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Evolving Roles for Programs and Organizations: Promoting Sustainable Land Management in Rural Uganda

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Introduction

As governments in developing countries implement structural adjustment policies, the role of non-government organizations (NGOs) and local organizations is becoming increasingly important (Farrington and Bebbington, 1993; Pender and Scherr, 1999; Uphoff, 1993). Market liberalization and the decentralization of government programs and services are common themes in many countries. The transition from state run services presents significant opportunities for organizations. Non-government organizations and community based organizations (CBOs) have the potential to influence economic, political and social life, and it has been argued that in some cases, organizations motivated by local ideas and financing may be better suited than governments to effectively address the development of rural communities (Uphoff, 2001).

The government of Uganda is currently decentralizing many of its services, including those that are directly related to agriculture and the environment. Given this shift in institutional support to rural areas, it is expected that sustainable land management will take on an increasingly important role in the agendas of non-governmental organizations (NGOs) and local communities (MAAIF, 1999). At the same time as government services in areas related to agriculture and land management are decreasing, land degradation in Uganda's rural areas is increasing (Pender, Jagger, Nkonya and Sserunkuuma, 2001). Whether organizations are evolving in key areas, how they are organizing themselves, and what impacts they are having with respect to improving land management and rural livelihoods are questions that policy makers should be interested in as the provision of traditional government services decreases throughout several sectors including agriculture and the environment.

For the purposes of this paper, programs and organizations include the range of institutions that may influence natural resource management and rural livelihoods in general. We define *programs* as institutions associated with the government of Uganda. Programs are unique in their ability to evoke the authority of the state to enforce decisions, levy taxes, and prohibit certain behaviors by implementing and enforcing laws (Uphoff, 1998). *Organizations* are divided into two categories, non-government organizations (NGOs) and community based organizations (CBOs). The category of NGOs includes both international and indigenous non-government organizations,

international organizations, and religious organizations. Community based organizations are administrated, financed and managed at the local level. CBOs are not part of a branch of a larger organization. Although NGOs and CBOs may not have the same degree of legal power as governments with respect to implementing and enforcing laws, taxes etc., they may have stronger linkages to communities and community resources, which allow them to affect change (Uphoff, 2001).

We also classify programs and organizations in terms of how their main focus influences the proximate and underlying causes of land degradation framework developed in Sserunkuuma *et al.* (2001). The proximate causes of land degradation in Uganda include natural factors such as soil type and climate fluctuation, and unsustainable farming practices such as decreased fallow periods and the cultivation of fragile lands (Ibid). Programs and organizations with a main focus of agriculture and veterinary services, or on environmental protection and improvement are included in this category. The underlying causes of land degradation as cited in Sserunkuuma *et al.* (2001) include population pressure, poverty, low-input subsistence farming and associated limited commercialization, lack of infrastructure and services, and land tenure insecurity. Many programs and organizations deal with these issues, and thus have the potential to impact smallholder and community land management decisions indirectly.

This objective of this paper is to characterize the programs and organizations that functioned throughout the country between 1990 and 1999 and their impacts based upon a community level survey conducted in 107 LC1s in 1999/2000. To provide context for the characterization we provide a brief historical sketch of the role of programs and organizations in the country prior to 1990. We consider how programs and organizations are distributed throughout the country by institutional structure and by main focus. We also consider the management structure, level of community involvement, and decision-making autonomy that the various types of programs and organizations have. The perceived impacts of programs and organizations in the context of land management, changes in average incomes, and welfare are discussed. Considering the character, evolution and impacts of programs and organizations between 1990 and 1999 provides policy makers with information about the potential roles for non-government and local organizations in the future, and also assists in identifying regions or sectors where NGOs and CBOs have yet to meet their potential.

Programs and Organizations in Rural Uganda – Past, Present and Future

Uganda provides an interesting case study of the development and evolution of programs and organizations and their relationship to sustainable land management. In the mid to late 1980s, in the wake of the Idi Amin and Milton Obote regimes, rural infrastructure was in serious disrepair, roads were impassable, school enrollments had declined, hospitals were without water, drugs or equipment, inflation was out of control, and living standards had drastically decreased (Howes, 1997; Brett, 1994; Brett, 1991). In addition to seriously lacking infrastructure and basic services, agricultural extension and support had been abandoned, and initiatives to promote sustainable land management were non-

existent. Under the relative political and economic stability established by the National Resistance Movement in the late 1980s, communities organized under the new peace to improve their livelihoods. Donors, self-help organizations, NGOs and others arrived to assist with rebuilding the country, particularly in fulfilling the roles that government agencies could not immediately provide (Dicklitch, 1998).

The history of local organization in Uganda dates back to the colonial period when trade unions and cooperative societies pressured the colonial regime for independence. These organizations included indigenous NGOs with political agendas, urban associations, trade unions and cooperatives such as the Ugandan African Farmer's Association. Until the time of Uganda's independence in the mid 1960s these organizations enjoyed independent leadership (Mamdami, 1993). Shortly after independence, Obote imposed government regulation of cooperatives (Cooperative Societies Act of 1963), and the regulation of trade unions (1970 Trade Union Act), which resulted in the formulation of a single state run cooperative and a single trade union organized and controlled by the state. Organizations lost the ability to provide leadership while taking on the new challenge of independence (Hyden, 1983). Although a 1973 decree restored the autonomy of unions, the social and political character of independent organizations was altered and unable to function effectively under Idi Amin's regime.

Programs dealing with agriculture and/or sustainable land management also failed under Obote and Amin. Agricultural research and extension services collapsed in the late 1970s, leaving the country without an effective mechanism for reaching small farmers. For almost a decade rural Ugandans were without an agricultural extension service that could advise farmers on the appropriate use of inputs, much less on natural resource management technologies (ISNAR, 1988).

Throughout the 1970s and 1980s only a few international NGOs functioned in the country providing disaster and relief services, and indigenous NGOs had very limited reach (Dicklitch, 1998). During this time the most outspoken rural voices were the churches (both Roman Catholic and Protestant), who - in addition to acting as human rights watchdogs, provided self-help to meet basic social needs (for example, assisting with burial costs and funeral arrangements). The church also became increasingly involved in the provision of basic health and education services as the economic collapse of state services worsened in the early 1980s (Nabuguzi, 1995).

Smallholder cash crop production was seriously affected under the Obote and Amin regimes. Smallholders involved in cotton production for export switched to food crops that could be sold in local or regional markets, and coffee survived as a smallholder crop only due to its relatively low labor inputs and the smuggling of produce across borders by an evolving network of private traders (Brett, 1991). Agricultural production, and the sale of agricultural produce were disrupted.

After Musuveni took over leadership of the country in the mid-1980s, economic, political and social change was rapid. The implementation of structural adjustment programs that emphasized market rather than state delivery of services was the economic focus of the

new government. Uganda's relative success with structural adjustment led to growth in real agricultural GDP of 4% per annum between 1987 and 1997, while real manufacturing GDP averaged 16% growth during the same period (Belshaw, Lawrence and Hubbard, 1999).¹ By the mid 1990's Uganda had strong economic performance achieving all of the benchmarks set by the International Monetary Fund's (IMF) Enhanced Structural Adjustment (ESAF) loan in 1987 (IMF, 1996).

In the late 1980s, during the first structural adjustment phase, the National Agricultural Research Organization (NARO) was formed. In addition to a strong focus on agricultural research, NARO would also take on the responsibility of organizing and training the extension personnel that would service the rural areas (ISNAR, 1988). Land distribution and tenure rights were also major land management issues. Throughout the Amin years the elite appropriated large tracts of land and evicted occupants without any recourse by the existing land boards controlled and governed by the wealthy land holding minorities, and common lands and forest reserves invaded by squatters (Brett, 1991). The new government assumed responsibility for monitoring and protecting common land and protected areas as the foreign NGOs, indigenous NGOs, community organizations and cooperatives reorganized.

Land management policy is currently being shaped by the Plan for the Modernization of Agriculture (PMA), the Poverty Eradication Action Plan, and the Decentralization of Public Service Reform Plan. The overarching statement of the PMA is that the "modernization of agriculture will be based on the adoption of appropriate and improved land and water management practices, adapted to various agro-ecological zones" (MAAIF, 1999). One of the main goals of the PMA is that all activities related to agricultural production, agricultural processing, trading, the supply of inputs and the import/export of agricultural produce will eventually be carried out by the private sector (Ibid). But it may take some time for the private sector to emerge as the leader in areas such as input and output marketing and rural credit delivery; thus the need for non-government organizations and community based organizations take the lead in providing these services. From a base of very little organizational participation in the rural economy in the late 1980s, there are currently thousands of programs and organizations functioning throughout the Uganda.² These programs and organizations are heterogeneous and cover a wide range of sectors and livelihood strategies.

Linking Programs and Organizations to Sustainable Land Management

Types of Institutions that Address Sustainable Land Management

Government institutions, non-government organizations and community-based organizations have strengths and weakness that influence their ability to effectively bring about change. Table 1 characterizes the strengths and weaknesses with respect to natural

¹ These growth rates can be compared with real average annual rates of growth of 4% for agriculture and 8% for manufacturing in the late 1960s and early 1970s (Belshaw, Lawrence and Hubbard, 1999).

² Dicklitch (1998) estimates that there were over 1000 NGOs registered in Uganda in the mid 1990s.

resource management of the three types of institutions that we consider in our analysis of programs and organizations.³

Table 1 – Common Strengths and Weaknesses of Alternative Institutions for Natural Resource Management^A

| INSTITUTION | COMMON STRENGTHS | COMMON WEAKNESSES |
|--|---|--|
| Government programs | <ul style="list-style-type: none"> • Can invoke the authority of the state to enforce decisions • Can have personnel specialized and trained for natural resource management tasks • Power to levy taxes and prohibit certain behaviors within framework of policy | <ul style="list-style-type: none"> • Often limited budget, staff and facilities for effective action • Can be influenced by economic interests concerned more with extraction than with conservation • Prone to partisan actions lacking legitimacy • Changes in leadership can disrupt, change or end programs |
| Non-government organizations (external to community) | <ul style="list-style-type: none"> • More flexibility than government organizations • Often able to provide or access relevant expertise • Access to financial resources government or communities cannot muster • Can operate pragmatically without much bureaucracy | <ul style="list-style-type: none"> • Financial resource base seldom steady or secure, so cannot assure long-term management • Can be constrained by factionalism or partisanship; internal conflicts • Can be object of jealousy and even obstruction from the government • Can be paternalistic and unresponsive to local needs and interests |
| Community based organizations | <ul style="list-style-type: none"> • More flexible than government organizations • Most access to local residents' knowledge of resources • Stake in the productivity and sustainability of resources | <ul style="list-style-type: none"> • Management capacity is subject to fluctuation over time • Persons with special interests can dominate/veto decisions and action • Local conflicts can interfere with natural resource management • Limited access to financial resources and technical expertise |

A. Adapted from Uphoff, 2001.

³ It should be noted that Table 1 is not an exhaustive presentation of institutions for natural resource management. Private enterprise, research institutions and other types of institutions can also influence sustainable land management in rural areas. We focus on the institutions that were most commonly involved in rural Uganda.

Government programs currently functioning in rural Uganda include the National Agricultural Research Organization (NARO), the National Environmental Management Authority (NEMA), the Rural Water and Sanitation Association (RUWASA), Agricultural Extension Program (AEP) and others. These programs are generally externally motivated, rely on the technical expertise of personnel from outside of the community, and as we have already discussed, have the unique ability to invoke laws, levy taxes and prohibit certain behaviors. However limited budgets, facilities and staff may limit the impact of government programs. Also, government programs may not be fully aware of community needs.

Non-government organizations generally have greater flexibility, and better access to technical and financial resources than government programs or community-based organizations. However, the commitment of NGOs to long-term goals, including sustainable land management is not guaranteed as financial resources may not be steady or secure, or government regulation of NGO activities may change over time. There is a wide range of NGOs functioning in Uganda. International NGOs include ActionAid, the African Highlands Initiative (AHI), CARE International, CONCERN, UNICEF and others. There are also numerous indigenous NGOs including, AT Uganda (Farmer to Farmer Appropriate Technology, Busoga Diocese, Uganda National Farmer's Association (UNFA), and the Uganda Women's Finance and Credit Trust (UWESO).

Community-based organizations may offer unique opportunities for sustainable land management. Perhaps the most important strength of CBOs is their stake in the productivity and sustainability of resources. Also, no limitation on the duration of CBO activities means that they can undertake longer-term activities than government programs or NGOs. However, maintaining consistent management over long time periods can be difficult. CBOs can be constrained by lack of local expertise and financing. Community-based organizations include LC1 level development associations and other types of local women's, youth and farmers associations.

Main Focus of Institutions that Address Sustainable Land Management

Though a government program, NGO or CBO may have a particular main focus or emphasis; their contribution to sustainable land management may not be immediately evident. Table 2 presents a summary of the proximate and underlying causes of land degradation and the potential roles for various types of institutions to influence natural resource conditions and improve welfare for rural households. Recall that the proximate causes of land degradation include natural factors such as soil type and climate fluctuation, and unsustainable farming practices such as decreased fallow periods and the cultivation of fragile lands (Sserunkuuma *et al.*, 2001). The primary underlying causes of land degradation in Uganda are hypothesized to include population pressure, poverty, low-input subsistence farming and associated limited commercialization, lack of infrastructure and services and others (Ibid).

Table 2 – Defining the Main Focus of Programs and Organizations in Relation to the Proximate and Underlying Causes of Land Degradation

| CAUSE OF LAND DEGRADATION | DESCRIPTION OF CAUSE | RELATIONSHIP TO LAND MANAGEMENT | MAIN FOCUS OF PROGRAMS OR ORGANIZATIONS |
|---------------------------------------|---|---------------------------------|--|
| Proximate Causes of Land Degradation | | | |
| Natural factors | Soil type and climate variability | Direct | Agriculture and veterinary services/extension Environment |
| Unsustainable farming practices | Decreased fallows and cultivation of fragile lands | Direct | Agriculture and veterinary services/extension Environment |
| Underlying Causes of Land Degradation | | | |
| Population pressure | Increase land pressure due to decreased fallows and partitioning of farmland, increased food demand | Indirect | Women's empowerment and emancipation Health ^A |
| Lack of infrastructure and services | Poor infrastructure can slow price signals and reduce access to inputs Lack of adequate education, health, water services etc. can reduce labor productivity | Indirect | Education Health Water and sanitation ^B General infrastructure |
| Lack of credit | Providing credit may affect the use/adoption of inputs and sustainable land management technologies | Indirect | Credit |
| Poverty | May lead to short term planning horizons that inhibit households from investing in land management | Indirect | Income generation Poverty eradication Social development Social assistance to the disadvantaged |
| Lack of community services | Generally meet short to medium term community needs for assistance | Very indirect | Mutual support Funeral arrangements Youth programs |

A. In some cases health related programs/organizations undertake sex education and family planning as their primary activity, in addition to a variety of other activities. Health related programs with a main activity of sex education/family planning are categorized under population. All other health related programs are classified under infrastructure and services.

B. Water related activities including construction and maintenance of water sources could allow farmers better access to water for small-scale irrigation or watering livestock. Given that these are secondary benefits of access to water sources, all water related activities are categorized under infrastructure.

For the purposes of this study, institutions dealing with the proximate causes of land degradation are limited to those with a main focus on agriculture or the environment. These programs/organizations undertake a wide variety of activities including: training and sensitization, supply of agricultural inputs, stocking and restocking animals, providing credit, afforestation and tree planting, promoting soil and water conservation, promoting farming, fishing, and livestock technologies, marketing of agro-products, energy conservation and research. In general these activities have a direct link to sustainable land management and are likely have the greatest potential to influence land use in the near term. For example, an organization promoting tree planting can influence natural factors leading to improved local microclimates, reduce rates of soil loss, and the provision of alternative sources of energy and construction material. Similarly, programs and organizations addressing unsustainable farming practices are also in a position to make a direct impact on land management. Activities such agricultural extension may facilitate the adoption of soil and water conservation activities that may lead to improved land quality.

Programs and organizations may also contribute to sustainable land management by addressing the underlying causes of land degradation. For example, population pressure affects the sustainability of land mainly due to declines in fallowing and decreased farm size (Sserunkuuma *et al.* 2001). Programs and organizations with a main focus on health whose primary activity is sex education or family planning have the potential to reduce rates of population growth. Similarly, programs that promote the empowerment of women are also likely to influence population growth rates. As women are endowed with increases in household economic decision-making power and community participation, birth rates are expected to decrease (Okello, 1985). Programs and organizations that empower women undertake activities including the provision of credit, training of skills related to non-farm labor such as crafts and trading that lead to independent sources of income for women, sex education/family planning, and general training and education on health and other issues.

Lack of infrastructure and services also indirectly affects land management. Poor infrastructure, particularly roads may slow the transmission of price signals to farmers, and reduce access to agricultural inputs which may affect incentives to invest in land management. Lack of other infrastructure and services, particularly in the areas of education, health, water and sanitation can influence labor productivity. Reduced on-farm labor due to the illness household members, particularly those with long-term or terminal illnesses such as HIV Aids, can reduce farm productivity and discourage households from undertaking longer term and/or labor-intensive land management investments (Haddad and Gillespie, 2001). The primary activities of programs and organizations that deal with infrastructure and services include the construction and maintenance of schools/health facilities/water sources/sanitation facilities, the provision of scholastic materials/ school furniture/hospital beds/equipment, adult education, blood tests/immunizations etc. Programs and organizations that provide credit may affect the use of agricultural inputs or sustainable land management practices.

Poverty can be a constraint to sustainable land management and also exacerbates many of the underlying causes of land degradation discussed above. Poverty may lead to short planning horizons, which in turn may prevent poor households from investing in land use technologies or conservation investments that slow or stop land degradation (Mink, 1993; Pender, 1996). On the other hand, poorer people may seek to invest more in their land if

they have few alternative investment opportunities and/or lower opportunity costs of their labor. A wide variety of programs and organizations have the broad mandate of poverty alleviation, including those that deal with income generation, poverty eradication, social development and social assistance to the disadvantaged. The range of activities these programs and organizations undertake is too long to list, but all have the common goal of improving rural livelihoods.

Programs and organizations that deal with the short to medium term goals of providing community services are of limited interest to this study. Although the contribution of these activities is very important to rural communities, and poor households in particular, their impacts on land management are likely very indirect and thus there is little that can be said about their contribution to sustainable land management. It should be noted that the development of this type of social capital might contribute to other forms of social capital more directly concerned with land management. These issues of social capital formation are beyond the scope of this study. What may be of some relevance to this study is the longevity and level of participation in these communities. Lessons learned from the strengths of organizations with this main focus may be applied to land management.

Characterizing Programs and Organizations in Rural Uganda

Data source

This study is based on a survey of 107 LC1s (local councils comprised of one or a few villages), and 107 villages from throughout Uganda conducted in 1999/2000. A random sample of LC1s was stratified by agricultural potential, market access and population density.⁴ Agricultural potential classifications are based upon average length of growing period, average rainfall, maximum annual temperature and altitude. Six zones were identified, the low and medium potential unimodal rainfall areas at moderate elevations (much of northeastern Uganda, and parts of northern and eastern Uganda), the low potential bimodal rainfall area at moderate elevations (lower elevations parts of southwestern Uganda), the medium potential bimodal rainfall area at moderate elevation (most of central and parts of western Uganda), the high potential bimodal rainfall areas (Lake Victoria crescent), the high potential bimodal rainfall areas of the southwest highlands, and the high potential eastern highlands (Sserunkuuma *et al.* (2001). Market access was classified using the measure of potential market integration estimated by Wood *et al.* (1999), which is a measure of travel time from any location to the nearest five town or cities, weighted by the population of the towns or cities. Areas with high market access include most of the Lake Victoria region, the southwest and eastern highlands, and parts of the north and west that are close to major roads or towns (Sserunkuuma *et al.* 2001). Population density was classified based upon parish level rural population density in 1991, where greater than 100 persons per square kilometer is classified as a high population density region (Ibid). Both highland (elevation greater than 1500 m.a.s.l.) and lowland sites are represented in the sample.

One village was randomly selected from within each LC1. Respondents were groups of approximately eight to fifteen LC1 or village members selected to represent different

⁴ Due to security threats in the northwestern part of the country during the time of the survey, some LC1's drawn in the random sample were dropped.

ages, occupations, and genders. Data on programs and organizations encompassed all programs and organizations present at the LC1 level and below.

Institutional Structure and Main Focus of Programs and Organizations

Institutional Structure

Table 3 provides a summary of the average number of programs and organizations that fall into the categories of government programs, non-government programs, and community based organizations as they have been defined earlier in this paper.

Table 3 – Average Number of Programs and Organizations per LC1 by Type, 1999^{A,B}

| PROGRAM OR ORGANIZATION | AVERAGE |
|-------------------------------|----------------|
| Government | 0.64 (0.11) |
| Non-government organizations | 0.99 (0.11) |
| Community based organizations | 0.62 (0.08) |

A. Means and errors are corrected for sampling stratification and sampling weights.

B. Values in parentheses represent standard errors.

In 1999, NGOs were most the most common type of program or organization with an average of almost one NGO per LC1. The average number of government programs and community-based organizations are approximately equal. The average number of programs/organizations within each institutional category across zones of agricultural potential, market access and population density is provided in Table A1.

The highest average number of government programs in 1999 was found in the bimodal high potential areas. There are on average 1.1 government programs per LC1 in this zone. The unimodal areas have the second highest number of government organizations. Conversely, the southwest and eastern highlands have very few government programs. The number of government programs is not significantly different across low and high market access areas, or areas of low and high population density.

The bimodal high and bimodal low potential zones had the highest average number of NGOs per LC1 (1.44 and 1.41 NGOs per LC1 respectively). These areas, including the Lake Victoria crescent and the southwest cattle corridor have good access to roads and markets, which may influence why NGOs are locating in these regions. The lowest average numbers of NGOs per LC1 are found in the medium potential bimodal and eastern highland zones. The eastern highlands have approximately one third the average number of NGOs per LC1 as are found in the bimodal high potential areas.

Community based organizations are predominant in the southwest highlands. LC1s in this region have an average of 2.13 CBOs per LC1. This is in sharp contrast to the eastern highlands and low potential unimodal areas, where there are no (eastern highlands) or few (unimodal) LC1s in our sample with community-based organizations in 1999. Community based organizations are more common in high market access areas.

The general picture seems to be that government programs, NGOs and CBOs are well represented in the bimodal high potential areas. Conversely the low potential bimodal areas government programs are not well represented. NGOs and CBOs have a presence in this area and may be fulfilling various roles in the absence of government programs. The highlands regions are very poorly represented with respect to NGOs, and the presence of programs and organizations in general is poor with the exception of community-based programs in the southwest highlands.

Main Focus

Programs and organizations have been categorized by main focus according to the discussion of the proximate and underlying causes of land degradation. Programs that deal with the proximate causes of land degradation include programs with a main focus on agriculture and veterinary services or the environment. Programs that deal with the underlying causes of land degradation include: population related programs (including women’s empowerment and emancipation and some health), infrastructure and service related programs (including education, health, general infrastructure and water), credit programs (that may lead to the adoption of purchased inputs), poverty alleviation programs (including income generation, poverty eradication, social development and social assistance to the disadvantaged), and community service programs that generally have shorter term goals (including organizations that offer mutual support, assist with funeral expenses and youth programs). Table 4 summarizes the average number of programs or organizations by main focus per LC1.

Table 4 – Average Number of Programs/Organizations per LC1 by Main Focus, 1999^{A,B}

| MAIN FOCUS OF PROGRAM OR ORGANIZATION | AVERAGE |
|---------------------------------------|----------------|
| Agriculture/Environment | 0.44 (0.07) |
| Population | 0.10 (0.03) |
| Infrastructure and services | 0.73 (0.09) |
| Credit | 0.08 (0.04) |
| Poverty | 0.76 (0.12) |
| Community service | 0.18 (0.03) |

A. Means and errors are corrected for sampling stratification and sampling weights.

B. Values in parentheses represent standard errors.

Approximately half of the LC1s in our survey had a program or organizations dealing with agriculture or the environment. Programs and organizations with a main focus that deals with the proximate causes of land degradation are most common in the high potential bimodal areas (almost one per LC1). There are very low numbers of these programs and organizations in the highlands areas where land degradation is a particularly serious problem, and in the medium potential bimodal rainfall areas. Higher

average numbers of agriculture and environment programs are found in LC1s with good market access or high population density.

With respect to those programs and organizations that deal with the underlying causes of land degradation, in general very few are focused on credit or women's empowerment/emancipation (taken as a proxy for addressing population pressure). There is a high proportion of programs/organizations that deal with infrastructure (including those focused on education, health, water and general infrastructure). The highest average number of infrastructure programs is in the southwest highlands. Improvements in health and education in the southwest highlands between 1990 and 1999 (see Pender, Jagger, Nkonya, and Sserunkuuma, 2001) may be related to the presence of these programs and organizations. In general, programs and organizations that deal with infrastructure are well distributed across low and high market access areas. Programs and organizations in the southwest highlands that deal with poverty and community services are common (1.35 and 0.91 program/organizations per LC1 respectively). In contrast, the eastern highlands have very few programs and organizations dealing with poverty and none that provide community services. Both poverty and community service focused programs and organizations are generally more common in high market access areas.

Of our sample of 107 LC1s 79% had at least one program or organization. It is difficult to understand why some LC1s had no programs/organizations. It is possible that in some cases there may have been a miscommunication during the administration of the questionnaire, or that there are simply no programs or organizations operating in these LC1s. These findings will be validated with data on household involvement in programs and organizations that are not yet available. Of the LC1s surveyed that had no programs and organizations, the bi-modal medium rainfall zones and the eastern highlands region have the highest proportion of LC1s with no programs or organizations (46% and 50% of LC1s surveyed in each strata respectively) (Table A3).

Characteristics of Programs and Organizations

Distribution of Institutional Types and Main Focus

The remainder of the analysis in this paper focuses on the 85 LC1s with at least one program or organization. The total number of programs and organizations among the 85 LC1s is 249.⁵ The distribution of programs and organizations by main focus and institutional structure is provided in Table 5. Approximately 19% of the total number

⁵ Note that 6 programs/organizations were dropped from the sample as they were classified as private enterprise.

Table 5 – Main Focus of Programs/Organizations by Type, percent^{A,B}

| MAIN FOCUS OF PROGRAM OR ORGANIZATION | TOTAL | PROGRAM OR ORGANIZATION | | |
|---------------------------------------|-------|-------------------------|---------------|---------------|
| | | Government | NGO | CBO |
| Agriculture/Environment | 18.5 | 6.7 (1.7) | 10.8 (2.4) | 1.0 (0.1) |
| Population | 4.2 | 0 N/A | 3.2 (1.0) | 1.0 (0.1) |
| Infrastructure and services | 31.9 | 12.3 (2.0) | 17.4 (3.1) | 2.2 (1.2) |
| Credit | 3.6 | 0 N/A | 2.6 (1.6) | 1.0 (0.1) |
| Poverty | 33.8 | 8.9 (2.7) | 10.1 (2.2) | 14.8 (2.7) |
| Community service | 8.2 | 0 N/A | 0 N/A | 8.2 (1.4) |
| Total | ~100 | 27.9 | 44.1 | 28.2 |

A. Means and errors are corrected for sampling stratification and sampling weights.

B. Values in parentheses represent standard errors.

of programs and organizations are focused on the proximate causes of land degradation. NGOs and government programs with a main focus on agriculture or the environment comprise the majority of the rest of these programs. Only one percent of the total number of programs in our sample was community based with a main focus on agriculture or the environment.

Infrastructure and poverty are the most common programs and organizations. The highest proportion of infrastructure programs is NGOs, though government programs are also well represented. Community based organizations form the highest proportion of poverty related programs, though NGOs and government are also well represented in this category. The proportion of total programs and organizations devoted to population and credit is relatively small (4.2% and 3.6% respectively). The majority of organizations that deal with these focus areas are NGOs.

Initiation and Longevity

When programs or organizations were initiated and their duration provides information on trends regarding how the composition of programs and organizations may be changing over time and the longevity of different types of programs and organizations.⁶ Information on the year programs and organizations were started indicates that those focusing on agriculture and the environment are more recently formed than those focusing on infrastructure, poverty and community services (Table 6).⁷

⁶ The duration (in years) of programs and organizations was estimated by calculating the total number of years of activity for those programs/organizations that had ended by 2000. For programs/organizations that have not ended, the duration was calculated by subtracting the year started from the year 2000. Thus duration mean duration to date.

⁷ There are too few observations in categories of population and credit to draw substantive conclusions about trends in these focus areas.

Table 6 – Year Started and Duration of Program/Organization^{A,B}

| MAIN FOCUS OF PROGRAM OR ORGANIZATION | PROGRAM OR ORGANIZATION | | | | | |
|---------------------------------------|-------------------------|------------------|----------------|------------------|----------------|------------------|
| | Government | | NGO | | CBO | |
| | Year Started | Duration (years) | Year Started | Duration (years) | Year Started | Duration (years) |
| Agriculture/Environment | 1997 (0.75) | 1.9 (0.4) | 1996 (0.56) | 4.0 (0.5) | 1992 (2.71) | 8.4 (2.7) |
| Population | 0 N/A | N/A | 1995 (1.07) | 4.5 (1.0) | 1987 (0) | 13 (0) |
| Infrastructure and services | 1996 (0.45) | 2.0 (0.4) | 1997 (0.40) | 2.5 (0.5) | 1992 (0.77) | 5.2 (0.7) |
| Credit | 0 N/A | N/A | 1997 (0.65) | 3.0 (0.4) | 1994 (0.90) | 5.9 (0.9) |
| Poverty | 1996 (0.54) | 2.3 (0.5) | 1995 (0.65) | 4.7 (0.6) | 1994 (0.99) | 5.6 (1.0) |
| Community service | 0 N/A | N/A | 0 N/A | N/A | 1983 (4.22) | 16.7 (4.2) |

A. Means and errors are corrected for sampling stratification and sampling weights.

B. Values in parentheses represent standard errors.

NGOs focusing on the proximate causes of land degradation have a longer duration than government programs (4 years for NGOs, vs. approximately 2 years for government programs). This suggests that NGOs may be pursuing longer-term projects with respect to those that focus on agriculture and the environment, or that NGOs are better able to sustain a commitment to particular communities.

Most infrastructure programs were started around 1996/1997 and run on average for approximately two years regardless of institutional structure. Poverty related programs were also started in the mid-1990s, though the duration of government programs is shorter than for NGOs and CBOs. Community based organizations clearly operate for the longer durations. CBOs dealing with community services were started on average in 1983 and have an average duration of approximately 18 years. Longevity and sustainability of community based organizations for poverty alleviation and community services are important characteristics. CBOs are likely good candidates for the promotion of sustainable land management given the medium to long-term goal of addressing land degradation.

Community Involvement

Level of community involvement is generally perceived as an indicator of a program or organization's success, and is also an indicator of sustainability.⁸ Table 7 provides information on the average number of community members involved in the program or organization in 1999 (for those still functioning in 1999), and in 1990, or the first year of the program or organization (if initiated after 1990).

⁸ We assume that the number of people involved from the local community is an indicator of community involvement.

Table 7 – Number of Community Members Involved in 1990 (or first year of program) and 1999^{A,B}

| MAIN FOCUS OF PROGRAM OR ORGANIZATION | PROGRAM OR ORGANIZATION | | | | | |
|---------------------------------------|-------------------------|----------------|-------------------|----------------|-------------------|-----------------|
| | Government | | NGO | | CBO | |
| | 1990 ^C | 1999 | 1990 ^C | 1999 | 1990 ^C | 1999 |
| Agriculture/Environment | 27.9 (5.7) | 26.8 (5.7) | 27.4 (7.4) | 26.9 (8.7) | 43.0 (7.4) | 23.3 (0.4) |
| Population | N/A | N/A | 13.7 (6.1) | 15.9 (8.3) | 35 (0) | 35 (0) |
| Infrastructure and services | 79.5 (22.5) | 60.6 (14.0) | 62.0 (16.2) | 40.1 (10.8) | 24.8 (5.0) | 49.9 (12.3) |
| Credit | N/A | N/A | 10.2 (3.4) | 12.2 (5.3) | 13.5 (1.5) | 62.6 (7.5) |
| Poverty | 23.6 (17.0) | 8.8 (4.5) | 58.4 (39.8) | 12.2 (5.3) | 28.5 (3.3) | 28.1 (3.2) |
| Community service | N/A | N/A | N/A | N/A | 34.5 (5.8) | 127.7 (25.3) |

A. Means and errors are corrected for sampling stratification and sampling weights.

B. Values in parentheses represent standard errors.

C. Number of community members participating in 1990 OR the first year of the program/organization.

Government programs and non-government organizations dealing with agriculture and the environment have approximately the same number of community members, and maintained membership levels between 1990 (or first year of the program) and 1999. The number of community members involved in agriculture and the environment is generally lower than in government and NGO infrastructure related initiatives. Community based organizations were able to maintain a constant level of involvement in programs or organizations with a main focus on poverty between 1990 and 1999, whereas there were significant decreases in the number of people involved in poverty related programs between 1990 and 1999 for both government and NGO led initiatives. There was a large increase in the average number of people involved in community service related CBOs.

Leadership and Finance

Who initiates, organizes and finances programs and organizations are also indicators of community involvement and sustainability. Programs or organizations initiated and/or managed by LC1 officials or LC1 residents are more likely to reflect local level concerns and priorities. Programs and organizations financed partially or totally at the LC1 level or below may be more sustainable than those with external funding. If community members are investing their own financial resources in an organization there is greater incentive to see the program or organization succeed. Organizations with local funding sources are also likely to have greater longevity than government programs or non-government organizations that often have projects of a fixed duration. These are important considerations for the medium to long-term goals of sustainable land management. Table A4 indicates the proportion of programs and organizations that were started, organized, and financed at the LC1 level and below.

Government programs are seldom initiated at the LC1 level or below. Only 11% of agriculture and environment related programs were initiated at this level. The proportion

of LC1 officials or LC1 residents initiating NGOs was higher. For example 18% of agriculture and environment programs were initiated at the local level. Community based organizations have a very high rate of local level initiation. For infrastructure related programs and organizations there are very low proportions of local level initiation for government programs and NGOs. Poverty related programs present a sharp contrast between NGOs and CBOs; 23% of communities initiated poverty focused NGOs, while 82% of LC1s in our sample initiated poverty focused CBOs.

Community (LC1 official or LC1 member) organization of programs and organizations is common for government programs. Government programs were locally organized for approximately 60% the government programs in our sample. NGOs have similar proportions of LC1 officials or LC1 members organizing. CBOs have the highest rates of local organization. Interestingly there is more community organization of government programs focusing on infrastructure and poverty than there are for NGOs focusing on the same. This finding suggests that NGOs focusing on these areas may be relying on external organization. With respect to financing of programs and organizations. All government programs and most NGOs are financed primarily by entities above the LC1 official or LC1 member level. NGOs are the only exception in our sample – seven percent of poverty focused NGOs are financed at the LC1 level or below. As expected, CBOs are almost completely funded at the LC1 level or below.

Community Autonomy in Decision Making

Information regarding whether or not communities have decision making power with respect to which activities to pursue, who to include as a member/beneficiary, how to raise revenue, and how to promote participation is included in Table A5. Government programs have moderate levels of participation. For example, communities choose whom to include as member for government programs focusing on agriculture and the environment in 61% of cases, infrastructure programs in 46% of cases, and poverty programs in 48% of cases. In general, NGOs have greater community autonomy than government organizations in the areas of raising revenue and promoting participation, though this is not the case for infrastructure related organizations. As expected, community based organizations have a very high degree of autonomy in all aspects of poverty and community service related organizations.

In general, government programs focusing on agriculture and the environment have greater community autonomy than programs focusing on infrastructure or poverty alleviation (with the exception of having control over raising revenue). NGOs have relatively high levels of community autonomy with respect to agriculture and environment, population and poverty related organizations. In particular, communities are involved in determining how to promote participation in organizations related to the proximate causes of land management. Community level promotion of participation is likely to improve the impact of these programs on land management.

Perceived Impacts of Programs and Organizations on Land Management and Welfare

The perceived impact of programs and organizations on land management, average incomes and welfare provides information about the influence that programs and organizations are having on the proximate and underlying causes of land management (Table A5). We caution that these data reflect only *perceived* impacts. Programs and

organizations may have indirect impacts that are not perceived by community members, or impacts may be perceived by community members, but not linked to the presence of the program or organization.

In general government programs are perceived to be increasing general welfare in rural areas, particularly in the case of infrastructure and service related programs. Average incomes and livestock production are also positively affected by the presence of government programs. NGOs are perceived to be resulting in increased welfare and average incomes, though the impact of infrastructure programs on average incomes is less than for other focus areas. Community based organizations are perceived to be having a positive impact on average income and general welfare. If CBOs are having impacts on land management, survey respondents did not perceive these impacts.

Programs focusing on agriculture and the environment are perceived to have a positive impact on land management, crop productivity, average incomes and welfare. Direct impacts on livestock production are not perceived to be as strong for programs and organizations focusing on the proximate causes of and degradation. Infrastructure programs are mainly having a positive impact on welfare, though government run infrastructure programs are perceived to be having a positive impact on livestock productivity. In general government infrastructure and poverty related programs are having little impact on land management and crop productivity. For the small sample of CBOs that deal with agriculture and the environment, their impact on both land management and welfare is strong.

Organizations addressing population are perceived to be having a positive impact on all aspects of land management, average incomes and welfare. Programs and organizations focusing on poverty are also having a positive impact on both land management and welfare. These widespread positive impacts are of interest and illustrate that organizations dealing with the underlying causes of land degradation can affect land management. NGOs focusing on infrastructure related activities are only significantly affecting welfare, land management and average incomes are not perceived to be impacted by their presence. However, government infrastructure programs are having a significant impact on welfare. Pender, Jagger, Nkonya and Sserunkuuma (2001) found that road development has a significant positive impact on natural resource management. This suggests that the indirect impacts of road development and other investments in infrastructure may be important, even if not perceived by community members. Further research including community and household level modeling, and/or econometric analysis is required to identify these potential indirect impacts of programs and organizations. Of interest is the limited impact that programs and organizations (mainly NGOs) focusing on credit are having on land management.

Conclusions and Policy Implications

Considering the character, evolution and impacts of programs and organizations between 1990 and 1999 provides policy makers with information about the potential roles for non-government and local organizations in the future, and also assists in identifying regions, or sectors where NGOs and CBOs have yet to meet their potential. The analysis of programs and organizations and their relationship to sustainable land management allows us to draw several conclusions.

In general NGOs are better represented than government programs and CBOs in our study of 107 LC1s. Government programs and NGOs are most common in the high potential bimodal rainfall areas, and under represented in the southwest and eastern highland regions. However, high average numbers of community-based organizations per LC1 may be fulfilling the role of absent government programs and NGOs in the southwest highlands. There are lower numbers of NGOs and CBOs in some less-favored areas including parts of the medium potential bimodal rainfall areas, and the eastern highlands. In both of these regions approximately half of the LC1s in our study had no programs or organizations. In addition, NGOs and CBOs are more common in areas with good market access and high population densities. This raises the question of whether government policies should be considered to provide incentives for NGOs and CBOs to target and operate in the less-favored areas that government services may be devolving from in the near future.

Programs and organizations dealing with the proximate causes of land degradation are concentrated in the high potential bimodal rainfall areas. In the southwest and eastern highlands where land degradation is a serious problem, there are relatively low numbers of programs and organizations focusing on agriculture and the environment. The unimodal and medium potential bimodal areas also have low number of these types of programs. Infrastructure programs are well represented across all zones of agricultural potential. The average number of programs dealing with poverty alleviation is highest in the southwest highland and bimodal high potential areas. There is a general absence of programs and organizations dealing with population pressure and access to credit – two of the major underlying causes of land degradation.

Looking at the 249 programs and organizations in our study allows us to draw some general conclusions about their characteristics and the potential for contributing to sustainable land management. Government programs make up 28% of the total number of programs and organizations and focus on three major areas (in order of importance), infrastructure, poverty alleviation, and agriculture/environment. On average, government programs that operated in LC1s between 1990 and 1999 were started in 1996, and functioned for approximately 2 years. The highest levels of community involvement for government programs were for those focusing on infrastructure. Programs focusing on agriculture/environment, and poverty had considerably lower numbers of community members involved – though the number of community members in agriculture/environment programs was maintained over time. Few government programs are initiated at the LC1 level or below, but there is a significant number that are organized at the LC1 level or below. Primary financing for government programs does not come from the LC1. Government programs had moderate levels of community autonomy, particularly in the areas of promoting participation and deciding whom to include as a member. Communities were expected to raise revenue for a significant portion of infrastructure related programs. In general the impact of government agriculture and environment programs is perceived by communities to be positive in term of land management (including crop and livestock production), average incomes and welfare. Government programs dealing with the underlying causes of land degradation were perceived to have a small positive affect on livestock production and larger positive impacts on general welfare.

Forty-four percent of the total number of programs and organizations in our study are NGOs. The three most important focus areas for NGOs in order of importance are infrastructure and service development, agriculture and the environment and poverty

alleviation. Most NGOs started between 1995 and 1997 and have functioned for between 2.5 (infrastructure) and 4-5 years (agriculture and the environment, population and poverty alleviation). Though NGOs had higher numbers of community participants in organizations focusing on infrastructure and poverty, the number of community members involved in agriculture and environment programs remained constant over time. This is an encouraging finding as it points to the potential sustainability of these projects. Community level initiation of NGOs is higher than for government programs. However, community level organization of NGOs is lower than for government programs. Most financing for NGOs does not come from the local community. Community involvement in decision making for NGOs is mixed – though on average communities seem to have a slightly higher degree of autonomy in decision-making than they do for government organizations. NGOs focused on agriculture and the environment, population and to a lesser degree poverty all seem to have a general positive impact on land management, incomes and welfare. This indicates that NGOs are perceived to affect land management by addressing some of the underlying causes of land degradation. It is likely that there are additional positive indirect effects of NGOs that are leading to improved land management that are not perceived by community members.

Community based organizations make up the remaining 28% of total programs and organizations and are almost exclusively focused on poverty alleviation and the provision of community services. Community service focused organizations had their start on average in 1983, and have an average duration of 17 years. Closer examination of the characteristics that allow these organizations to succeed over long time periods may have important implications for sustainable land management. Only 1 percent of the total number of programs and organizations was a CBO that focused on agriculture or the environment, so there is much untapped potential. Community based organizations focused on poverty maintained levels of organization membership, while organizations focused on community services had considerably increased membership over time. The majority of community-based organizations are initiated, organized and financed at by the LC1 official or LC1 members. As expected community autonomy over decision-making is very high for CBOs and may be one of the major factors contributing to their longevity and relative success. CBOs are perceived by community members to have positive impacts on average incomes and welfare. Further study of potential indirect effects including the promotion of sustainable land management is a topic for further research

As Uganda's plans for decentralization of government services move forward there are several questions policy makers might consider. The first is whether or not there should be incentives for NGOs and CBOs to locate or operate in less-favored areas. The absence of programs and organizations in the medium potential bimodal areas and the eastern highlands should be explored. Second, for sustainable land management it will also be important for policy makers to consider those areas where very few organizations are focusing on agriculture and the environment. Areas of the country where land degradation is particularly bad might be considered as priority areas for promoting the evolution of NGOs and CBOs that deal directly with the proximate causes of land degradation. Also, the potential impacts of programs and organizations that focus on the underlying causes of land degradation on sustainable land management should be further explored. Third, can the characteristics that community-based organizations exhibit (i.e. longevity, high and increasing rates of community member involvement, community initiation and financing, and community autonomy in decision making) be used to

achieve the goal of sustainable land management. It appears that there may be enormous untapped potential for the role of CBOs in sustainable land management.

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Appendix A

Table A1– Average Number of Programs and Organizations per LC1 by Type, 1999^{A,B}

| PROGRAM OR ORGANIZATION | AVERAGE | AGRICULTURAL POTENTIAL | | | | | | MARKET ACCESS | | POPULATION DENSITY | |
|-------------------------|----------------|------------------------|----------------|----------------|----------------|---------------------|-------------------|----------------|----------------|--------------------|----------------|
| | | Unimodal | Bimodal low | Bimodal medium | Bimodal high | Southwest highlands | Eastern highlands | Low | High | Low | High |
| Government program | 0.64 (0.11) | 0.74 (0.17) | 0.36 (0.15) | 0.39 (0.11) | 1.10 (0.32) | 0.17 (0.10) | 0.30 (0.22) | 0.58 (0.11) | 0.66 (0.15) | 0.60 (0.11) | 0.66 (0.16) |
| NGO | 0.99 (0.11) | 1.10 (0.40) | 1.41 (0.37) | 0.50 (0.14) | 1.44 (0.22) | 0.79 (0.29) | 0.55 (0.25) | 0.64 (0.14) | 1.13 (0.14) | 0.78 (0.13) | 1.10 (0.15) |
| CBO | 0.62 (0.08) | 0.07 (0.07) | 0.85 (0.36) | 0.33 (0.14) | 0.52 (0.15) | 2.13 (0.35) | 0 | 0.25 (0.12) | 0.78 (0.11) | 0.48 (0.14) | 0.70 (0.12) |

A. Means and errors are corrected for sampling stratification and sampling weights.

B. Values in parentheses represent standard errors.

Table A2– Average Number of Programs and Organizations per LC1 by Main Focus, 1999^{A,B}

| MAIN FOCUS OF PROGRAM OR ORGANIZATION | AVERAGE | AGRICULTURAL POTENTIAL | | | | | | MARKET ACCESS | | POPULATION DENSITY | |
|---------------------------------------|----------------|------------------------|----------------|----------------|----------------|---------------------|-------------------|----------------|----------------|--------------------|----------------|
| | | Unimodal | Bimodal low | Bimodal medium | Bimodal high | Southwest highlands | Eastern highlands | Low | High | Low | High |
| Agriculture/Environment | 0.44 (0.07) | 0.32 (0.19) | 0.57 (0.23) | 0.14 (0.06) | 0.87 (0.19) | 0.13 (0.10) | 0.25 (0.21) | 0.17 (0.10) | 0.55 (0.10) | 0.26 (0.10) | 0.53 (0.10) |
| Population | 0.09 (0.03) | 0.15 (0.08) | 0.08 (0.08) | 0 N/A | 0.17 (0.08) | 0.09 (0.09) | 0.25 (0.21) | 0.02 (0.02) | 0.13 (0.05) | 0.05 (0.03) | 0.12 (0.05) |
| Infrastructure and services | 0.74 (0.10) | 0.74 (0.10) | 0.76 (0.33) | 0.76 (0.25) | 0.58 (0.17) | 0.52 (0.22) | 0.61 (0.29) | 0.77 (0.18) | 0.71 (0.11) | 0.67 (0.16) | 0.75 (0.12) |
| Credit | 0.08 (0.04) | 0.07 (0.07) | 0.07 (0.07) | 0 N/A | 0.18 (0.11) | 0.09 (0.09) | 0 N/A | 0.03 (0.02) | 0.11 (0.06) | 0.07 (0.04) | 0.09 (0.06) |
| Poverty | 0.76 (0.12) | 0.68 (0.27) | 0.97 (0.33) | 0.49 (0.19) | 0.82 (0.26) | 1.35 (0.3) | 0.09 (0.05) | 0.51 (0.19) | 0.86 (0.15) | 0.74 (0.18) | 0.76 (0.15) |
| Community service | 0.18 (0.03) | 0 N/A | 0.17 (0.13) | 0.04 (0.04) | 0.12 (0.07) | 0.91 (0.14) | 0 N/A | 0.04 (0.03) | 0.25 (0.05) | 0.08 (0.04) | 0.24 (0.05) |

A. Means and errors are corrected for sampling stratification and sampling weights.

B. Values in parentheses represent standard errors.

Table A3: Distribution of LC1's Without Programs or Organizations^A (n=22)

| | AVG. | AGRICULTURAL POTENTIAL | | | | | | MARKET ACCESS | | POPULATION DENSITY | |
|--|------|------------------------|-------------|----------------|--------------|---------------------|-------------------|---------------|------|--------------------|------|
| | | Unimodal | Bimodal low | Bimodal medium | Bimodal high | Southwest highlands | Eastern highlands | Low | High | Low | High |
| Proportion of LC1's surveyed with no programs or organizations | 21% | 7% | 8% | 46% | 6% | 6% | 50% | 21% | 21% | 18% | 22% |

A. Means and errors are corrected for sampling stratification and sampling weights.

Table A4 – Programs or Organizations Where Communities Initiated, Organized and Financed Activities, percent^{A,B}

| MAIN FOCUS OF PROGRAM OR ORGAN- IZATION | PROGRAM OR ORGANIZATION | | | | | | | | |
|---|-------------------------|--------------------|-------------------|--------------------|--------------------|-------------------|--------------------|--------------------|----------------|
| | Government | | | NGO | | | CBO | | |
| | Comm. initiated | Comm. organized | Comm. financed | Comm. initiated | Comm. organized | Comm. financed | Comm. initiated | Comm. organized | Comm. financed |
| Agriculture/ Environment | 10.7 (10.4) | 44.9 (17.0) | 0 (0) | 18.3 (10.0) | 44.7 (12.8) | 0 (0) | 100 (0) | 100 (0) | 0 (0) |
| Population | N/A | N/A | N/A | 22.2 (16.1) | 53.0 (19.5) | 0 (0) | 100 (0) | 100 (0) | 100 (0) |
| Infrastructure and services | 5.9 (4.1) | 65.4 (9.9) | 0 (0) | 9.1 (5.5) | 56.2 (10.3) | 0 (0) | 67.8 (26.2) | 67.8 (26.2) | 54.9 (26.7) |
| Credit | N/A | N/A | N/A | 17.1 (17.5) | 17.2 (17.3) | 0 (0) | 100 (0) | 100 (0) | 69.5 (29.9) |
| Poverty | 0 (0) | 54.2 (11.8) | 0 (0) | 23.2 (9.3) | 40.3 (10.5) | 7.2 (6.4) | 81.7 (6.7) | 70.9 (8.4) | 90.2 (6.2) |
| Community service | N/A | N/A | N/A | N/A | N/A | N/A | 97.2 (2.7) | 97.2 (2.7) | 97.3 (2.7) |

A. Means and errors are corrected for sampling stratification and sampling weights.

B. Values in parentheses represent standard errors.

Table A5 – Community Autonomy in Decision Making, percent^{A,B}

| MAIN FOCUS OF PROGRAM OR ORGANIZATION | PROGRAM OR ORGANIZATION | | | | | | | | | | | |
|---------------------------------------|-------------------------|-------------------|----------------|----------------|------------------|-------------------|----------------|----------------|------------------|-------------------|----------------|---------------|
| | Government | | | | NGO | | | | CBO | | | |
| | Chose activities | Include as member | Raise revenue | Promote part. | Chose activities | Include as member | Raise revenue | Promote part. | Chose activities | Include as member | Raise revenue | Promote part. |
| Agriculture/Environment | 40.2 (18.0) | 61.4 (12.4) | 0 (0) | 61.4 (12.4) | 43.5 (10.8) | 67.4 (11.6) | 35.0 (12.9) | 75.3 (9.5) | 100 (0) | 100 (0) | 73.8 (27.3) | 100 (0) |
| Population | N/A | N/A | N/A | N/A | 47.0 (21.9) | 100 (0) | 22.9 (19.3) | 91.9 (8.0) | 100 (0) | 100 (0) | 100 (N/A) | 100 (0) |
| Infrastructure and services | 10.7 (6.9) | 46.0 (11.2) | 61.8 (10.7) | 86.8 (6.7) | 15.8 (6.4) | 45.7 (8.5) | 18.1 (6.8) | 58.1 (8.2) | 67.7 (2.6) | 100 (0) | 67.8 (26.2) | 100 (0) |
| Credit | N/A | N/A | N/A | N/A | 100 (0) | 100 (0) | 72.4 (26.3) | 100 (0) | 100 (0) | 100 (0) | 100 (0) | 100 (0) |
| Poverty | 52 (15.1) | 47.5 (11.4) | 18.0 (9.4) | 42.4 (13.1) | 54.5 (12.7) | 62.2 (11.5) | 38.5 (12.8) | 58.8 (10.7) | 100 (0) | 97.4 (2.7) | 100 (0) | 95.1 (4.8) |
| Community service | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 100 (0) | 100 (0) | 100 (0) | 100 (0) |

C. Means and errors are corrected for sampling stratification and sampling weights.

D. Values in parentheses represent standard errors.

Table A6 – Perceived Impacts of Program or Organization, rank^{A,B,C}

| MAIN FOCUS OF PROGRAM OR ORGAN- IZATION | PROGRAM OR ORGANIZATION | | | | | | | | | | | | | | |
|---|-------------------------|----------------|------------------|----------------|-----------------------|------------------------|----------------|------------------|----------------|-----------------------|------------------------|----------------|------------------|----------------|-----------------------|
| | Government | | | | | NGO | | | | | CBO | | | | |
| | Land Mgmt. Qual. | Crop Prod. | Livstk. Prod. | Avg. Inc. | Welf. Of People | Land Mgmt. Qual. | Crop Prod. | Livstk. Prod. | Avg. Inc. | Welf. Of People | Land Mgmt. Qual. | Crop Prod. | Livstk. Prod. | Avg. Inc. | Welf. Of People |
| Agriculture/ Environment | 1.30 (0.28) | 1.03 (0.31) | 0.53 (0.23) | 0.93 (0.32) | 1.08 (0.23) | 1.11 (0.15) | 1.11 (0.31) | 0.71 (0.16) | 0.81 (0.16) | 0.97 (0.14) | 1.73 (0.27) | 2.00 (0) | 1.73 (0.27) | 1.00 (0) | 1.72 (0.27) |
| Population | N/A | N/A | N/A | N/A | N/A | 1.20 (0.30) | 1.00 (0.36) | 1.06 (0.36) | 1.23 (0.31) | 1.37 (0.24) | 0 (0) | 1.00 (0) | 0 (0) | 1.00 (0) | 1.00 (0) |
| Infrastructure and services | 0.16 (0.12) | 0.19 (0.12) | 0.67 (0.19) | 0.60 (0.19) | 1.50 (0.17) | 0.10 (0.05) | 0.10 (0.05) | 0.22 (0.07) | 0.32 (0.09) | 1.11 (0.17) | 0.64 (0.52) | 0.64 (0.52) | 0.64 (0.52) | 0.78 (0.40) | 1.00 (0) |
| Credit | N/A | N/A | N/A | N/A | N/A | 0.17 (0.17) | 0.17 (0.17) | 0.17 (0.17) | 0.89 (0.32) | 0.89 (0.32) | 0 (0) | 0 (0) | 0 (0) | 1.70 (0.30) | 2.00 (0) |
| Poverty | 0.16 (0.13) | 0.32 (0.12) | 0.46 (0.19) | 0.73 (0.22) | 1.04 (0.19) | 0.68 (0.18) | 0.76 (0.14) | 0.57 (0.15) | 0.85 (0.17) | 0.91 (0.13) | 0.23 (0.13) | 0.21 (0.11) | 0.15 (0) | 1.08 (0.13) | 1.27 (0.12) |
| Community service | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.09 (0.09) | 0.12 (0.09) | 0.12 (0.09) | 0.95 (0.21) | 1.25 (0.17) |

A. Means and errors are corrected for sampling stratification and sampling weights.

B. Values in parentheses represent standard errors.

C. Rank where 0= insignificant impact, 1=minor improvement, 2=major improvement, -1=minor harm, -2=major harm