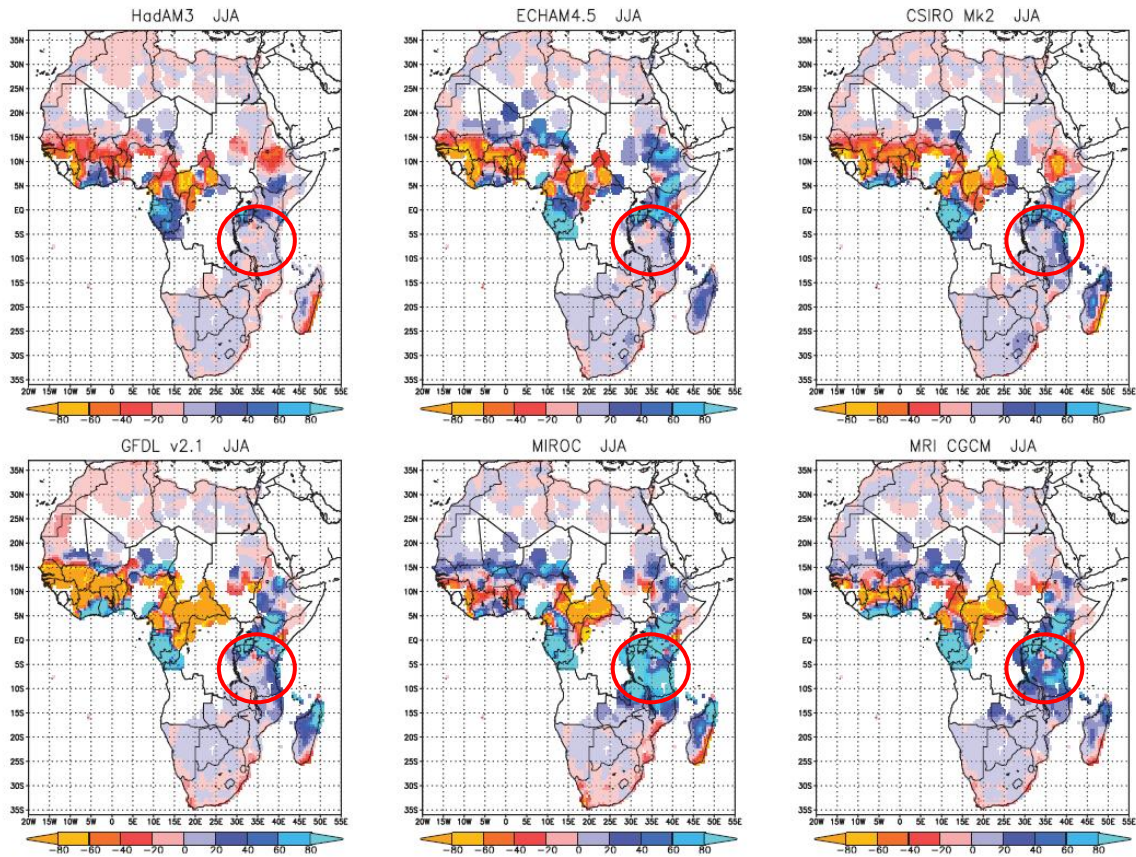


Figure 3.5 Anomalies of mean monthly precipitation (mm) using daily data downscaled from six GCMs for the future periods 2070-2099 (top row) and 2080-2099 (bottom row). Tanzania is circled in red. Source: Hewitson and Crane (2006) in Christiansen et al. (2007).

This provides a broad geographical context for my study. Next, I will examine my research location at a smaller scale. My research in the Arusha region involved collaboration with three local Tanzanian NGOs over a period of six weeks during June and July 2008. In the next three sections, I describe each of these NGOs in more detail.

3.2.2 Maasai Women Development Organization (MWEDO)

Maasai Women Development Organization (MWEDO) is a local NGO working with Maasai communities in the Arusha and Manyara regions of north central Tanzania. Within the Arusha region, MWEDO works in both the Monduli and Longido districts. I had access to MWEDO through connection and collaboration with a Pennsylvania State University's Women's Studies Department service learning project. MWEDO has between thirty and forty paid and voluntary employees. The organization's main focus is on economic development and education of female members of the Maasai, a pastoralist group located throughout south central Kenya and north central Tanzania. Because traditional Maasai pastoralism is inextricably linked with the availability of land for grazing livestock, changing climatic conditions directly impact the ability of the Maasai to survive and prosper. This, in turn, impacts the development and education opportunities of Maasai women. For this reason, MWEDO is concerned with issues of climate change adaptation.

3.2.3 Green Arusha Society (GAS)

Green Arusha Society (GAS) is a small NGO working with multiple communities to promote environmentally sustainable development. GAS was contacted through the Arusha NGO Network (ANGONET), a website catalogue of NGOs working in the Arusha region. GAS staff includes six part-time, volunteer employees. The organization's main focus is to promote environmental responsibility through activities such as tree planting, education and responsible waste management. GAS was selected as a collaborator for their commitment to both social and environmental sustainability,

for their work with local communities, and their use of learning and education as tools for building successful sustainable practices.

GAS selected the fifteen villages it works with based primarily on the perceived presence of a deforestation problem, although geographic location was a secondary factor. All of the villages are within driving distance of the GAS office in Arusha town and close to a main road. While GAS would like to work in more remote villages, they have limited funds for fuel to reach them. Furthermore, because trucks carrying tree saplings must be able to reach the villages, proximity to a paved road is essential, especially in the rainy season when muddy unpaved roads become impassable.

3.2.4 Pastoralists' Alliance for Climate Change Adaptation and Development (PACCAD)

Pastoralists' Alliance for Climate Change Adaptation and Development (PACCAD) is a fledgling organization. At the time of my interaction with PACCAD, two founding members were in the process of obtaining official NGO status for the organization. Once they acquire NGO status, the organization will begin activities toward achieving its main goals of facilitating interaction and the flow of knowledge and resources between other NGOs working with pastoralist communities. PACCAD, in this sense, is establishing itself with the expressed purpose of filling the role of a boundary organization. PACCAD founders are trying to fill a perceived gap in access to information and resources about climate change. I made initial connections with PACCAD through the director of MWEDO, one of the organizations that PACCAD hopes to work with once it gains official status.

3.3 METHODS

Data collection in the field involved a combination of qualitative methods and participatory tools. Each of my research questions was addressed through a series of interviews and activities taking place in the context of each NGO. Below, I describe and justify my choice of methods. Table 3.1 provides a breakdown of methods by research question they address and participating NGOs. A detailed outline of each activity can be found in the Appendix. All methods were approved by the Pennsylvania State University Office for Research Protections Social Science Institutional Review Board. All participants provided their voluntary informed consent before taking part in any interviews or research activities.

3.3.1 Research Questions

My first and second research questions (How does the NGO address climate change adaptation? How does the NGO facilitate information flow and learning across scales?) were addressed in a series of individual semi-structured interviews with the directors of each NGO. I met with each director for two to three interviews lasting between 60 and 90 minutes each. These interviews were designed to identify how and from where NGOs access information on climate change and adaptation, and to examine how this information translates into concrete adaptation projects or activities. The semi-structured nature of the interviews meant that, while I had prepared a checklist of questions or topics for each interview, I was also able to remain flexible to pursue unexpected ideas for discussion (Chambers 1994). None of the interviews were

Research Questions Addressed	Method Employed	Participating NGO
How does the NGO address climate change adaptation? How does the NGO facilitate information flow and learning across scales?	Two to three semi-structured interviews with NGO director; 60 to 90 minutes in duration each.	GAS MWEDO PACCAD
What spaces for collective or anticipatory learning are created by NGOs and local communities?	Focus group discussion with participatory mental mapping activity with five NGO employees; 120 minutes in duration.	MWEDO
	Focus group discussion with participant-guided tour led by two NGO employees; 180 minutes in duration.	GAS
	Semi-structured interview with NGO director; 30 minutes in duration.	PACCAD

Table 3.1 A breakdown of methods used to address each research question and participating organizations.

videotaped or recorded, although I took notes throughout the process. I chose not to tape the interviews because bringing equipment with me or obtaining it in the field would require significant effort, and because the relatively small number of interviews I conducted could easily be recorded through note-taking. Furthermore, I felt that introducing foreign technology into the interview process could make participants who are unused to such technology nervous or uncomfortable.

Specific topics during these interviews ranged from a discussion of the concrete aspects of running an NGO (employee management, funding, access resources such as office space and computers), to the motives and goals underpinning the NGOs' projects,

the directors' understandings of the science behind climate change, and the ways that the NGOs' future goals take climate change into account. A significant portion of time was spent on barriers to incorporating climate change into the NGOs' agendas.

My third research question (What spaces for collective and anticipatory learning are created by NGOs and local communities?) was addressed differently in each NGO, due to structural constraints and participant preferences. The three activities used included a focus group discussion accompanied by a participatory mapping activity, a participant-guided tour, and a semi-structured interview. All NGO employees and full-time volunteers were invited to participate in this portion of the study. Five employees at MWEDO were willing to participate, but only two GAS employees and the PACCAD director were available. The difference in number of participants is a function of both overall number of NGO employees, and the stage of NGO development. MWEDO has more than thirty paid and volunteer employees, GAS has six volunteer employees, and PACCAD, at the time, was a fledgling organization without official status, and only two volunteer employees.

3.3.2 Focus Group Discussion and Participatory Mapping

Five employees at MWEDO, including three women and two men between the ages of 18 and 45, participated in a focus group discussion and participatory mapping activity. The entire process lasted approximately 120 minutes. The discussion accompanied by a visual activity helped to minimize the barrier posed by language skills. Although all participants spoke English, some members were at first hesitant to speak. All members actively participated when presented with the opportunity to contribute

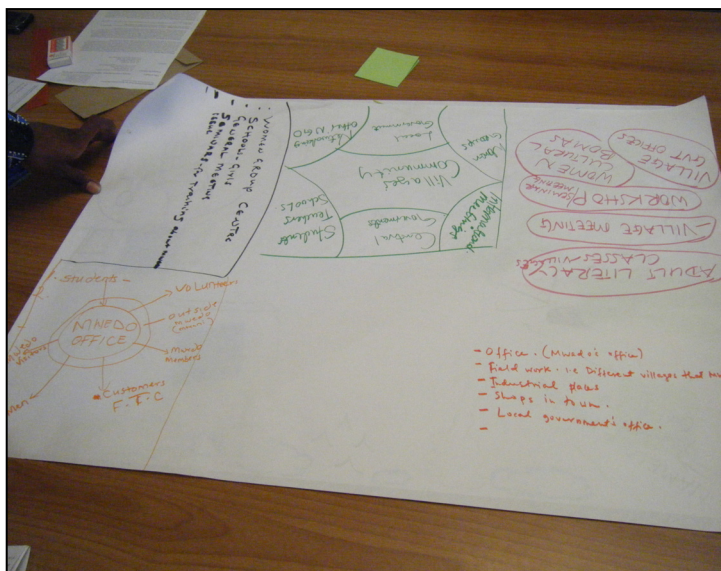


Figure 3.6 Individual brainstorming of spaces of interaction

through a visual medium. Because MWEDO staff members have different capacities in the organization, by having a focus group discussion, key ideas and diverging rationales for decision-making in the organization could be

identified (Kindon 2005). Furthermore, by diagramming among a group of peers, credibility and rigor is established through built in ‘member checking’ and triangulation (Kesby 2000).

I provided the participants with markers and paper, and asked them to draw or map places where they interact with community members, where decisions are discussed and made, and where opportunities for learning or education occur. The participants first individually listed the places where interaction between NGO employees and community members at the regional level takes place. They then combined forces to create a single map of a typical village with which they worked, and identified key places where NGO-community interaction occurs within the village space. As they drew, they discussed the chronology and timeline of these interactions. Much of MWEDO’s interaction with communities is dependent upon following specific steps to gain permission to access privileged locations and community members through community gatekeepers. Once the spaces of interaction were identified, participants used stickers to describe the type of



Figure 3.7 Creating a participatory mental map of spaces of interaction.

interaction that occurs in each space. This ranged from official interactions such as group meetings to unofficial interactions such as gossip. Finally, participants identified which of the spaces they found most helpful for achieving NGO goals, and which

spaces they perceived to be most beneficial for community members. During the discussion and activity, I took notes and photographs. I did not videotape or record the discussion, for the same reasons presented in section 3.3.1.

3.3.3 Participant-Guided Tour

Because all GAS employees are part-time and volunteer, only two out of the six employees (one man and one woman, between 35 and 45 years of age) were available to participate in this stage of the research project. When asked to map the spaces of community interaction, the employees declined but presented the counter-offer of a guided tour of the spaces of interaction within one community during the focus group discussion. This method is roughly the equivalent of the “transect walks” in participatory rural appraisal, in which a researcher walks with participants through an area, observing,



Figure 3.8 Participant-guided tour.

asking, listening, and discussing the characteristics of a particular rural environment (Chambers 1994).

Again, one beneficial function of the tour was to demonstrate the importance of the chronology in NGO-community interaction. Stops on the tour were ordered based on the necessity to gain permission from key gatekeepers to access further stops on the tour. During the tour, pictures were taken of spaces that were of particular importance to GAS.

These photo opportunities were accompanied by an explanation of why these spaces were of particular importance. The tour was accompanied by a discussion of the usefulness of each space in filling GAS' and community-member needs. The duration of the tour was approximately 180 minutes. I did not videotape or record the discussion, for the same reasons presented in section 3.3.1.

3.3.4 Semi-Structured Interview

Because PACCAD is still in its formative stages, does not have official NGO status, and currently has only two (founding) members, my approach to research question 3 with PACCAD was somewhat different. I followed a standard semi-structured interview format for a 60 minute interview with the director of PACCAD. Because at the time of the interview, PACCAD had not yet officially begun to interact with

communities, my questions were limited to identifying the types of interaction that the PACCAD director envisioned for the future. Thus, the interview centered on questions of the hypothetical types of interaction that PACCAD would have with communities in the future. One of the benefits of this situation was that in the interview, the director shared his imagined vision of how PACCAD would function in its ideal capacity. I recorded this interview in written notes rather than videotaping or recording it, for the same reasons presented in section 3.3.1.

3.4 DOCUMENTATION OF RESEARCH AND DATA ANALYSIS

Throughout all of the interviews and activities, I took notes. At the end of each day, I reviewed, organized and summarized key findings from my notes. Following my return from the field, I typed up my notes and used a color-coding system to organize the data for analysis. Notes were initially coded according to which of the research questions they addressed, and then further subdivided into categories within the framework of each research question.

Notes on research question 1 (How does the NGO address climate change adaptation) were subdivided and coded based on structural characteristics of the NGO, current NGO goals and projects, possible future goals and projects that incorporate climate change adaptation and sources of information about climate change. Notes pertaining to questions 2 and 3 (How does the NGO facilitate information flow and learning across scales, and what spaces for collective and anticipatory learning are created) were subdivided and coded based on based on the types of NGO-community interaction they described (gatekeeper permissions, meetings, learning opportunities,

unofficial interactions). This type of data coding provides a foundation for analysis of my data and discussion of my findings.

CHAPTER 4

RESULTS

Finding ways to bolster adaptive capacity in local organizations and the communities will make them both more resilient in the face of uncertain and increasingly variable future climate change. The literature suggests that this can be accomplished by building flexibility into institutions, facilitating cross-scale and cross-level interaction, and providing spaces for collective and anticipatory learning (Adger et al. 2003; Agrawal 2008; Cash et al. 2006; Eakin 2005; Kelleher 2005; Pelling et al. 2008). In Chapter 3, I discussed my research questions and methods, built around my main objective of identifying how local NGOs are currently fostering adaptive capacity and building resilience in rural Tanzania. In Chapter 4, I present the results of my research.

This chapter is divided into three sections. Section 4.1 contains the results of my research that pertain to my first research question: How do NGOs in rural Tanzania address climate change adaptation? In Section 4.2, I address my second research question: how do the three NGOs in my case study facilitate information flow and learning across scales? Finally, I answer my third research question in Section 4.3 with a discussion of the spaces created and used by each NGO, and the potential for these spaces to be sites of collective and anticipatory learning.

4.1 NGO AGENDAS, CLIMATE CHANGE, AND ADAPTATION

Each NGO incorporates climate change adaptation into its mission and projects in different ways and to a different degree than the others. Green Arusha Society's focus on environmental issues is both motivated by and seeks to address changing climate conditions, since the problem the organization aims to address (deforestation) and its perceived solution (planting trees) are explicitly understood to be, respectively, the cause of and the means to reverse climate change. Maasai Women Development Organization addresses education, economic development, and health among Maasai women, although environmental issues (including climate change) are recognized as factors in a complex system of stressors that set the context for the organization's programs and projects. Pastoralist Alliance for Climate Change, Adaptation, and Development's agenda explicitly tackles climate change adaptation within the context of local organizations working with pastoralist groups. The main goal of the organization is to fill a perceived knowledge gap that prevents local organizations from successfully addressing climate change adaptation. This section looks in more detail at each of the NGOs' agendas, the projects and strategies employed to address them, and the role of climate change adaptation within them.

4.1.1 Green Arusha Society

Green Arusha Society's official mission is "to improve the day-to-day life of urban and rural people by imparting knowledge, awareness, and skills on environmental conservation and ecodevelopment through inclusion of target groups" (GAS Mission Statement). Although climate change is not explicitly identified in the mission statement,

according to the organization's director it is one of the factors in the chain of events that necessitates GAS projects. While he sees deforestation as the main cause of soil degradation, drought and negative economic impacts in Tanzania, he believes that initial deforestation triggers a positive feedback loop of warming and drying of the local climate, resulting in even less forest growth. The increasing severity of droughts in the past thirty years (Fig. 3.3) is taken as evidence of this. The vicious cycle can only be reversed through reforestation:

“Trees are the only solution for all of these problems. Creating forests will change the weather. Trees pull down the clouds and make rain. Trees help with fuelwood, shade and rain. The Eastern Arc Mountains [a nearby range in northeast Tanzania] have regular rains and lots of trees. In Arusha, there are rains once a year, while before when there were more trees, there were more clouds and more rain...[We tell] people that the climate change has occurred because they have destroyed the forests” (Elijah¹, Director, personal interview).

GAS's primary activity is tree planting. The organization has three tree planting projects, each aimed at a different target group: the School Environmental Development Project, the Women Environmental Awareness Project, and the Village Environmental Committees. The School Environmental Development Project (School Project) is the oldest, begun in 1997. GAS targeted schoolchildren first not only because they were easy to teach, but because they were “the way to open the gate to the community”. GAS

¹ All names of interviewees in this thesis are pseudonyms to protect the privacy of the research participants.



Figure 4.1 Fifteen government primary schools advertise their “Green Mazingira Clubs,” established by Green Arusha Society.

began by founding a “Green Mazingira² Club” in government primary schools in fifteen villages to teach children about conservation. The club activities circulate around the main activity of planting trees on the school property. Each club member is responsible for watering one

tree each day. In the past, the clubs have participated in interschool competitions to see who could plant and care for the most trees, but in the past few years, decreased funding has limited the Green Mazingira Clubs to caring for trees they have already planted. A further constraint on the School Project is the government practice of moving teachers from school to school every few years. GAS began the School Project by training teachers to lead the Green Mazingira Clubs, but in many schools, no trained teachers are left behind after a few years, and funds to train new teacher simply do not exist.

When GAS founded the Women Environmental Awareness Project (Women’s Project) in 2005, they sought to overcome similar problems by establishing a “trainers of trainees” (TOT) system. In the TOT system, GAS began by training ten women in each of the fifteen villages where they had already begun the School Project. Each of these women trains two more women every three months and the number of trained project members grows exponentially. Furthermore, the Women’s Project is locally and self-

² *Mazingira* is Kiswahili for “environment.”

funded through its activities. GAS provides the initial equipment for tree planting, but the participants provide the land. The basic premise is “economic development through environmental work” (Elijah, Director, personal interview), and the project functions similar to a microenterprise; each month, participants contribute small amounts of capital to one member for the purpose of establishing a small business, generally raising trees to sell or harvest, or vegetable gardening. By not relying on the ability of GAS to provide capital flow, as the School Project does, the Women’s Project is less threatened when GAS funding dries up. The director describes the goals of the Women’s Project this way: “The vision is to see community commitment. [We] show them that no one outside the village is responsible for their environment, no one outside will help, *they* must restore the environment” (Elijah, Director, personal interview).

The third project, Village Environmental Committees, is the most recently begun. The mission of this project is to get the government to take part in environmental conservation in general, and in the School and Women’s Projects specifically. The



Figure 4.2 Village Environmental Committees plant trees around local government buildings, where they hold their meetings.

director believes that government participation is necessary to make the other projects sustainable, particularly the School Project. GAS trains local government leaders in each of the fifteen villages, who in turn train

other local leaders and community members. These government leaders form Village Environmental Committees. The activities of a Committee are threefold. First, Committees plant trees around government offices and on other public land, to serve as an example to the village and school children. Second, Committees oversee the School Projects and Women's Projects when GAS staff cannot be there, and mobilize day-to-day work on these projects. Overseeing the other projects includes regularly monitoring the progress of participants, as well as providing a night guard at the school to discourage vandalism or theft. Third, the Committees facilitate GAS's relationship with groups working on the School and Women's Projects, both by lending legitimacy to the GAS organization, and by institutionalizing the supervision of project activities.

All three projects center on GAS's primary mission to increase tree cover in the villages. In situations where a village has other pressing needs, such as securing water sources, GAS does not modify its practices. This is in part because the organization may simply lack the resources or influence to help villages achieve other goals, but is predominately because deforestation and the resultant climate change are seen as the primary problems from which other environmental and economic problems stem (as evidenced by the director's understanding of the causes of climate change, above): "GAS decides what is the most primary problem [in the village]: the environment! So GAS plants trees. [We] may not have the power to get a local community water. This is a government issue, and GAS does not have the influence here" (Elijah, Director, Director, personal interview).

Implicit in GAS's approach is the understanding that climate change is occurring as a result of local behavior (deforestation), and therefore can be controlled and reversed

by “greening” the local environment. This approach does not take into account synoptic climate conditions that shape the local conditions. GAS views the local climate as a relatively closed system, and thus believes that targeted environmental conservation efforts (tree planting) will effectively regulate the system. Under this paradigm, there is little room for addressing adaptation, and no room for addressing adaptive capacity. Adaptation is useful only in the form of short term coping mechanisms, until the recent warming and drying tendencies can be reversed, as the GAS director believes they will be: “There has not yet been a significant [climate reversal] occurring, because there has not been enough time. The small plots in each village must be connected into a big forest, and it will need about thirty years to see a real climate [reversal]” (Elijah, Director, personal interview). Building adaptive capacity is not viewed as necessary at all, because of GAS’s perceived control over the climate through the medium of tree planting; no surprises are anticipated, so no organizational flexibility is necessary. The mindset of GAS is that the organization already has the solution to the perceived environmental problems, and that these problems are unchanging and can be unproblematically ascertained. Because my data collection was limited to interviews with organizational employees, I had no opportunity to compare this perspective with that held by community members.

4.1.2 Maasai Women Development Organization

Maasai Women Development Organization was founded in 1999 with the vision of “improved sustainable livelihood of Maasai women in Tanzania” (“Our Profile”). MWEDO’s official mission is “to work towards the empowerment of disadvantaged

Maasai women economically, politically, culturally, and socially” (MWEDO Brochure). The organization has established three main programs and a number of subsidiary projects to realize its goals: an Education Program, an Economic Empowerment Program, and a Health Program. Although environmental issues and climate change are not at the forefront of MWEDO programs, they are present as one of a number of cross-cutting themes that are included in all three programs. While there is a broad framework for each program, the specific strategies employed at the community level are determined by local MWEDO members.

The Education Program is twofold, including the Adult Literacy Project and the Education Access for the Underserved Pastoralist Girls Project. The Adult Literacy Project aims to improve literacy skills of Maasai women with the secondary goal of reflecting upon and improving their health, economic situation, and quality of the



Figure 4.3 Maasai Women participating in MWEDO’s Adult Literacy Program. Source: www.maasaiwomentanzania.org

immediate environments around their homesteads. Reading and writing skills are built in group meetings using an interactive teaching methodology, in which skill-building is combined with exploration of and reflection upon human rights, land rights, gender, and environment issues to develop and enhance the women's capacities to improve their health, livelihoods, and agricultural assets. The Education Access Project targets "underserved" Maasai girls: those from large families with low incomes in remote communities. The project currently provides funding for over 200 girls in secondary school and college programs, and because of the high demand of the program, MWEDO recently began a fundraising campaign with the goal of financing 1,000 girls by the year 2015. The director of MWEDO sees the Education Program not only as a means of improving gender equity, but as a way of building adaptive capacities in a rapidly changing world:

"The reason behind the education for pastoralist boys³ and girls is to diversify their options. There were few educated people. Most knowledge was indigenous, normal, annual understanding of environmental change. This knowledge will die slowly because of changing patterns" (Vumi, Director, group discussion).

Because traditional Maasai environmental knowledge is based on observed seasonal patterns of temperature and rainfall that have been relatively predictable from year to year, changing climate patterns that are characterized by more

³ MWEDO's Education Access project does not target Maasai boys, although MWEDO recognizes education to be important for both girls and boys. Maasai boys generally have more opportunities for and access to education than Maasai girls.

extreme variability are rendering the traditional Maasai knowledge system moot.

The MWEDO director believes that this “dying” knowledge system can be supplanted through modern scholastic education.

MWEDO’s Economic Empowerment Program begins with commodity production and provides support for women’s businesses all the way to the market level. Beyond initially funding women’s microenterprise projects, MWEDO encourages the development of producers’ associations at the village level. These associations encourage women to collectively build business skills and share resources, including tools for production, and information about successful production and marketing. The majority of these businesses are based on the production of traditional Maasai beadwork, jewelry, clothing, and craft wares. In addition to encouraging business associations, MWEDO has created a number of market linkages for women in outlying communities. In 2007, MWEDO opened the Maasai Women Fair Trade Centre in downtown Arusha, where the women’s products are available for purchase. The organization also advertises and markets products locally and internationally in magazines, catalogues and over the



Figure 4.4 Maasai women producing jewelry for sale through MWEDO’s Economic Empowerment Program. Source: www.maasaiwomentanzania.org

internet. Because Maasai women have traditionally been responsible for household reproduction and have been excluded from economically productive activities, by helping Maasai women to capitalize on jewelry-making

and beading skills that they often already possess, the Economic Empowerment Program is helping Maasai households broaden their livelihood base. The income generated through women's craft production offers a buffer against hardship experienced during times of environmental crisis (such as drought or cattle disease), when traditional Maasai agricultural and pastoral livelihoods are threatened.

The Health Program includes an HIV/AIDS Prevention, Care, and Nutrition Project, and a Maternal Health and Child Care Education Project. Both of these projects' strategies include mainstreaming awareness and providing educational opportunities by linking traditional health practitioners with local authorities, peer health educators, and hygiene, nutrition, and environment experts. MWEDO's focus in the Health Program is on improving and supplementing traditional healing practices, rather than replacing them. Although the Health Program only peripherally addresses the environment and the Economic Empowerment Program does not seem to encompass it at all, environmental issues (including climate change) are seen by the MWEDO staff as being central to both. Maasai health and livelihoods are understood to be inextricably linked with land degradation, deforestation, state conservation efforts, and global climate processes:

“Whatever is happening [with the climate] elsewhere is also happening in Tanzania and in the Maasai community...Cattle, livestock was sustainable. But there were several changes. Drought. There was a household level impact, migration was necessary for the men, a decreasing number of cows, decreasing food...Men migrate to cities, women and children remain. MWEDO equips women with necessary capacities to

deal with the situation...There is an HIV/AIDS increase because of male migration and return. Our health program keeps people able to add to the production of the community” (Peter, Programs Coordinator, group discussion).

“Nowadays, at least part of the family is sedentary....But sedentary pastoralists cause overgrazing and land degradation. Encroachments by farmers and investments [in land privatization] is becoming a problem. Pastoralists don’t have [land] access that they need....National parkland is a problem. There is no more ‘coexistence’” (Vumi, Director, group discussion).

While MWEDO programs are not specifically targeting climate change, they are promoting adaptation and building adaptive capacity in the face of a complex nexus of social, economic, and environmental stressors by helping the Maasai broaden their livelihood base to include economic options that are less sensitive to environmental variation and change. By strengthening linkages between women within the communities, and between the communities and external resources, organizations, and markets, MWEDO is facilitating the flow of knowledge and resources. Furthermore, MWEDO is aware that because of changing environmental patterns, much traditional knowledge will be rendered moot. Equipping pastoralists with a wider array of options to manage this new future “knowledge gap” where reliable environmental predictions no longer exist is one outcome of the organization’s programs and projects. These options

include both possibilities for generating new knowledge by accessing information from external sources (through schools, health workers, and other organizations), and possibilities for participating in economic activities that are less susceptible to negative impacts from rapidly changing and unpredictable weather and climate patterns.

4.1.3 Pastoralists' Alliance for Climate Change, Adaptation, and Development

As an organization still undergoing the process of gaining official status, Pastoralists' Alliance for Climate Change, Adaptation, and Development has not yet undertaken any projects. Nonetheless, the organization's mission is clear: to access and share knowledge and information about climate change adaptation. PACCAD's strategy will be to create formal linkages between local NGOs and sources of climate change information and adaptation funding centers, and also provide platforms for the NGOs to share information amongst themselves. PACCAD's objective is to facilitate the building of adaptive capacity within organizations, rather than directly within local communities. By targeting local organizations with a wide range of programs, activities, and agendas, including education, health, environmental conservation, and economic development, PACCAD hopes to provide NGOs with the capacity to flexibly respond to the needs of their constituents as they shift in response to changing climate conditions.

Climate change is understood by PACCAD's director as being a process that occurs across scales, and represents a distinct gap in current development and livelihood projects in Africa:

“Climate change needs to be addressed globally by local organizations. Climate change awareness and resources are small in Africa. Discussion is nonexistent. It is only discussed by “experts”. Where can people get knowledge and resources? The effects are here already. How can we act?” (Martin, Director, personal interview).

For most pastoralist communities, changing weather and climate patterns have already begun to make prediction difficult, meaning that pastoralists’ decisions about land use and herd movement are becoming riskier. Because of this, the PACCAD director perceives the need to be both reactive and proactive in response to climate change: to both adapt to what is already occurring and to build adaptive capacity in the face of the unpredictability and increased variability. But rather than begin a new organization that works directly with communities, PACCAD’s objective is to mainstream climate change adaptation in the agendas of NGOs already working on a variety of issues. This approach targets the underlying institutions and organizations that shape adaptive capacity at the village level, with the goal of improving this capability.

4.2 INFORMATION FLOW AND LEARNING ACROSS SCALES

How do NGOs facilitate information flow and learning across scales? What information do they transmit, and what information do they omit? What linkages do they provide, and for whom? Do they function as boundary organizations that translate and transmit information across scales? Or do they provide opportunities for direct interaction between stakeholders? In this section, I address these questions within the

context of each NGO, and examine the implications of the NGO practices for building adaptive capacity.

4.2.1 Green Arusha Society

Green Arusha Society accesses the information it uses from a wide variety of sources. Newspapers, magazines, books, television, and internet are the organization's main sources of information. Meetings and conferences on environmental issues provide GAS staff with opportunities to interact with other NGOs and environmental stakeholders within Tanzania. The director recently attended his first international conference on behalf of GAS, the Global Greens Conference in Brazil in 2008, which focused on forests around the world and problems and solutions related to environmental change and global warming. In spite of this, the director surprisingly still claims to believe that climate change in northern Tanzania is a locally-created problem. One possibility is that the doggedly persistent global narrative that blames local mismanagement for deforestation and land degradation is somehow mistranslated into blaming local communities for climate change.

Outside of its tree planting projects, GAS participates in three other information-sharing activities. First, the director intermittently targets the broader community through a radio program. The thirty-minute program is broadcast two times a week for two weeks, when funding is available, which is sporadic. The programs focus on day-to-day household and livelihood behavior and how it impacts the environment. Second, the GAS director works as an advisor for foreign students studying at the School of International Training (SIT) in Arusha. Students at the school volunteer with Green

Arusha Society for one month while completing field research for the SIT program, and thus both share their own knowledge while collecting data from GAS and village members. Third, GAS collects information from people in the villages where it works, for the purpose of sharing with donors and funding agencies: “It is easy to get information from local people because they are familiar with GAS and...they are willing to share their information about problems so they can get help or money....GAS uses this information to make proposals for donors” (Elijah, Director, Director, personal interview). However, if local village priorities do not align with GAS goals, the villagers’ priorities are often disregarded: “GAS decides what is the most primary problem: the environment!...We as GAS are experts, we know, because we have access to information” (Elijah, Director, personal interview).

In GAS’s tree planting projects, the director employs his own knowledge of agroforestry and vegetation. Much work goes into selecting tree species. The organization generally provides fast growing, semi-arid (drought tolerant) exotic agroforestry species, including *senna spectabilis*, *melia azedarach*, and *croton megalocarpus*. Indigenous acacia species are also sometimes planted because of their ability to tolerate drought and grow in clay soils. Indigenous silk oak and wild mango are also planted because they increase soil nitrogen content and are reliable sources of firewood. *Melia azedarach* and Finger Euphorbia are grown for soil stabilization and erosion control. Despite the detailed knowledge put into the decision to plant certain trees, this information is often not passed along beyond initial training sessions with a core group of teachers, women, and government leaders. The perception is that basic skills for tree-care are enough for project success. Passing along excess information is

simply not necessary. For example, “[students in the Green Mazingira Club] don’t learn about different species. A tree is at tree. They have all the same requirements” (Elijah, Director, personal interview).

Thus, detailed knowledge may go into making decisions about how GAS’s projects are undertaken, but this information is often not passed beyond GAS staff or the core groups of original participants in GAS training sessions. In this situation, as well as when GAS collects information from villagers to share with donors, the organization is facilitating the flow of select information between stakeholders and across scales (see Figure 4.5). By filtering the flow of information, GAS is not only able to maintain the village’s dependence on the organization’s assistance, but to ensure that its organizational

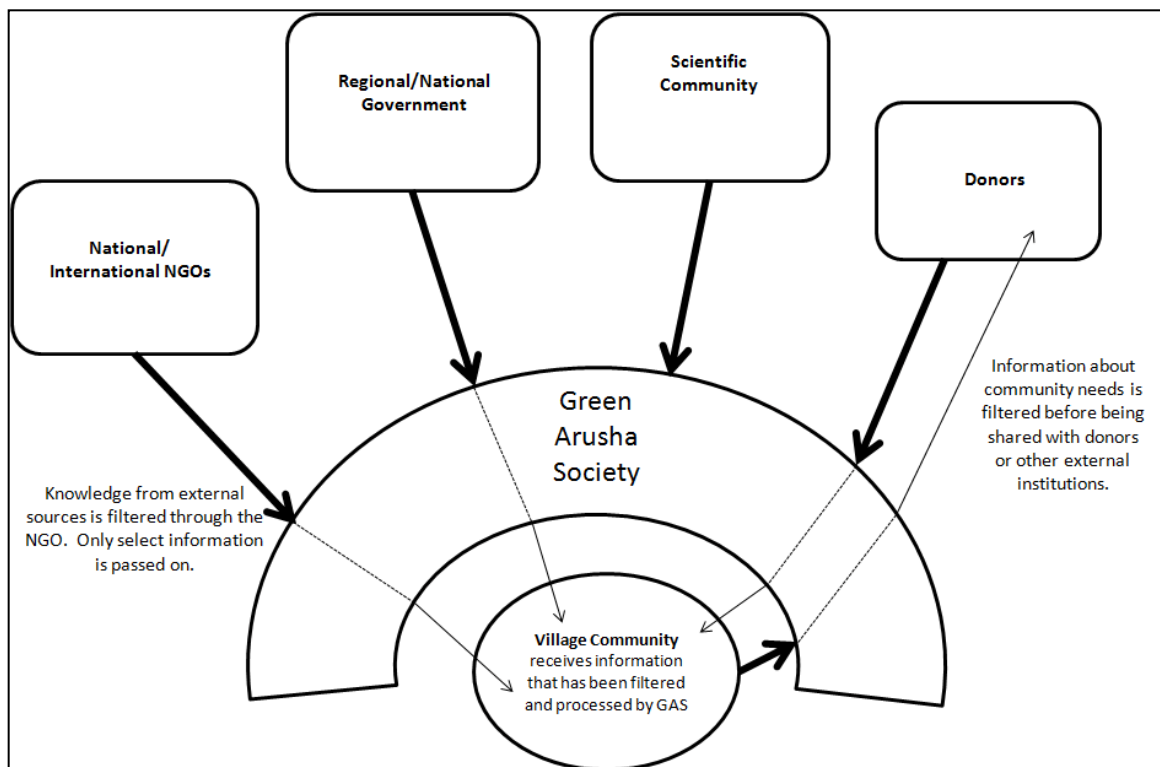


Figure 4.5 Green Arusha Society filters information that it shares across scales and levels. This ensures that the village remains dependent upon the organization’s assistance, and gives GAS more control over what activities will take place in the village.

mission, rather than villagers' priorities, will be supported by donors. Both of these strategies limit the options and flexibility of the villagers' in choosing how to invest their time, energy, and resources, and hence, limit their adaptive capacity.

4.2.2 Maasai Women Development Organization

Maasai Women Development Organization has regular board meetings and invites all of its 3000+ members to an annual meeting, where they determine the organization's priorities: "Different people, districts, climate, needs, understanding. We have to strategize around these differences" (Vumi, Director, group interview). While different members may have different goals, general priorities are shared (for example, securing access to safe drinking water is prioritized over building a road) and consensus can usually be arrived at through communication. How MWEDO exchanges information and plans projects at the individual village level functions somewhat differently. MWEDO is acutely aware that the mode of information transmission can determine the success or failure of a project at the village level, as illustrated by this exchange in a group discussion:

Peter: "You must understand the traditional way knowledge flows through the community. Information is transmitted most easily through traditional routes (elders, etc.) rather than through the government."

Vumi: "It depends on the information, but *also* on how you present the information. You go to the chief, he calls a group of elders or leaders

together, they hear you argue your case. If they don't like it, they can and will block it. They may block it, for example, by only inviting men to your meetings, rather than the women, for whom the meeting is intended."

MWEDO follows a three-step process when determining when and how to begin a project in a given village (Figure 4.6). This process involves sharing particular types of information with different actors in a specific chronological order. Each tier of the process involves gatekeepers who have the power to permit the project to continue to the next level, to explicitly deny permission, or to permit the project but prevent its success

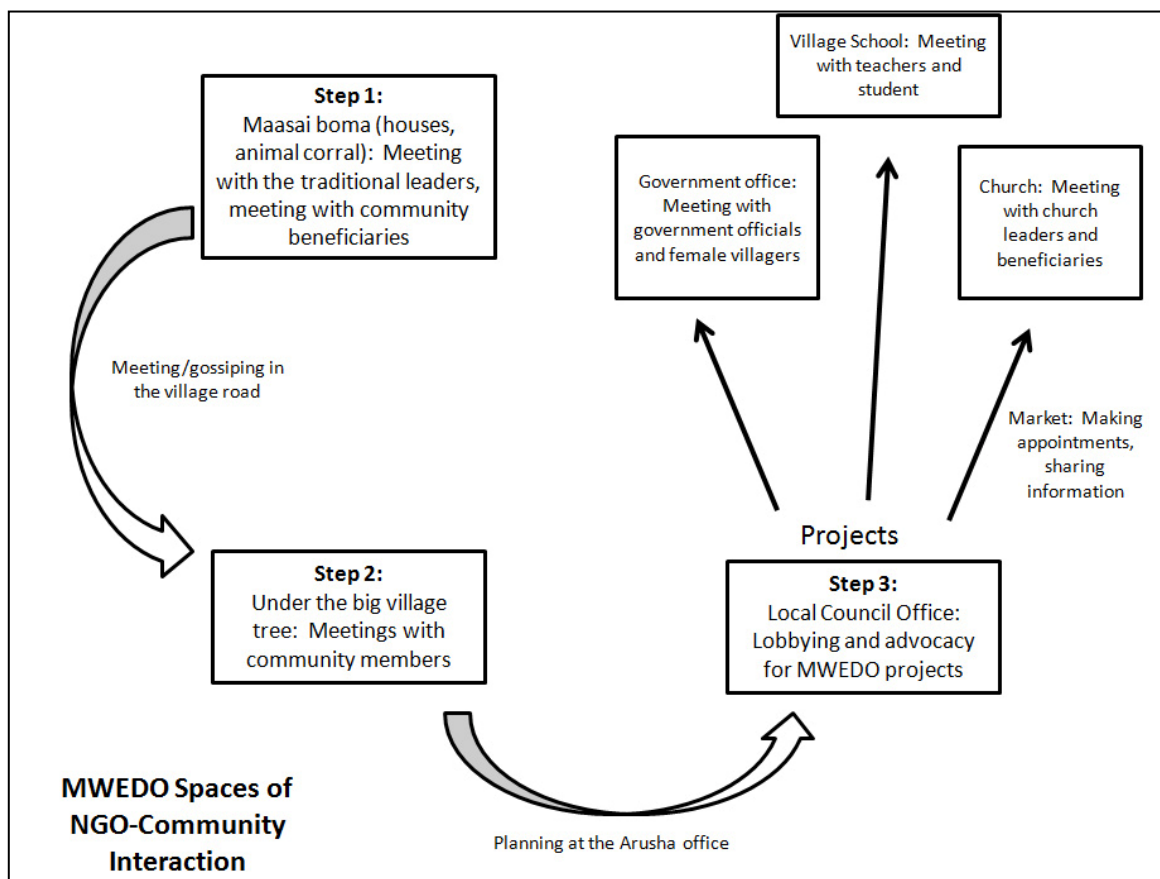


Figure 4.6 MWEDO Spaces of NGO-Community Action. Officially designated spaces of interaction are depicted in squares. Informal interactions occur alongside these. The chronology of MWEDO's three-step process for beginning a project is shown here.

by creating unfavorable conditions for project execution. In the first step, MWEDO approaches village elders for permission to have a village meeting about possible projects. By going in with an open-ended agenda, MWEDO accomplishes two things: first, it allows villagers to determine their priorities rather than imposing an agenda on them, and second, without a clearly framed agenda, village elders are less likely to strongly oppose a village meeting with MWEDO. In the second step, a village meeting is held in which MWEDO works with villagers to determine if and how they can cooperate on a project, given village needs and MWEDO's organizational objective. If the meeting is successful, MWEDO staff returns to the Arusha office to plan the details of the project. The final step involves lobbying for the project at the local consul (government officials), who are the final gatekeepers in granting project permission. When communicating with the consul, information is often presented in statistical or numerical form, as quantitative data is most effective for substantiating the need for a project and convincing the consul that it is worthwhile.

Within its programs and projects, the information that MWEDO shares with villages centers on building skills, diversifying livelihood options, and improving well-being. MWEDO specifically tries to share information that is "aligned to respect and preserve positive traditional values and customs" ("Our Profile"). MWEDO programs provide opportunities for members and holders of traditional knowledge (elders, traditional healers, village birth attendants) to build supplemental knowledge through direct interaction with outsiders and experts. This focus on supplementing rather than replacing traditional knowledge and MWEDO's flexible approach to determining project strategies build adaptive capacity both among its members and within the organization

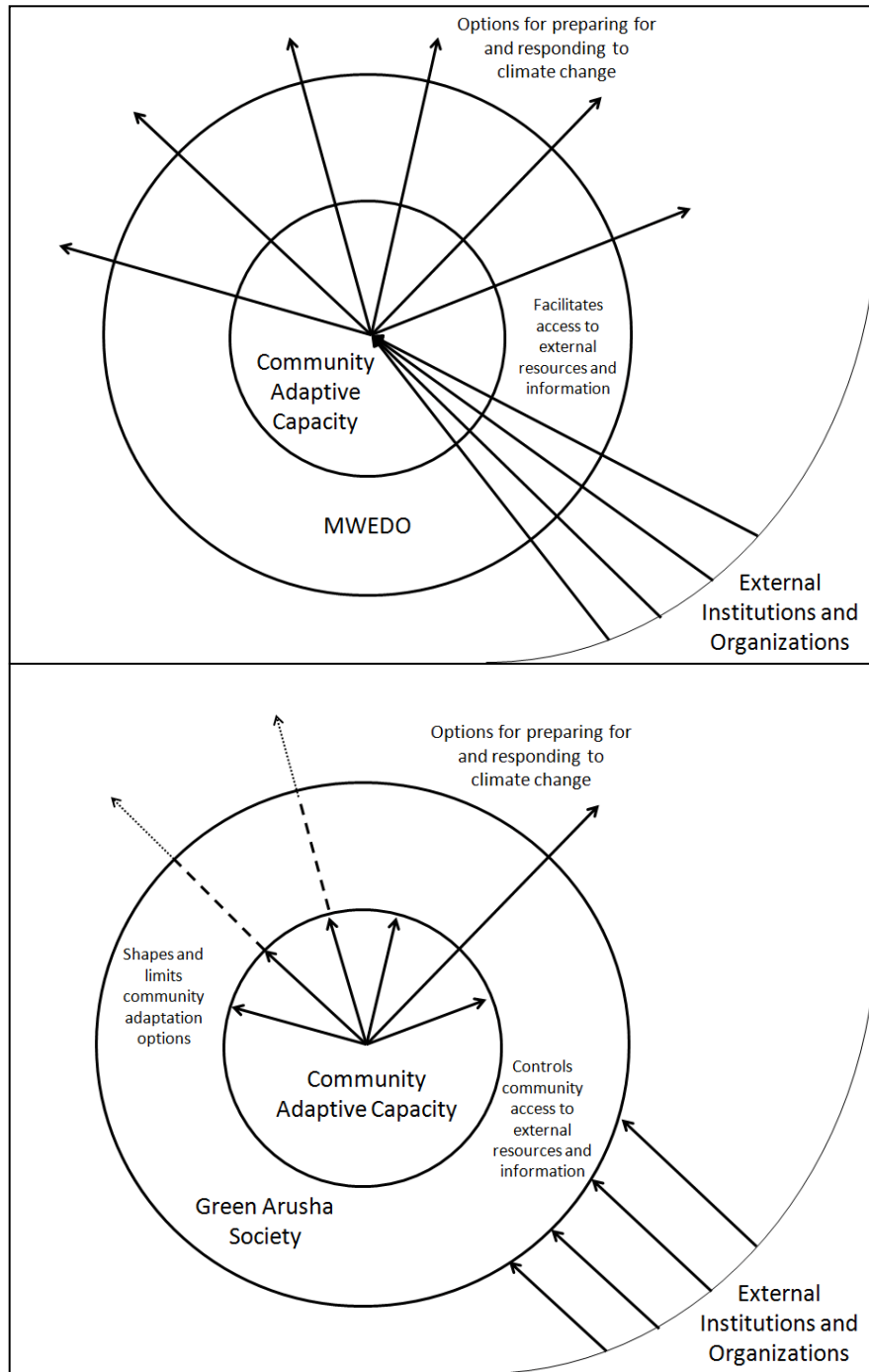


Figure 4.7 MMWEDO facilitates the flow of information and resources from external sources, allowing communities to improve their adaptive capacity by increasing their range of options for preparing for and responding to climate change (top diagram). Green Arusha Society, on the other hand, controls opportunities for forming linkages between communities and external institutions and organizations, thereby reducing the adaptive capacity of communities by limiting opportunities for innovation and learning about options for preparing for and responding to climate change (bottom diagram).

itself. Villagers have a wider array of options to choose from when making decisions that will affect their livelihoods and well-being and MWEDO itself has flexibility in choosing a route to achieve its own objectives (Figure 4.7).

4.2.3 Pastoralists' Alliance for Climate Change, Adaptation, and Development

PACCAD's clear cut goal is to provide opportunities for sharing knowledge and information both across levels (for example, between local and national organizations) and across scales (between academics and practitioners). This will fill the perceived gap between experts who generate knowledge, and practitioners, who put it to use. However, PACCAD itself does not yet have the tools to access this knowledge and information. PACCAD's director identifies a number of questions that need to be solved before PACCAD can begin to fill this gap: "How is the government involved in climate change? How do institutions work on climate change? How can collaboration occur? How can meetings occur? CDMs—how do they work? How can these be linked with PACCAD? Who wants to be involved? PACCAD needs to discover government policies on climate change. Maybe through the internet?" (Martin, Director, personal interview).

While PACCAD understands that information flow is key to diversifying options, increasing flexibility, and building adaptive capacity, the question remains: how can local organizations access information generated in global arenas, by governments, international organizations, and academics? How can an organization become a *boundary* organization? PACCAD already has ideas about linking together local organizations in meetings, training sessions, discussion groups, and centers for sharing

resources and knowledge. However, the organization is still unclear about how to make linkages and sharing information beyond the local arena.

4.3 SPACES FOR COLLECTIVE AND ANTICIPATORY LEARNING

Each organization in this case study provides multiple spaces for interaction and learning at the community level. This section examines the potential of these spaces to move beyond being sites of instrumental and communicative learning to become sites of iterative, collective, anticipatory learning. I also explore the association between how a space is chosen or created, who has access to it, and its ability to perform as a site of collective and anticipatory learning.

4.3.1 Green Arusha Society

A participant-guided tour through Kisongo village sheds light on the process by which Green Arusha Society staff interacts with village members. Table 4.1 provides a matrix of spaces where NGO staff interacts with villagers, the quality of these spaces, and the activities taking place within them. Each time GAS staff enters a village to work on a project, GAS staff must first visit the village government offices and formally greet the government spokesperson and village officers. These officials are members of the Village Environmental Committee, and work closely with GAS staff to regulate the School Project and Women's Project. The Committee holds regular meetings in the government office. The Women's Project groups, because they are coordinated by the Committee, also meet at government offices or sometimes at a member's house. The School Project's Green Mazingira Club meets at school. GAS tree planting activities are

Space of NGO-Community Interaction	Formal or Informal Interaction	Activities in the Space
Village Government Office	Formal	<ul style="list-style-type: none"> • Gaining permission to enter community • Women's group meetings • Village Committee meetings
Government Primary School	Formal	<ul style="list-style-type: none"> • Green Mazingira Club meetings
Community Member's Home	Formal	<ul style="list-style-type: none"> • Women's group meetings
Public Outdoor Areas	Formal	<ul style="list-style-type: none"> • Tree planting • Women's group and school group meetings
Rented Meeting Hall/ Private Lodge	Formal	<ul style="list-style-type: none"> • Teacher trainings • Government committee training sessions

Table 4.1 Spaces of interaction between Green Arusha Society and communities.

visible everywhere: outside of government offices and on other public lands, on school property and outside of the homes of the women's group members. GAS training sessions and workshops are generally held in a rented space outside of the village (often a private lodge or meeting hall). Such sessions and workshops are by invitation only, and participants are sometimes provided with a cash stipend for attending.

GAS spaces are mainly sites of instrumental and communicative learning. Specific tree planting and caretaking skills are taught, and a new perspective on caring for the environment is encouraged. GAS tightly controls the information that villagers receive and share, leaving little room for collective learning that would deviate from the

organization's agenda. Anticipatory learning is likewise out of the question. Because GAS believes that the climate can be regulated through human action, there is only one possible climatic result of its projects, rather than a variety of outcomes which must be "anticipated". Furthermore, because government regulation of GAS projects has been institutionalized in the Village Environmental Committees, participating villagers are further discouraged from deviating from the prescribed GAS project to pursue iterative learning through experimentation and critical reflexivity.

4.3.2 Maasai Women Development Organization

MWEDO recognizes the importance of spaces where official organization occurs, such as village meetings, and spaces of unofficial interaction, such as the village road or the marketplace. Staff members mapped the spaces of interaction and labeled them according to what activities occur within them (Figure 4.8). Table 4.2 contains a matrix

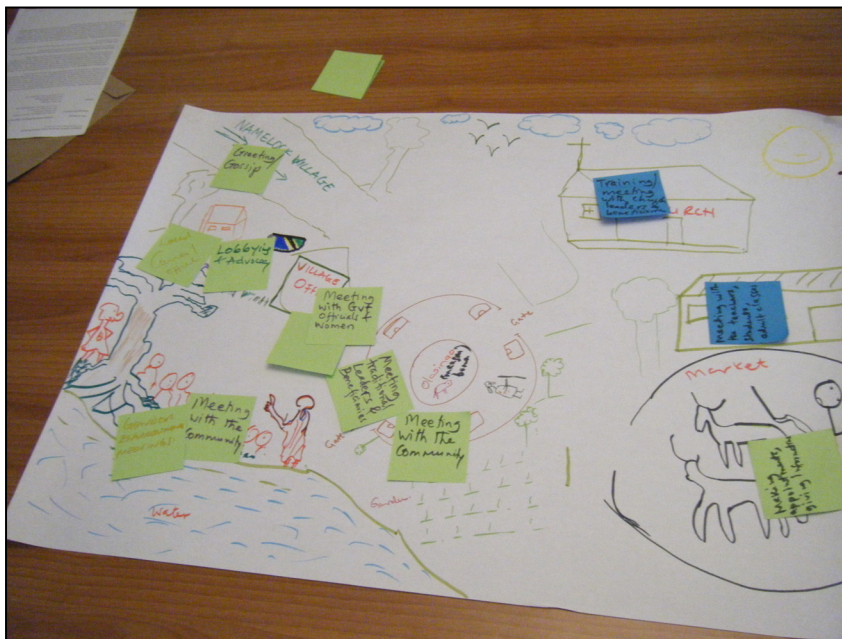


Figure 4.8 Map of NGO-Community interactions created by MWEDO staff. Labels indicate activities occurring in each space.

of spaces of interaction identified by MWEDO staff, whether these spaces are sites of formal or informal meetings, and what activities take place in each space.

Space of NGO-Community Interaction	Formal or Informal Interaction	Activities in the Space
Village Road	Informal	<ul style="list-style-type: none"> • Greetings • Gossip • Trust-building
Village Boma (House)	Formal	<ul style="list-style-type: none"> • Meeting with traditional leaders • Community meetings
Under the Big Tree	Formal	<ul style="list-style-type: none"> • Community meetings • Project decision-making
Local Consul's Office	Formal	<ul style="list-style-type: none"> • Lobbying for projects • Advocating for women's rights
Village Government Office	Formal	<ul style="list-style-type: none"> • Meeting with government officials • Meeting with women's groups
Church	Formal and Informal	<ul style="list-style-type: none"> • Meeting with church leaders • Meeting with community members • Trust-building
School	Formal	<ul style="list-style-type: none"> • Meeting with teachers and students
Marketplace	Informal	<ul style="list-style-type: none"> • Gossip • Trust-building • Making appointments • Spreading news by word-of-mouth

Table 4.2 Spaces of interaction between MWEDO and communities.

Staff members expressed multiple opinions about which spaces were most integral to accomplishing MWEDO objectives:

“Community meetings, things really get done there. Details get hammered out. Women, men, church leaders, traditional leaders, local government,

village government are all at meetings” (Vumi, Director, group discussion).

“The gossip and greeting [in the village road] is most important. It is unofficial, a good place to be accepted by the villagers” (Bruno, Student Volunteer, group discussion).

“Meeting with the traditional leaders, so you can get the go ahead” (Beatrice, Administrative Assistant, group discussion).

“The marketplace...For example, MWEDO wants to run a workshop, you spread the news by word of mouth at the village market. There is fast transmission of information” (Martha, Community Volunteer, group discussion).

These local spaces of information exchange help break down preconceptions and barriers to trust building held by both villagers and organization staff. By sharing ideas and information in both formal and informal settings, villagers and MWEDO staff are making use of “shadow spaces” (Pelling et al. 2008) that provide them with the opportunity to question programs and routines, and reflect upon their own roles in village projects. By bringing the fruits of shadow space reflection to the table at official village meetings, group meeting of the literacy project, and other program activities, iterative questioning of a village projects and activities can take place, suggestions for

experimentation and changes can be made, and collective and anticipatory learning can take place.

4.3.3 Pastoralists' Alliance for Climate Change, Adaptation, and Development

While PACCAD is still in the process of formalizing the details of its agenda and future projects, there is a clear commitment to sharing information and facilitating learning. Whether this learning will be iterative, collective, and anticipatory, remains to be seen, and will depend upon the types of spaces that PACCAD makes use of, the way that it presents information, and the degree to which it encourages experimentation and flexibility in its interaction with constituent organizations.

CHAPTER 5

DISCUSSION

In this chapter, I link the results and analysis from Chapter 4 with broader implications for building adaptive capacity to and fostering opportunities for learning in the face of climate change. I begin the first section with a discussion of the role of NGO agendas in facilitating or constraining opportunities for building adaptive capacity, specifically focusing on how and by whom organizational decisions are made. In the second section, I examine the ways that NGOs can foster spaces of resistance, shadow spaces, and heterotopian spaces for collective and anticipatory learning by building trust in communities and taking risks that promote opportunities for learning. I end with a discussion of the challenges and opportunities associated with creating a boundary organization.

5.1 CONSTRUCTING AN NGO AGENDA THAT FOSTERS ADAPTIVE CAPACITY

When comparing the agendas of two of the three case studies (GAS and MWEDO) presented in this thesis, two major differences can be identified that influence each organization's ability to foster adaptive capacity both within the communities in which it works, and within the organization itself. First, GAS's agenda explicitly addresses environmental and climate change as problems that need solving while MWEDO views environmental and climate change as the context within which its

broader agenda of improving Maasai women's education, health, and livelihood options exists. Second, GAS's agenda is set by the organization staff and leaves little room to make adjustments that reflect the needs and goals of participating communities. MWEDO, on the other hand, explicitly leaves room in its agenda to be able to flexibly respond to the needs, desires, and constraints of the diverse communities that the organization serves.

By addressing environmental and climate issues separately from other issues of community well-being, such as access to safe water sources or improved livelihood options, GAS's agenda frames the problems it seeks to solve as being separate from and only indirectly beneficial to overall community well-being. Furthermore, because GAS predicts a thirty-year period before the climatic effects of tree planting become apparent, any tangential benefits to community well-being through tree planting and land or climate restoration are not expected to occur for three decades. Long term environmental benefits therefore occur at the cost of immediate community well-being, as valuable time, labor, and capital resources are diverted to planting trees as prescribed by the GAS agenda. Finally, by insisting that its agenda takes precedence over other community needs, such as access to water (as seen in Section 4.1.1), GAS may actually be undermining overall current and future well-being. This strict adherence to a predetermined agenda limits both the communities' and GAS's own organizational ability to flexibly respond to multiple current or future stressors; in other words, it limits people's adaptive capacity, as defined in Section 2.1: the ability of a system to modify itself in response to existing or anticipated stressors (Brooks 2003).

Community and organizational resilience are also likely to be undermined by the focus on environmental problems and solutions, rather than broader community interests, livelihoods, and well-being. A resilience perspective in decision-making, as described in Section 2.1, “shifts policies from those that aspire to control change...to managing the capacity of social-ecological systems to cope with, adapt to, and shape change” (Folke 2006, 254). The GAS agenda views the appropriate response to undesirable environmental or climate change to be to attempt to *control* the change by planting trees, rather than to *manage* the communities’ *capacity* to cope, adapt, and shape the way the change occurs. But because climate change is characterized by uncertainty, is expected to manifest itself as increased variability in temperature and precipitation, and may be compounded with other variables such as economic change, complete control is simply not possible. If communities and organizations do not have the capacity to manage unexpected change because they are focusing on controlling change, their resilience is lowered. Hence, a sudden or unexpected event can easily push them beyond a threshold of coping and into a state of deteriorating well-being from which they cannot easily recuperate. Thus, an NGO agenda that seeks to control change, rather than to manage the capacity to anticipate or respond to change, may actually undermine community and organizational adaptive capacity.

In comparison, MWEDO’s agenda couches its interest in environmental issues and climate change within its broader goals of improving Maasai women’s education, health, and livelihood options. Environmental issues and climate change are viewed as being inextricably linked with problems of land tenure and access, health and nutrition, economic security, and even Maasai cultural identity. Because MWEDO understands

climate change to be part of these larger complex systems interactions that encompass multiple variables and broad geographic areas, the organization does not identify any clear-cut way to control climate change. Rather, it addresses climate change by first seeking to identify the ways that it is manifest at the scale at which MWEDO works, and then by equipping communities and MWEDO members with tools for managing it. For example, as described in Section 4.2.2, MWEDO recognizes that local knowledge based on observed seasonal climatic patterns is becoming less useful as climate change causes local patterns to change. MWEDO sees its Education Program as a way of addressing this problem, by providing communities with access to new, non-local knowledge that maintains its validity in spite of climatic and environmental change. MWEDO therefore does not seek to *control* change, but to provide communities with tools to *manage* their *capacity* to cope with, adapt to, and shape change. Furthermore, while MWEDO does have broad organizational goals and framework projects, it allows the communities with which it works to determine the specific details of its project agendas. This gives both the communities and the organization itself the ability to modify their agendas and practices as circumstances and current or future stressors change, and therefore increases people's adaptive capacity.

This comparative analysis has direct implications for organizations, such as PACCAD, that are still in the stages of setting an agenda that addresses climate change and determining how to translate this agenda into projects on the ground. First, to build adaptive capacity both in partner communities and internally in the organization, NGOs should consider couching climate change and environmental issues within broader and complex social-ecological interactions when setting their agendas. By indirectly

addressing climate and environmental change, NGOs can avoid practices that attempt to *control* change, and instead foster practices that *manage* communities' and the organizations' *capacity* to cope with, adapt to, and shape change, thereby building community and organizational resilience. Second, seen from a resilience perspective, NGOs may want to consider avoiding agendas that prescribe detailed actions and projects, and instead allow room for flexibility and negotiation with communities to determine projects. This would require overcoming factors that may currently prevent NGOs from doing this, including the fulfillment of donors' expectations, budget limitations, or limited training among staff, for example. This points to a ripe area for further research: uncovering ways of altering these institutional constraints or avoiding narrow and prescriptive agendas in spite of them. Avoiding narrow and prescriptive NGO agendas will give communities a wider array of options to choose from when making decisions that will affect their livelihoods and well-being, and will give organizations flexibility in choosing a route to achieve their own objectives. Thus, both organizations and communities are more likely to improve their ability to modify their agendas and practices if current or future stressors change, thereby fostering adaptive capacity.

5.2 SPACES FOR COLLECTIVE AND ANTICIPATORY LEARNING

Armitage et al. (2008) warn against an uncritical discussion of learning that does not take into account the variety of types of learning that can occur, or the specific implications or outcomes for learning in particular contexts. It is therefore useful to differentiate between experiential learning (learning by doing), transformative learning

(learning as a reflective process), and collective or social learning, in which groups of individuals collaboratively learn through processes of iterative reflection and experimentation (Armitage et al. 2008; Petts 2007). Anticipatory learning is identified as a fourth type of learning, characterized by the specific goal of avoiding “learning by shock” by proactively thinking about the future and addressing future problems (Deshler 1988).

Collective and anticipatory learning tend to challenge underlying procedural norms or worldviews, rather than merely addressing routine problems or errors, making these two types of learning more successful at helping individuals and groups avoid obstructive patterns and imagine and invent new ways of thinking and being (ibid.). Armitage et al. (2008) point out specific characteristics held by institutions and organizations that encourage learning that challenges underlying norms and worldviews: a commitment to building trust, willingness to take risks, transparency, engagement with civil society, and individual citizen participation. The presence or absence of these institutional traits impacts an organization’s ability to encourage spaces for collective and anticipatory learning that challenge underlying norms and world views. In the next three subsections, I use the GAS and MWEDO case studies to discuss examples of two of these traits, the commitment to building trust and a willingness to take risks, and examine how they relate to the creation of three types of spaces for learning: spaces of resistance, shadow spaces, and heterotopian spaces in the context of two organizational case studies.

5.2.1 Trust Building and Spaces of Resistance

Trust building is noticeably absent from GAS practices. The organization employs government groups to police its projects, which demonstrates a lack of confidence in community members' ability or desire to complete projects. A reciprocal lack of trust is demonstrated by the GAS director's complaint that "local people have a wrong perception with regards to these projects...[They] think that GAS is pocketing money" (Elijah, GAS Director, personal interview). This mutual lack of trust means that divergences from narrowly-defined project agendas are treated with suspicion and strongly discouraged in spaces of official organizational-community interaction. For example, students participating in the School Project's Green Mazingira Club are taught to plant and care for the trees that they are given, but they are not taught about the specific qualities of different tree species that make them more or less appropriate for different climate or soil types. The perception held by GAS staff is that the students do not need to know this to complete their prescribed tasks, but by failing to share this knowledge with students, GAS is actually limiting the students ability to potentially put this knowledge to use through reflection and experimentation, or iterative learning.

Furthermore, by employing government-run Village Environmental Committees to oversee projects when organization staff cannot be there, GAS ensures that divergence from project agendas does not occur, even outside of spaces of official organizational-community interaction. This limits the opportunity for creating of "spaces of resistance," as theorized by Townsend et al. (2004). Spaces of resistance are spaces created by individuals or communities that use resources provided by the NGO to accomplish objectives outside of the NGO's official agenda. The NGO may or may not know about

or condone these spaces, which are used to pursue individual material needs or a “wider vision” than that of the NGO (ibid., 872). Although spaces of resistance may subversively or surreptitiously divert NGO resources, this does not necessarily connote illegality or a threat to the NGO’s agenda. For example, a water source provided by an NGO with the expressed purpose of irrigating household gardens becomes a space of resistance when used to support cash crop agriculture. The NGO may or may not know about or agree with this legal usage of the water source, but the unplanned and unofficial nature of it renders it a space of resistance. Because spaces of resistance are specifically characterized by the utilization of resources for unintended purposes, these spaces are sites of innovation and creativity. However, they are less likely to occur when NGO projects and resources are being strictly monitored at all times, as performed by the Village Environmental Committees for GAS. While this may prevent spaces of resistance from undermining NGO activities, it also hampers positive opportunities for innovation, which relies on unplanned divergences that are shaped by iterative reflection and experimentation; in other words, collective and anticipatory learning. Mutual trust between GAS and its partner communities would mean that spaces of resistance could be created that make use of GAS resources without undermining the specific goals of the organization.

What might these spaces look like, and how could they promote community resilience by fostering adaptive capacity? Currently, GAS projects involve planting trees for the purpose of causing a reversal of local climate change over the next few decades. The NGO prescribes what trees will be planted, where, and how they should be cared for. The Village Environmental Committee is employed as an enforcement agency, making

sure that there are no divergences from the GAS plan, and protecting trees from theft and vandalism. However, this also limits opportunities for experimentation with tree species, location, and care practices that could lead to outcomes that increase the communities' capacity to adapt to climate change, without undermining the GAS agenda. For example, experimentation with tree location could lead to the discovery of synergistic relationships between the trees and crop gardens. This would be a space of resistance where resources provided by the NGO (the trees) are simultaneously used to support individual material needs (crops) while still achieving the goal set by the NGO. Such opportunities for experimentation and innovation may increase adaptive capacity by providing communities with new and flexible techniques for modifying their environment and agricultural practices in response to changing climatic conditions.

5.2.2 Trust Building and Shadow Spaces

Closely related to spaces of resistance is the idea of “shadow spaces”. Pelling et al. (2008) argue that to most effectively promote iterative, reflexive learning in organizations, spaces for both informal and formal learning and interaction should be permitted. Shadow spaces are those informal spaces of interaction within an organization that allow opportunities for questioning organizational routines, incentive systems, or norms. They are neither formally enshrined within the organization constitution, nor are they subject to control or management through the institutional framework of the organization (ibid.). Shadow spaces differ from spaces of resistance because they are initiated by individuals within an organization and occur, albeit unofficially, within the

organizational system, whereas spaces of resistance are created by outsiders to fill goals external to the organization.

In Section 4.3.2, we see that MWEDO values informal spaces of organizational-community interaction, such as the gossip and greeting that take place on the village road and which serve to reinforce trust and acceptance between communities and the organization, or the exchange and transmission of information that occurs via informal interactions at the village market. Based on the available data, it is unclear whether MWEDO intentionally fosters these informal interactions as shadow spaces, in which organizational routines and norms may be questioned. However, these interactions may function as shadow spaces if community members and organizational staff use them to express concerns about project goals or methods, and to discuss alternative ways of accomplishing organizational objectives. Furthermore, it is certain that MWEDO uses these informal interactions to build trust with communities and to exchange information, such as the availability of new crops or agricultural techniques (according to MWEDO staff-member Mary, in a group discussion). Because MWEDO does not formally monitor or control the way all of the information that they share is used, the organization thereby leaves room for experimentation and innovation.

The presence of shadow spaces may benefit both MWEDO and its partner communities by fostering their capacities to adapt to climate change. Shadow spaces can foster “internal dissent as a positive force for local innovation and adaptation” (Pelling et al. 2008, 869) by promoting reflexive behavior in individual organizational members. By sanctioning such shadow spaces, MWEDO can foster the constant negotiation of institutions and norms within their organization. This may lead to improved

organizational response to shifts in community objectives and needs that are dependent on contextual characteristics such as climate change. For example, if market access is limited by poor road conditions and a lengthening of the rainy season, informal discussion among community members and NGO staff may lead MWEDO to shift its activities to focus on a solution to the problem of local market access. A second way that shadow spaces may benefit organizations and communities is identified by Pelling et al. (2008) in a case study where organizational shadow spaces facilitate “timely and efficient flow of resources and information in response to past analogues of abrupt climate change” (880). A similar argument may be made about the informal spaces used by MWEDO to exchange information. If MWEDO fosters public spaces for unofficial community-NGO interaction, such shadow spaces could provide a network for information and resource exchange that the organization can mobilize to prepare for or respond to rapid-onset events such as floods. In this situation, shadow spaces can function as information conduits in an early warning system or as sites for reorganization after an extreme event has taken place.

5.2.3 Risk Taking and Heterotopian Spaces

Heterotopian spaces, as defined by Foucault, are atypical spaces which disturb convention and stimulate the questioning of norms in other places (Foucault 1986). Jones and SPEECH (2001) argue that heterotopian spaces can promote change external to themselves by “pushing-out-on” normalized social relations (5). This “pushing-out-on” occurs through repetition of behavior within the heterotopian space that is eventually carried out into daily life. When previously unquestioned norms are challenged by new

possibilities starting within the heterotopian space and then within the broader community, collective learning may occur as individuals communally imagine and explore new ways of interacting and being in the world. Collective learning in this situation increases community resilience by open up new possibilities for interacting with, preparing for, and reacting to the future.

Heterotopian spaces are therefore, by definition, spaces of collective learning that question dominant value systems, worldviews, and assumptions, and therefore may help learners avoid obstructive patterns of thinking that lead to “learning by shock” (Deshler 1988). One example of a heterotopian space would be a girls’ school in a community that traditionally does not place value on the education of women. Such a school would obviously challenge gender norms, and could potentially lead to the questioning of other gender expectations in the community. If the community is experiencing out-migration of male members to pursue urban livelihoods as agricultural profits decrease due to climate change or market fluctuations, a more flexible definition of the rights and role of women in the community may prevent the community from learning by shock as it becomes necessary for female community members to take on new responsibilities.

According to Armitage et al. (2008), by taking risks to extend learning opportunities that challenge values and worldviews, organizations foster opportunities for collective learning that may result in fundamental changes to behavior or thinking that promote adaptive capacity (Armitage et al. 2008). Communities and organizations alike take risks when they provide learning opportunities through the medium of heterotopian spaces, because examining dominant value systems, worldviews, and assumptions goes hand-in-hand with challenging power structures and questioning the privilege of those

who hold power. First, there is the risk that creating a heterotopian space might generate conflict between those whose power is challenged and those who challenge it, or between those who stand to gain from change and those who stand to lose. Second, there is the risk that abandoning or radically changing one institution could lead to the collapse not only of the institution in question, but of related institutions as well. For example, introducing pesticide use into an agricultural system may solve a pest problem, but may have the unintended effect of contaminating groundwater. Third, abandoning a problematic institution in favor of another institution could actually “downgrade” community resilience if the new institution is even more problematic. Fourth, organizations put their reputation and legitimacy at risk by providing opportunities for people to question popular beliefs or long-standing norms. In spite of these risks, heterotopian spaces are uniquely suited to fostering adaptive capacity, because they facilitate anticipatory learning by challenging underlying worldviews and institutions that may limit creative and novel responses to changes and stressors.

What makes heterotopian spaces unique from other spaces for learning is that by enacting change within the confines of their space, people are able to physically embody and experiment with changed norms or value systems at the same time that they reflect upon them. This differs from the typical experiential or learning-by-doing looped-process of experience followed by reflection followed by experimentation. Because people in a heterotopian space may be enacting an entirely new way of being based on the deconstruction of value systems, worldviews, and assumptions, they come into direct contact with three of Kelleher’s (2008) anticipatory learning values: creativity, synergy, and emergence. Creativity happens when individuals within a heterotopian space

generate new and original values and understandings to replace those they are challenging. Synergy occurs as these individual creations combine to create new value systems or worldviews that are greater than the sum of the individual creations. Finally, emergence occurs when new structures of interaction and organization arise out of the synergistic value systems or worldviews. By identifying how the learning values presented in Kelleher (2008) manifest themselves in heterotopian spaces, it becomes apparent how heterotopian spaces may function as spaces of anticipatory learning where the status quo is challenged, new ways of being are uncovered, and the future may be collaboratively co-created through collective action, reflection, and experimentation.

The group meetings of MWEDO's Adult Literacy Project are an example of heterotopian spaces in action. Maasai women traditionally do not have access to formal education and do not participate in community level decision-making. The Adult Literacy Project provides both a space for formal learning for Maasai women, and encourages reflexivity and discussion of human rights, land rights, gender, and environmental issues. Encouraging women to participate in issues of community and household importance within the heterotopian space of the Literacy Project directly challenges the institutional norm that prevents women from participating in such discussions in the broader community. Furthermore, individuals in this space may encounter opportunities for anticipatory learning by taking advantage of creativity, synergy, and emergence to imagine different ways of valuing the world and understanding their place in it, and novel structures of interaction and organization based on these new worldviews. These occasions for anticipatory learning foster the general adaptive capacity of participating individuals and, potentially, the broader community;

similar opportunities can be harnessed to build the capacity to adapt to climate change in particular. Heterotopian spaces could be important sites for uncovering the dominant belief system and power structures underlying environmental decision-making in a community. By initiating a change in a particular land use or livelihood practice within a bounded heterotopian space, organizations could provide communities with the chance to question why they make the decisions they make, and whether change is possible, rational, or desirable.

5.3 BOUNDARY ORGANIZATIONS: CHALLENGES AND OPPORTUNITIES

The first two sections of this chapter explore the internal makeup of organizational agendas, practices, and spaces, and how they facilitate adaptive capacity and opportunities for collective and anticipatory learning. This section focuses on how organizations can serve as conduits of information and resource flow between external stakeholders. Boundary organizations are organizations that function as intermediaries or facilitators between stakeholders in “two different worlds” (Forsyth 2003, 141). Ollson et al. (2004) demonstrate how a boundary organization facilitates the successful co-management of Swedish wetlands. Boundary organizations can facilitate knowledge sharing across levels and scales by providing spaces for interaction and coordination between stakeholders. In many cases, boundary organizations may be the only link that local-level communities or organizations have with broader institutions and organizations.

Providing cross-scale and cross-level linkages often necessitates the translation of information into useable form for stakeholders with differing needs. In particular,

effective translation may prevent scale mismatches (see Section 2.3) that occur when available knowledge about the world does not match the scale or level at which decisions are made. A prime example of this is global climate models that have a resolution that is too coarse to be of use in short-term decision-making at the local or regional level (Cash et al. 2006). Scale mismatch can even undermine adaptive capacity in certain situations. For example, a local land manager that makes decisions based on long-term global climate projections of increased rainfall may be unprepared for localized drying or climate variability that occurs over shorter time periods. Boundary organizations responsible for sharing this information may be able to translate it into a format that effectively demonstrates the uncertainty of the projections, as well as the unique implications for the local level and short term decision-making.

However, there is also the risk that boundary organizations may perpetuate environmental misperceptions and scale mismatches. Forsyth (2003) argues that boundary organizations at the science-policy interface are often to blame for discursively framing complex and poorly understood problems in a biased way, thus legitimizing one environmental narrative at the cost of another. A powerful example of this is an environmental myth that has been perpetuated by many organizations at the science-policy interface, centered on the belief that local rural livelihood practices such as slash-and-burn agriculture lead to deforestation, land degradation, and climate change. The universal truth of this claim has been successfully challenged by a number of researchers (see Bassett and Zuéli 2003, Blaikie and Brookfield 1987, Hecht 1985, Peet and Watts 1996, and Sundberg 2003). Moseley and Laris (2008) likewise point out that NGOs sometimes have incentives for promoting narratives of environmental degradation, such

as the one above. Promoting paradigmatic narratives may increase fund-raising possibilities or provide employment for NGO workers (ibid., citing Swift 1996). Forsyth (2003) argues that such examples demonstrate that “boundary organizations [provide] definitions or approaches to contested science that are then used as ‘fact’ ” (142). However, the possible beneficial function of boundary organizations should not be overlooked.

How can a boundary organization avoid reproducing biased or false environmental understandings by encouraging information flow and sharing that allows for the *co-creation* of knowledge, science, and policy? One way is to facilitate bilateral flows of knowledge and resources. In the example of climate change adaptation in a rural community, instead of simply providing community members with access to resources for and information about dealing with climate change, boundary organizations can transmit information back from the community to the policy-makers and scientific researchers. This may allow resources and policy to be tailored to local community needs, and can provide data from empirical local observations that may add to scientific and political understandings of climate change impacts. These kinds of interactions are examples of “spaces of exchange,” or multilevel networks that provide opportunities for learning across scales (Tompkins et al. 2002). Spaces of exchange can be combined with “spaces of dependence,” which are local level spaces that allow for the basic realization of an organization’s goals (ibid.)

The PACCAD case study shows the potential hurdles faced by a fledgling boundary organization. While spaces of dependence between local organizations and PACCAD are already established, creating spaces of exchange is proving more difficult.

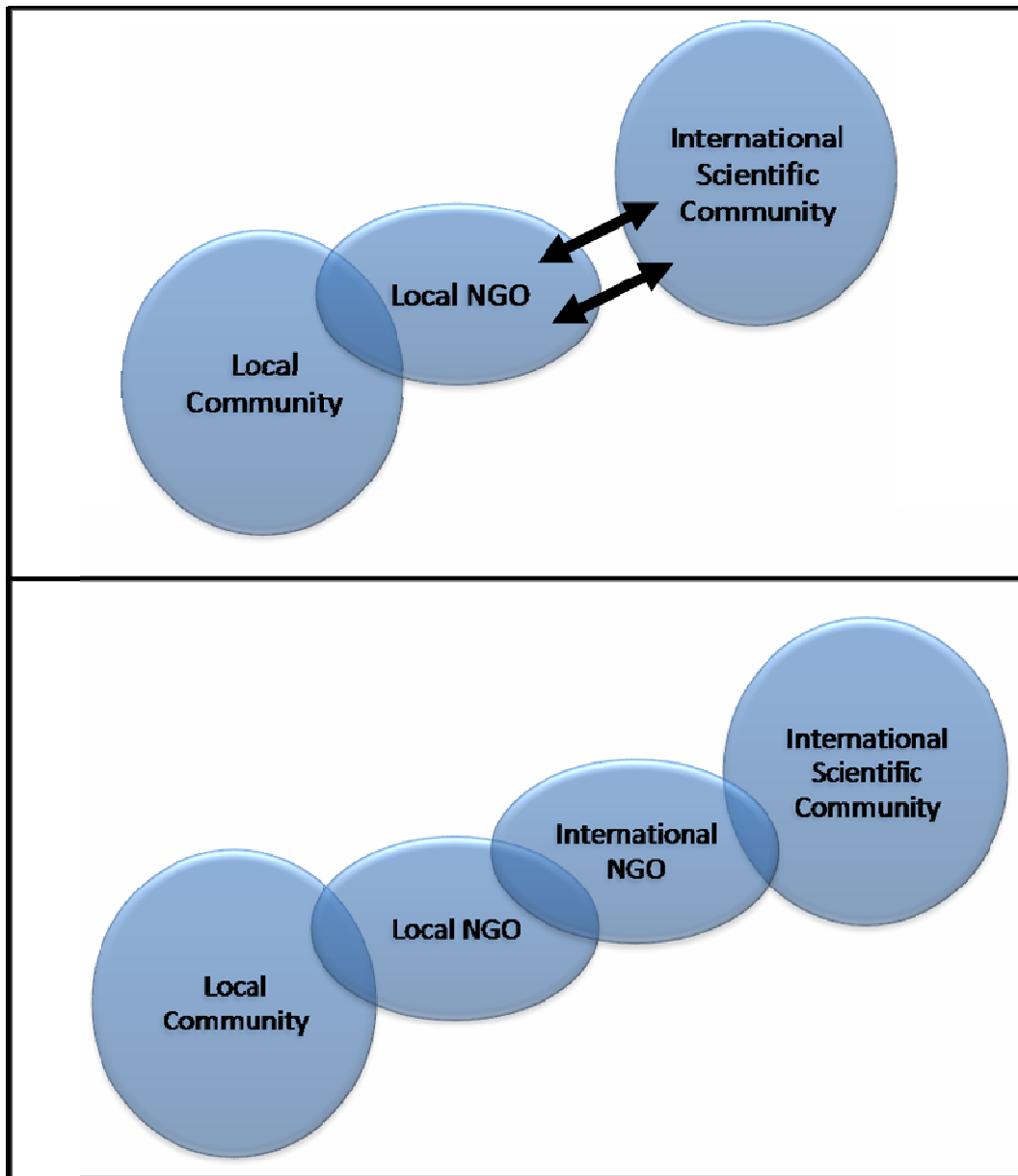


Figure 5.1 Local NGOs may not have the capacity to create spaces of exchange, making it difficult to bridge the gap between levels or scales (top diagram). By working in partnership with organizations that have established spaces of dependence at their own levels, organizations may function more effectively in a boundary capacity (bottom diagram).

In fact, at the time the field research was completed, the PACCAD director was at a loss as to how to make contacts with experts, scientists, and policy makers at broader scales. Because PACCAD is starting out at the local level, it faces the same gap that it is trying to bridge for other local organizations.

The solution to this problem may lie in institutions and organizations at broader scales, which will have to reach across the gap to meet local organizations such as PACCAD halfway. At the same time, the importance of locally-based boundary organizations should not be underestimated. Organizations such as PACCAD may be rich in local contacts, and have well-established spaces of dependence. They often have the keys to access local communities that broad-scale organizations must work for years to obtain. An optimal system may therefore be boundary organizations working as coupled systems, in which local organizations with established spaces of dependence combine forces with larger organizations that have access to spaces of exchange. This way, one organization is not responsible for straddling the gap between scales or levels. Instead, two organizations work together to bridge the space between them (Figure 5.1).

5.4 SUMMARY

In this chapter, I have drawn on my own empirical research and the broader literature to explore the role of NGO agendas in facilitating and constraining adaptive capacity, the ways that NGOs create spaces for collective and anticipatory learning, and how boundary organizations connect NGOs and local communities with broader-scale institutions and organizations. This is only a beginning discussion of the ways that the energy and resources of local NGOs may be harnessed to help communities build adaptive capacity and to avoid “learning by shock” as they experience climate change. My study and the subsequent discussion is certainly constrained by the fact that I am limited to three case studies, although the diversity of the organizations has allowed me to examine the ways that a range of organizational qualities facilitate or constrain

adaptive capacity and spaces for collective and anticipatory learning. Questions remain as to how spaces of resistance, shadow spaces, heterotopian spaces, spaces of dependence, and spaces of exchange are perceived and used by individuals and communities external to the organization, providing an arena that is ripe for further research.

CHAPTER 6

CONCLUSION

Research on climate change adaptation is only beginning to move beyond retrospective and outcome-oriented analyses. Recent literature shifts focus to look at the ways that people can prepare for a range of possible changes by increasing their adaptive capacity. However, most of these studies look at either broad-scale institutions or isolated cases that are difficult to draw generalizations from. Practical and generalizeable research into the ways that local institutions and organizations can foster adaptive capacity is currently limited. My thesis fills this gap by providing detailed case studies of three NGOs in rural Tanzania, and assessing their abilities to foster adaptive capacity both within their partner communities, and within the organizations themselves. By examining how these NGOs understand climate change, how this understanding impacts their agendas, and how these agendas translate to projects on the ground I reveal how certain organizational characteristics of local NGOs promote adaptive capacity. In particular, I identify how NGO practices cultivate organizational and institutional flexibility, how they facilitate information flow across scales and levels, and how they create spaces for collective and anticipatory learning, key elements for the creation of resilient systems.

The potential impacts of this research are profound. Global funding mechanisms for climate change adaptation are currently poised to begin supporting localized adaptation projects. However, the distribution of funds remains problematic, in part due to the lack of knowledge about what approaches to adaptation might be most effectual,

and how these approaches might be successfully implemented (Klein and Möhner 2008). Likewise, already-established local organizations are often interested in incorporating adaptation into their agendas, launching new programs to address the looming threat of increased extreme events and variability, and poising themselves to effectively take advantage of possible opportunities presented by climate change. However, like global and international institutions, local organizations are also at a loss as to how best to proceed.

Instead of assessing the outcomes of particular adaptation strategies, this thesis examines three ways that local organizations foster adaptive capacity in the face of climate change that is likely to be accompanied by increased variability and the occurrence of more extreme events. First, targeting climate change through a discourse that situates it as a distinctly local phenomenon may lead NGOs to unnecessarily limit the adaptive capacity of their partner communities, as seen in the case of Green Arusha Society. By recognizing the global social and environmental contexts that shape how climate change occurs and how local communities may prepare for and respond to change, NGOs account for both contextual complexity and system uncertainties that shape a community's adaptive capacity. Couching climate change adaptation in a broader host of agenda items may therefore offer organizations more flexibility to shift their focus as contextual circumstances dictate, as seen in MWEDO's situation. Second, fostering opportunities for interaction between stakeholders across scales and levels can broaden the resource and knowledge base of communities and organizations alike, giving them a wider range of options to choose from in decision-making surrounding climate and environmental change. Third, creating spaces for collective and anticipatory learning

to take place can help build adaptive capacity by promoting the creative generation of new ideas, synergistic communal cooperation to create novel value systems, and the emergence of innovative structures and institutions to support different ways of being.

The focus on only three NGOs over a relatively short (six-week) period is one of the shortcomings of this thesis. Corroboration of my organizational findings through the perspectives of local partner communities and individuals would strengthen my claims about the ability of certain NGO characteristics and projects to foster adaptive capacity and build community resilience. Unfortunately, time constraints and language barriers did not permit me to collect data at the community level. A comparison with a broader range of NGOs at the local, national, and international level would also have potentially allowed me to control for external factors that shape NGO agendas and projects, such as donor stipulations, bureaucratic and legal constraints, and access to resources such as financial capital and labor. Furthermore, a deeper examination of the historical context and political economy of Tanzania would have broadened the scope of my research to include an understanding of what factors shape the choices that NGOs make when establishing their agendas.

In spite of these shortcomings, this thesis establishes a framework for further research into the ways that local organizations may facilitate climate change adaptation and community resilience. Perhaps the most pressing question for research on institutional adaptation is that of the ways that organizations make linkages across scales and levels, and work with stakeholders that have conflicting needs and values. As seen in the case study of PACCAD, it is difficult to overcome the initial static friction to build linkages with broader institutions. How do organizations at different scales make

contacts with each other and build mutually beneficial relationships? This question must also address the complexity of situations in which organizations with divergent or conflicting goals learn to cooperate. Similarly, how do organizations forge linkages in situations of intercommunity conflict? Communities are not homogenous entities, and navigating conflicting values while facilitating cross-scale and cross-level linkages and building adaptive capacity may require a particular skill set.

In this thesis, I have drawn on my own empirical research, literature on adaptation and adaptive capacity, and social learning theory to examine the ways that local organizations facilitate adaptive capacity to promote communities that are resilient in the face of global climate change. This is only the beginning of a discussion of the ways that communities and NGOs can form bonds to avoid “learning by shock”. Such a discussion must include a scope that moves beyond a localized context to look at the complex and dynamic relationships that link institutions and stakeholders at multiple scales. It must take into account both the internal characteristics of organizations and communities, and the external environmental, political, and socio-economic forces that shape them. This thesis provides a starting point for research that uncovers how people, institutions, and organizations adapt to climate change and the ways that innovation and collective action can help people prepare for both the negative impacts and potential benefits of global environmental change.

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APPENDIX:
RESEARCH ACTIVITY SHEETS

**A.1 FOCUS GROUP DISCUSSION AND PARTICIPATORY DIAGRAMMING
ACTIVITY**

Research Questions: How does the NGO address climate change? How does the NGO facilitate information flow and learning across scales?

Goal: Identify routes used by the NGO for accessing and sharing information. Identify how this information is used by the NGO. Determine how this information translates to concrete adaptation projects or activities.

Participants: All interested NGO employees, and volunteers identified by the NGO director. All participants must be 18 years or older.

Materials: Markers or pens, paper, activity guide, table.

Directions:

1. Ask the participants where they get their information about climate change from, who they share it with, and what projects they participate in that make use of this information.
2. Lay a large piece of paper on a flat surface. Ask the participants to diagram the flow of information.
3. Throughout the activity and afterward, discuss the flow of information and responses to other questions below.

Questions:

- What is the main goal of the NGO?
- Have you heard about climate change adaptation?
- Does the NGO try to address climate change adaptation? Why or why not?
- How does the NGO address climate change adaptation? (if applicable)
- Where do you get information about climate change and other environmental issues from?

- Is the information understandable, or does someone in the NGO “translate” the knowledge for everybody else?
- Who do you share the information with in the NGO?
- Who do you share the information with outside of the NGO?
- How is the information put to use?
- What information is the most helpful? The least helpful?

A.2 SEMI-STRUCTURED INTERVIEWS

Research Questions: How does the NGO address climate change? How does the NGO facilitate information flow and learning across scales?

Goal: Identify ways that individual NGO employees make use of information within the context of their specific duties. Determine specific details about how information translates into concrete adaptation projects or activities.

Participants: Key NGO employees as determined during the diagramming activities.

Questions:

- What information is the most helpful in completing your duties? The least helpful?
- Is there information that would be helpful, that you are currently unable to get?
- What specific projects have you worked on in the NGO that make use of this information?
- Do you share information with members of the community? Which members?
- Are there activities outside the NGO (within the community) that make use of this information?
- Do you share information with government officials, decision makers or researchers?
- How do they make use of this information?
- Is the NGO able to flexibly respond to changing climate conditions?
- Does the NGO help the community flexibly respond to changing climate conditions?

A.3 PARTICIPATORY MAPPING ACTIVITY, RANKING ACTIVITY AND FOCUS GROUP DISCUSSION

Research Questions: What spaces for collective and anticipatory learning are created by NGOs and local communities?

Goal: Identify spaces where community/NGO interaction occurs, where decision making occurs, and where there are opportunities for learning or sharing information. Determine whether these spaces facilitate or constrain community resilience.

Participants: All interested NGO employees, and volunteers identified by the NGO director. All participants must be 18 years or older.

Materials: Markers (pens, stones, beads, sticks, etc.), paper, activity guide, table or flat surface.

Directions:

1. Ask the participants where, when and how the NGO interacts with community members. Ask them where and when community and NGO decisions are made, and who makes them. Ask them where they learn or share information, and with who.
2. Place a large piece of paper on a flat surface. Ask the participants to draw a map of where information sharing, learning and decision making takes place.
3. Give the participants one type of marker. Ask them to place these markers on the spaces that have provided them, as individuals, with opportunities to respond to climatic or other stressors.
4. Give the participants a second type of marker. Ask them to place these markers on the spaces that have limited their options to respond to change.
5. Throughout the activity and afterward, discuss these spaces, the opportunities or problems they provide, and responses to other questions below.

Questions:

For each space:

- What occurs in this space?
- Who has access to this space?
- Who is responsible for maintaining this space?
- (How) can this space be made more open and accessible?

- (How) can this space be made more useful?
- How has this space helped or hurt you, individually?
- How has this space helped or hurt you, as a community?
- How has this space provided you with options to respond to increased rainfall? To drought?

For all of the spaces:

- Which spaces are the most important or helpful? Least important/helpful?
- Which spaces are “community” spaces? Which are “NGO” spaces?