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ENABLING EQUITABLE COLLECTIVE ACTION & POLICY CHANGE FOR POVERTY REDUCTION AND IMPROVED NATURAL RESOURCE MANAGEMENT IN THE EASTERN AFRICAN HIGHLANDS

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ABSTRACT

The role of local and external institutions in natural resource management (NRM) is gaining attention in the literature, fostering greater understanding of the relationship between collective action and poverty, collective action and equity, and the conditions under which collective action institutions take root. It has also led to increased understanding of how uncritical practices by external development institutions can propagate social inequities in NRM. Yet little research has been conducted to understand how to foster local collective action institutions where they are absent, or to improve institutional practice. This research integrates empirical and action research in an effort to generate working solutions to problems facing rural communities in their efforts to manage their natural resources in the highlands of Ethiopia and Uganda. Following a brief introduction to the literature and the research, findings are presented according to two distinct phases of research. Data are first presented on existing forms of collective action, the influence of local and external institutions on economic development, and NRM problems that persist despite their negative livelihood consequences. Action research themes selected from a list of identified problems are then presented in greater detail, with lessons learnt thus far in attempting to overcome institutional barriers to improved NRM. The paper concludes with a discussion of the implications of findings for research, institutional practice, and policy.

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INTRODUCTION

Despite an increased awareness of the institutional foundations of development and natural resource management, development interventions continue to have a strong technological bias. Development and conservation interventions continue to be carried out with an uncritical view to equity and possible negative repercussions on certain social groups and to environmental sustainability, while local institutions (rules and structures) remain largely invisible to outside actors. Yet, the shortcomings lie not only with practitioners, but within research. Research on the institutional dimensions of development and NRM continues to emphasize problems rather than solutions. This research sought to address these shortcomings by integrating institutional analysis (for problem identification and targeting of interventions) with institutional interventions (for development of good practice). Our findings suggest that action research on the institutional foundations of development and NRM is a fertile ground for research in support of practical development challenges.

This research is relevant for policy for several reasons. First, development actors tend to ignore local institutions and their role in livelihoods, preferring instead to set up new structures—representing both a lost opportunity as well as marginalizing local institutions that work. Secondly, research and development organizations focus on individual over collective decision-making, often leading to solutions that bring benefits to some groups at the expense of others, either because others do not access benefits, or because actions taken by some individuals have a negative impact on others. Finally, for the full potential of collective action to be realized in development and natural resource management, reforms in institutional practice and local policies are needed. This requires political commitment to equity in the ways in which development organizations interface with local communities and national policies translate to local-level practices, and to bottom-up policy reforms that can give extra weight to local agreements.

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LITERATURE REVIEW

Collective action in natural resource management

The role of collective action in agricultural development and natural resource management is by now well documented. Scholars have looked at the role of collective action in enhancing farmer participation and human capital (Coleman, 1988; Heinrich, 1993; Uphoff and Mijayaratna, 2000; Woolock and Narayan, 2000); determinants and operational principles of collective action (Ostrom, 1990; Pandey and Yadama, 1990; Wittapayak and Dearden, 1999); and the conditions under which collective action can be a vehicle for enhancing equity in natural resource management (Kelly and Breinlinger, 1995; Leach et al., 1999; Molyneux, 2002). Yet the bulk of research on collective action is in the context of common property resources (Gebremedhin et al., 2002; Munk Ravnborg and Ashby, 1996; Ostrom 1990; Scott and Silva-Ochoa, 2001).

Collective action is also a fundamental pillar of landscape or watershed-level natural resource management. In addition to regulating rights and responsibilities to common property resources and public goods (Gaspart et al,. 1998; Ostrom, 1990), collective action has a role to play in managing biophysical processes that cut across farm boundaries (Munk Ravnborg et al., 2000). Collective action can also play a role in negotiating joint investments and technological innovations for enhanced productivity, regulating the distribution of exogenous resources within local communities (Meinzen-Dick et al., 2002) and negotiating solutions which optimize returns to diverse local interest groups (German et al., 2006a, 2006b). Given the sheer number of users in watersheds, the transaction costs of organizing and the tendency for outside interventions to structure positions of privilege vis-à-vis any given resource (Munk Ravnborg and Ashby, 1996; Schroeder, 1993), representative structures and mechanisms for structuring the interface of outside actors with local communities are needed (German et al., 2006b). This is in recognition of the inherently political nature of natural resource management (Rocheleau and Edmunds, 1997; Schroeder, 1993), which requires that the outcomes and distribution of benefits of watershed management and related project interventions be transparently negotiated and monitored.

In addition to understanding what collective action can achieve, research has highlighted some of the conditions under which institutions of collective action for NRM emerge. These include the presence of clearly defined rules for resource management and access (including sanctions), a clear definition of members and boundaries of the resource, adaptive management mechanisms (monitoring systems, ability to modify rules as the need arises), conflict resolution mechanisms, and a manageable size of the user group and the resource (Ostrom, 1990; Pandey and Yadama, 1990; Wittapayak and Dearden, 1999). Each of these factors plays an important role in influencing levels of mutual trust as well as expectations of what may be gained through cooperation (Blau, 1964; Burns et al., 1985). Yet, key gaps in our understanding remain on how to facilitate the evolution of institutions of collective action where these are absent. More research is needed to understand how equitable, meaningful (well-designed and enforceable), yet flexible, rules can be generated, and how to mobilize existing or new capacities for participatory governance of natural resources (Carney, 1998; Scoones and Thompson, 2003).

Collective action, institutions and equity

Through their role in structuring access to other forms of capital (natural, financial, physical, and human), local and external institutions alike play an important role in structuring opportunities and benefits capture. Research has shown that collective action can contribute to asset accumulation or protect households from loss of assets through their ability to mitigate risks. These functions may play out directly, by improving people's ability to work together to overcome limitations of wealth, farm size, and bargaining power (di Gregorio et al., 2004), and to access and control assets that could be difficult to access individually (Knox et al., 2002; de Haan, 2001). For example, joint input or output marketing can enhance market access or improve profit by minimizing transaction costs (Place et al., 2002). Collective action also plays an indirect role by facilitating access to credit and micro-financing, information, and technologies (Grootaert, 1999; Knox et al, 2002; Valdivia and Gilles, 2001). Each of these functions has implications for assets creation. On the other hand, collective action can help to minimize loss of assets during times of hardship by distributing risk among households, for example, by mobilizing resources during times of illness or death. Collective action thus helps individuals to better cope with risk and provides a safety net function that neither the government nor private sector is able to offer in most places (Place et al., 2002; de Haan, 2001).

In addition to contributing to financial capital, collective action has also been shown to underpin service delivery for infrastructure and social services (Nitti and Jahiya, 2004). Action research findings are also pointing to the role of collective action and diverse forms of social capital in enhancing human capital and spreading transaction costs of improved NRM (Coleman, 1988; Heinrich, 1993; Meinzen-Dick et al., 2002; Uphoff and Mijayaratna, 2000; Wallis, 1998; Woolock and Narayan, 2000). Yet, despite the potential of collective action for enhancing access to other important development resources, group composition, dynamics, and governance are fundamental for these potentials to be realized (Davis et al., 2004). This is especially true for managing the distribution of benefits from such interventions (Grootaert, 2002; Jassey, 2000; Molyneaux, 2002). Therefore, the relationship between collective action and equity depends in large part on the functions and capacities under which these forms of social capital operate.

External institutions also have a fundamental role to play in agricultural development and sustainable natural resource management. Yet all too often, uncritical development interventions by government and NGOs have led to a host of unanticipated negative outcomes due to failure to understand existing institutions. Failure to recognize self-organizing local institutions in the management of common property resources and imposition of overly rigid property rights regimes on traditional systems have proven to constrain, rather than enable equitable, adaptive and sustainable management of natural resources (Bloch, 1993; Davison, 1988; Kevane and Gray, 1999; Lastarria-Cornhiel, 1997; McDonald, 1991; Munk Ravnborg and Ashby, 1996; Nemarundwe and Kozanayi, 2003; Ostrom, 1999). Other authors document how outside interventions can increase risk due to more delimited resource access (Ngaido and Kirk, 2001; Turner, 1999). Finally, some interventions have proven to further entrench existing inequities by creating the conditions for elite capture of program benefits or natural resources (Rocheleau and Edmunds, 1997; Schroeder, 1993).

Despite these deficiencies, if outside interventions can influence the distribution of power and voice, there is potential for realigning the distribution of technologies, resources, and benefits (Knox et al., 2002). Such efforts could help to counter the tendency of extension benefits to go to wealthier farmers (Knox et al., 2002; Grabowski, 1990) or the causal role played by wealth in structuring resource access (Meinzen-Dick et al., 2002). Given the context of decentralization and devolution of policy structures in Uganda, Ethiopia and elsewhere (Raussen et al., 2001), and evidence of elite capture from similar experiences at the local level (Bachrach and Baratz, 1970; Munk Ravnborg and Ashby, 1996; Olson, 2001), lessons on how to engage and empower more vulnerable groups are sorely needed. This is particularly true given the many, often discrete, ways in which elite dominance can be asserted (Bachrach and Baratz, 1970). These cases point to the need for a better understanding of the ways in which external institutions facilitate wealth acquisition by different social groups and of strategies to foster more equitable outcomes from external interventions.

Program context

This research was conducted under the rubric of the African Highlands Initiative (AHI), an ecoregional program of the CGIAR and ASARECA[2] convened by the World Agroforestry Centre. The program's aim is to improve livelihoods and arrest natural resource degradation in the intensively cultivated highlands of eastern and central Africa. AHI works in a collaborative mode with interdisciplinary teams of scientists from National Agricultural Research and Extension Systems (NARES) and development partners in benchmark sites, where new approaches are field-tested and experiences synthesized regionally. These benchmark sites were chosen based on: high population densities, clear signs of natural resource degradation, and representativeness of the site to larger highland areas within each country (for subsequent application of lessons learned).

Since 2002, AHI has worked to develop a participatory, integrated approach to NRM at landscape / watershed scale. Different from many other watershed management programs focusing primarily on soil and water conservation, AHI is fostering an approach to integrate all components of the production system (crop, livestock, tree, and soil) and landscape (encompassing common property resources such as water, communal grazing lands, and forests). This requires that trade-offs and synergies between diverse goals be made explicit and managed, including income generation with conservation; production of crops, trees and livestock; and biomass increases with nutrient and water conservation. It also must acknowledge that natural resource management is inherently political, with decisions about which management goals to foster leading to unequal benefits and often favoring some groups at the expense of others. The concept of participation must move beyond numbers of participants in community events to acknowledge these dynamics and foster greater equity in voices, choices, and benefits. This paper reports on findings from the institutional research associated with integrated social, biophysical, and institutional interventions. The primary objective of this research was to develop

[2] CGIAR stands for the Consultative Group for International Agricultural Research; ASARECA is the acronym for the Association for Strengthening Agricultural Research in East and Central Africa.

and document successful approaches for facilitating equitable collective action processes and negotiated natural resource management solutions.

RESEARCH QUESTIONS AND HYPOTHESES

Research questions

Empirical Research:

1. What is the role of existing institutions (groups, rules and norms, property rights, decentralization systems) in leveraging or constraining decision-making and resource access by diverse groups?
2. What contextual factors (institutional, policy, historical, contested knowledge) hinder collective action and exacerbate poverty through inequitable decision-making and access to natural resources in the each site?
3. What are the impacts of action research interventions on participation in decision-making processes, identified watershed problems, policies, and resulting livelihoods/assets of diverse groups?

Action Research:

1. What conditions (social, technological, policy, economic) and facilitation processes are required to enhance socially-optimal voices (decision-making), choices (technological, social, and income options) and benefits (poverty alleviation, improved management, and access to natural resources)?
2. What policies, by-laws, and support from local government are required to bolster community actions and collective action toward more effective and equitable NRM and income generation? What are the most effective approaches for engaging communities with local government and service providers to achieve these policy reforms?

Hypotheses

1. Strategies to improve natural resource management at farm and landscape levels will be more effective if decision-making on technologies and natural resource governance is equitable, given the broad social support required to sustain collective action.
2. Increased capacity to develop better designed and more equitable by-laws will improve livelihoods by enabling technology adoption, enhancing collective action in natural resource management, and reducing the need for bylaw enforcement.

METHODOLOGY

Site selection

Four sites were chosen for this research—two in Ethiopia and two in Uganda. All sites are highland micro-watersheds characterized by smallholder farming systems, high population density and evidence of natural resource degradation. These sites have each served for 5 to 10 years as benchmark sites for the African Highlands Initiative, where new approaches to integrated natural resource management are first developed and tested, and from which regional lessons are drawn from comparative research. Each site is home to one or more ethnic groups with a long history of occupation of the area and limited in-migration from other groups or areas. Despite some similarities, each site has unique characteristics that merit attention in the context of collective action and NRM.

Areka Site

The Areka site is located in the Wolaita region of south-central Ethiopia. The area is a mixed crop-livestock system with a high diversity of staple and cash crops (enset, wheat, maize, barley, sorghum, sweet potato, Irish potato, faba bean, field pea, and horticultural crops). Livestock are grazed in a large communal grazing area or in semi-communal fenced plots. Despite the diversity of enterprises characterizing the system, landholdings are extremely small (.74 and .26 hectares on average for high and low wealth categories, respectively), and the area is subject to chronic food deficits. Unique to this site are a large number of landless families who earn a living as sharecroppers or through petty trade.

Key NRM challenges in this site include: a) enhancing the productivity and returns from crop, livestock, and tree components without further exacerbating system nutrient decline; b) arresting water resource degradation and resource conflicts through more optimal land management practices and improved governance; and c) increasing the viability of agriculture (through intensification and value addition) as a pathway to food security.

Ginchi Site

The Ginchi Benchmark Site is located in Western Shewa Zone, Ethiopia, home to the Oromo ethnic group. It is a mixed crop-livestock system that is more extensively managed than other sites. The system is very limited in biomass. Indiscriminate cutting of remnant trees and contiguous forest stemming largely from regime change and the resulting ambiguity in tenure systems (Bekele, 2003), and failure to invest in NRM practices with delayed returns due to perceived tenure insecurity have contributed to large areas of landscape devoid of vegetation and with very low nutrient stocks. This has placed increased burden on women and children who must walk long distances to gather fire wood, and has caused negative impacts on soil nutrients due to the sharp increase in the use of dung for fuel in recent decades (Omiti et al., 1999). Loss of tree cover and cultivation of Eucalyptus around springs have led to the degradation of springs, the sole source of water for both humans and livestock. Yet, the tendency for humans and livestock to share common watering points has made water quality more of a concern than water quantity in the minds of local residents.

High-value crops like Irish potato and garlic are grown on fenced homestead plots, while extensive outfield areas are used almost exclusively for barley production. Valley bottoms are used exclusively for livestock grazing. While all land is officially owned by the government, individuals have de facto ownership over all land in the watershed. Yet management is collective in certain spatial and temporal niches. Households own outfield areas on both sides of the catchment, cultivating one side of the catchment and leaving the other side for grazing during the rainy season. The side of the catchment that is left for grazing is done so by all households with contiguous plots, enabling free movement of livestock by those households owning land in the area. Valley bottoms are grazed year-round, with access during the cropping season restricted to those households owning plots of land in these areas. During the dry season, outfields and valley bottoms are open access resources. This scenario makes systems innovation very challenging, requiring collective action not only among households living within the watershed but involving others who graze their livestock in the area.

The key challenges for integrated NRM include: a) intensifying production (of crops, livestock and trees) while ensuring sustainable nutrient management in the system; and b) reversing water resource degradation by fostering positive synergies between trees, soil conservation structures and water in micro-catchments. Furthermore, seasonal open access grazing makes investments in afforestation and soil conservation structures in the outfields challenging as cattle can easily destroy such investments. Site teams and local leaders have highlighted this as a key challenge for this site, and targeted local negotiations and integrated policy and technological innovations as avenues for innovation.

Kabale Site

The Kabale benchmark site is located in Kigezi highlands of southwestern Uganda, home to the Bakiga ethnic group. The area is characterized by high population densities, steep cultivated slopes, fragmented landholdings, land shortages, and adequate rainfall. This site is also a mixed crop-livestock system with a relatively small livestock component. Communal grazing areas are negligible, making zero grazing a necessity and free grazing—where it does occur—a source of conflict due to damages incurred to crops. In addition to limited numbers of livestock, enterprises include Irish potatoes and vegetable crops in the valley bottoms, and cereals (sorghum, maize, wheat, and finger millet), pulses, and bananas on the hillsides. Trees are few and declining in number, a trend which has been exacerbated in recent years as a result of a high demands from a nearby gin distillery.

Key NRM challenges in this site include: a) integrating technological innovation with improved natural resource governance to minimize the incidence of conflict emanating from small landholdings, limited economic opportunities, and gender inequalities; b) improving incomes from small and fragmented landholdings through soil fertility management, diversification, and value addition; and c) managing the dependency syndrome, acute in this site due to a high density of NGOs and CBOs with short-sighted support strategies.

Kapchorwa Site

Kapchorwa District is located on the slopes of Mt Elgon in eastern Uganda. The district has a total population of 193,510 as per the 2002 population and housing census. The district population growth rate is at 4.33 percent, which is high compared to the national average of 3.3 percent. The district has three ecological zones: lowlands (33 percent), which are almost deserted due to insecurity caused by cattle rustling; highlands (34 percent), which are heavily settled and cultivated; and forest (33 percent), which is a protected area. Agriculture is the main economic activity, engaging over 82.1 percent of the working population. The primary crops are maize, bananas, coffee, beans, wheat, barley, sunflower and vegetable crops, with 82.1 percent of households living from farming.

The district is also home to the Mount Elgon National Park, established as a Crown Forest in 1930. Management of the area within and surrounding the park has been subject to the whims of shifting government policies on forest management, changes which have affected most severely the native Benet who have occupied the moorlands inside the park for the last 200 years. These changes have also negatively affected conservation in the area, as park officials and local residents alike have exploited the loosely guarded protected area under the current land tenure arrangement and the ambiguity of rights to adjacent communities.

Key challenges include equitable resource access given histories of ethnic conflict (cattle raiding); managing resources sustainably within and in the buffer zone of the national park given the history of displacement and conflict; and limited quality and access to support services due to a sparse NGO presence, limited coordination among sectors, and weak civil society.

Research methods

The methodology consisted of four primary steps:

Situation Analysis

The situation analysis used an empirical research approach to understand: (i) how resources are distributed within communities; and (ii) the role of internal and external institutions in enhancing or constraining resource access and decision-making by diverse groups. The situation analysis consisted of two primary methods. Focus group discussions were first utilized to identify local and external institutions and the participants, beneficiaries, and nature of benefits derived from each. The second step consisted in household interviews to quantify levels and variation in household assets (the five capitals) by gender and wealth, and participation or involvement with local and external institutions (assessed as one component of social capital). In each site, at least sixty household interviews were conducted. Households were purposively sampled by gender (men, women from female-headed households, and women from male-headed households) and wealth (based on local indicators and thresholds).

Stakeholder Workshops

Following the situation analysis, site and national stakeholder workshops were conducted to share findings and agree on action research priorities. Site-level

workshops consisted of: (i) feedback of findings; (ii) identification of NRM issues requiring collective action, changes in institutional practice and/or by-law reforms; (iii) prioritization of these issues, based on a set of minimal criteria; and (iv) development of preliminary action plans for prioritized topics. The screening criteria for action research themes included the following:

1. Involves change at multiple levels (local, outside institutions, policies);
2. Involves current inequities or requires close attention to diverse local priorities;
3. Can bring some change within 1 ½ years.

Action Research

Following stakeholder prioritization of action research themes, site teams developed action research protocols to clarify the research questions and facilitation strategies to be tested in facilitating local stakeholders to address identified problems. Each theme involved two levels of action research:

1. Local-level action research on how to foster collective action in natural resource management through explicit consideration of diverse views when negotiating access to benefits, natural resource management strategies, and policy proposals; and
2. Higher-level (sub-county/peasant association (PA) or district/woreda) action research on how to support equitable collective action processes at the local level through changes in institutional practice, policies that reflect local priorities, and negotiation support.

Two to four action research protocols were developed by each team, to articulate the Theme of Title of research; the Background/Rationale; action research Objectives; the Methodology, emphasizing the process for facilitating equitable, negotiated solutions to identified problems; Data to be collected; and an Action Plan with a timetable and responsibilities.

In several sites, most notably Areka and Ginchi, a common strategy was tested to foster negotiated solutions to identified NRM problems. This consisted of the following steps for each action research theme:

1. Identification of stakeholders, with an emphasis on local interest groups;
2. Meet with the individual stakeholder groups (individuals who share a common position in relation to the issue) to raise awareness, elicit their views on the problem and solutions, and their preferred approach to engagement;
3. Multi-stakeholder negotiations, including:
    a. Feedback on the identified natural resource management issue and meetings with individual stakeholder groups;
    b. Open dialogue to validate and clarify issues and interests;
    c. Negotiation of socially-optimal solutions that do not bring harm to any given group and emphasizing concessions on both sides, including agreed rules for resource management (often in the form of formally endorsed by-laws) and technologies which provide alternatives to practices restricted in by-laws; and

d. Action planning.

4. Periodic participatory monitoring and evaluation to assess progress, troubleshoot, and re-strategize.

Impact Assessment

The final step of the research was to evaluate outcomes and impacts from the action research intervention as a means to improve the strategy as well as to draw general conclusions about the approach used. This was done through a participatory methodology where research teams were asked to conduct focus group discussions with each stakeholder group to identify local indicators and track their performance over time. They were asked to record participant responses in detail, noting what was said, who said it, and to use exact wording in the local language where possible.

FINDINGS

Situation analysis

Household Assets and Investment Potential

Household surveys measured current levels of assets using the five capitals: human capital (age and education level of household members), social capital (access to social networks, participation in local forms of collective action), natural capital (water, forest, land, and so on), financial capital (off-farm income, savings) and physical capital (roads, structures, transport, communications). The idea behind this was to determine: (i) whether current assets determine ability to acquire new assets; and (ii) to understand the role of both local forms of collective action and outside institutions in asset accumulation.

Table 1 shows a two- to six-fold increase in land and livestock holdings from lower to higher income households. To determine the extent to which wealth begets wealth, we analyzed annual levels of investment in productive activities by wealth category (Tables 2 and 3). This was used as an indicator of the extent to which wealth determines the ability to acquire additional wealth through investment. Data suggest a strong correlation between current wealth status and ability to invest in productive activities.

Table 1. Land and livestock assets by wealth category

Type of Asset	**Areka (Ha)**		**Ginchi (Ha)**		**Kabale (Acres)**		**Kapchorwa (Acres)**	
	High	Low	High	Low	High	Low	High	Low
Landholdings	0.74	0.26	3.4	1.2	7.2	2.0	5.2	0.1
Heads of Cattle	3.7	0.6	6.4	3.2	0.31	0.15	20.3	1.2

Table 2. Agricultural investments by wealth category in Ethiopian sites

Annual Investment	Ginchi (Birr)			Areka (Birr)		
	Low	Med	High	Low	Med	High
Seed	336.1	510.9	273.9	72.1	106.8	165.7
Pesticide	28.3	69.0	48.3	0.6	0.4	0.9
Fertilizer	133.2	210.7	407.6	46.5	84.9	173.2
Feed	65.8	170.9	232.5	10.8	20.6	55.0
Veterinary	23.3	55.1	72.9	9.8	10.5	15.0
Total	**586.7**	**1,016.6**	**1,035.2**	**139.8**	**223.2**	**409.8**

Table 3. Agricultural investments by wealth category in Ugandan sites

Annual Investment	Kabale (Ugandan Shillings)			Kapchorwa (Ugandan Shillings)		
	Low	Med	High	Low	Med	High
Seed	23,640	31,844	72,129	19,980	29,464	42,388
Pesticide	3,269	7,074	35,059	13,000	20,000	80,714
Fertilizer	119	279	19,823	1,035	10,963	18,000
Feed	2,144	11,820	20,882	2,000	76,683	100,000
Veterinary	226	3,270	7,177	4,666	20,000	86,000
Total	**29,398**	**54,287**	**155,070**	**40,681**	**157,110**	**327,102**

Influence of Local and External Institutions on Assets and Livelihoods

Local collective action institutions were abundant in all research sites. They include local savings and loan groups, merry-go-rounds (rotational savings), religious associations, funeral associations and stretcher groups, labor sharing arrangements for private and communal works, traditional conflict resolution mechanisms, saving or pooling resources for celebrations, commercial labor groups (Kabale), and land and livestock sharing arrangements (Ethiopian sites). Benefits of these institutions are both social and economic. Social benefits include strengthened social ties and networks and support during periods of hardship while economic benefits include access to resources for agricultural and domestic functions (labor, utensils, food, seed, cash), and safety net functions. Local institutions were seen almost unanimously to benefit all participants. One exception was found in Ethiopia, where contracting out land to others is seen as enriching some households (landowners) at the expense of others. Yet households continue to practice this activity when they have no alternative, generally due to the shortage of inputs (primarily labor).

While all participants are seen to benefit in most forms of collective action, certain participants benefit more than others for some forms of collective action. For example, land and livestock sharing arrangements in Ethiopia confer unequal benefits to participants. Landowners benefit most in sharecropping because they receive the benefits of their land with limited investment, but benefit least in contracting because they are paid poorly for the use of their land. Livestock sharing arrangements are similarly imbalanced. In Areka, *Hara* is seen to benefit the cattle owner most because they acquire offspring with limited investment, while the

individuals rearing cattle receive only livestock products. In Ginchi, on the other hand, *Ribi* is seen to benefit the poor most, who acquire offspring as well as livestock products from cattle owned by others.

While local forms of collective action are seen to benefit all participants, some social groups cannot gain access to certain forms of collective action. Resource-poor households, for example, generally cannot participate in savings and loan groups, while commercial labor groups are male-dominated. The sick, elderly, and disabled seldom participate in local forms of collective action but often receive some form of assistance from others. In Kabale, women are more active in local forms of collective action, particularly those involving agricultural production.

Despite the caveats, communities generally agree that local forms of collective action play a strong positive role in livelihoods. This function is achieved by enabling households to access resources and acquire assets that would have otherwise been unachievable, buffering households during shocks and crises, and expanding social networks for intra-household sharing and support.

Collective Action in NRM

With the exception of labor sharing arrangements, there was a notorious absence of collective action for addressing shared natural resource management concerns. Many NRM problems requiring collective action therefore remain unsolved. Two predominant scenarios were identified that help to explain why NRM problems requiring local collective action institutions persist in the eastern African highlands despite their negative affect on livelihoods:

1. Scenario 1: Natural resource management problems affecting agricultural productivity and requiring collective solutions are treated as individual problems by the community and by external organizations.

One example is soil and water conservation. Extension organizations continue to work with individual households when promoting soil and water conservation technologies, despite the need to foster common drainage ways. No household wishes to have common drainage ways pass through their farms because they take up agricultural land and excess water can damage crops. The costs and benefits of soil and water conservation for farmers residing in upper and lower parts of the landscape also differ. Those residing on lower parts of the landscape may benefit from the deposition of fertile soil from the upper slopes or be negatively affected by excess run-off or deposition of infertile soil. Those residing on upper slopes have less of an incentive to invest since their farms less affected by upslope cultivation activities. Soil and water conservation activities clearly require negotiated solutions to such problems, to facilitate solutions that are not overly harmful to any give land user, and to enable the investments of any given household to align with the perceived benefits.

Another example is the control of pests, disease, weeds, and wild animals. While traditional forms of collective action for pest and disease control were found in Tanzania, most contemporary approaches to pest and disease control emphasize control by individual households. Yet the efforts that one household must expend to control these problems grossly exceeds the benefits of such efforts, given the tendency of farm plots and livestock to be contaminated by adjacent farms and

local livestock populations. Collective action can go a long way in enhancing the returns from efforts to control crop and livestock pathogens.

2. Scenario 2: Land users emphasize individual economic returns over collective goods or collective impacts.

One example is the cultivation of fast-growing tree species on farm boundaries. This a practice benefits the land owner economically, but adversely affects the livelihoods of adjacent households given the competition of these trees with crops for light, nutrients, and water as well as allelopathic affects associated with some tree species. Boundary management practices clearly require *negotiated* solutions that balance the needs of the landowner (income and wood from trees) with the concerns of affected households (ability to use their agricultural land to its potential).

A second example involves land management practices that compromise the long-term water supply. Problems include heavy siltation of waterways; pollution of springs and waterways with detergents, human waste and pesticides; the negative effect of certain land use practices on the water supply (for which "thirsty" trees are perceived as a major culprit); and levels of consumption of irrigation water. Under these scenarios, livelihood improvements of some land users are achieved at the expense of other households. Such scenarios clearly require a governance solution in which harmful land use practices are regulated according to collective choice arrangements.

Institutional Practice

Contrary to local institutions, which were generally seen as equitable and supportive to most households, the activities of a number of external institutions were seen as highly biased in the groups benefiting. Institutional practice unknowingly favors some groups at the expense of others, while local institutions have not stepped in to fill the gap and to govern development interventions and resources more equitably. This has led to increased social differentiation, and loss of cohesion as local leaders and participating households are blamed for excluding others. Some government agencies are also seen to be corrupt, undermining policies that they themselves are supposed to enforce—and commitment by stakeholders at all levels to these policies. Table 4 summarizes local institutions seen to confer unequal benefits to local residents in Ginchi and Areka sites. Clearly, institutional biases—mostly unintentional—are widespread, and urgent action is needed to avoid the elite capture of benefits from their interventions.

Table 4. Formal institutions with perceived *unequal* benefits to local residents

Type of CA	Ginchi	Areka	Kapchorwa	Kabale
Agricultural Research	Favor farmers with previous exposure to technologies and information, living near roads and with some education.	Benefits few farmers who have enough land and labor.	On-farm experiments conducted with few farmers, and results/varieties not shared with community. Little follow-through on experiments or technical follow-up.	Only those who can afford or access inputs value the research initiatives.
Agricultural Extension	Educated farmers benefit most; Galessa has poor coverage.	Farmers with a lot of land and labor; male farmers.	National Agricultural Advisory Services (NAADS): continuity affected by fund availability; only support registered farmer groups who pay the annual 10,000 fee; support more the elite farmers who easily adopt technologies.	NAADS allegedly favours the relatively well off who can co-fund, kinsfolk of leaders and prominent members of society.
Local Administration	Those working in KA benefit(ed) most; some perceive a bias toward their friends and relatives.	Not mentioned by farmers.	Biased towards the "politically correct."	Those related to, or favoured by, LA staff given special attention.
Cooperatives	All members benefit equally from inputs; those who cannot make down-payment do not benefit.	Poorest farmers benefit least.	Involved in barley coffee and maize marketing to World Food Programme (WFP) and mainly serves large-scale farmers (Kapchorwa Commercial Farmers' Association).	Savings and loan mechanisms: By nature this is an exclusionary association which mainly serves the more resource endowed farmers who are able to save.
National Conservation Authority	Not mentioned by farmers.	Not mentioned by farmers.	Local employees of Uganda Wildlife Authority (UWA) (park rangers) favor community members who engage in illegal extraction that is condoned by and benefits these officials.	National Environment Management Authority (NEMA) tends to pamper some communities (Kabisha and Kyabagara), paying farmers to ferry planting materials and dig water trenches on their own land.

Stakeholder workshops

Site-level stakeholder workshops were the most instrumental for generating concrete strategies for addressing identified problems and will be the focus of this

section. Following feedback of findings from the situation analysis findings, participants were asked to identify NRM issues requiring collective action in their respective sites. These are summarized in Table 5. Following prioritization, the priority two to four issues were selected for intervention and joint learning through action research. These are denoted by the cut-off line in each column of Table 5. The discussion of priorities generated so much enthusiasm that the group task to select the top two issues was sidelined in some sites, with participants refusing to eliminate some themes from intervention. This caused some sites to select three or four topics for intervention rather than the specified two.

Collective action can be fostered through both negotiation support of local stakeholders (to reach local agreements) and by-law reforms (to enforce local agreements), while changes in institutional practice can be fostered through facilitated learning-in-practice. Participants were therefore asked to highlight specific types of interventions required for each of the prioritized action research themes, namely: (i) negotiation support; (ii) by-law reforms; and (iii) changes in institutional practice. Proposals made by participants, summarized in Table 6, formed the basis for action research interventions.

Given the verification of problems stemming from limited stakeholder collaboration at the local level (horizontal stakeholder engagement) as well as from poorly structured linkages with external organizations (vertical stakeholder engagement), each of these was prioritized in action research. Table 7 summarizes how the case studies presented in the next section relate to these two levels of intervention. While a few case studies may be clearly defined around horizontal or vertical stakeholder engagement, a few others clearly combine both strategies in the identification of solutions.

Table 5. NRM issues identified by stakeholders as requiring collective action in each benchmark site

Areka	Ginchi	Kabale	Kapchorwa
1. Spring development (appropriate tree species and spring maintenance) 2. Equitable approaches to technology dissemination 3. Boundary tree management 4. Collective action for the control of pests, diseases and wild animals --------- [3] 5. Soil conservation (common drainage ways, collective action for labor-intensive activities) 6. Management of communal grazing land 7. Loss of income at harvest (seed consumption, early harvest / sale) 8. Policy issues required to address all watershed themes	1. Spring management (appropriate trees, ensuring long-term water supply, maintenance of structures) 2. Soil and water conservation (gulley stabilization, common drainage, collective action for labor-intensive activities) --------- 3. Niche-compatible agroforestry (farm boundaries) 4. Savings and credit associations 5. Controlling livestock movement for protection of outfield investments 6. Crop diversification 7. Equitable approaches to technology dissemination 8. Dung collection from outfields (collective action to regulate access to dung, alternative fuel source)	1. Enhanced cooperation in natural resource management among watershed residents 2. Harmonizing by-laws between conservation zones and adjacent areas (with and emphasis on free grazing) 3. Soil erosion control, emphasizing steep slopes and impacts on valley bottom plots 4. Minimizing harmful agroforestry practices, especially on land boundaries --------- 5. Strengthening women's decision-making and tenure rights over land 6. Land boundary conflicts 7. Controlling bush burning 8. Constructing / maintaining water sources 9. Equitable inheritance practices	1. Collective action in enterprise development and making land investments 2. Co-management of resources of protected area buffer zone and benefits sharing 3. Collective action to mitigate conflicts in NRM accruing from diverse or unclear property regimes (land, tree, water, grazing rights) and sharing of benefit streams --------- 4. Collective action in eco-friendly practices for landscape-level conservation 5. Conflicts from poor farming practices and wild fires 6. Collective action to enable investments in labor-demanding NRM activities, especially for sick women. 7. Access to information on technologies and financing

[3] Broken line represents the cut-off for activities chosen for implementation (above the line).

Table 6. Interventions proposed during national stakeholder meeting to enhance collective action in NRM

Intervention	Areka	Ginchi	Kabale	Kapchorwa
Negotiation support	1. Negotiating access to technologies by groups facing barriers (women, poor) 2. Widespread mobilization for porcupine control with involvement of elders and *mengistaw budin* (governmental body), and research different "treatments" in different villages 3. Involve Peasant Association and religious leaders to facilitate negotiations for farm boundary management by gender, wealth, and divergent interests (cultivating and affected farmers) to identify appropriate niches for Eucalyptus and appropriate substitute species 4. Foster negotiations on spring management by gender, wealth, and divergent interests (land owners and spring users), involving government and religious leaders, to minimize the effect of Eucalyptus on water and ensure equitable contributions to spring maintenance 5. Negotiating soil conservation activities among adjacent farms and administrative units, adapting technologies to land size and farming system	1. Negotiating regulations on livestock movement in outfields to facilitate soil conservation and agroforestry investments 2. Negotiating trees compatible with springs (among spring owners and users) and farm boundaries (among farm owners and affected farmers) 3. Negotiating equitable contributions to spring maintenance 4. Negotiating soil and water conservation structures (common drainage channels, and balanced investments by upslope and downslope farmers) 5. Negotiate benefits sharing of introduced technologies	1. Support local negotiations for increased cooperation within and among villages. 2. Lobbying and advocacy of the political and technical leadership at sub-county level to support ongoing project initiatives which have been lacking.	1. Negotiating access to water points for all community members (in particular for livestock) 2. Negotiate access to and control of communal grazing lands 3. Negotiating access to / custodianship of natural resources in Mt. Elgon NP by indigenous people 4. Negotiating compatible technologies 5. Mobilization for adoption of eco-friendly practices for landscape conservation 6. Negotiating equitable benefits from eco-enterprises

Table 7. Forms of stakeholder engagement promoted through different action research themes and sites

Form of Stakeholder Engagement	Case Studies
Horizontal	1. Porcupine control in Areka, Ethiopia 2. Enabling outfield conservation investments in the Galessa highlands (Ginchi site), Ethiopia
Horizontal and vertical	1. Participatory governance of natural resources in Kabale District, Uganda 2. Facilitation of equitable technology dissemination in Areka, Ethiopia
Vertical	1. Facilitation of co-management of the Mt. Elgon National Park in Kapchorwa District, Uganda

Lessons from implementation of prioritized actions

While many of the interventions are at early stages of implementation, early successes suggest the promise of building upon negotiation support in enhancing collective action in natural resource management at the local level and improving institutional practice to enhance equitable benefits capture from development interventions. Results will be presented in the form of case studies by action research theme. The first three case studies emphasize horizontal stakeholder engagement processes, while the last two emphasize vertical forms of engagement with outside institutions.

Case #1: Porcupine Control in Areka, Southern Ethiopia

Background

Crested porcupine is the most important vertebrate pest in Gununo Watershed, as identified by farmers during a stakeholder workshop held in Soddo in 2004. While a number of traditional control mechanisms were known, some were coveted by local experts earning a living for their specialized knowledge. Furthermore, application of known control methods on an individual basis was ineffective in controlling the pest, given that porcupines travel more than 14 km in a single night, and infestation rates from neighboring farms and villages were high. Collective action was therefore seen as essential for controlling this problem.

Objectives of the activity included the following:

- To assess and determine effective traditional porcupine control methods, and assess their impact on crop loss to porcupine, food security, and livelihoods in the study area;
- To evaluate effective approaches to mobilize collective action for porcupine control; and
- To develop decision support tools from the challenges and lessons learnt for use by other research and development organizations.

Strategy used to foster collective action in porcupine control

The approach used to foster collective action in porcupine control consisted of the following main steps:

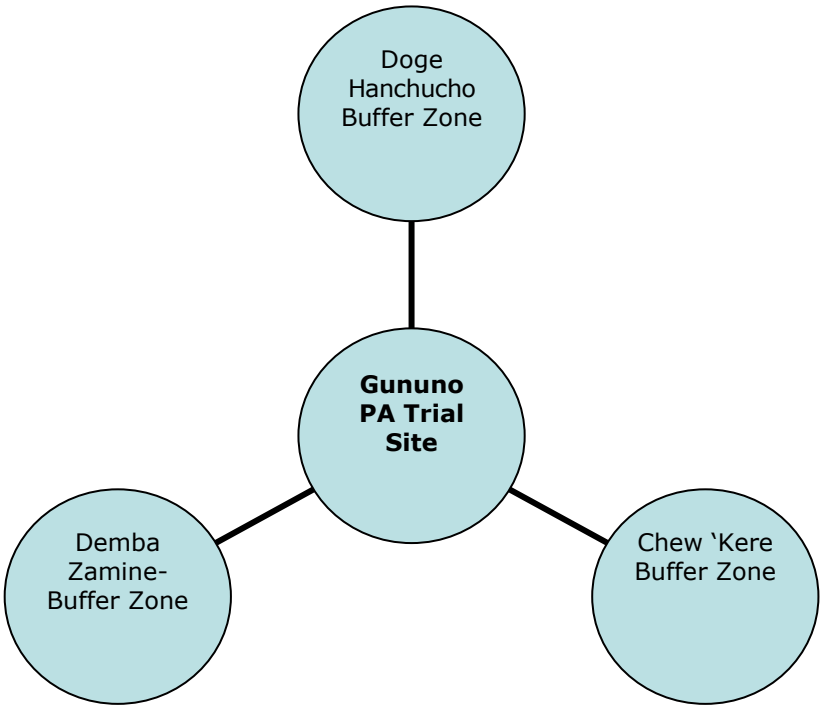
1. Identify indigenous and chemical pest control methods and the landscape niches where each is best applied through interviews with key informants, and design treatments to test different control methods;
2. Discussion facilitated by HARC scientists on the most appropriate forms of collective action for coordinating the porcupine control campaign and by-law reforms;
3. Stakeholder identification through consultations with randomly selected households;
4. HARC-facilitated negotiations between different interest groups to generate solutions acceptable to all (with an emphasis on highly affected farmers and farmers less affected by porcupines);
5. Village-level meetings facilitated by AHI-CAPRi[4] community facilitator to formulate by-laws on porcupine control with full participation of each village;
6. Training by expert farmers and HARC scientists on the application of indigenous and chemical methods of porcupine control, emphasizing strategies previously unknown to them (namely, the wire trap method), and of development unit (DU) leaders on the collection of data on numbers of porcupines killed/caught, methods used, and so on using prepared data collection forms;
7. Mass mobilization by community members in the application of identified treatments;
8. Data collection, monitoring, and evaluation by DU leaders and Unit farmers.

Findings

Farmers presented many traditional control methods for porcupine but prioritized three methods considered to be most effective: deeply dug pits at the outlet of a porcupine cave, circular ditches around graveyards, and a wire trap system. A fourth chemical treatment, Zinc Phosphide, was also used in combination with the first two methods as two additional treatments. Farmers modified the first method of deep digging to 3-4 meters' depth to more shallow pits (1-1.5m) when done in combination with Zinc Phosphide (RATOL™). Methods were selected based on their suitability to different niches within each DU. These would be applied during the season when porcupines are most harmful to crops.

[4] CAPRi is the CGIAR Systemwide Program on Collective Action and Property Rights.

Fig. 1. Schematic diagram representing a trial site and buffer zone of porcupine control



The research involved collective action across all sub-PAs under each DU. Farmers selected DUs units of collective action because they have the ability to enforce local by-laws in support of collective action, and—with only 25 to 30 households—may easily manage collective action and monitor activities during implementation. During the campaign, each developmental group assigned one to two developmental days per week assigned for collective action against porcupine control alone in the watershed. It was further decided that the PA Magistrate Court and local leaders will follow up in by-laws enforcement during the collective action period.

Social negotiations were then supported among farmers whose crops are frequently affected and the least affected households, as well as with farmers participating and not participating in the Safety Net Program.[5] By-laws were then

[5] The Safety Net Program is a government program designed to help low income farmers by paying them to carry out developmental activities (construction of schools, offices, health centers, road maintenance, and so on) for the PA. Some non-participating farmers are uncooperative in collective activities, arguing that Safety Net farmers must collaborate since they are paid to do so by the government. However, negotiations led to the joint conclusion that porcupines are a problem for both parties and affect each group equally, requiring joint efforts by both groups.

formulated through full participation of farmers and distributed to all PA and sub-PA leaders.

Once control methods, administrative units, and by-laws for operationalize collective action were established, and the relevant individuals trained on control methods and data collection procedures, the campaign was launched. Farmers passed on foot and vehicles with mega-phones and local music were used to publicize the campaign across all DUs, villages and PAs. Following the campaign, records were taken by DU leaders on the number of porcupines caught or killed by different farmers, villages, niches, and control methods.

Final numbers indicated that 984 porcupine were killed or caught through collective action in the watershed in a single growing season. Among Gununo watershed, Offa village ranked first in the control of porcupine. This may be attributed to the high levels of collective action sustained by all households. This high level of collective action was in turn due to higher levels of porcupine infestation in this village relative to other villages in watershed, as evidence by the high number of porcupine niches known in the village (more than 100). The use of rodenticide in combination with the modified deep digging (1.5m depth) at the outlet of the porcupine hole proved to be the most effective control methods compared to other methods.

A number of important outcomes and impacts were observed from the collective approach to porcupine control, namely:

- Increased motivation for working together toward common problems among watershed farmers;
- Decreased time and energy spent keeping watch of crops at night, leading to substantial improvements in quality of life;
- Decrease human disease resulting from staying outside all night long, and decreased frequency of visiting health centers, clinics, and hospitals; and
- Household incomes and food security increased from reduced crop losses by porcupine.

Lessons

The following lessons can be distilled from this case study:

- Efforts spent in pest control will be disproportionate to the rewards; collective approaches can substantially increase returns from investments of individual farmers.
- Combining local knowledge, introduced technologies, and collective action into a single strategy can produce synergies otherwise unattainable by individual strategies in isolation.
- By-laws can help to substantially advance collective action by minimizing free riders who can easily undermine collective action initiatives.

Case #2: Participatory Governance of Natural Resources in Kabale District, Uganda

Background

In Rubaya sub-county, like in many other areas in the Kigezi highlands of southwestern Uganda, land management has taken on huge dimensions as one of the leading human and environmental challenges. Natural resource management has mainly taken the form of scattered individual farmers each independently carrying out land conservation measures on their small land plots. Most NGOs working in NRM in the region tend to emphasize technological dimensions of NRM, often neglecting community perceptions and interests, and the social and psychological dynamics underlying human behavior. Government organizations such as the National Environmental Management Authority (NEMA) had, for example, paid community members to implement land management technologies, such as digging water trenches on their own land. Because development agencies supporting NRM work with farmer groups initially often end up supporting few households and supporting individualized decisions on land management, many problems that are collective in nature remain unaddressed. Examples include land conflicts, incompatible trees on farm boundaries, destruction of crops from free grazing and bush burning, and acute land degradation (such as gulleys or landslides) requiring collective solutions. Finally, poor leadership and non-enforcement of NRM by-laws has led to a situation where rules, where present, are left un-enforced. Local Environmental Committees (LECs) were established by local government to coordinate and oversee environmental concerns at Parish and Sub-County level. These Committees are perceived by farmers as dysfunctional due to financial and capacity constraints and lack of downward accountability. Other local institutional structures for NRM have also been established through research and development interventions. In Rubaya Sub-County, the location of this study, AHI/CIAT[6] has established Policy Task Forces (PTFs) in 4 pilot villages to address NRM conflicts. While collective action in NRM is much stronger in these villages as a result, the effectiveness of by-laws under their jurisdiction is still undermined by inadequate enforcement, lack of political will, and inadequate support to technological options meant to operationalize the by-laws.

Strategy for enhancing multi-stakeholder efforts in NRM

AHI-CAPRi facilitated multi-stakeholder efforts for improved NRM in three sub-counties of Kabale District. From the outset, AHI-CAPRi set out to build on existing institutional foundations—namely, LECs and PTFs. The foundations set by earlier work on by-laws provided a strong foundation for early successes in Rubaya Sub-County. Results are therefore presented for Rubaya, including both the initial 4 pilot villages located in three parishes as well as two additional villages located in two additional parishes. These additional villages were included to cover areas worst affected by land degradation, and to scale up interventions from original pilot villages.

[6] CIAT stands for International Center for Tropical Agriculture.

AHI-CAPRi followed a series of eight steps to engage stakeholders to develop collective solutions to shared NRM problems. These steps included:

1. Community fora were called by sub-county and village leadership representatives and identified volunteer community-based NRM facilitators, and communities were sensitized by leading them through a self-analysis of the role of collective action in NRM and livelihoods;
2. Meetings facilitated by the AHI-CAPRi community facilitator (CF) at sub-county level with representatives from pilot villages and local leaders (elected officials and opinion leaders) to identify or develop organizational structures for spearheading NRM at sub-county and village levels;
3. Capacity building of existing or new structures by CF and local government on their roles and responsibilities in NRM;
4. Support to NRM structures to lead a participatory review of existing by-laws in the four villages with longstanding involvement in AHI and formulation of new by-laws in the two new villages to strengthen natural resource governance;
5. Cross-site visits organized by the CF to bring members of villages new to participatory by-law reforms and sub-county leadership to communities that had successfully implemented model NRM by-laws and technologies for experiential sharing;
6. Multi-stakeholder workshop to harmonize by-laws emanating from the 6 villages at sub-county level with representatives of sub-county and village NRM structures, each village (LC1s, male and female farmer representatives), local government (sub-county chief, LC3 chairperson and secretary for Production) and the NAADS Coordinator;
7. Technical support provided by CF to sub-county NRM structures to plan and facilitate parish and village meetings for the purpose of sensitizing community members and eliciting their feedback on newly revised or formulated by-laws at sub-county, parish and village levels;
8. Lobby leadership to endorse by-laws which will apply uniformly at sub-county level.

Findings

The sub-county leadership and community representatives resolved that new organizational structures be established to supersede both PTFs and LECs but incorporate their functions. Reasons mentioned by farmers and other stakeholders included the fact that some PTFs were not fully functional, and new pilot communities lacked these structures. LECs, on the other hand, were said to exist only in name. They were constituted via appointments by the sub-county leadership and of limited effectiveness due to inadequate financial resources and ambiguity in their roles and responsibilities. Thus, NRMPCs were constituted at sub-county and village levels to spearhead NRM initiatives, comprised of sub-county and village leadership (ex-officio members) and elected committee members. NRMPCs differed were seen as more representative than prior structures, extending to village level through involvement LC1 leaders, farmer representatives, and community-based

NRM facilitators. Furthermore, at sub-county level, they were composed of all representatives of LCs from pilot villages, village NRMPCs, community-based facilitators, and ex-officio members at the sub-county level. PTFs included only two members at Parish level drawn from the pilot villages.

In villages where by-law reforms were ongoing under AHI, participatory review of by-laws was carried out to address deficiencies of existing by-laws. Some of the existing by-laws lacked punitive measures, such as fines. Other by-laws were too general in nature, failing to specify how they would be operationalized. In villages new to participatory governance, new by-laws were established. Most of these were derived from experiences from other communities with experience in participatory by-law reforms, taking into account the unique circumstances and land management challenges in a particular community or landscape or felt NRM needs. Following the formulation of by-laws on free grazing and soil and water conservation, technologies were seen as necessary for by-law implementation. For example, prohibitions on free grazing require alternative sources of fodder and soil, and water conservation would require planting of trees and grasses to stabilize conservation structures. Collective action emerged around communal tree nurseries for this purpose.

Cross-site visits proved instrumental in motivating additional interest in improved natural resource governance in villages new to the approach due to concrete benefits observed. Community members were motivated by both the social cohesiveness for collective action, effectiveness of technologies (check dams, water trenches), by-laws, and the outcomes of these innovations when applied collectively. Cross-site visits catalyzed farmer interest to immediately return to their villages and implement observed methods of controlling soil erosion. Pick-axes, spades, and forked hoes were provided as an incentive to farmers. By-laws helped to mobilize collective action in constructing check dams across upper slopes to reduce run-off to farms below, while individually dug water trenches were used to capture excess water. Following construction of soil erosion control structures, seedlings from previously established nurseries were ready to be transplanted to protect the conservation structures.

The meeting at sub-county level to harmonize by-laws led to the development of one final set of by-laws for adoption at the wider sub-county level (see Box 1). Several different types of criteria were used in this harmonization process. The sub-county chief assumed veto power to ensure that locally formulated by-laws adhere to national laws on maximum fines[7] and their feasibility under existing financial and land use scenarios. Where fines were conflicting but not considered too high by the Chief, participants selected a single figure through consensus. Levels of fines selected by participants depended on their determination of the balance between feasibility and fairness—not too harsh to be unfair, but at the same time high enough to ensure that by-laws are followed. Farmers also strongly felt that local leaders should be exemplary in NRM. If they do not follow the by-laws, then everyone else feels they also have no reason to respect the law. Elected leaders were often reluctant to support enforcement of NRM by-laws for

[7] Local Government Act of Uganda forbids by-laws established at sub-county level to fine in excess of two currency units (40,000 Ugandan shillings, or approximately US$25).

fear of alienating the electorate, in effect jeopardizing their source of votes. Accordingly, one of the key roles promoted by NRMPCs was to lobby the leadership structures to buy into the concept of supporting the establishment and enforcement of NRM by-laws.

Following this harmonization process, the NRMPC assumed responsibility for calling the "NRM By-law Sensitization / Stakeholder Meetings" at parish and village level to raise awareness on the harmonized by-laws and elicit feedback from farmers. Each by-law was discussed one by one in plenary, giving the participants the opportunity to critique the by-laws. After finishing this process, amendments were made to the harmonized by-laws. The by-law on bush burning, for example, was amended to include damage to property caused by wildfires over and above the fine of 10,000 shillings for those starting the fire. Farmers similarly requested an additional by-law amendment on free grazing, requiring the culprits to compensate households for the value of crops lost, soil conservation structures damaged, and other damages incurred.

Lobbying to sub-county leadership for by-law endorsement was done by the NRMPCs from village and sub-county levels from September, 2006, following the harmonization of by-laws at sub-county level. As a result of persistent lobbying, by-laws were finally endorsed by the Rubaya sub-county Local Council on January 17, 2007. Copies of endorsed by-laws were distributed to local leaders in each village and to Village Information Centers. To bolster political support to by-law enforcement, a publicity campaign at village, parish, and sub-county levels, and district endorsement of by-laws were scheduled.

Table 9 summarizes local evaluations of the project through the identification of local indicators and assessment of their performance. It also led to collective investments in over 2.5 km of check dams on upper slopes and individual investments in approximately 6.4 km of water trenches on private property.

Box 1. Reformulated and harmonized by-laws in Rubaya sub-county*

Soil and Water Conservation:

- Everyone shall dig water trenches (soil erosion structures), especially on hillsides in their own land prior to any cultivation. Anyone who violates the above by-law will be liable to a fine, which will be decided by the sub-county (LC3) council, in collaboration with representatives of Policy Task Forces (PTFs).
- Napier/Elephant grass and other grasses (and/or trees) shall be planted in landscapes where water trenches are not feasible, such as in very rocky or rugged terrain.
- Every farmer should consult neighboring land owners prior to breaking down the terrace or contour bund along the common land demarcations or borders.
- *No one shall cultivate their land without digging water trenches, planting trees and grasses, to conserve soil and water in their own land.*
- *Prior to cultivating, everyone should excavate trenches, steps, and A frames.*

Those who violate these by-laws shall be fined 5,000 Uganda Shillings (UGX) and do the needful; or else they will be forwarded to the LC 3 council authorities for punishment.

Grazing:

- *No one shall graze in the valley whether or not the land in the valley is one's own.*
- *Everyone shall graze in their own land; and if not, seek permission to graze in others' land. Any abandoned land—including hill top land—should be utilized for growing agro-forestry species.*
- *No one is allowed to come from another country and graze in Uganda. [Ref: Rwanda]*.

Those who violate these by-laws will be fined UGX 10,000.

Water:

- Everyone who draws water from a communal water source or well shall cooperate with others in its cleaning or maintenance.
- Anyone utilizing land near a communal well, road, foot path, or water trench should reserve a stretch of 1-2 meters of uncultivated land between their land and the said communal structures.
- *No one is allowed to graze, cultivate, and wash clothes from the well*.

Those who violate this by-law will be fined UGX 5,000.

Other:

- *Burning of grasses, hillsides, weeds and trees is strictly prohibited (Those who violate this by-law will be fined Sh. 10,000).*
- *When cultivating, leave some reserve narrow strips of land along boundaries, the road side, livestock tracks, etc. (Those who violate this by-law will be fined Sh. 5,000).*
- *Whoever cuts down trees should plant more (Those who violate this by-law will be fined Sh. 5,000).*
- *Every household should cultivate fruits, such as Avocados (Those who violate this by-law will be fined Sh. 5,000).*
- *Anyone who owns or rents land in another village should abide by the NRM by-laws obtaining in that village.*

Note: Village Policy Task Forces (PTF) should have representatives at LC 3 (sub-county) level.
* By-laws in italicized font are those which are newly proposed by communities.

Table 9. Observed changes in local indicators for participatory by-law reforms

Observed Change	Indicators
More harmony cultivated between crop farmers and livestock owners	▪ Fewer NRM conflicts (cases) registered in LC courts. ▪ More compliance to by-laws on grazing, e.g. irresponsible free range grazing progressively diminishing as more farmers are adopting zero grazing and planting of fodder crops.
More people changing their attitudes to embrace NRM	▪ More people voluntarily attending NRM meetings and practicing improved soil erosion control technologies, such as digging check dams and planting trees and grasses. ▪ More neighboring farmers working both individually and collectively on digging erosion control check dams and trenches. ▪ The wealthy community members beginning to work with the poor members on collective NRM.
Improved awareness that check dams and water trenches are effective means of controlling soil erosion in hilly terrain.	▪ More people increasingly adopting digging check dams and water trenches to counter soil erosion. ▪ Those who dug check dams have testified that this dramatically checked soil erosion, for example, in Mushenyi village. ▪ Better methods of digging erosion control structures.

Lessons

This case study illustrates the following principles for collective action in NRM:

- In initial stages of intervention, there is strong need to take time to sensitize and train local resource users on the benefits of improved NRM and natural resource governance;
- Political commitment plays vital role in NRM, especially in mobilization, sensitization, policy formulation, and by-law enforcement.
- Changing peoples' attitudes to embrace land management/NRM practices is a long-term process, as illustrated by the greater responsiveness of farmers in the sub-county where by-law reforms had a longer history.
- Sustainable land management, often treated as the responsibility of individual households by farmers and development agencies alike, requires collective effort in the form of collective rules and regulations and implementation of agreements.
- Promoting by-law implementation without putting in place the requisite technological options to facilitate their implementation is futile, as farmers will have no choice but to ignore by-laws if no livelihood alternatives exist to meet their basic needs.

Case #3: Equitable Technology Dissemination in Areka

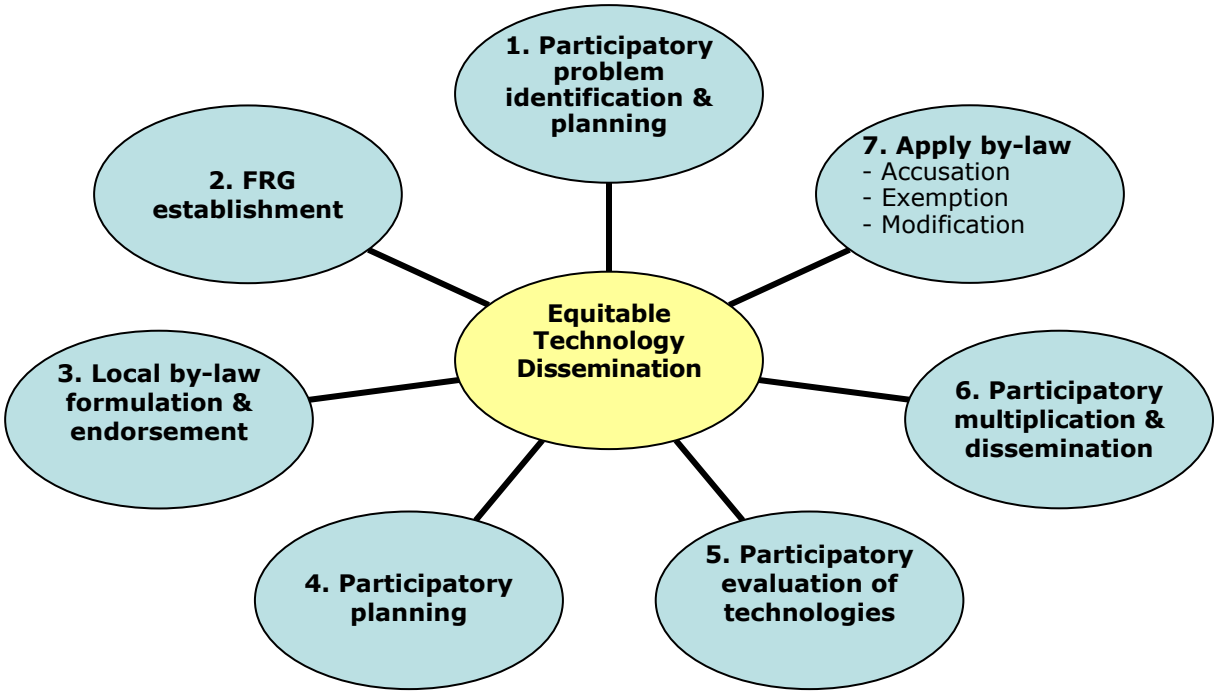
Gununo Watershed is located in the high lands of southern Ethiopia where land is scarce due to intense population pressure. Productivity of crops is very low due to several factors of which poor genetic potential is one. Thus, food shortage is common for at least three months, even in years of good rainfall. The government has tried to disseminate improved seeds to farmers through credit. However, repayment rates were very low, and the government is currently disseminating improved seeds to farmers for cash payment. As most farmers in the watershed are

resource poor, especially women, it has become difficult for them to access improved seeds through this system. During preliminary focus group discussions, women complained of an extreme gender bias in agricultural extension. Hence, a participatory action research was conducted on how to enhance improved seed access in the watershed since 2005 through the support of AHI.

Intervention Strategy

Following identification of gender inequities in agricultural extension during gender-disaggregated focus group discussions (situation analysis) (see Figure 3), community meetings were called by AARC (Adet Agricultural Research Centre) scientists and CAPRi community facilitators to discuss the way forward. The meetings were held at village level (five villages of Gununo Watershed) to identify and prioritize local problems and possible solutions. These decisions, involving by-law formulation and technology multiplication following the specifications laid out in by-laws, were then reviewed and approved in a watershed-wide forum again facilitated by AHI site teams. Innovative farmers were selected by the watershed community and five farmer research groups (FRGs) were formed (one per village) in two PAs to evaluate crop varieties and identify those with high levels of acceptance by farmers. As varieties were being evaluated, draft by-laws specifying rules and procedures for equitable technology multiplication and dissemination were developed at village level through focused discussion with farmer representatives chosen by wealth status and gender. These draft by-laws were then authenticated by local PA leaders for subsequent enforcement. Seeds of tested crop varieties (*Boloso-I* for taro, *Simba* for wheat) were given to farmers according to rules established in the by-laws, through a system of in-kind credit and following trainings on management practices. These farmers agreed in turn to multiply and transfer the same amount of seed they were given to other selected farmers according to agreed by-laws. Follow-up monitoring to ensure compliance with agreed by-laws was done by FRG leaders, FRG members and other male and female watershed residents at various stages of the process. FRG leaders were charged with the responsibility of reporting offenders to the local administration, who would in turn take action through the local PA courts. Data were collected on the repayment process and farmers' perceptions about the effectiveness of the approach.

Figure 3. Steps in the approach to equitable technology dissemination



Findings

FRGs established. To implement the proposed community plan of participatory seed technology evaluation, multiplication, and dissemination, FRGs were established to enable a greater number of farmers to participate in research and extension activities in the watershed. FRG members were selected by the community and included farmers from different social categories (women, poor, poorer, and wealthier farmers). A total of five FRGs were established in the five zones of the watershed. Each was established in an area (village) rather than around a particular crop. This was done to reduce the difficulty in management and facilitation of greater numbers of FRGs than if they were crop-based.

By-law formulated. To enhance crop production and address challenges of technology access, farmers felt it necessary to identify local seed multiplication and dissemination channels that would give equal consideration to different categories of farmers, independent of gender or wealth. Thus, the local by-law was established to establish equitable and sustainable technology multiplication and dissemination. A number of meetings were held with key informants and with the community to develop the draft by-law. Finally, agreement was reached to have one by-law which was believed to benefit all social categories equally throughout the watershed. The by-law was authorized by two PA leaders and social court judges.

Box 1. Articles in the by-law

According to the by-law, one third of the beneficiaries must be women while selecting beneficiary farmers. A farmer has to manage the new starter seed given to him/her better than or equivalent to his/her own private seed. He/she has to transfer equal amounts of improved seed he/she was given initially to another farmer selected by FRG leaders immediately after harvest. If he/she needs to sale the surplus product, he/she has to sell it to farmers within the watershed at a free market price until all the watershed community gets access to the improved seed. If there is not anyone who wants to buy the seed within the watershed, the seed owner can sell his/her product out of the watershed after informing the situation to FRG leaders. If a farmer disobeys the by-law, he/she will be accused by FRG leaders to the PA court. The PA court will make the judgment and the PA leaders take action based on the results of the judge. If a farmer partially loses his/her seed through natural disaster, he/she will transfer less amount based on the FRG leaders' judgment.

Seed multiplication and dissemination. Selected varieties of seed from taro and wheat and taro corms were distributed to farmers as starter seed through FRG leaders. These crop varieties were evaluated by farmers before wider dissemination. Farmers were given starter seeds in credit (credit in kind without interest) so that they would pay back equal amount of seed to be transferred to other selected farmers until the entire watershed community gains access. One hundred sixty farmers from five villages were each given five kilograms of improved wheat seed (varieties *Wabe* and *Abola*). This amount of starter seed was assumed to cover an area of 400m^2 land. Similarly, corms of an improved taro variety called *Boloso-I* was distributed as planting material to over 120 farmers. The FRG leaders monitored seed multiplication and dissemination from sowing to harvest. The yield of the new variety of taro was by far higher than the local cultivars and was preferred by all farmers also for its other characteristics. The high yield was attributed to the high number of tillers (up to 40) and corms per hill, coupled with relative tolerance to low moisture stress. Currently, the new taro variety is disseminating very fast, primarily through purchase, and farmers said "thanks to the new taro variety we do not need food aid from the government hereafter". Performance of new wheat varieties was similar to the local variety and variable from one farm and village to another due to differences in fertilizer application and weeding.

Credit repayment and by-law implementation. Based on the by-law, all farmers successfully repaid taro, while rates of repayment of wheat seed varied by village, with about 25 percent of farmers in Gegecho and Ofa repaying only after follow-up negotiations and farmers in the remaining villages paying voluntarily. Despite the lower rates of repayment of wheat, repayment nevertheless improved over the formal extension system by 24 to 277 percent among different watershed villages.

Those farmers who did not repay their credit were accused at local courts through FRG leaders of their respective villages. Most of them expected exemption from repayment, as previously experienced, but acknowledged their responsibility.

A few said that their wheat yield was poor, and because of that they were unable to repay.

Outcomes

Some of the benefits of the approach may be attributed to the technologies disseminated. In a participatory monitoring and evaluation exercise, all of the interviewed farmers said that the new taro variety had greatly contributed to increasing food security in the watershed due to its high productivity, early harvest, and resistance to decay when stored in the field for long periods. This has extended the season in which food is readily available in farmers' fields from 4/5 months to 7/8 months a year. The high productivity of the new taro variety also plays a vital role in alleviating the problem of land scarcity in the watershed. The variety is also becoming a cash crop. Some farmers said that they had never received such income from any other crop—even from coffee, Ethiopia's primary cash crop. Some farmers declared a 225 percent increase in income relative to the local variety in the same area of land. One farmer received more than 2000 Birr (US$230) from taro in 2006, and several households are expanding the area under taro cultivation. The variety also saves on fuel wood, from three bundles of fuel wood to one to cook a pot of taro. The Ministry of Agriculture at the district level is now trying to put this variety in its regular food security program after visiting Gununo watershed.

Yet the benefits go beyond the technologies to the approach used, bringing more equitable benefits to women and poor farmers relative to the formal extension service. Farmers in some villages stated that no female-headed households in their villages had ever accessed improved seed through the formal extension system. At the end of the season, farmers claimed more than a five-fold improvement in technology access by women and an almost three-fold improvement in access by poorer households. In-kind credit was also seen as more favourable to farmers than financial loans, as was the ability of farmers to learn about new technologies prior to adoption through prior testing of technologies within FRGs. Unlike the previous credit system in which farmers consume or sell all of their produce to escape repayment, most farmers were able to maintain improved seed for the next planting season. Surprisingly, farmers claimed to prefer the approach over the current Safety Net Program, which gives seed to resource poor farmers at no cost. While partially attributable to the variety used, the approach to on-farm screening was also instrumental in improving varietal performance.

Given their previous experience, farmers were reluctant to work with researchers in the beginning, assuming nothing new would come to them. The relationship between researchers and farmers has improved due to the active participation of farmers and greater consideration of their interests by researchers. Farmers outside of the research area liked the current study and started requesting their administrators to have credit be repaid by seed rather than cash.

In addition to these initial successes, several challenges were noted that hindered the effectiveness of the approach:

- A few FRG leaders were unable to carry out agreed roles and responsibilities effectively. This had negative implication on the by-law implementation process, as reflected in incorrect selection (bias) of farmers and limited follow-up to crop management.

- It was uncommon to accuse relatives or neighbors who failed to repay credit.
- The by-law lacked an article to hold FRG and local administrative leaders accountable to agreements, undermining repayment rates.
- Although one third of the beneficiary farmers had to be women, it was challenging to maintain this proportion for each technology due to inadequate land tenure and use rights.
- Farmers following poor cultural practices (weeding, fertilization) caused crop yield to be reduced, with negative implications for repayment.
- Some farmers were reluctant to repay, giving different reasons such as crop damage and seed impurity. A few farmers also took seeds while they did not have enough land left to plant/sow. Favoring newly introduced varieties, others tried to return non-true seed purchased from market rather than the new varieties.
- While access to seed among different social categories improved within the watershed, the approach did not adequately address seed demand from farmers residing outside of the watershed in the same administrative zones.

These challenges nevertheless provide lessons on how to improve upon the approach in the future.

Lessons

The following lessons may be distilled from this case study:

- Farmers tend to respect their social by-laws more than government rules in credit repayment for improved seed, suggesting that locally negotiated by-laws have great promise in strengthening equitable development processes.
- Negotiating repayment is more effective than formal law enforcement. More farmers who did not pay their credit in time repaid following informal negotiation than formal accusation.
- The behaviour of individual FRG leaders played a big role in repayment of in-kind loans, suggesting that FRG leadership selection process needs to be researched in greater detail.
- Credit repayment rates improve when high yielding and preferred crop varieties are provided. On the other hand, deficiencies of the technologies may cause erroneous assumptions about the effectiveness of by laws.
- The varieties under dissemination have become familiar within a short period, and the dissemination process hastened beyond expectation. This was particularly true for taro, which was introduced targeting increased food availability, but has also become a cash crop.
- Most farmers who failed to repay in-kind loans were prohibited to take new seeds. While this is harsh punishment for the offenders, it will strengthen technology access in the future by improving rates of repayment and farmer-to-farmer spread of technologies.

Case #4: Co-Management of Mount Elgon National Park

Conservation Policy in Uganda

In the 1930s, the British colonial government declared the Mount Elgon area a Crown forest and gazetted it as a forest reserve, officially excluding people from the area. The native Benet (Ndorobo), however, continued to occupy the area until 1983, when the Government of Uganda changed the official designation to Mt. Elgon Forest Park, forcing all people still residing within the Park boundaries to leave the protected area. A portion of the area was de-gazetted to resettle the Benets. In 1993, the Government of Uganda again changed the designation of the protected area to Mt. Elgon National Park, shifting management from the Forest Department to the Uganda Wildlife Authority (UWA). This led to tighter restrictions on protected area access by local people, further souring relations between communities and Park staff, and leading to illegal harvesting of park resources by local residents—a practice tacitly accepted by corrupt park rangers. From 1995 a new co-management policy was implemented for all protected areas in Uganda. This policy was designed to improve relations with local people through a move toward shared responsibility for park management and conservation as well as shared benefits.

Consequences for livelihoods, conservation, and people-park relations

Up until the 1970s, there was no legal permission to cultivate in the forest, and the forest was left intact. However, the indigenous Sabiny or Benet were given special consideration outside the law (through an informal understanding), as their land use practices posed no threat to the health of the forest reserve. Cultivation was only practiced in the Moorlands, and forest use was limited to hunting and gathering. The status of the forest during this period was overseen jointly by Forest Department and community leaders**.**

In the 1980s, resettlement of the communities outside the park marginalized the Benet from their traditional resource base and livelihood system. After prolonged pressure from the Benet community (a group of elders) and District leaders, an area of the Forest Reserve was de-gazetted for use by the Benet. In the process of resettlement, not all the Benets were resettled, and some remain landless to date, illegally settled inside the National Park. Following this period, the Benet community no longer had legal rights to own and utilize the land they had inhabited for the previous 200 years. There was no effective consultation process for the future use of the protected area or discussions of what alternatives the community had to sustain their livelihood. The livelihood changes induced by resettlement and growth in human and livestock population only increased pressure on park resources, compromising both livelihood and conservation objectives.

When management of the Forest Reserve shifted to UWA in 1993, the relations between the Benet and the government deteriorated quickly as a result of harsh enforcement of exclusionary policies. Livestock grazing and cultivation of Irish potatoes in the Moorlands was prohibited, and any remaining Benet homes inside the protected area were burned. The informal community of elders, with the support of Action Aid and Land Alliance, formed a legal entity called the Benet

Lobby Group. The Benet Lobby Group and Benet Settlers Association (BESA) worked at local and national levels to raise awareness of immediate risks to their livelihoods, and sustained a court case against the Government of Uganda until its resolution in favour of the Benet in 2005. Exclusionary policies had a number of other negative spin-offs, including increased corruption by protected area officials as they encouraged bribes from local elites (mostly non-Benet) for access to forest resources. The pressure was borne largely by women and children, who were physically abused. More recent co-management policies have brought no benefits to the Benet due to government favouritism toward other ethnic groups with whom they have no history of conflict, but who have limited to no customary rights to these resources.

Empowering the Benet to benefit from co-management policies

The Kapchorwa District Landcare Chapter (KADLACC), with the technical and financial support from AHI-CAPRi, is working to bring an intervention that will end this impasse between the Benet and UWA. The intervention strategy included the following steps:

1. Participatory mapping with district stakeholders by KADLACC to identify interest groups to be involved in co-management and equitable benefits sharing in the protected area.
2. Focus group discussions, facilitated by KADLACC, with each of the identified stakeholder groups: four Benet villages located in the de-gazetted zone, UWA (Community Rangers with their Sector Head), and the Benet living outside the resettlement zone.
3. Stakeholder meeting facilitated by district champions to initiate dialogue on co-management among various government departments (Agriculture, Environment, Forest), community-based organizations (CBOs), farmer groups, and non-governmental organizations (NGOs). A consensus was reached on key issues from the community's point of view, and community members presented requests for technologies that could address their livelihood and conservation needs.
4. Visit by KADLACC to the UWA Sector Warden's office to communicate the Benet's interest in acquiring technologies found in the UWA field office. UWA obliged by providing tree and fodder planting materials.
5. A District level meeting, facilitated by KADLACC, was held involving community representatives, sub-county council members, the UWA Sector Head, district leaders, and local government departments. The discussion entailed the following:
   - Exploration of livelihood and conservation issues surrounding the Park and areas of mutual interest among the various stakeholders;
   - Exploration of possibilities for co-management, given the highly polarized views from the different parties and the ongoing court case between the Benet and UWA, in which it was agreed that this would not deter an informal consensus-building process; and

- Development of an action plan around agreements reached, including specified days when the Benet can collect honey and bamboo shoots in exchange for community contributions to controlling illegal activities within Park boundaries.

6. Informal discussions among community members and KADLACC on the types of activities that could be negotiated to further build the relationship with UWA while posing no significant threat to conservation objectives of the protected area.
7. Multi-stakeholder meetings facilitated by KADLACC at Parish level with community representatives, an UWA official, and representatives of sub-county government to elicit community views on protected area management and negotiate rights and responsibilities in co-management.

Outcomes

The reconciliation process was jump-started through UWA efforts to share technologies with the Benet and by initiating collaboration around issues mutually agreed upon. From within each stakeholder group, allies closer to reconciliation were identified, and a trust-building process was initiated at different levels of governance. Through informal lobbying, the parties were enabled to understand each other's points of view, facilitating agreements to be reached on the process to be used in developing understanding among the stakeholders. At a later stage in the negotiation process, UWA representatives and the Benet were both encouraged to focus on the interests of the other party, with the conservation of biodiversity forming an agreed 'bottom line' objective. This enabled them to move beyond the former positioning around particular outcomes (such as total exclusion vs. restoration of historical tenure and use rights) to dialogue around resource use options that would not compromise the bottom line. This led to the Benet to expand their expectations beyond land rights to include access to resources within Park boundaries. The two parties were then able to reach a mutual agreement on shared custodianship of the Park, working collaboratively toward environmental objectives and creating optimism for a lasting solution.

According to the Benet, a number of compromises were reached. In exchange for certain rights to park resources, the Benet must play a formal role in policing park entry by others. Early indicators suggest that this had increased the number of Benet households entering the park as well as the amount of bamboo being harvested from the park, but dramatically decreased the number of livestock grazing inside park boundaries. The number of arrests was also reported to decrease. These indicators—in addition to environmental condition within the park—must be closely monitored into the future to ensure the early success in conflict management can be sustained.

Lessons and insights

Though still in its early stages, a number of lessons have emerged that will help to shape further interventions and which may be of use to other co-management processes within and outside of Uganda. These include the following:

- KADLACC provided a forum for both parties to engage positively despite the history of conflict and an ongoing court case. Identification of and support to local champions to facilitate multi-stakeholder natural resource management processes (in this case, co-management of the Mount Elgon National Park) has proven instrumental in managing conflict.
- Despite warnings that dialogue could not be advanced during the situation of intensified conflict represented by the ongoing court case, the re-opening of dialogue on protected area co-management has created opportunities for rapprochement and greater mutual understanding despite the situation of tense conflict.
- Collective action among diverse stakeholders to address NRM issues within and outside protected areas promotes dialogue and is likely to foster greater access by communities to the natural resources in contention.
- Parallel multi-stakeholder processes at diverse levels help to bridge the gap between policy intent (for example, collaborative management of protected area resources between government and communities) and realities on the ground by creating dialogue among diverse interest groups at each level.

DISCUSSION AND CONCLUSIONS

Local communities were found to have a rich array of collective action institutions, which in turn provide a variety of economic and social support functions. While some of these were seen to support some groups more than others, most forms of collective action were found to have largely positive roles to play in livelihoods. However, practices of formal support agencies were found to be biased by wealth, gender, levels of political influence, and other factors, exacerbating inequities over time. Action research on methodological innovations to overcome these biases and to build upon the strengths of local institutions is sorely needed.

Another important finding was that local forms of collective action seldom emphasize common solutions to felt NRM problems other than provision of inputs (land, labor, capital). Efforts are sorely needed to strengthen the institutional foundations for community-based natural resource management. Action research findings have illustrated the potential for improving livelihoods and fostering more sustainable use of natural resources by catalyzing collective action on NRM where it is absent. Effective collective action seems to require use of both informal negotiation support processes and formal by-law reforms and enforcement. Participatory by-law reforms create stakeholder buy-in, which reduces ambiguity and makes people feel more accountable to other parties when brought to account for their actions. The combination of formal and informal mechanisms seem to be needed to revitalize natural resource governance and related livelihood and environmental service outcomes. External agents, whether NGOs, community-based organizations, or local government, also have an instrumental role in bearing the transaction costs of organizing collective action. These roles include information provision, community mobilization, facilitation, advocacy, monitoring, and negotiation support.

Overall, the findings support the two research hypotheses. Strategies to improve NRM at farm and landscape levels did prove to be more effective when more equitable decision-making processes were used to explicitly acknowledge diverse stakes. However, given the diversity of these stakes, by-laws also played a fundamental role in holding each party accountable to resolutions reached through negotiations. Adapting by-laws to local conditions and stakeholder priorities also induced marked livelihood improvements by enabling collective action and technology adoption. However, participatory by-law negotiations did not reduce the need for by-law enforcement. Rather, participation made offenders feel more responsible to agreements once accused, increasing the effectiveness of informal efforts to increase compliance. Improved governance of natural resources is, therefore, a process that involves overcoming past expectations and behaviours, and gradually learning the value of trust.

Implications for practitioners

- Collective action serves critical development and social support functions in local communities. External institutions should seek ways to build upon local institutions that are highly valued or contribute most to livelihood goals, in particular for women and poorer households. Part of this effort should be oriented toward finding ways to minimize the effect of wealth on the potential for wealth accumulation by linking technology dissemination with low-risk forms of credit and diversification of assets of the poor.
- External development institutions often unintentionally increase existing inequities (based on gender, wealth, age, or ethnicity) by working only with active community members and failing to establish mechanisms for equitable access to project benefits. Methodological innovations to overcome these biases and socially-disaggregated monitoring of interventions (by gender and stake, and including non-participants of any activity) are sorely needed to capture such biases early on and identify ways in which they can be overcome. This is particularly true for agricultural research and extension and law enforcement.
- Local forms of collective action emphasize enhancing buying power and safety net functions, leaving many common natural resource management problems unaddressed. External support for horizontal negotiations among local resource users is needed to support collective solutions to NRM problems that remain unaddressed despite their negative livelihood consequences.
- Extension and development organizations must consider the political dimensions of natural resource management in terms of winner and losers from any given development intervention, and the existence of diverse interests and stakes on any given issue. They must then learn to work explicitly with these political dynamics to foster more equitable solutions to development and NRM challenges through stakeholder identification, negotiation support (to identify socially-optimal NRM solutions and mechanisms for equitable benefits capture), and socially-disaggregated monitoring of interventions.

- There is also an urgent need for NGOs, local government and other development actors to get involved in natural resource policy formulation and implementation processes. This is due to the intimate association between negotiation support, technological innovation, and rules and regulations on NRM, and the urgent need to engage their facilitation skills in fostering more equitable and participatory natural resource governance processes.
- Fostering collective action where it is absent in addressing felt community needs requires informal negotiation support, formal by-law reforms, and forms of enforcement adapted to local social realities. Participatory by-law reforms create stakeholder buy-in, which reduces the cost of enforcement and reduces ambiguity. Neither formal nor informal mechanism would be fully effective without the other.
- The external agent, whether an NGO, community-based organization or local government, bore the transaction costs of organizing collective action. The role of these actors involves both information provision and time spent in organizing and facilitating community events.

Policy and research implications

The following implications for policy may be derived from this research:

- Policymakers must seek ways to build upon the strengths of local institutions and the crucial social support functions they provide, in particular for women, the poor, and other marginalized groups. They must also seek ways to facilitate the participation of poorer households in development by assisting them in bridging the assets gap hindering their ability to invest. This might include strategies and policies for linking technology dissemination with low-risk forms of credit, and diversification of assets for the poor rather than the current policies of enterprise specialization.
- While many national natural resource policies exist, many are not followed, leaving a governance gap in many highland communities. Participatory by-law reforms suggest an interest in improved natural resource governance among local residents. More attention should be paid to building the soft skills and processes required to create community buy-in for good governance (such as stakeholder identification, facilitation, and negotiation support), and for enforcement mechanisms that are effective, while providing alternatives where policies restrict livelihoods options.
- The partitioning of mandates between research, extension, and law enforcement agencies—and failure by most organizations to consider the role of negotiation support in fostering socially-optimal development outcomes and policies—causes these issues to be treated separately and important synergies to be lost. Mechanisms and incentives for institutional cooperation toward more equitable and negotiated solutions to NRM are sorely needed. While local residents can formulate NRM by-laws that address their own felt needs, by-law enforcement by communities themselves is a challenge as it involves sanctioning friends and relatives.

Throughout eastern Africa, communities demand for local government to play a role in the enforcement of by-laws generated by communities themselves. This should be taken into account in the process of decentralization and local government reforms in the region so that participatory governance processes can be *institutionalized* in the region. Part of this process will require capacity-building of government actors themselves in the facilitation of—and responsiveness to—bottom-up decision-making.

- While empirical research on the institutional aspects of development has advanced our understanding of the pitfalls of development practice and the characteristics of local institutions, two fundamental gaps remain. The first is in ensuring widespread access to lessons learnt among development practitioners to improve their practice. The second is the need to move beyond the identification of problems to the identification of viable solutions (good practice) through the coupling of empirical and action-oriented research. Managers of research and development institutions must actively seek ways to bridge these two research traditions with practice to generate more equitable and effective development support strategies.

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