

ANNEX A SCIENTIFIC REPORT - R7856

Strengthening Social Capital for Improving Policies and Decision-Making in Natural Resources Management



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Abbreviations and Acronyms

AFRENA – Agroforestry Research Network for East and Central Africa

AHI – Africa Highlands Eco-regional Programme.

ASARECA -Association for Strengthening Agricultural Research in Eastern and Central Africa.

CARE-FIP - CARE-Farmer Innovation Project.

CDF - Community Development Facilitator.

CIAT- International Centre for Tropical Agriculture.

CPR – common pool resources

DFID – Department for International Development.

ECAPAPA - East and Central Africa Programme on Agricultural Policy Analysis.

HHs - Households

ICRAF – International Centre for Research in Agroforestry.

Masl – metres above sea level

NAADS – National Agricultural Advisory and Development Services.

NEMA - National Environmental Authority.

NRM – Natural Resources Management.

NRSP – Natural Resources Systems Programme (of DFID).

R&D – Research and Development.

SWC – Soil and water conservation.

VPTF – Village policy Task Force.

EXECUTIVE SUMMARY

Recent decentralisation reforms in Uganda have shown promising improvements for participatory policy formulation and decision-making at community level. However, there is still concern that decentralisation has not resulted in improvements in natural resources management (NRM), nor has it affected the capacities and decision-making processes of local communities. Effective decentralisation must be based on effective local institutions (or mature social capital) for engaging small-scale farmers and rural communities directly in the articulation of their NRM policy needs and innovations.

The central hypothesis of the project was that presence of social capital is a necessary pre-condition for the participation of resource-poor farmers in policy formulation and implementation and for the adoption of NRM innovations that require collective action and collaboration. Therefore initiatives and processes to strengthen the 'social capital' of local communities, facilitating policy dialogue and supporting policy action, would improve the adoption of sustainable NRM practices and policies. The purpose of the project was to strengthen social capital, improve local institutions and policies, and to support the integration of participatory approaches to policy decision-making and formulation and implementation of byelaws and local policies for accelerating wider-scale adoption and dissemination of NRM technologies in the south-western highlands of Uganda. The project explicitly addressed three key aspects of sustainable livelihoods; social capital, natural capital, and policy, institutions and processes.

The project was implemented in the highlands of Kabale District, Western Uganda, using case study approaches for analysis of social capital and livelihood strategies; participatory assessment of land degradation, participatory policy process action research, and participatory NRM. Investigation into the different dimensions of social capital increased understanding of how social capital is activated in the pursuit of livelihoods, particularly how access to (or exclusion from) social capital can assist or impede access to other forms of capital, and hence influence livelihood choices and outcomes. Results showed that endowments in certain dimensions of social capital decreased the occurrence of conflicts, and played a significant role in minimizing conflicts in NRM. However, social capital mechanisms alone do not possess the resources needed to promote broad-based and sustainable NRM. Rather, complementarities and synergies between social capital and local policies are required to improve NRM.

The project initiated and supported village byelaw committees and policy taskforces at different levels, and strengthened their capacities to review, initiate, formulate and implement byelaws and other local policies. The participatory policy process action research framework concentrated on five key elements: facilitating community visioning and planning of desired future conditions; participatory policy analysis; linking bottom-up processes to higher level policy processes through policy dialogue and policy learning events, and supporting policy action at different levels. As a result of this process, pilot communities have formulated and are implementing several byelaws on soil conservation, tree planting, controlled animal grazing, drinking of alcohol, wetland management and bush burning, with different levels of success.

The study suggests a five "In"s model: strengthening local institutions; providing information; linking byelaws to NRM innovations; finding and promoting incentives, and building a network of influence, as effective mechanisms that research and development organisations can use to influence policy action for sustainable NRM. With the decentralisation process in Uganda, there are significant opportunities to translate research results into policies that can help to accelerate wider-scale adoption of NRM technologies. However, influencing policy in NRM is a long process that needs perseverance and a sustained programme of interventions and influence by different institutions. A proactive communication strategy is required for improving uptake promotion of research products to a variety of stakeholders. There is a need for a post project tracking of the outcomes and impacts of the process on natural resources management and broader livelihood impacts.

KEY WORDS

Adoption, byelaws, conflicts, decentralisation, gender, livelihoods, NRM, participatory action research, policy process, scaling up, social capital, Uganda

1. INTRODUCTION

The decline of agricultural productivity caused by the degradation of natural resources in highland systems is having a negative impact on livelihood systems and is a root cause of poverty (AHI, 1997). Agricultural research has provided technologies and extension services have given advice; however, these problems are persisting. The dearth of innovative participatory approaches to generate and disseminate technologies, poor links between research and development, policy, and local communities have been found to limit adoption and impact of NRM technologies. To address sustainability, productivity and equity concerns, new ways of conducting research are required.

The Africa Highlands Eco-regional Programme (AHI) strategy emphasises: 1) integrating solutions to productivity and NRM issues by adopting participatory and systems approaches; 2) strengthening partnerships, enhancing collaboration and building the capacity of institutions and organisations involved in NRM and agriculture; 3) improving the integration of biophysical and social science research; and 4) linking local policy formulation to technology development (AHI, 1997; Wang'ati, 1994).

However, despite the recognition that policy processes are important for sustainable livelihood outcomes and natural resources management, there is concern that NRM research and technology development have not been reflected in policy change, nor have they affected decision-making processes of wider communities. For more than two decades, participatory methodologies have proved effective in enabling people to take greater control of the development process. However, with few exceptions, efforts have not focused on increasing local participation in policy review and formulation (Scoones and Thompson, 2003). Most policy studies have focused on policy analysis, often at the macro, national level. In a review of agricultural policy analysis in Africa, Idachaba (2001) observed that policy analysis is the easier part; "the much more difficult and rather murkier part is to get the policy implemented and adopted by users; that is to get the results of policy analysis and icy recommendations into political decisions by governments" (Idachaba 2001:46).

The challenge facing policy analysts in Africa is how to get the intended beneficiaries, small-scale resource poor farmers, to influence policies in NRM. Many scholars have argued that participatory research approaches can make a significant contribution towards this critical, yet missing area of policy research (Scherr et al., 1996; Idachaba 2001; Keeley, 2001; Vincent, 2003; Scoones and Thompson 2003). Yet, as concluded by Vincent (2003), the critical gaps which participatory research still needs to address are the development of wider policy initiatives for transforming NRM and the building of new policies to support NRM.

Recent decentralisation efforts in Uganda have shown promising improvement in the participation of local people and other stakeholders in the policy decision-making process. These changes have brought some impressive results, creating a fundamentally different environment for open and participatory policy and decision-making at the lower local community level (James et al., 2001; Egulu and Ebanyat, 2000). However, despite such progress, there is concern that decentralisation has not resulted in improvements in the management and use of natural resources, nor has it affected the capacities and decision-making processes of local communities over the management of natural resources. Effective decentralisation therefore must be based on effective and sustainable local institutions (or mature social capital) for engaging local communities directly in the articulation of their policy needs, in the analysis, design and implementation of policies and innovations (Rasmussen and Meinzen-Dick, 1995).

Omamo (2003) stressed that a search for options for sustainable community-based collective action in NRM, lies at the core of the agenda of policy research in NRM.

Recent research has shown the importance of social capital foundations for successful policy interventions, NRM and community development (Pretty, 2003). 'Social Capital' is defined as the features of social organisations (social networks, social interactions, norms, social trust, reciprocity, cooperation) that facilitate coordination and cooperation, and that enable people to act collectively for mutual benefit (Woolcock and Narayan, 2000; Narayan and Pritchett, 1999). It encompasses the nature and strength of existing relationships between members, the ability of members to organise themselves for mutual beneficial collective action around areas of common need and managing the social structures required to implement such plans; and the skills and abilities that community members can contribute to the development process (Uphoff and Mijaratna, 2000).

The central hypothesis of the project was that the presence of social capital is a necessary precondition for the participation of resource-poor farmers in policy formulation and implementation, and for the adoption of NRM innovations that require collective action and collaboration. Therefore initiatives and processes to strengthen the 'social capital' of local communities, facilitating policy dialogue and supporting policy action would improve the adoption of sustainable NRM practices and policies. The main thrust of this action research was supporting and facilitating the integration of participatory approaches into policy decision-making by strengthening local-level processes and capacity for developing, implementing and enforcing byelaws and other local policies to improve natural resources management in Kabale, a mountainous district in the highlands of south-western Uganda. Thus the project addresses four key components of rural livelihoods; social capital, human capital, local policies and institutions, to improve natural capital.

The rest of the report is organised into five sections. First we discuss the different conceptualisation of social capital and their critiques. Section three describes the research setting and the methodology of the study. We then examine the status of NRM in the highlands of Kabale. The following section describes and assesses the different dimensions of social capital and their role in NRM. The results of the participatory policy action research process are presented in five points based on the policy process operational framework: community visioning and action planning, participatory byelaw analysis, policy learning events; and policy dialogue linking bottom-up and top down processes, mechanisms for policy process management and for supporting policy action. The results of the study and their implications for NRM policy, research and development are discussed in the concluding section.

2. CONCEPTUALISATION OF SOCIAL CAPITAL

The term 'social capital' is a concept that has generated much debate in recent years. A starting point for research under this project, was to examine the various meanings and applications of 'social capital' together with their strengths and limitations. Social capital is one of the five capital assets in the pentagon of the livelihoods framework. (Carney, 1998). In this formulation social capital is considered to be the social resources upon which people draw in pursuit of their livelihood objectives. These include networks and relations of connectedness, both vertical and horizontal, that increase people's trust and ability to work together and expand their access to wider institutions such as political or civic bodies. It includes membership of more formalised groups and relationships of trust, reciprocity and exchange that facilitate co-operation, reduce

transaction costs and may provide the basis for informal safety nets amongst the poor (DFID Sustainable Livelihoods Guidance Sheets, section 2.3.2).

The term 'social capital' implies that social relationships are themselves resources which can assist in increasing well-being (Rudd, 2000). However, in order to develop strategies to build on social relationships and increase participation it was necessary to consider what forms of social capital exist, how these are constituted through various community associations and indigenous institutions with different forms of solidarity and cooperation, patterns of inclusion and exclusion and negative, as well as positive outcomes.

2.1 Different conceptualisations in the literature.

One of the earliest formulations of the concept of social capital is found in the work of Pierre Bourdieu. He identifies several dimensions of capital - economic, cultural and social capital, which become effective and legitimised through the mediation of symbolic capital. Bourdieu emphasised the social construction of social capital and its attachment to forms of stratification which, in turn, are associated with the exercise of economic and other forms of exploitation (Siisiäinen, 2000; Fine, 2002). Social capital becomes a resource in the struggles that are carried out in different social arenas as actors seek to advance their interests and change their positions within hierarchical social structures (Siisiäinen, 2000)

An important aspect of Bourdieu's contribution was the emphasis on social capital as a resource that is connected with group membership and social networks. He defined social capital as "the aggregate of the actual or potential resources which are linked to the possession of a durable network of more or less institutionalised relationships of mutual acquaintance and recognition or, in other words, to membership in a group." Membership in groups and involvement in the social networks and social relationships developing within and from such membership can be utilised in efforts to improve the social position of the actors in a variety of different fields. Group memberships creating social capital have a "multiplication effect" on the influence of other forms of capital (Bourdieu 1986). Thus Bourdieu's approach to concept of social capital is concerned both with the structure of social networks and the resources contained within the network that may be drawn on by its members.

Other early antecedents of current debates on social capital focused more on the normative community dimension, "the features of social life – networks, norms and trust – that enable participation to act together more effectively to pursue shared objectives" (Putnam; 1996:66). The emphasis was on shared values and horizontal associations between people which facilitate community collaboration and mutual collective action and contribute to economic prosperity (Putnam, 1993). The strength of social capital was measured by the density of voluntary organisations. Putnam argues that social capital in form of civic engagement reduces incentives for opportunism and corruption and makes for a more efficient and less distrustful society.

It was recognised that this relatively simple definition worked well in small homogeneous areas (Narayan and Pritchett 1997), but did not capture the range or complexity of social relationships (Grootaert, 1998). It tended to assume the existence of a homogenous community with shared interests and values rather than competing interests. Other interpretations emphasised complexity while defining the specific function of social capital as an aspect of social structure which facilitates certain actions of actors – whether persons or corporate actors - within that

structure. (Coleman 1990:302). Hence the focus was broader than networks of trust between individuals within a community and included examination of vertical associations (Coleman 1988 and 1990). This highlights issues of hierarchical relationships, unequal power distribution and negative outcomes as a dimension of the operation of social capital; benefits to some may imply harm to others or may result in socially undesirable outcomes. Strong norms of solidarity may lead to excessive claims and economic decline, while weak solidarity may lead to failure of trust and cooperation (Granovetter 1995:137).

A third perspective sees social capital as including the social and political environment that enables norms to develop and shape social structure, with a particular focus on formal and informal institutions (North, 1990). The focus extends beyond civil society to include government, political and legal institutions and other forms of networking based on partnerships for innovation and competitiveness, for example, with universities, enterprises, business networks, and the labour market (Cohen and Fields 1998). In this view, social capital generated through civil society engagement is insufficient alone to bring about economic transformation.

More recent formulations and studies using the concept of social capital build on these principles. Uphoff and Mijayaratna (2000) distinguish between structural and cognitive forms of social capital, refining the notions of shared norms and trust at individual and household levels, and the horizontal and vertical social networks constituting social capital. They define *structural* social capital as referring to the networks, linkages and practices within and between communities, including membership in formal and informal associations, participation in decision making and the forms of social organisation within which networks of relationships are located. In contrast, *cognitive* social capital refers to the attitudes, values, beliefs, social norms and behaviours that exist within a community (Uphoff and Mijayaratna, 2000; Grant, 2001). Examples of cognitive forms of social capital include interpersonal trust, norms and values facilitating exchange and reciprocity, cooperation and collective action, tolerance of diversity, altruism, personal commitment to community action, confidence in formal and informal institutions. Both structural and cognitive social capital must be combined to create the potential for mutually beneficial collective action within a community.

The two dimensions relate to a further refinement of the concept of social capital into *bonding*, *bridging* and *linking* social capital (Grooetaert and Van Bastelaer, 2001; Pretty, 2003). Pretty describes 'bonding' social capital as the social cohesion within groups or communities resulting from relationships between people of similar ethnicity, social status and location, based on local ties, trust and shared moral values, reinforced by working together. This is closely allied to cognitive social capital. 'Bridging' social capital refers to the structural relationships and networks which cross social groupings, involving coordination or collaboration with other groups, external associations, mechanisms of social support or information sharing across communities and groups (Narayan and Pritchett, 1999). 'Linking' social capital crosses describes the ability of groups to engage with external agencies, either to draw on useful resources or to influence policies (Pretty 2003). Linking social capital crosses status, linking poor people and those in positions of influence.

The synthesis of studies under the World Bank Social Capital Initiative indicates the high levels of social cohesion where strong bonding social capital exists, allied with strong vertical linkages (Grooetaert and Van Bastelaer 2001). Bonding social capital alone is limited in impact, since its strength is founded on exclusivity. The 'synergy approach' to social capital (Woolcock and Narayan, 2000) resonates with earlier perspectives which argued the importance of the wider social and political environment and institutions beyond civil society. However, Woolcock and Narayan focus on the need for complementarities and partnerships across sectors and between

public and private actors, local government and local communities, emphasising the nature and extent of ties connecting people and communities and public institutions.

The building, sustaining or more negatively, the undermining of social capital, can depend on wider policies that help to determine the resources available to people. While agreeing that social capital in the form of networks and associational activity is an important resource in tackling poverty and social disintegration, some writers emphasise that it is no substitute for policies designed to achieve a more socially integrated society through redistributive measures and sound economic policies (Molyneux, 2001). Policies should strengthen the capabilities of agents to enter into voluntary and mutually beneficial association sustainable over time, rather than simply being short term and parasitic on the ties of solidarity that may exist. In conditions of poverty, 'coping strategies' might be a more appropriate description than 'social capital' to denote the forms of co-operation that arise.

The above perspectives have somewhat different emphases on which dimensions of social and institutional relationships should be included in the concept of social capital. However, all focus on the ways in which stable social relationships can enhance effectiveness and efficiency of collective and individual action. Social capital has the characteristic of a public good; with the implication that it can be strengthened, through allocating resources to support and build these relationships and institutions. Hence the particular relevance of social capital for the sustainability of natural resources and the environment, which often requires collective or coordinated action for its maintenance and enhancement and the imposition of sanctions on short term self interested behaviour (Rudd, 2000). The shared norms and values underpinning this cooperation are generated through patterned social interactions, both formal and informal (Collier, 1998) and hence by stimulating an "interactive process of identification of alternatives, discussion, contestation and decision making" (Rudd 2000), social capital can be created and strengthened.

2.2. Measurement of social capital

There are theoretical and methodological difficulties associated with various efforts to *measure* social capital (World Bank, 2000; Narayan and Pritchett, 1999; Grootaert and Van Bastelaer, 2001). Obtaining a single measure of social capital is difficult given the comprehensive, multidimensional and dynamic aspects of social capital and there are unanswered questions over how this measurement relates to economic growth and development. Work under the World Bank Social capital project has led to the development of an Integrated Questionnaire for the Measurement of Social Capital. Six dimensions are considered: groups and networks; trust and solidarity; collective action and cooperation; information and communication; social cohesion and inclusion; empowerment and political action (Grootaert et al., 2004).

Narayan and Cassidy (2001), identify criteria or indicators for measuring social capital. These include group characteristics such as financial contributions, frequency of participation in activities and extent of participation in decision-making, heterogeneity of membership; prevalence of norms of trust, helpfulness, fairness; closeness of everyday social interaction. Criteria also include community characteristics, - neighbourly connections (for child care, help in illness), the extent of voluntary work on community activities and sanctions for non participation; the extent of trust among different groups within family, neighbourhood and leadership roles both inside and outside village; a sense of pride and identity; the extent of communication.

At the community level, Pretty (2003) distinguishes three types of social capital: bonding, bridging and linking capital. 'Bonding' social capital describes the relationships between people of similar ethnicity, social status and location, and refers to social cohesion within the group and community based on trust and shared moral values, reinforced by working together. 'Bridging' social capital refers to relationships and networks which cross social groupings, involving coordination or collaboration with other groups, external associations, mechanisms of social support or information sharing across communities and groups (Narayan and Pritchett 1999).

'Linking' social capital describes the ability of groups or individuals to engage with external agencies, and those in position of influence, either to draw on useful resources, or to influence policies (Pretty, 2003). At the individual and household levels, Uphoff and Mijayaratra (2000) distinguished between structural and cognitive forms of social capital. Structural social capital refers to the networks, linkages and practices within and between communities. In contrast, cognitive social capital refers to the attitudes, values, beliefs, social norms and behaviours that exist within a community (Grant, 2001). Both structural and cognitive social capital must be combined to create the potential for mutually beneficial collective action within a community.

2.3. Critiques of social capital

Aspects of the development of the concept 'social capital' have been outlined above, but an important criticism is that the tendency has been to treat it as a politically neutral term, avoiding confrontation with social inequalities, social exclusion, structured power relations and conflict (Molyneux, 2001). The perspectives of Putnam and Coleman have been elaborated rather than those of Bourdieu. An approach to planning and policy implementation through community participation based on shared social capital, runs the risk of ignoring or by-passing the vexed question of the voice of the poorest and those with least power to influence the emerging consensus.

The different roles of men and women with respect to the maintenance of social capital also risk being subsumed if approaches exclusively emphasise the 'household' as the locus of social capital and participation. Since women are frequently those with the strongest community and kin ties, maintaining social capital "can come at a high, if unacknowledged, cost to women" (Molyneux, 2001:177). There are gender differences in the kinds of networks to which men and women belong. Women's networks are often more akin to coping strategies, relying on unremunerated time and non-monetised labour exchanges, as compared with the more economically advantageous networks of men (Mayoux, 2001).

Some of the methodological difficulties in relation to social capital are common to wider research into poverty and livelihoods, including challenges of how to derive valid generalisations, to link different levels of analysis, incorporate diversity of livelihood components, especially over time, and how to understand the relationship with the macro context together with political economy analysis (Murray 2001; Bagchi et al 1998). A radical critique is presented by Ben Fine (2002) who regards the term social capital as a catch-all phrase, potentially including all social variables in whatever context and having the capacity "to mean more or less anything", and therefore not analytically useful.

Other writers have raised the criticism of tautology in the discussion of social capital. For example, the assertion that communities will be more successful in collective action if there are high levels of trust and social capital, while at the same time considering collective action, networking and cooperation themselves as the indicators of high level of social capital. At

community level, social capital is conceptualised both as the structural and relational context within which people make livelihood decisions, and also as a resource on which people can draw for specific outcomes. One partial solution to this dilemma is to examine the relationship between social capital and its antecedents in structures of resource access and power relationships linked with the interests of differently socially situated groups.

3. RESEARCH SETTING AND METHODOLOGY OF THE STUDY

3.1. Research setting

In Uganda, the highlands account for 27% of land area and close to 40% of the total population. They are mostly in the south-western and western part of the country, as well as in the east. The action research was conducted in Kabale district in the south-western highlands. The district is characterised by high population density (exceeding 400 inhabitants/km² in some areas), steep cultivated slopes (1500 to 2700 masl). With an adequate bi-modal rainfall (annual average 1000mm) and volcanic soils, the district has high agricultural potential. However, increased population pressure has resulted in severe degradation of natural resources, fragmented small farmlands and a decline in agricultural production, which pose significant challenges to rural livelihoods.

Kabale is one of the eight AHI benchmark sites. AHI's guiding philosophy is a client-driven approach using participatory methods and an effective research-development continuum. This enables researchers working in collaborative, synergetic partnerships, to bring together diverse contributions to foster farmers' innovation and collective action for design and dissemination of appropriate, integrated technologies and methods for improving NRM in diverse and complex situations. Recognising that policy support is always needed for the adoption of NRM innovations, the African AHI established a policy-working group to increase the policy relevance of research at the local level, and to design alternative policy instruments to facilitate adoption of NRM technologies.

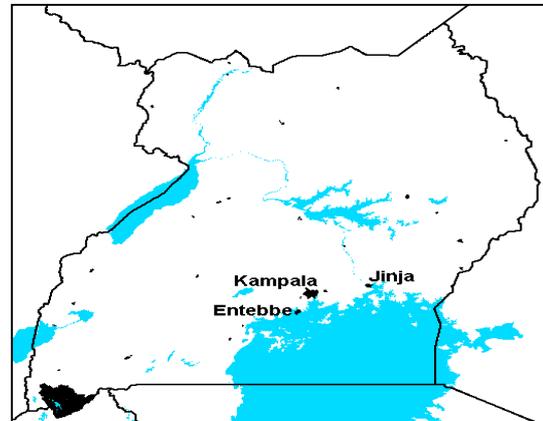
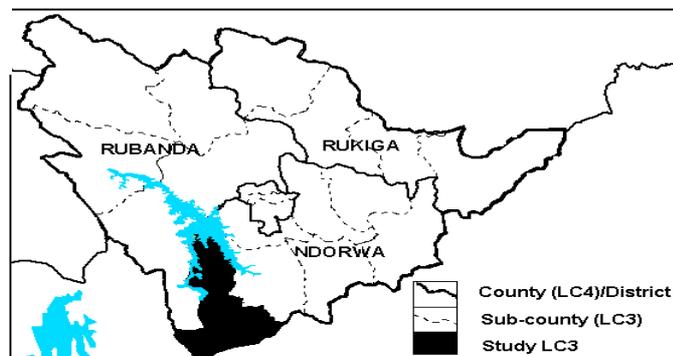


Figure 1: Map of study area

The AHI local NRM policy research initiative focuses on assessing the effectiveness of local NRM policy processes and the relationships between policy change, technology adoption, and NRM (Place, 2001). The policy working group initiated a series of workshops with district level and national policy makers to:



(i) forge dialogue amongst stakeholders involved in agricultural production and NRM; (ii) catalyse local

political support for positive and sustainable NRM, and (iii) identify key NRM policy issues that require concerted action and collaboration.

One of the priority areas identified in the first workshop in 1999 in Kabale was to improve NRM through strengthening of local-level processes and capacity for developing, implementing and enforcing byelaws and other local policies. Further consultations with policy stakeholders led to the development and implementation of this project for linking NRM research and development to byelaws formulation and implementation. The project was implemented in four selected pilot communities in Rubaya sub-county, Kabale district in south-western Uganda.

3.2. Institutional and policy framework

Decentralization in Uganda is one of the most ambitious reforms of local governance in Africa. The decentralization process was initiated in 1986 and culminated in the 1995 Constitution and the 1997 Local Government Act which provide the legal framework for the participation of local communities in policy-making. The mechanisms of decentralization are established and functioning, with the structure of a five-tier system of local councils and local government structures, a bottom-up planning process, and powers to collect and disburse local revenue (James et al., 2001), develop and implement byelaws and local policies for land use, environmental management and agricultural production (see table 1).

At the base of the local government structure, the local council or LC1 (village of about 50-100 households) consists of all adults residing in a particular village who elect a nine-member village local council executive committee. Beyond the village or LC1, in ascending geographical size, there are parishes (LC2), sub-county or gombolola (LC3), county (LC4) and district (LC5) councils. The sub-county level (LC3) is the basic unit of local government, both political and administrative. The district (LC5) is the highest level of local government and links with central government. The provision of local government elections guarantee widespread representation at the various councils and include quotas by gender, people with disabilities, and youths. For example, at least one-third of the council members must be women, an affirmative action to empower women and promote gender equity.

Table 1 Decentralised structures in Uganda: levels and main functions

Local Council Level	Composition	Functions
Local Council 1: Village (composed of more or less 50 households)	9 members, at least 4 women	<ul style="list-style-type: none"> • Assist in maintaining law, order and security • Initiate, support and participate in self help projects • Recommend persons for local defence units • Serves as communication channels with government services • Monitor the administration of projects • Impose service fees • Collect taxes • Resolve problems and disputes Make byelaws
LC 2: Parish (composed of 3-10 villages)	<ul style="list-style-type: none"> • Depending on the number of villages, elected from the village. At least 4 women 	<ul style="list-style-type: none"> • Assist in maintaining law, order and security • Serves as communication channels with government services • Initiate, support and participate in self help projects • Monitor the administration of projects • Resolve problems and disputes
LC 3: Sub-county (Composed of 2-10 parishes)	<ul style="list-style-type: none"> • Depending on the number of parishes, 1/3 women • youth • 2 persons with disabilities • elected councillors from parishes 	<ul style="list-style-type: none"> • Local government • Enact byelaws • Approve sub-county budget • Levy, charge, and collect fees and taxes • Monitor performance of government employees • Formulate, approve and execute sub-county budgets • Resolve problems and disputes
LC 4: County (composed of 3-5 sub-counties)	<ul style="list-style-type: none"> • 5, chairpersons or vice-chairperson from each sub-county 	<ul style="list-style-type: none"> • Advise district officers and area members of Parliament • Resolve problems and disputes • Monitor delivery of services
LC 5: District (composed of 3-5 counties)	<ul style="list-style-type: none"> • 36 members • 12 women councillors • youth • 2 people with disabilities • 19 elected councillors 	<ul style="list-style-type: none"> • Exercise all political and executive powers • Provide services • Ensure implementation of and compliance with government policies • Plan for the District • Enact district laws and ordinances • Monitor performance of government policies • Levy, charge and collect fees and taxes • Formulate, approve and execute district budgets

Source. Adapted from Raussen et al., 2001.

3.3. Methodology, data collection and analysis

The implementation of the study required a creative combination of alternative research methods, and sources of information to ensure the participation of local stakeholders, and to crosscheck and validate information collected in order to achieve the multiple objectives of the study. The project used a triangulation of research approaches, including case study approaches, household interviews and participatory action research to improve understanding of the multiple dimensions of social capital and to explore their relationships with NRM and livelihoods.

3.3.1. Case studies and household surveys

The decision to conduct case studies in four pilot villages in Kabale District, South Western Uganda, was linked to the objective of understanding how resource access and utilisation by different social groups related to levels of social capital in the form of networks of social relationships and group participation. The case studies were designed to look comparatively at households in contrasting circumstances to explore the reasons for differences in livelihood patterns between richer and poorer households and how these related to natural resource management practices.

The livelihoods framework was used to develop checklists covering areas for exploration (human, physical, natural, financial and social capital from the assets pentagon) and for each type of asset, exploring the relevance of social capital. (appendix C). Also included were gender and decision-making processes, understanding of policies and institutions, perceptions of vulnerability and longer term livelihood strategies and preferred outcomes. The checklist also included questions on the range of informal relationships and social networks as aspects of bonding social capital and on linkages beyond the village –membership of externally linked organisations or outside contacts as indicative of bridging and linking social capital. Particular attention was given to the social relationships involved in NRM decisions, for example between the owners of neighbouring plots on a single hillside.

The checklist was used as a flexible tool, applied over a number of visits (each household was visited once every two weeks for a period of 4-5 months). This allowed for the build up of trust and for the cross checking of information which is difficult in one-off questionnaire surveys. It allowed discussion of sensitive issues such as gender roles and responsibilities, group membership and credit arrangements, strategies for coping with poverty. It also facilitated comparison of attitudes to NRM expressed on an individual private basis with those voiced in public discussions. Throughout the case study discussions, attempts were also made to record comments that reflected the existence of cognitive forms of social capital; for example, the extent to which people expressed trust and confidence in their neighbours, kinsfolk and fellow villagers or conversely, suspicion or jealousy; confidence or lack of it, that they felt in their political leadership and values of helping others and cooperating together. While this did not cover the complete annual cycle, it did capture some significant decision making points, the harvest of main season crops at the end of June/early July, dry season valley bottom cropping, land preparations and cropping decisions for the following season, and a critical period for livestock.

The case studies covered households across a range of wealth and status, including the poorest. This allowed inclusion and consultation with households who were not represented in groups or project participatory activities, especially poorer women. The case studies were intended to increase understanding of how social capital is activated in the pursuit of livelihoods, particularly how access to (or exclusion from) social capital can assist or impede access to other forms of capital and hence influence livelihood choices and outcomes. It was also hoped that case studies could illuminate any negative dimensions of social capital, such as excessive burden of obligations to family, kin and friends within informal social capital networks (Rose, 1997) or perceptions of corruption or exclusion. The case studies were intended to be complementary to the questionnaire surveys and group discussion approaches conducted under the project as well as data from other projects in the district. The case study comparisons across different household types was also intended to show which strategies for improving NR management and productivity have more relevance for which groups, and what additional policy changes and

capacity building would be needed for their implementation - specifically the viability of options which are necessarily implemented at a level beyond the individual, versus options which can be implemented on single plot scale by an single decision maker.

The case studies were complemented and enriched by a multistage adaptive sample survey of 145 households comprising 52% male and 48% female farmers. Through this analysis, the existing patterns of social capital were to be identified and opportunities for building and extending its role in NR management explored, particularly strategies to support social capital building of the poorest. Where social capital is lacking, or where existing forms play negative roles for sections of the community, strategies to create new forms of social capital would be considered. The examination of social capital in Kabale district was not attempting to construct aggregate estimates of the amount of social capital in the project pilot areas, but to generate understanding of how social relationships operated in practice within community groups and organisations and informally within and between households and external bodies.

3.3.2. Participatory assessment of land degradation in the pilot communities:

As part of situation analysis, a systematic participatory field assessment of land degradation was undertaken to generate and strengthen knowledge about NRM and to facilitate the development of community action plans for improved NRM and reversal of land degradation. This participatory land degradation assessment was complemented by detailed household surveys on natural resources management practices by farmers, and the in-depth case studies of selected households. This followed the methodology for field assessment of land degradation described by Stocking and Murnaghan (2001), and supplemented by other methods for valuing land degradation and soil fertility loss. The case studies also included a monitoring of agricultural and natural resources management practices using plot record sheets. The study also examined the dimensions and types of conflicts in NRM, and their management mechanisms.

3.3.3. Participatory policy process analysis and action research:

The project's approach was grounded in the tradition of action research (Reason and Bradbury, 2001; Dick, 2001), a process that pursues action (policy change) and research (understanding of policy processes), at the same time learning by doing (participatory natural resources management). The process had the following key elements:

- a. *Participatory community visioning and planning:* The participatory NRM community planning aimed at stimulating collective analysis of NRM issues through visualisation, diagramming and other relevant participatory tools to facilitate communities to develop plans and strategies for improving NRM.
- b. *Participatory byelaw analysis:* The project conducted a review and analysis of existing formal byelaws (soil and water conservation, food security, tree planting, bush burning, controlled grazing, and swamp reclamation bye-law) and assessed farmers knowledge and perceptions of the effectiveness of existing byelaws.
- c. *Promoting and facilitating policy dialogue* through regular stakeholders workshops, meetings and consultations and *policy* task forces at the various levels (District,

Sub-county, parish, villages, pilot communities), and facilitating communities and local councils to set up monitoring and evaluation systems for byelaw implementation and NRM in the pilot communities.

- d. *Supporting policy action:* The project facilitated the formation and functioning of local policy committees or taskforces at three different levels of decentralisation (village, sub-county and district), and provided direct support to the process of formulation and implementation of byelaws and regulations. Specific activities were geared towards improving the capacity of local authorities to review and formulate byelaws and to manage conflicts.

3.3.4. Data analysis

Data analysis involved appropriate analytical procedures and techniques for qualitative and quantitative data analysis. Qualitative data analysis (see Denzin and Lincoln 1994; Krueger, 1998) emphasises understanding, interpreting and explaining the different dimensions and manifestations of the issues under investigation. Content and narrative analyses were useful to look for patterns or certain regularities that emerge from the numerous stories and observations made during the research process. They identified actions and statements that support the emerging hypotheses, and helped to look for negative instances that refute the hypothesis, by checking the range of perspectives in a number of different situations. For the survey questionnaire data, we used relevant statistical tools (descriptive, bivariate and multivariate analysis) within the statistical package for social sciences (SPSS 11.0), and STATA (version 6.0) econometric computer software.

4. RESULTS AND DISCUSSIONS

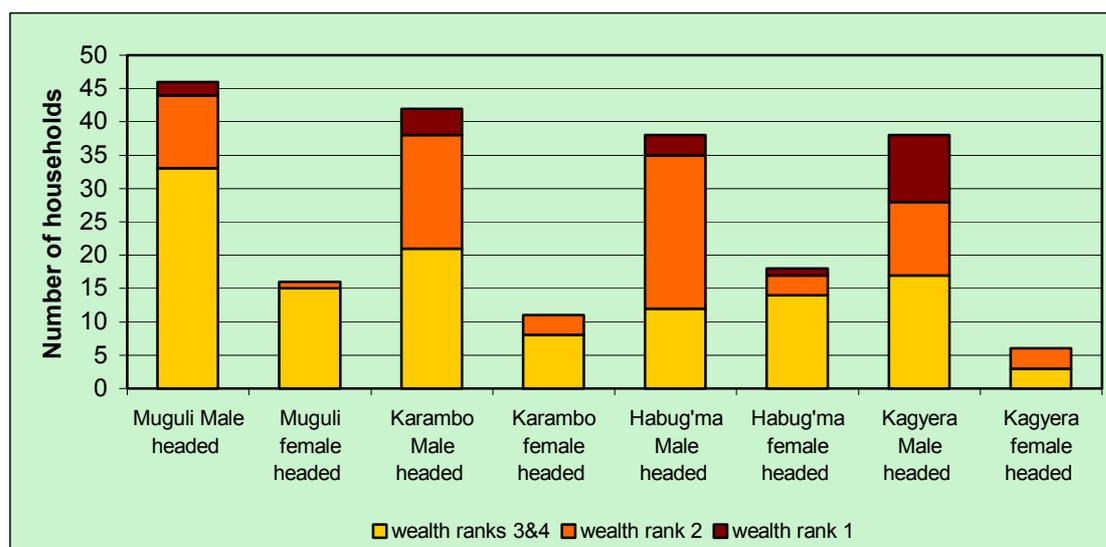
4.1. Rural Livelihoods and Natural Resources Management and Use in Kabale

4.1.1. Rural Livelihoods and poverty

“Poverty will never come out of this village” said a farmer reflecting a general attitude across all the villages. There is no doubt that poverty is one of the characteristics of the different villages surveyed and indeed much of rural Africa. A common participatory technique used to examine the sources of vulnerability and the different wealth indicators in rural communities is wealth ranking (Grandin, 1988). This can provide a basis for exploring the ways in which rich and poor households are different, as well as their pathways out of poverty. Wealth ranking exercises based on local socially defined well-being categories showed that the majority of farmers were in the average group (53%). Resource-rich farmers (not so poor) represented some 18%, while the “poor” represented some 26% of households in most communities.

The four villages in Rubaya sub county selected for the case studies were Habugarama in Kitooma parish, Muguli and Kagyera in Mugandu parish, and Karambo in Buramba parish. They vary in size from 46 to 62 households. Wealth ranked household lists for Muguli and Karambo were available from the CIAT BAPPA study and for Habugarama and Kagyera from the ECAPAPA funded land conflict study.

Figure 2 Distribution of all households by wealth rank in the case study villages.



Factors differentiating rural households in Kabale district have been explored in some detail. Wealth ranking exercises pointed to the significant role of access to land. Other factors are land size and location, children in school, ownership of cattle and improved breeds, off farm income, children in Kampala and house type.

The relative poverty of households and particularly of female headed households was as follows:

- 57.2% of households were in wealth ranks 3 and 4, 33.5% in wealth rank 2 and 9.3% in wealth rank 1.
- 23.7% of households were female headed. Only one female headed household was included in wealth rank 1 and this was a household with a husband working in Kampala.
- 19.6% of women headed households were in wealth rank 2 and 78.4% were in wealth ranks 3 and 4 compared with 37.8% and 50.6% of male headed households in the same categories.
- Comparing across the villages, the distribution of wealth ranks is most even in Kagyera and most skewed in Muguli (77.4% of households in wealth ranks 3 and 4). The highest proportion of female headed households was in Habugarama (32.1%) and the lowest in Kagyera (13.6%)

Factors differentiating rural households in Kabale area were explored. Among the most significant was access to land. Other important criteria defining wealth or well being, are - ownership of cattle and improved breeds, off-farm income, ability to send children to school, a house with iron sheet roofing, remittances from family members in Kampala, food security, ownership of means of transport. The “poor” were often described as: “One who has no house, no food for children. Children of school-going age are not in school; they have “brown hair” (kwashiorkor), and at times [they are] infested with jiggers and may steal food. The poor have no food for the family, they must labour for food. They have no land for ploughing, or only a small piece of land around a poor house, and no livestock.” To better appreciate the pathways out of poverty, we asked farmers to give examples of people who were originally poor, but who have

managed to “jump” out of poverty. The following cases illustrate some strategies farmers have used to escape from extreme poverty.

- Some very poor people squeezed themselves to work hard in order to educate their sons, so that they can get a job and be able to transfer money back home and take care of their parents. Those who were lucky made it and now have good jobs in Kampala or abroad and have built good houses for their parents. They are sending money to their families. Most elderly people with good housing receive support from their children.
- Some people were poor because of excessive drinking. They decided to stop drinking and started brewing beer to generate cash. They can now buy good land where they can produce potatoes and sorghum, and make good money.
- Some farmers have joined a group to work together and save money. With savings and credit from the group, you can start a small business or invest your money in purchasing good land. There are now many local credit groups that one can join.
- There are cases of poor families that used to work for food and clothing. After some time, they acquired land to grow their own crops. In some cases, they are given small livestock after some time.
- Many people are forced to migrate to other districts or to go and work in tea estates to earn a living. Many of them have made it and are sending some money to their families. Some left the village and then returned to start new businesses such as making enguli.

In addition to these contextual and structural factors, other factors include fragmentation and low productivity of land, the lack of markets for crops, low prices for agricultural products, lack of rural infrastructure, individual behaviour such as drunkenness and laziness, as well as social and family circumstances, such as being widowed or separated from husband, or orphaned at an early age.

Livelihood options for most people are limited to food crops production. Most households derive their income from sale of agricultural products. The majority of farmers derived their farm income from sale of sorghum (75% of households), potatoes and beans (50% households) (see table 2). However, in terms of the amount of income derived from farm products, potatoes were by far the highest income earner, providing an average of Shs. 35,411 per season. T-test statistics showed that men derived substantially higher income from sorghum compared to women (mean difference =22,167; $t=-2.63$, $P=0.008$), while no significant difference existed for potatoes and other crops. Other sources of income include tree poles, sweet potatoes, and cabbage as well as tobacco, maize and poultry for a rather small number of households.

Table 2: Percentage of households deriving income from agricultural products

Main sources of agricultural incomes	Female HHs	Male HHs	All households
Sorghum	75.7	74.3	75
Potatoes	51.4	48.6	50
Beans	44.3	54.1	49.3
Trees (poles)	21.7	24.3	23.1
Peas	27.1	18.9	22.9
Sweet potatoes	27.1	16.2	21.5
Cabbage	15.7	12.2	13.9
Banana	11.4	9.5	10.4
Tobacco	4.3	6.8	5.6
Maize	8.6	10.8	9.7

Survey results revealed that over half of the households are female-headed households- (de jure and de facto¹). This proportion is considerably higher compared to the national average of 23%. Recent survey results in Kabale also showed an increasing number of female-headed households (David, 2004). This is a clear indication of out-migration and the low growth rate of population reported in the 2002 census. Similarly, close to 30% of households interviewed had some members of their households living outside the village, and over 40% of the interviewed farmers have lived outside their villages, in towns and cities as well as in other districts. The average household size was about 6 persons per household, of which 2 were dependant children (below productive age). More than 64% of women have attained at least primary school compared to over 80% of men. However, although the proportion of men and women with primary education was comparable, the proportion of men with secondary education was double that of women. These findings are consistent with other studies carried out in Kabale District (AHI, 1998; Sanginga et al, 2002), and we therefore believe they are largely representative of the characteristics of the wider population.

4.1.2. Livelihood strategies

Discussions on this topic was intended to explore the main causes of vulnerability as perceived by the different households, the strategies which they were following to hope to overcome them and their aspirations for the future. While there were some common themes across households of different wealth status, particularly with regard to problems of agricultural productivity, there were some important contrasts in strategies and aspirations. The examples below are illustrative of these.

Wealth rank 1

Muguli (M1) - This household, male headed, which derives its main income from both agriculture and business, felt that vulnerability was created by ;

- Exhausted soils which result in low yields, which lead to food shortages.
- Shortage of cash during harvest season when produce prices are very low.
- Cattle theft from Rwanda, especially when meat prices in Rwanda are very high.
- The after effects of the war in Rwanda which spilled over to their area – rehabilitation has not been an easy task.
- Cross- border trade has not been lucrative since its liberalization.
- Decrease in incomes due to the ever falling produce prices.

His strategy was to seek loans to start new business and then invest income from trade and loans in buying land. His aspiration is for his children to move from agriculture to salary earning through education.

¹ These include widows and women with absentee husbands

Kagyera (K1) - The main sources of income for this household (also male headed) were crop sales and livestock trade. His focus was on vulnerability of agricultural production and ways to overcome this.

- Poverty in the area is caused by poor crop varieties and seeds which the communities plant like local Irish potatoes, tomatoes, beans, tobacco and cabbages which have low productivity and don't fetch high prices.
- Heavy rains, which destroy the planted crops, also encourage poverty among the local community
- Lack of money to buy pesticides.
- Lack of jobs and income generation is also another cause of poverty in addition to lack of markets for poor crops cultivated.

His suggested strategies were:

- To plant improved varieties, apply pesticides and use fertilizers and compost manures to increase the production.
- Look for NGOs to assist in looking for markets for our products, because the local markets are cheap.
- Borrow money from saving groups to begin livestock business
- Look for NGOs which can lend people money at low interest rates to begin business
- Join seminars/ workshops that sensitise people how to improve agriculture and how to develop business skills.

His aspirations were to have more livestock (20 cows and 10 goats), more plot (25 plots), invest in permanent housing and send his children to university. Another wealth ranked 1 household, in Karambo village, had similar aspirations to the above – to have a permanent house in Kabale to do business, to keep zero grazing exotic cattle, to acquire more land, to go for further education and to buy a new car.

Wealth rank 2

Kagyera (K2a) This household depended on agriculture and the construction work of the household head. Vulnerability was explained in the following terms;

- The decline in crop harvests creates vulnerability for the household. When the harvest is low, almost all is kept for home consumption in order to avoid food insecurity and this means scarcity of money.

The family's priorities are to improve their agricultural production (beans, Irish potatoes and sorghum) to access improved seeds. *“socially, when you (have) food, you don't experience any problems in*

the community, and ...when you have a quality harvest, one is assured of a market which increases the flow of money in the household”.

Their aspirations were to have a better house and kitchen and better seating in the house; more land sufficient for them and their children in future; to have more livestock and some cows for milk; to buy better clothes for household members; and to have food security throughout the year

Kagyera (K2b) This is a female headed household which derives most of its income from agricultural production. She considered that vulnerability was created by the following factors;

- Specialisation in agriculture
- Destruction of crops by weather i.e. both rains and drought
- Pests which destroy crops
- Lack of markets for agricultural produce
- Lack of loan schemes (*entandikwa*) from the government which would help to start self-help projects.

Her strategy is to go to credit groups for loans. She has tried grow a variety of crops so that if one does not do well, the other can compensate. She is looking to improve agricultural production by accessing improved seeds, agricultural inputs and markets with better prices. Her aspirations for the future are for her son to become a progressive businessman dealing with crops.

Wealth rank 3

Muguli (M3a). The main sources of income of this household are agriculture and agricultural wage labour. Vulnerability was defined as follows;

- Food insecurity arising from land shortage due to the population pressure on land. Land fragmentation has accelerated food insecurity in the village
- Vagaries of weather including floods, hailstorm, heavy rainfall and prolonged drought
- Low agricultural yields contributed to cash shortage, there is no surplus for sale hence no cash realised in the household.
- Health problems have also contributed to shortage of cash in the household. The fact that most of the household members are sick, labour for production is very low.
- Lack of resources such as land and domestic animals has also limited cash flow in the household.

Their strategy is to invest in sheep and goat rearing; to plant fertility improving species; to use agricultural knowledge and skills to increase output and yields (beans, potatoes and sorghum) and to produce higher quality products. Their aspirations are to have enough food and a surplus

for sale; to educate their sons and daughters, to buy more land and build a permanent house; to have more livestock and pay the bride wealth.

Kagyera (K3b) This household depends on crop sales, agricultural wage labour and beer brewing. Comments on vulnerability were;

- Crops are not productive because the soils are exhausted, and this, together with pests and diseases produces little to sell, leading to low incomes.
- Illness forces sale of crops at low prices, which encourages poverty.
- Shortage of land because of the increasing population - in one plot you can put in three different crops which all have to compete for nutrients, hence loss of fertility.

His strategy in case of urgent need is to go to a savings group, his father in law, father and neighbours for assistance, but paying back is a problem. He has become poorer and has sold every thing to pay medical expenses for his wife. He is planning to migrate. He used to have at least 80,000/= in his pocket every two months, but now he doesn't have even 50/=. He says *“Even if I work very hard, I will never get out of poverty”*.

He intends to look for work as an agricultural labourer in Masaka; join savings groups and borrow money to begin a business - but still the interest and what to mortgage becomes a problem; increase agricultural production of beans and sorghum through hiring land; and experiment with new crops like pyrethrum. His future aspirations are to build an iron-roofed house; have livestock (3 goats, cows and hens); have more land, pay bridewealth for his wife; see his children in school; and to stop drinking. *“I drink because of poverty. If I had some money I would do business.”*

4.1.3. Sources of income and income levels

Estimates of aggregate household incomes from arising from the diverse activities characteristic of households in the four villages are very difficult. The case studies provided insights into level of income derived from sales of agricultural produce although they were less accurate in estimating income from business sources. Other studies (see annex B) have estimated the mean seasonal income at 122,350 Ugandan Shillings for female farmers and 177,631 for male farmers. Over 50% of female farmers were in the lower income categories, i.e. less than 25% of the mean income. The figures from the present case studies show similar results for women farmers in the lower wealth ranks. There are strikingly large differences in income between the richer and poorer households, reflecting their different assets and occupational involvements.

Table 3 Estimated income from agriculture (crops, livestock and trees) for the season, by household wealth rank and gender. (Ugandan shillings)

Wealth rank	Maguli		Karambo		Habugarama		Kagyera	
	M	F	M	F	M	F	M	F
1	583,500		N/A		N/A	135,000	440,000	

2	346,000	240,000	N/A	N/A	985,000	N/A	509,000	200,000
3/4	17,000	65,000	30,000	20,000	N/A	N/A	N/A	
	80,000		N/A				101,000	
	69,000							

Sorghum sales accounted for the largest proportion of agricultural income for wealth rank three households, followed by beans and woodlots. For wealth rank 2, potatoes were more important and for wealth rank 1, woodlots and livestock were included. Other crops sold included cabbages and wheat.

When off-farm income is included, income estimates for the richest households reach in excess of 500,000/- for the same period (two households over 1,000,000/-) and for middle ranking households between 240,000 and 900,000/-. The poorest households depend on agricultural or other casual labour and assistance from relatives for additional income. With daily agricultural wage rates between 500-1000/- , it is unlikely that poor women could generate more than 50,000/-, from this source.

Discussions on sources of finance and credit with the case study households indicated the vital role played by social capital in accessing financial capital, particularly for poorer households. The major source of loans for agricultural investment, for home improvement and for meeting the cost of medical bills was from village based savings groups. For membership of these groups, the conditions were the payment of a membership fee; to be able to afford the monthly contribution and to be of a trustworthy character. The majority of the poor to middle ranking households had membership in at least one savings group, and in some cases were members of several. In contrast, membership of village savings groups was *not* characteristic of the richer households, some of whom had bank accounts and secured larger loans directly from commercial banks, at what they maintained were lower rates of interest than the 10% per month charged by village credit groups.

There were differences in the levels of regular financial contributions to savings groups. For example, Muguli Tweterane – “Muguli let us unite”, founded in 1992 requires a contribution of 20,000/- per month. There are 11 members, 2 of whom are women. It provides loans at 20% interest over 6 months. Two of the wealthier case study households in Muguli were members, one of whom received a loan of 150,000 which she successfully repaid in 6 months. Other groups have more modest entrance requirements. They require contributions of between 1000/- and 2000/- per month and provide loans to members. Interest is 10% per month. Joining fees of these groups vary between 5,000-10,000/-. Some are women only groups, others are mixed. Some groups have exclusive non-financial criteria for membership - some are clan based, some church based (e.g. the Mothers’ union). Interest rates on loans to members of these groups is around 5% per month and joining fees are slightly lower at 1000-3000/-.

Other types of savings group are more geared toward food security. Contributions are in kind after the harvest season, which are later given out to members who need seed at planting time, to be returned with a profit e.g. if one took 5 kgs of seed, she should return 6 kgs i.e. 1 kg for every 5 kgs. Loans are also given, and the profits used to buy more produce during the harvest period, which is later shared among members in time of scarcity or for planting.

The most common uses for loans are for agricultural production, including seed purchase, or for use in family crises, such as illness. Agricultural groups in particular, provided loans used for land purchase, livestock purchase and construction of animal housing. In spite of the prevalence of savings groups, nevertheless, there is also a strong reliance on social networks of relatives and friends to provide small amounts of loans and financial support (for example, a loan from in-laws of 10,000/- to pay graduated tax) . Nearly all adult members of the case study households reported giving small amounts of financial assistance to their relatives, friends and neighbours. People resort to taking interest bearing loans when their financial requirements are higher than can be informally supported. There were several examples where individuals reported being a former member of a savings group which had collapsed due to default on payment, financial mismanagement or corruption.

4.1.4. Access to and use of Natural resources

Arable land is seriously fragmented across different hills, valley bottoms and wetlands. Most households have plots scattered across and outside the village (about 3 plots, ranging from 0 to 38). In some villages, the number of plots owned by non-residents exceeded those owned by village residents. The average number of plots per household was 6.8 ranging from 0 to 27 plots for women headed households, compared to 9.36 ranging form 0 to 40 for male-headed households. Only four households were reported to be landless, while about 60% of farmers had more than 5 plots of farmland, with close to 10% of male households reporting more than 20 pieces of farm land. Most female-headed households (45%) reported between 2-5 plots. The average size of individual plots varies between 0.1 and 0.7 acres.

Table 4: Household Productive Assets

Assets	Women	Men	All households
Mean number of assets			
Average total number of plots	6.87 (27)*	9.36 (40)	8.16 (40)
Number of plots on hillsides	4.6 (14)	7.6 (38)	6.2 (38)
Number of plots in valley bottoms	1.2 (7)	1.3 (16)	1.2 (16)
Number of plots in other villages	2.6 (16)	2.9 (38)	2.8 (38)
Number of small ruminants per household	1.9 (15)	2.2 (17)	2.1 (17)
Number of poultry per household	3.4 (19)	2.4 (8)	2.9 (19)
Percent of households owning assets			
Percent of households owning more than 5 plots of land	50.7	68.9	60.2
Percentage of households owning small ruminants	49.7	57.5	54.3
Percent of households owning local cattle	7.6	24.6	20.7
Percent of household owning dairy cattle	2.9	4.1	3.5
Percent of households owning bicycle	30.4	37.9	34.3
Percent of households with iron sheet	85.3	93.2	89.4
Percent of households with cemented houses	20.2	15.1	17.6

Assets	Women	Men	All households
Percent households owning a radio	63.2	74.3	69.9

*Figures in brackets are maximum

The degree to which fragmentation appears on the landscape is deemed excessive, and has been found to impede incentives for better management of distant plots (Bamwerinde and Place, 2000; Raussen et al., 2002). This highly disjunctive pattern of land ownership also makes collective action on soil conservation and management efforts exceedingly difficult. Most of these plots are privately owned having been inherited from parents. However, increasingly there is a growing market for land. A considerable proportion of farmers have purchased some plots (35.6%) in their villages, or in other villages (43.8%) as well as in the valley bottom (43.6%).

Land transactions are increasingly in the form of cash, although different arrangements for renting land with labour, livestock or sharing of harvests still exist in some limited cases. Prices vary according to the size and location of the plot, from approximately US\$ 1 million for large plots to US\$ 100,000 – 50,000 for small plots. The prevalent prices for hiring and renting plots vary between US\$ 100,000 for large plots (approximately 100m²), and 20,000 for small plots (less than 50m²). Communal ownership of agricultural land is almost non-existent, except for reclaimed swamps, which are managed by marshland groups, but the plots are allocated to individual members of the groups.

Estimating access to land in terms of area is challenging in a rural environment where production takes place on numerous small and widely dispersed plots. Nevertheless, the combination of number of plots and an estimate of area is indicative of the overall level of land resources to which households have access. The case studies showed marked differences in land access between the case study households and according to gender. Estimated average land holdings for female-headed case study households were 2.5 acres, while for male-headed households it was 4.3 acres.

The distribution of ownership suggests that the second wealth rank category has the highest average land ownership (5.22 acres) compared with wealth rank 1 (3.35 acres) and wealth rank 3 (2.64 acres). In the light of the pattern of occupations given in table 1 above, it seems likely that wealth rank 1 households do not maximise their land holding, given their focus on non farm occupations, but rather specialise in particular enterprises, e.g. potato production, timber. The relatively low land ownership of wealth rank 3 households is an indication of the pressure on land that many attribute as the underlying cause of soil degradation. Wealth ranks 1 and 2 had between 5 and 30 plots, with two households having consolidated their plots into a single area. Wealth rank 2 were more likely to hire land in. Wealth rank 3 and 4 households had between 1 and 8 plots and some were also renting land out, reflecting the older dependant age groups in this category.

4.1.5. Gender and access to land

The main gender differences were the acquisition of plots from husband's clan or relatives by women, and purchase from in-laws by men. Women headed households had a lower % of rented plots. Social capital, particularly bonding social capital in the form of clan or kinship relations influences access to land. In addition to patrilineal inheritance, land was acquired through rent and purchase. These purchasing and renting arrangements were often based on kinship and village neighbourhood linkages.

On land ownership, men expressed the view very strongly that while women have rights of access to land, they do not have full ownership or the right to sell. However, others said that although men have the right to sell land, the wife has to sign her agreement before the transfer can be complete. Men also viewed trees as their property. Women have access to trees for firewood, but cannot sell them. This view may explain why a widow was having problems with the clansmen of her late husband who were attempting to steal trees from her woodlot. However, women express their relationship with the land in rather different terms, referring to their individual decisions in acquisition and management of land. The actuality is more a matter of complex negotiation;

“...Agricultural land belongs to the man and the woman only has access, but these days they claim land is theirs also. Trees also belong to the man, but the wife can have access, but not to cut or to sell. If she does you quarrel. As far as livestock are concerned, both the man and woman agree. For example, the husband takes to the market, gets the money and the wife keeps the money. However the husband has to get some share for drinking like 1000/= to sit with other men in the bar. But this depends on whether that man works at home and helps the wife....”

Households varied in patterns of responsibilities and decision making. In some, the husband was the main decision maker on all aspects of household planning – crops, livestock, crop sales, food security and children’s education, although their wives made day to day decisions on consumption and activities. In others, the husband /wife relationship was more consultative and major financial decisions were made jointly. Some women heads of households said they would consult their late husband’s relatives on actions relating to disposal of land and livestock (where these were inherited rather than bought with her own money).

For many households, including the more wealthy, women are the main day to day managers and decision makers concerning cropping activities. But a distinction was drawn between ‘family’ crops which women have management control and those financed by men with hired labour to generate starting capital for a business. Income from women’s activities, such as providing labour on other people’s farms, is hers to spend. Most women said they were free to join any village group.

4.1.6. Participatory land degradation assessment

Several scholars have extensively documented the status of natural resource management and technologies for reversing land degradation in the highlands of Kabale (for an annotated bibliography, see Tukahirwa, 1999, and for inventory of technologies see Raussen et al. 2002). The status of agricultural-based NRM in the highlands of Kabale cannot be better summarized than this explanation by an elderly farmer, Zaburooni (now in his late 70s), who came to the village in 1944 when he was about 18 years old.

“ This area was not occupied before the 1940s. The first people settled on the hilltops as there were forests and jungles lower down. There were about seven families present at that time. They built houses on the top and cultivated around the houses. ...When more people came to the area, the clan leaders would allocate enough land that could support a family, depending on the family size. They did not think about the future or acquire huge chunks of land ready for expansion. ...In the past you could stand on a hilltop and only see another hill top because of the dense and tall bushes in the valley. Everything was trees; all the valleys and slopes were also covered with forest. (...) Cultivation started at the mid slopes, moving down to the lower slopes, in order to scare away predators (wild pigs, leopards and lions). (...). The east-facing slope was the first to be cultivated, starting from the mid slope to the valley, then expanding south on the eastern slope. (...)

We used to plant plots in alternate years (3 years) to regain its fertility. When you leave a plot to rest, grasses grow up and later rot and the soil gains (...).

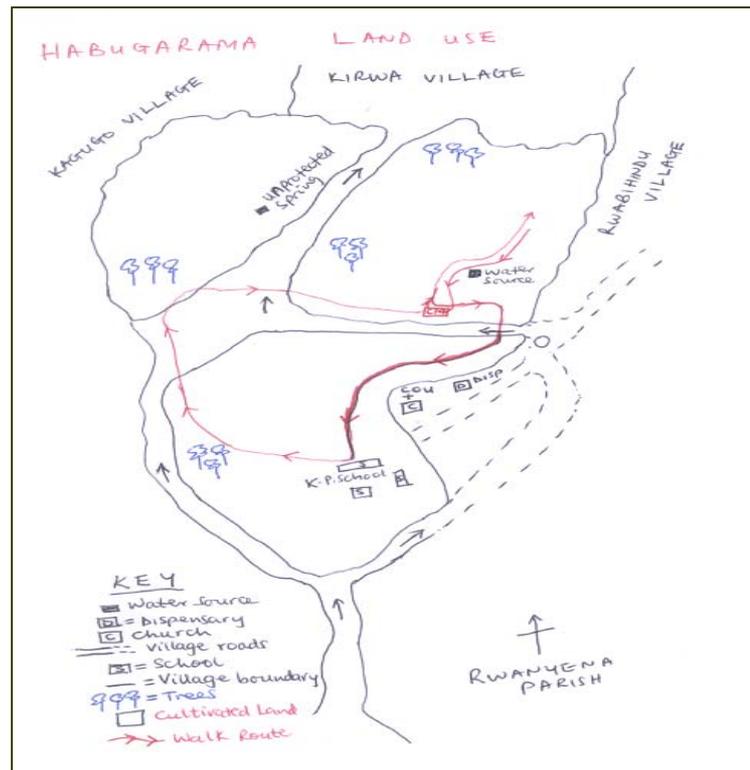
The hills top and valley bottoms were used as grazing lands for everybody. Now because many people came into the village and with constant tilling without resting the land, people are now forced to cultivate both the valley bottoms and the hilltops. Some rich and powerful people have also bought the fertile parts of the valley bottoms for their exotic dairy cows. Some used their power to grab communal grazing land, like the whole of that hill...The Government also is stopping people from using the wetlands and swamps, where we used to fish and collect papyrus and building material. Now people are arrested for collecting papyrus from the swamps, or firewood from a village woodlot...This is very difficult for the poor and old people like me who don't have money. When we came to this village, money was not the issue, and there were plenty resources for the village. Now we have so many disputes over the use and property of land, even for grazing land and other communal properties. People are now competing for everything (...)

Results of individual interviews, focus group discussion, participatory mapping, land degradation assessment and field observations lend strong evidence for the existence of acute land degradation, erosion, and declining soil productivity in Kabale. Based on farmers' rough estimation, less than 30% of the cultivable land in their villages is still arable, as the other 70% has been degraded. However, most of the degraded land is still being cultivated, and only about 20% has been abandoned. This trend is confirmed by (Bamwerinde and Place 2002) who assessed the extent of land abandonment in the Kigezi highlands.

Fallow plots among the case study households were 9% of the total number of plots and were estimated at 6% of the area. The case studies constitute too small a group to generalise about the relationship between size of land ownership and fallow. Olsen (1996) found a clear relationship between fallowing and farm size in Kabale district. In her transect of 263 plots, the % area of fallow and the duration of fallow was higher for larger farmers (59% of land fallow of which 20% was for 2-3 years) compared with small and medium (33% fallow of which 23% was for less than one year). Fallowing also increased with distance from the homestead. Fallowing was also more likely where farmers perceived there to be quite serious erosion compared with plots where there was none.

In order to get a clear picture of the extent of the problem, land degradation issues, geographical distribution of natural resources, current NRM practices and other related factors, a participatory land degradation in each of the four villages was facilitated, using transect walks (Map 3), mapping and field measurements.

Figure 3: A transect route by farmers in Habugarama



Among the problems affecting poor soil productivity, the majority of farmers reported soil erosion causing gullies and destroying soil conservation structures such as terraces, and causing flooding in the valley bottoms. However, some areas have been more affected by erosion, landslides and flooding than others. Raussen et al. (2002), in their inventory of technologies to improve NRM and agricultural production in western Uganda, reported that soil erosion and flooding, low levels of use of improved production technology, land fragmentation, low and fluctuating market prices, poor market access, unavailability of inputs and depleted soils, are the key elements leading to low soil productivity.

The types of erosion that farmers described as existing in the study villages are gully erosion, sheet erosion, and rills. Gullies “Emikoki”, are evident and are more pronounced on the mid-slopes, at times stretching from the top to the bottom of the hills as well as in the valley bottoms. The farmers’ maps in figure 1 illustrate this. The ‘massive’ water runoff that passes through these gullies during the rainy season tends to collapse the conservation structures that the farmers have attempted to put in place, such as bunds and terraces. The field assessment of land degradation (Annex F) estimated that between 3 and 21 t/ha of soils are lost to these different types of erosion.

Figure 4 Farmers' maps showing hot spots of land degradation in the Buramba-Mugandu watershed.



4.1.7. Adoption and Use of Soil Conservation and soil fertility improvement Practices

There are several soil conservation and soil fertility improvement practices that farmers can use to combat land degradation and restore soil fertility. However, their levels and intensity of use are variable. We assessed the level of use of different technologies by farmers. The results in table 4 show that the most common soil fertility improving practices regularly used by farmers, are the traditional practices such as seasonal crop rotation (usually sorghum-beans-potatoes) practiced by 67.5% of farmers and short fallow (33.3%).

Similarly, over half of farm households reported using farmyard manure to improve soil fertility. However, the use of farmyard manure is generally confined to home garden plots and those

located on gentle slopes where the surface run-off is minimal. Studies have also shown that the quantity and quality of farmyard manure are not adequate for effective restoration of soil fertility (Muzira et al., 2003). Over a third of the households reported the lack of manure as a constraint to restoring soil fertility. Only one out of five households regularly uses crop residues and organic matter for restoring soil fertility. About 70% of households never use crop residues systematically for improving soil fertility. In addition to production of limited biomass, there is competition between use of crop residues such as sorghum or bean stems for soil conservation and other domestic needs for fuelwood, livestock feed and construction materials as well as other domestic needs. As reported by other studies in Uganda (Nkonya, 2001), there is virtually no use of inorganic fertilizer by Ugandan small-scale farmers. We found that only a handful of farmers are actually using inorganic fertilizer, generally on the highly profitable potato seed production. As market opportunities for the crop increase, more farmers are likely to invest in purchasing fertilizer to increase productivity and become more competitive.

Although farmers reported awareness of agroforestry technologies for improving soil fertility and combating soil erosion, as well as other multiple benefits of agroforestry, the actual use of such technologies is still limited to about 25% of farmers. Among the constraints for this limited use of agroforestry, the most common were land fragmentation, small land size and lack of planting materials. However, it is important to note that use of agroforestry was higher in Bubale sub-county, reflecting significant progress in the dissemination of agroforestry technologies by AFRENA and its partner NGOs.

The most common soil conservation methods practiced include constructing terraces, digging trenches, planting trees, planting agro-forestry trees, planting elephant grass and short fallowing (see table 4). Terracing is a distinguishing characteristic of the Kigezi highlands. This practice was introduced by the colonial administration in the 1940s-1950s and since then farmers have cultivated their land using terraces. The study found that over 40% of farm households have established several new terraces over the recent past. Conversely, 43.3% of households have experienced collapsing terraces due to soil erosion, or destruction by neighbours due to boundary conflicts. In general, when the terrace bund increases in height, farmers may decide to reduce or break the old bund and construct new ones. We found however, that this practice is one of the major causes of conflict between neighbours. In some communities, specific byelaws have been formulated to regulate construction and maintenance of terrace bunds.

Farmers are increasingly using trenches to combat erosion. However, most trenches are not protected by grass strips or trash lines and as a consequence fill up quite easily. Use of trash lines is often visible immediately after sorghum harvest. However there is competition between use of sorghum stems for soil conservation and other domestic needs. Similarly, mulching is constrained by lack of biomass and competition for livestock feed, fuel wood and other domestic needs.

Table 5 Use of Soil Conservation Measures by Farm Households (Percent of farmers)

Soil Conservation Measures	(Percent of farmers)		
	Women	Men	All households
Construction of new terraces	38.6	45.3	42.1
Digging of trenches	32.9	38.7	35.9
Natural fallow	31.4	34.7	33.1
Agroforestry technologies	25.7	30.7	28.3
Fallowing with trees	20	32	26.2
Mulching	14.3	21.3	17.9

Planting grass strips	8.6	9.3	9.0
Use of trash lines	5.7	6.7	6.2

In general, the adoption behaviour of both male and female farmers was comparable, although the proportion of men using agroforestry technologies is much higher for technologies requiring high labour and capital inputs. Although much of the soil conservation practices are based on technologies that have been available for more than 30 years, many farmers are increasingly using agro-forestry trees for controlling erosion, improving soil fertility, livestock feed, fuel wood, production of staking materials for climbing beans and tomatoes as well as poles for sale. Results also indicate a clear willingness to use and purchase agroforestry technologies and other improved technologies. There were significant differences between men and women in the average number of NRM technologies purchased by farmers. On average, men purchased more than 3 technologies compared to less than two for women (mean difference= 1.07; $t=1.8$ significant at 1%). However, there was no significant difference in their willingness to acquire them.

The case study discussions focused on the perceived quality of the land, the decisions made on land management and the reasons for these. Soil types and condition were described by farmers for each of their plots (see appendix 5). For example, of the thirty plots described in Muguli, nine had problems with both soil erosion and low fertility, six were described as having erosion problems and six were said to be of poor soil fertility. No fertility or erosion problems were reported on the other nine plots. The main reason given for loss of soil fertility was overcropping. In cases of serious fertility and erosion problems some owners had abandoned plots or were fallowing the land. Other strategies were to plant agro forestry species (*Calliandra*), use manure or kitchen waste and to dig trenches.

Generally plot owners did not collaborate with owners of neighbouring plots to dig trenches or to carry out other soil conservation works. However, the ability to influence the activities of those on surrounding plots – particularly those with plots higher up the slope, was recognised as important. This was facilitated if the surrounding owners were relatives or from the same village. One case was reported where all owners with plots on a particular hill had dug trenches. There were several plots where owners of neighbouring plots had refused to dig trenches. One elderly woman, head of a wealth ranked 4 household, said that she had been told to put trenches on one of her plots which she admitted was susceptible to soil erosion, but that “she did not have the power”. This scenario has important implications for the enforcement of byelaws on soil conservation, since the capacity of the elderly and poorer household to comply with the requirements is very limited.

4.1.8 Types and dimensions of conflicts over the use and management of NRM

Izac and Sanchez (2001:8) defined natural resource management (NRM) as “the sustainable use of the resources base of agriculture in order to meet the production goals of farmers as well as the goals of the rest of the community”. This definition stresses that NRM systems are characterised by the utilisation of natural resources for multiple purposes and multiple stakeholders. The use and management of natural resources in the highlands ecosystems are susceptible to multiple forms of conflict due to the fragile agro-ecological and social space

characterised by the utilisation of natural resources for multiple purposes, by multiple users, involving complex and unequal relationships among a wide range of social actors and stakeholders. As people everywhere compete for the natural resources they need to ensure or enhance their livelihoods, NRM is in many ways a form of conflict management (Buckles and Rusnak, 1999; Castro and Nielsen, 2003; Hendrickson, 1997). The view that conflict is a feature of NRM has been recently emphasised by Adams et al. (2003). Conflict management is also an important dimension of social capital. Therefore understanding conflicts is crucial for any policy efforts for improving NRM, and for strengthening social capital.

We defined conflicts as situations involving people or social groups with different interests, and mutually antagonist tendencies and opposing influences, competing for the use of limited resources to ensure or enhance their livelihoods (Mitchell 1981 in ACTS 1999; Means et al. 2002). Their manifestations, dimensions and level of intensity vary greatly. They can be implicit or explicit, proximate, local, regional, national or international, latent or violent. The study inventoried 701 conflict cases from the household interviews (table 5), while the analysis of court cases inventoried 79 cases of conflicts over the use and management of natural resources. Eventually, all the households interviewed reported knowledge of more than three conflicts (55.6%), with no significant difference between men and women (t value = -0.327). These results suggest that conflicts are common and are an important characteristic of the use and management of CPR. They range from intra- and supra-household gender relations, to antagonist, distrustful relationships and violent clashes amongst farmers, and between farmers, local communities, government and external institutions. These include conflicts between multiple local resource users (agriculturalists, livestock owners, upstream and downstream users) for multiple purposes (cultivation, grazing, income, and domestic uses, etc.), and rules (national policies, byelaws and community regulations), as well as conflicts between local communities concerns for better livelihoods and national and international concerns for environment conservation.

Table 6 Types of conflicts in natural resource management and use in the study communities (N=701)

	Rubaya and Bubale	Ikumba and Kashambya	All
Livestock grazing on crops	77.2	71.6	74.7
Boundary conflicts	74.7	65.7	70.5
Stealing of crops and livestock	49.4	41.8	45.9
Cutting of trees	43.0	43.5	43.1
Land grabbing and selling	36.4	53.7	43.9
Bush burning	29.5	52.2	40.0
Land inheritance conflicts	24.1	33.3	28.3
Animals raiding crops	11.5	43.3	26.2
Eviction from farm land and wetlands	8.8	43.6	24.7
Terraces destroyed by neighbours	34.2	26.3	24.3
Conflicts involving women	31.6	33.3	32.4

One of the most common types of conflicts is related to the destruction of terraces, bunds and farm boundaries, causing destructive land use in the uplands and water/soil run off in the lowlands. This affects over 70% of households. This type of conflict is fuelled by the excessive fragmentation of very small agricultural land, and the high competition over the use of farmland. This increasing competition has also created different types of land and boundary disputes, from

illegal sale of land, grabbing of land, eviction from wetlands, property rights (resource ownership, access), destruction of terraces, cutting of trees and theft of resources.

The other generalized form of conflict affecting the majority of households in all the surveyed communities, is livestock grazing on crops. Traditionally, there were common grazing lands where farmers could take their livestock during the rainy season, away from cultivated field crops. However, with increasing competition for resources, most grazing land has been turned into farmland for individual farmers. In addition, children who used to take care of livestock are now attending school under the universal primary education programme. Some farmers with considerable resources can still afford to hire people for grazing their cattle and livestock. Poor farmers are forced to keep their livestock near their homes, or near farmland or on free range. In many cases, these goats escape and are found to graze on beans, sorghum, potatoes that have germinated, or are still in a juvenile stage. This type of conflict is more acute shortly after planting, and usually opposes farmers keeping small livestock (goats, sheep and pigs) to other farmers cultivating food crops. Grazing land conflicts also include access to and use of water sources and cattle tracks for animals by different stakeholders (farmers, ranchers, pastoralists).

Conflicts between two or more communities often concern competing and overlapping claims to communal grazing land and wetlands, woodlots, or the theft of resources (plants, livestock, wetland and forest products). Bush burning used as a land preparation practice and by herd boys, has also caused several conflicts within and between communities. Often fires which were deliberately started in order to burn vegetation before land preparation or to allow quick vegetation growth during the dry season, have been difficult to control and have affected people's properties, some times even burning down houses. In some cases, these competing claims over communal resources have resulted into violent clashes between farmers and between communities.

The different types of conflicts between local communities and governments and international concerns over the use and conservation of forest, wetlands and protected areas are increasingly receiving significant amount of research and policy attention (Hart and Castro 2000; Scott, 1998; Borrini-Feyerabend, 1996). It is, as Bloomley (2003) points out, an expression of divergent interests between different stakeholder groups at various levels and unequal power relationships between the stakeholders. Wetlands and protected areas are considered by local communities as common pool resources providing many opportunities, while government agencies (involving international actors) restrict the use of such resources (wetlands, woodlots, forests and associated resources). There are also conflicts between local communities and elites (government authorities, NGOs, rich farmers) over grabbing of lands and eviction, privatisation and expropriation of CPRs, trespassing on private property. The decentralization process has also resulted in conflicts between different levels and agencies of government over authority to regulate natural resource management (e.g. District Agricultural Office, Environment and Forest departments on regulating use of community woodlots, wetlands, planting trees) and potentially conflicting or non coordinated policies and regulations.

The results of individual interviews revealed that about one third (32%) of reported conflicts directly involved women. Gender-related conflicts have multiple dimensions and are often latent. In many cases however, these conflicts are becoming more manifest, and have resulted into violent confrontation in some other cases. As important natural resource users, women are directly involved in conflicts. However, for too long, researchers and development practitioners have largely neglected the gender dimensions of conflicts. It is now increasingly recognised that gender analysis is fundamental for understanding NRM and NRM conflicts, and to constructively find ways of resolving conflicts (Hamilton and Dama, 2003; Means et al., 2002).

4.2. Diagnostic and assessment of social capital:

The project's exploration of social capital involved a combination of research approaches. Household case studies have been analysed and interpreted in conjunction with complementary data from household surveys and participatory rural appraisal exercises. The decision to conduct case studies in the four pilot communities (Muguli and Kagyera in Mugandu parish, Habugarama in Kitooma parish and Karambo in Buramba parish) relates to the diverse nature of social capital, in particular the need to explore informal social capital and complement survey approaches. Through case study analysis, the existing patterns of social capital were identified and opportunities for building and extending its role in NRM management explored. The case study approach also allowed a broadening of the focus on social capital from constituted groups to the wider network of social relations. The selection of households across wealth ranks and gender ensured inclusion of households who are often not represented in groups or participatory activities; especially those headed by poorer women. This was necessary for developing an understanding of how poor women can be more involved in decision making on NR management and of the gender implications of NRM policies, byelaws, technologies and constraints.

Having stratified the households according to wealth rank and gender of the household head, the case study households were randomly selected within the strata. Between 5 and 7 households were selected in each village, making a total of 24 households (10 of which were female headed). A second 'reserve' sample was taken for substitution in case a selected household was unable or unwilling to participate. Full data sets were obtained for 20 households.

A checklist format for the household case studies was constructed around the livelihoods framework. It was designed to explore the how social relationships and 'social capital' influence access to assets; to natural resources, to food security, to loans, job opportunities and for sourcing labour and accessing information. Discussions were held concerning the social relationships involved in NRM decisions, for example, between the owners of neighbouring plots on a single hillside. The household survey attempted to unbundle social capital into its dimensions to generate appropriate measures of bonding, bridging, cognitive and structural social capital.

4.2.1. Memberships in local organisations and farmers' groups

To explore the existing patterns of social capital, the discussions with members of case study households covered their membership in local associations and networks, the criteria for membership and the activities and benefits received. They also explored informal relationships and the values associated with these, including the extent to which people expressed trust in their neighbours and community leaders.

The number of groups existing and operating at village level is indicative of the strength of associational life, and hence of social capital. They varied from formal registered groups with linkages beyond the village, to informal neighbourhood cooperation. Table 7 shows the results of a recent inventory of farmers' groups commissioned by the National Agricultural Advisory and Development services (NAADS), which identified over 500 groups with over 10,000 members in Rubaya sub-county.

Table 4 Number of farmers' groups in Rubaya sub-county.

Parish	Number of groups	Number of registered groups	Number of farmers in groups
Buramba	63	41	1437
Mugandu	54	18	1457
Karujanga	70	34	2408
Kibuga	71	42	1102
Kahungye	50	40	480
Bigaaga	50	40	796
Rwanyana	84	46	2006
Kitooma	65	43	928
Total	507	304	10614

Source: Opondo, 2002

A consistent typology of groups and associations is difficult to formulate, however, a distinction can be made between groups open to anyone with an interest in the activities able to meet the membership contribution and those targeted to specific categories of people with more exclusive criteria. The former are more closely associated with the notion of bridging and linking social capital, while the latter are more founded on bonding social capital. Examples of the first type are:

- Agricultural groups, initiated by NGOs operating in the subcounty, (including AHI and AFRICARE) and mainly for introduction of improved seeds, cropping practices and soil conservation. Some groups provided loans for accessing agricultural inputs
- Specialised agricultural groups such as fish farming and pyrethrum linked with the National Agricultural Advisory Service.
- Ruhu Rweitaka – village based groups which provide assistance and community support at funerals. Members are from the whole community. Often associated with these are the ‘Engozi’ or stretcher groups for carrying the sick.

Also associated with bridging social capital, there is a range of elected political and representational roles for managing village affairs. These also link to structures at sub-county level.

- Committee positions on local councils (LC1)
- Wetland management groups which control the allocation of land in the valley bottoms. These cross cut villages.
- Village policy task force committees – facilitated by the project with members chosen in an open community meeting.

Groups of the second type, founded on bonding social capital and operating internally within the villages included: savings groups, labour groups for agricultural production and profit share, food security/food storage groups in which members contribute quantities of crops for storage for later sale at higher prices or to be made available in times of shortage, or for seed. Membership of these groups was often made specific to certain categories of people on the basis of common interest and capability, for example for youth, for women, or for widows. Finally, there were some specialist groups subject to more specific criteria ;

- the Mothers’ Union and Fathers’ Union, for which church membership was required. These had social and moral aims as well as practical support for members.
- Clan based groups for social development and for savings.
- Cultural groups.

Table 5 Group memberships by case study household in Muguli

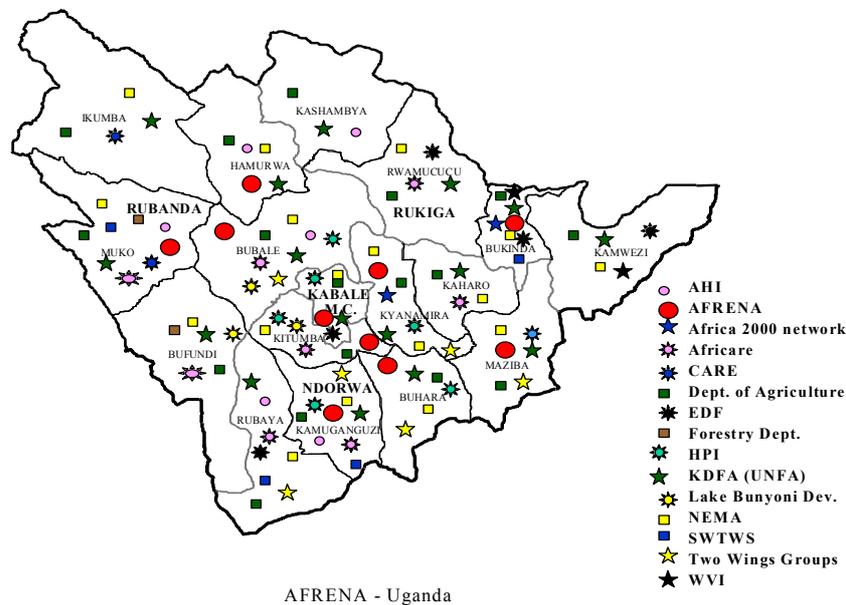
Wealth rank	Gender	Groups
M1	M	<ul style="list-style-type: none"> • Chair LC1. • Adviser/chair of agricultural group- <i>Muguri Turvanise Obworo</i> working with AFRICARE • Wetland management group • ‘Engozi’ group - <i>Funeral group</i> - Ruhu Rweitaka • Mothers’ Union (W)
M2A	F	<ul style="list-style-type: none"> • Savings group - <i>Muguri Tweterane</i> • <i>Funeral group</i> - Ruhu Rweitaka • Mother’s union
M2 B	M	<ul style="list-style-type: none"> • Vice chair LC1 & wife is on disciplinary committee. • Pyrethrum group • Soil conservation group • Stretcher group (<i>Engozi</i>). H responsible for security • <i>Savings group</i> - <i>Bujara Kweterana</i> • Muguri youth association – agricultural production and profit share – secretary for labour • General secretary of clan group for self development - <i>Bungura Kweterana</i> (H) • Clan based savings group for <i>Basigi</i> (W) • Participates in community work.
M3 A	M	<ul style="list-style-type: none"> • Savings group - <i>Bayore Bakyara Kweterana</i>, (W) • Funeral group - <i>Ruhu Rweitaka</i> (W) • Savings group - <i>Bujara Kweterana</i> (H) • Youth Group (H is secretary) • <i>Community work in maintaining feeder roads.</i>
M3B	M	<ul style="list-style-type: none"> • <i>Muguri Shukasika</i> Savings group (W) • Ngozi group <i>Bayole Kweterana</i>. • Savings group - <i>Banyore</i>
M3 C	M	<ul style="list-style-type: none"> • CIAT agricultural group. • Bayole timber group store (<i>Ngozi</i> group linked with <i>Ruhu Rweitaka</i>). • Muhenvu women’s group (W)

M4	F	<ul style="list-style-type: none"> • Savings group - Banyore Kweterana • Agricultural groups CIAT and AFRICARE • Byore Bakazi women's savings group (under Ngozi group) • Community work on roads and wells
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There were high levels of membership in community based groups by both men and women across different wealth categories. For example, in Habugarama village (about 55 households), there are about 10 local groups and organisations ranging from labour parties, credit and savings groups, pig rearing groups, farming groups, a swamp association, to “Determined Women” a drumming and singing group. Mrs. Betty is a member of about seven of these groups, and occupies various positions within them: vice-chairperson, secretary, treasurer and committee member. Similarly, Mr. Bitarabyo is the chairman of the Mugandu/Buramba society, a member of the Uganda seed potatoes producer association, chairman of Barisa-Bahinge (livestock keepers and soil conservation), and an executive committee member of the sub-county forum. Participation in groups by case study households appears higher in Muguli and Kagyera compared with Habugarama and Karambo.

Venn diagrams produced by farmers' groups also show that many villages are well endowed in bridging and linking social capital and have intensive links with external organisations, mostly NGOs. Kabale is perhaps one of the districts where there is a concentration of NGOs and research organisations working in NRM issues (Figure 2).

Figure 5: NRM organisations in Kabale



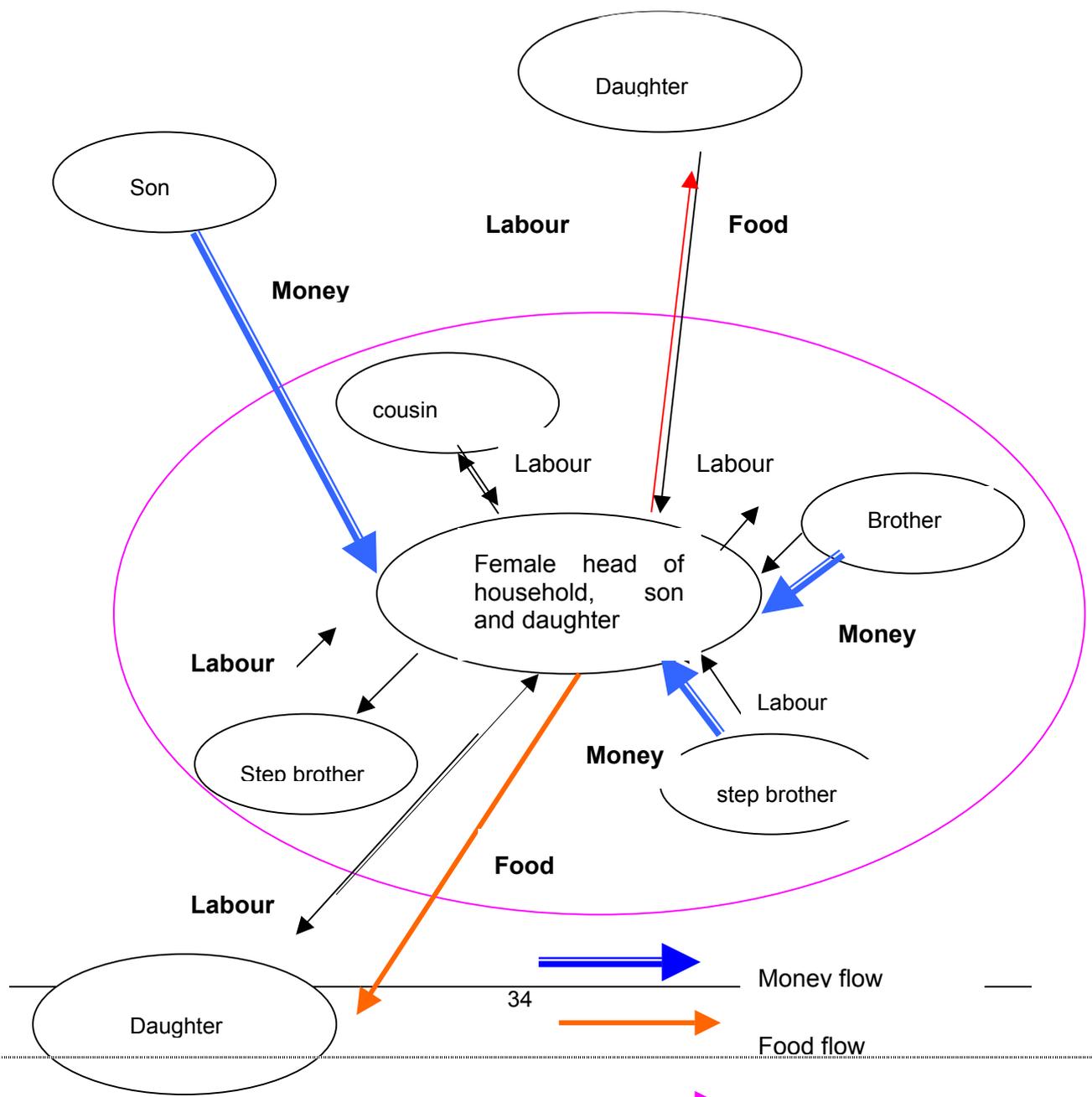
4.2.2. Bonding social capital and social networks.

In addition to membership of village groups, the discussions focused on informal social networks and how they provided support for livelihoods. These informal networks, or bonding

social capital were very significant for day to day management of household food and cash needs as well as coping with problems. Clan identity is an important aspect of bonding social capital. Clan identity is transmitted through the father to sons and daughters. The clan is an exogamous patrilocal unit; neither sons nor daughters can marry from their own clan, but while a son can marry a girl from his mother's clan, a daughter cannot marry a man from her mother's clan. The strength of clan relationships varies across the different villages, but it was generally recognised that clan members should help each other in emergencies and in times of sickness.

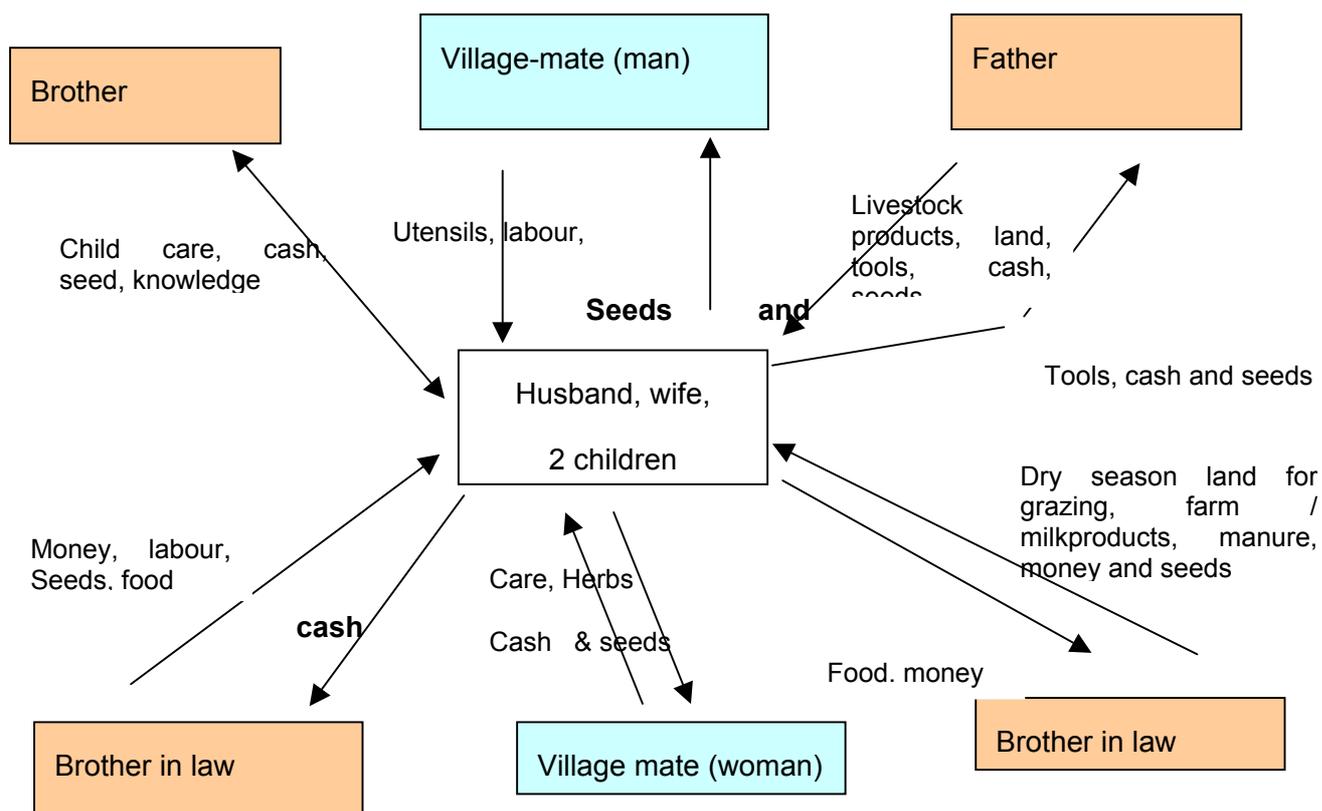
There are several clans in each village, although two or three may be dominant. Clan membership can facilitate labour exchange on crops provide seeds for planting and access to small loans and food sharing. Clan groups also reinforce social ties through parties and celebrations. In addition to clan membership, which forms the basis of social networks, trust and social norms of reciprocity and cooperation that facilitate bonding social capital, we found that a considerable proportion of farmers belong to several groups. Networks of households where both husband and wife had clans people and close kin in the village reflected this, while those who had come more recently to the village networked more through friendship and relationship with neighbours.

Figure 6 Social network diagram, showing ties with kin inside and outside the village.
(Household wealth rank 2, Kagyera village.)



The most frequent exchanges were of labour, cash, food, seeds and tools. In addition, land for cropping, grazing land and livestock herding services were secured through relationships with kinsfolk. Households with members working outside received remittances of cash, often reciprocated with gifts of food. Children in two of the poorer case study households were supported by payment of school fees from relatives. Another household, female headed, in Kagyera shows a further extension of this pattern. The household head lives in the village of her birth and is surrounded by relatives. She receives significant help from her married children living outside the village.

Figure 7 Social network diagram, showing ties with relatives and non relatives inside the village. (Wealth rank 2 – Muguli village)



Discussions on sources of finance and credit with the case study households indicated the vital role played by social capital in accessing financial capital, particularly for poorer households. The major source of loans for agricultural investment, for home improvement and for meeting the cost of medical bills was from village based savings groups. For membership of these groups, the conditions were the payment of a membership fee; to be able to afford the monthly contribution and to be of a trustworthy character. The majority of the poor to middle ranking households had membership in at least one savings group, and in some cases were members of

several. In contrast, membership of village savings groups was *not* characteristic of the richer households, some of whom had bank accounts and secured larger loans directly from commercial banks, at what they maintained were lower rates of interest than the 10% per month charged by village credit groups. Some groups have exclusive non-financial criteria for membership - some are clan based, some church based (e.g. the Mothers' union). Interest rates on loans to members of these groups is around 5% per month and joining fees are slightly lower at 1000-3000/-.

In spite of the prevalence of savings groups, nevertheless, there is also a strong reliance on social networks of relatives and friends to provide small amounts of loans and financial support (for example, a loan from in-laws of 10,000/- to pay graduated tax) . Nearly all adult members of the case study households reported giving small amounts of financial assistance to their relatives, friends and neighbours. People resort to taking interest bearing loans when their financial requirements are higher than can be informally supported. There were several examples where individuals reported being a former member of a savings group which had collapsed due to default on payment, financial mismanagement or corruption.

However, not all households are involved in the associated savings activities. The nature of the benefits received from group membership is very variable. Some of the groups functioned more as support systems for times of crisis rather than mechanisms for accumulating profit and making investments.

4.2.3. Trust and cooperation

Generally people felt that there were good levels of trust and cooperation within their villages, particularly among neighbours and kin. This view was stronger amongst older people in regard to their relationships with each other, rather than in their relationships with the younger generation. *"They are too ambitious and they have developed the tendency of being cheats"*.

A number of people mentioned the disruptive social impacts of the civil war in Rwanda which affected many families with relatives on both sides and fostered a "get rich quick" mentality as a consequence of the looting. However, tensions exist. There were indications that economic success can bring perceptions that clansmen and neighbours are resentful or jealous, in one case expressed in allegations of witchcraft. Other tensions arose where widows or wives had a poor relationship with their in-laws, often because they are using land resources accessed through their husband's family. This situation can be difficult if the women do not have their own relatives or clansfolk present in the village.

The level of participation in collective activities was generally high. However, instances of collective action related to agriculture and NRM tended to be limited to members of active groups only. These include rotating exchange labour or group labour for a number of farm operations such as planting, weeding, harvesting, etc. Only one out of four farm households reported active participation in organising collective action to improve the management of natural resources in their communities for the benefits of others. Analysis showed that resources are generally shared with group members (66.1%), neighbours and friends (52%) as well as relatives (41%) and other community members (38.3%), with a combination of the above depending on the type of resources.

4.2.4. Social capital and access to resources

Social capital, particularly bonding social capital in the form of clan and kinship relations influences access to land. In addition to patrilineal inheritance, land is acquired through rent and purchase. These relationships are often based on kinship and neighbourhood linkages.

The case studies showed marked differences in land access between the richest and poorest households. Wealth ranks 1 and 2 had between 5 and 30 plots, with two households having consolidated their land in a single area. Wealth rank 2 were more likely to hire land in. Wealth rank 3 and 4 households had between 1 and 8 plots, and some were also renting land out, reflecting the older dependent age groups in this category. Bonding social capital was also important for accessing reciprocal agricultural labour and labour hire, although there were different views. One wealthier household head commented that he avoided relatives when hiring labour as it could cause problems if they did not do a good job.

One of the differentiating factors between the wealth ranks 2 and 3 is the range of sources of income. Wealth rank 3 mainly depend on income from crops and agricultural wage labour. Three households in this group depended on agriculture alone, while others coped by selling wage labour (3 households); or depended on remittances and assistance from kin (3 households). Interestingly, many belong to savings groups, although their participation is threatened if they are unable to afford their regular contribution. The main source of livelihood security for the poor is through bonding social capital.

The more wealthy households were characterised by multiple sources of income including non-farm income, such as remittances from outside the village; trade (particularly cross border trade with Rwanda, or a skilled profession (teaching, traditional healing/birth attendant) or other artisanal skill (bricklaying, brewing, tailoring). They often held leadership roles in farmers' groups or in local politics. Of the twelve households in wealth ranks 1 and 2, four were dependent on agricultural income, but this was diversified. In addition to crops, they were involved in livestock and poultry production, bee keeping, wood and charcoal production. Kin relations were also an important means of accessing job opportunities outside the village (e.g. in Kabale or Kampala). Several households made regular visits to Rwanda, both for business and to visit relatives there.

There were gender differences in social capital and access to resources. Women's networks through which they accessed land, labour and other support were founded on kinship and neighbourhood relationships, irrespective of wealth rank. Where women marry into a village where their own clanspeople are present, this conveys an advantage. Otherwise women who do not have clanspeople in the village, develop relationships based on friendship, neighbourhood. Men had more formal networks across wider social groups (bridging) and more contacts outside the village (linking).

Since women largely access land through their husbands, they do not have the right to sell land. Widows have to consult their husbands' clan on the sale of resources such as land, trees or livestock. They may also experience insecurity if their deceased husband's family tries to reclaim the land, particularly if there are no children. The degree of women's participation and control over agricultural decision making varies among households. Crop management is largely in women's hands, although disposal of the crop is often decided by men. Many households operate a division of labour in which women take main responsibility for agriculture activities, while men are involved in non farm occupations.

4.2.5. Social Capital and adoption of NRM technologies

The study examined the role of different dimensions of social capital and other factors in determining farmers' adoption and use of soil conservation measures. Table 7 shows the factors that positively and significantly influenced the use and adoption of agroforestry technologies. These included gender (men had higher probability of practising agroforestry than women), income levels, extent of collective action, and boundary conflicts.

The effects of social capital variables show mixed results. While bonding social capital as measured by the extent of collective action was positively and significantly related to the adoption of agroforestry, mulching and terracing technologies, the effects of structural and cognitive dimensions of social capital were generally negative. The probability of adopting soil conservation measures decreased significantly with the number of plots. The more plots farmers have, the less likely they will use soil conservation measures. The effects of conflicts were generally not significant, except in relation to agroforestry technologies. Farmers who reported boundary conflicts were more likely to adopt agroforestry technologies to demarcate their land. However, there was a significant inverse relationship between tree conflicts and agroforestry technologies. Understandably, this type of conflict discouraged farmers from planting trees on their farm.

Table 6: Determinants of use of soil conservation technologies by farmers' households

	Agroforestry	Mulching	Making new terrace bunds
Gender (1=men)	2.847***	0.051	1.484**
Age	-0.027	-0.01	0.003
Education level	-1.008	0.096	0.409
Farm income	3.36e-06*	1.506-06	2.19e-06
Number of plots	-0.059	-0.103**	-0.0883*
Number of livestock owned	0.070	0.0703	0.177**
Number of adult males	0.016	0.761	0.235
Sub-county location	-0.041	0.679*	-1.203**
Collective action	0.191***	0.07**	0.228***
Bonding social capital	1.075	0.602	1.756**
Cognitive social capital index	-0.126*	-0.086**	-0.194***
Linking social capital	0.088	-1.081*	-0.939
Structural social capital	-1.577*	-0.103	-2.632***
Tree conflicts	-1.956***	-0.118	0.304
Boundary conflicts	1.353**	-0.062	-0.028
Constant	0.0683	-0.990	

*Significant at 10%; ** Significant at 5%; Significant at 1%.

4.2.6. The role of Social Capital in Minimizing NRM Conflicts

The hypothesis states that the presence of social capital is a necessary condition for conflict management. This hypothesis was examined with empirical data from conflict case studies, household interviews, key informant interviews and other participatory tools in four sub-counties in Kabale District. The results show that social capital mechanisms are an important resource for managing conflicts and improving the management of natural resources. Farmers and

communities use a plurality of strategies, processes and avenues to resolve conflicts, from avoidance, negotiation, mediation, arbitration and adjudication as well as coercion and violence.

One of the traditional institutions for managing conflicts is the clan. Traditionally, the basic social organisation of the Bakiga people of Kabale utilizes the agnatic lineage structure based on the principle of patrilineal descent, which forms the core of social organisation and permeates practically every aspect of life. Clan membership forms the basis of social networks that facilitate coordination, cooperation, reciprocity, trust, and social norms that are required for CPR management and conflict resolution. Clan elders and members formed the basis of traditional or customary conflict resolution mechanisms. Many conflicts between clan members are sorted out through negotiation and conciliation; a voluntary process in which parties reach mutually agreed decisions. Usually what is decided by the clan elders and agreed between the two parties is respected. The desire to avoid confrontation often outweighs the individual goals that the parties are trying to achieve. We found that in 34% of cases conflicts between clan members are not reported and are handled in private. Avoidance is often used when the conflict is trivial, or when confrontation has a high potential for damage, or when clan elders and members can resolve the conflict more effectively (Means et al., 2002).

The interviews and case studies revealed that many gender-related conflicts do not come into public domain and are often resolved at the level of the clan. Because the clan is an exogamous patrilocal unit, conflicts are taken to men's clans. Since power relations within societies are reflected and reproduced in social networks, women find themselves disadvantaged in different ways. First they do not belong to the clan structures and networks that are involved in managing conflicts. The clans operate through male in-groups in masculine social spaces which exclude women. Also because of their socialization into gender roles, women may not be aware of their rights and lack confidence in themselves; they think that they cannot win any case against their husbands or any other male member of the clan.

In a considerable number of cases, *bonding* social capital mechanisms (clan leaders, neighbours, relatives, village members) are perceived as having a limited capacity for resolving conflicts, as many cases taken to them are often unresolved and often require intervention of local policy structures (LC1) for arbitration. This perception was particularly significant for women compared to men, corroborating women's perceptions that local mechanisms are biased against women.

A combination of social, economic and political factors has undermined the ability of local mechanisms, clan elders and community organisations to manage conflicts (Means et al. 2002). The decentralisation process has established local councils at village level which concentrate both political and administrative powers to manage community life, including arbitrating disputes and making byelaws and other local policies. Political interference was often cited as a key constraint to the effectiveness of local clan leaders to resolve conflicts. Other problems included corruption and laxity of local leadership. In many instances, some educated and wealthier farmers were not willing to accept decisions by local communities and clan elders, preferring to take their cases to legal and administrative structures at the sub-county level.

Results show that other forms of social capital (*bridging*) as expressed in the density of farmers' groups, and particularly women's groups, have a relatively higher capacity to resolve conflicts, as most cases are resolved through mediation and negotiation within these groups. It is apparent that these groups also have high levels of bonding social capital (trust and cooperation, norms and rules within groups) as well as bridging social capital (capacity of groups to make links with other groups, and linking with the local political (LC) system. A high density of local organisations may suggest a relatively high level of social capital and associational life and a

stronger capacity for managing conflicts. However, in the case of supra-community conflicts, low levels of social capital (especially weak bridging and linking social capital) coupled with dysfunctional policies, can lead to serious conflict. One important conclusion from these cases is that social capital mechanisms for managing conflicts are not effective for conflicts between local communities and external powerful stakeholders. In these cases formal administrative and political structures substituted for social capital mechanisms.

Many of the formal conflict resolution mechanisms often have a high social cost for local communities, especially to women and other vulnerable groups, who end up bearing the burden of paying fines and other forms of social exclusion and coercion. Formal mechanisms and policies may work best when, through redistributive, integrative and capacity building measures, they strengthen the capabilities of stakeholders to enter into voluntary and mutually beneficial collective action and negotiation, sustainable over time. Evans (1996) and Tandler (1997) (in Molyneux, 2002), noted that successfully participatory projects have frequently depended upon a creative synergy between the state (policy) and civil society (social capital). When local policies were combined with social capital mechanisms in a positive sum way, conflicts were likely to be minimized.

However, this synergy worked only where there were high levels of social capital, social institutions and well functioning local policies that were coherent and credible. In the case of conflicts over parks, low social capital (as expressed in bridging and linking social capital) and weak policies led to rampant conflicts and the use of local council powers to resolve conflicts and arbitrate disputes. Achieving a positive synergy between social capital and policy requires effective facilitation to strengthen and build social capital and local capacity for more participatory and collaborative methods of conflict management, and to transform NRM conflicts into opportunities for collective action.

The results also suggest that the capacities of different actors, resource users, local communities, and policy makers to address CPR conflicts can be enhanced. This would require developing and implementing effective approaches, building the necessary human and social capital as well as policy processes for minimizing conflicts. Castro and Nielsen (2003), Means et al. (2002) and Hendrickson (1997), as well as several other scholars, conclude that effective prevention and management of conflicts require skills and tools which are often lacking in many organisations, institutions and communities. These findings were reinforced at the end-of-project policy stakeholder feedback workshop attended by over 80 participants representing farmers, technical personal, political leaders and policy makers from Kabale district, as well as invited political leaders and policy makers of the neighbouring districts of Kanungu, Rukungiri and Kisoro.

4.2.7. Strengthening social capital

Pretty (2003), Uphoff and Mijayaratna (2000), Woolcock and Narayan (2000) and many others have shown that social capital lowers the cost of working together and facilitates cooperation, trust, and collective action. Therefore strengthening social-capital i.e. the self-organisational capacities within communities, and creating conditions in which local people are able to formulate, review, monitor and implement appropriate byelaws, and engage in mutually beneficial collective action creates the foundations for decentralisation and local decision making.

One key achievement of this process has been the establishment and functioning of village byelaw committees and local institutions for managing the policy process and facilitating policy dialogues with local government structures and other key stakeholders. These village committees

and local institutions have proved to be critical in building support for byelaw review and formulation, mobilising political, social, human and technical resources that are needed to sustain the participation of local communities in policy dialogue and action and for the adoption of NRM innovations. They are also supporting mutual beneficial collective action and other important dimensions of social capital such as exchange of information and knowledge, resource mobilisation, collective management of resources, cooperation and networking and community participation in research and development activities. They are increasingly becoming a vehicle through which farmers are pursuing wider concerns, initiating new activities, organising collective action among members and extending relations and linkages with external organisations. They are also increasingly taking the lead in catalysing the development process within their communities, and are increasingly making demands to R&D organisations.

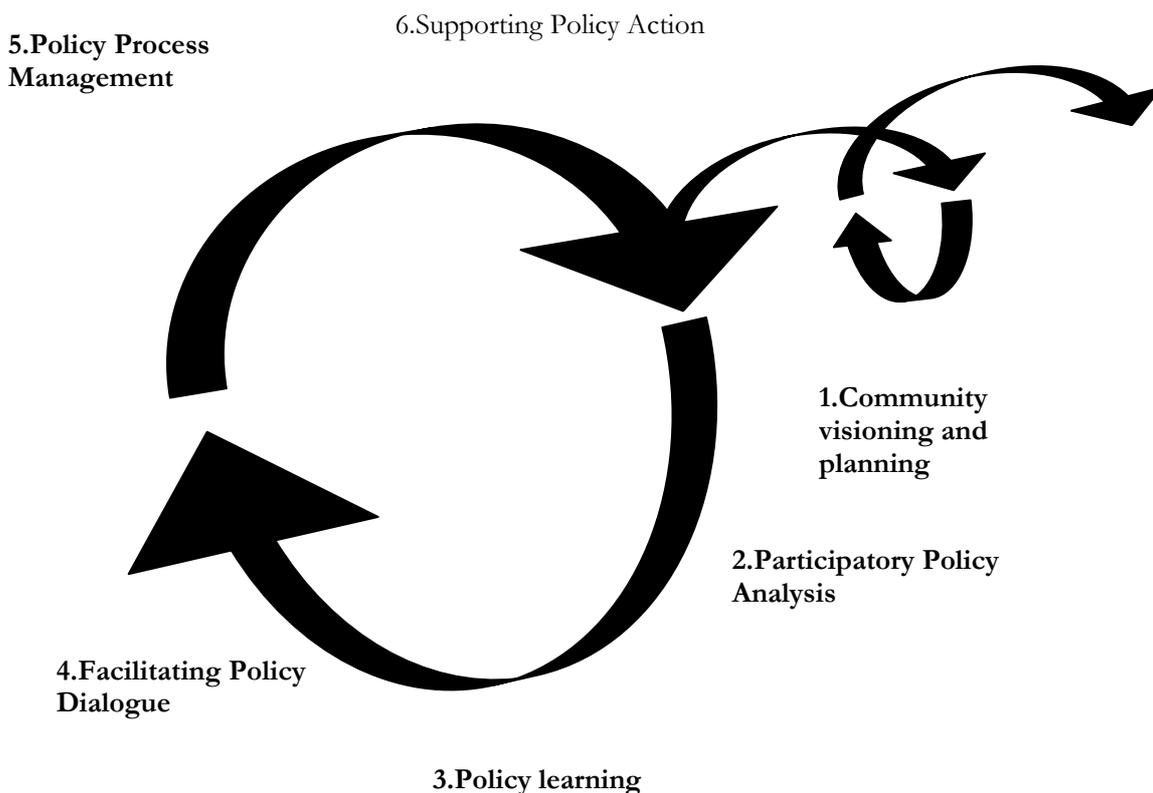
However, the inadequacy of human and social capital at the different levels of local government is a key constraint to policy formulation and implementation. Researchers can have an important influence on policy by helping to build the capacity of local councillors, helping their understanding of the situation, giving them credible data and evidence, and strengthening their confidence. Tailor-made capacity building events targeting those who make and implement policies are critical to have any sustainable policy change. One key recommendation was to engage in a participatory action research mode to strengthen the social-capital within pilot communities, and to create conditions in which local people are able to formulate, review, monitor and implement appropriate byelaws that encourage mutually beneficial collective action. The steps included among others:

- Identifying and supporting farmers' organisations and local institutions in relation to NRM, building their organisational capacities
- Stimulating participatory visioning and planning through visualisation, diagramming and other relevant participatory tools; and stimulating collective reflection and analysis of policies and bye-laws, and their NRM practices;
- Strengthening local capacities (of both communities and government institutions) to initiate, review and formulate more integrative byelaws and local policies, for turning byelaws into use, monitoring and reporting their implementation, and sanctioning non-compliance.
- Building the capacity of different stakeholders in participatory approaches for alternative conflict management.
- Facilitating opportunities and space for collective action, and create common platforms and fora for negotiation of NRM issues.
- Linking community groups with higher level policy institutions, and organisations of influence to develop sustainable institutional arrangements for NRM at different levels.

4.3. Participatory Policy Analysis and Action Research

The project adapted and refined the policy process framework (figure 3) with the following key components: i) community visioning and planning; ii) participatory policy analysis, iii) participatory policy learning, iv) policy dialogue, v) supporting policy action, and vi) policy process management.

Figure 8. The participatory policy process framework



4.3.1. Developing community visions of desired future conditions and NRM plans

Most participatory research projects routinely start with a participatory rural appraisal (PRA) exercise to identify problems and constraints in the farming system and as an entry point into communities. Recently, PRA has come under criticism for being superficial, extractive, transitory, unable to initiate change and build local capacities (Ashby, 2003; Cook and Kothari, 2001), and lacking adequate processes of follow up. At the heart of initiating participatory policy analysis and the development of community NRM action plans, there was an intensive and iterative process of participatory diagnosis and community visioning to stimulate collective learning and articulation of desired future conditions. Community visioning was used as a highly interactive process for establishing dialogue and engaging farmers and rural communities in collective analysis and thinking about the future, for defining strategies for achieving better livelihood outcomes, and for empowering rural people to become agents of their own change. The community visioning process was based on the SARAR technique (The World Bank, 2000), which stands for the following five attributes:

- **Self-esteem:** a sense of self-worth as a person as well as valuable resource for development;
- **Associative strength:** the capacity to define and work toward a common vision through mutual respect, trust and collaborative effort;
- **Resourcefulness:** the capacity to visualize new solutions to problems, and the willingness to take risks;
- **Action planning:** combining critical thinking and creativity to come up with new, effective and reality-based plans in which each participant has a useful and fulfilling role; and

- **Responsibility:** for follow through until the commitments made are fully discharged and the vision of benefits achieved.

Visioning using SARAR techniques has the advantage of facilitating an internal drive for change, starting with collective analysis of opportunities, strengths and community assets and brings different perspectives for achieving collective visions. An important principle of this approach is that it starts with an analysis of strengths and opportunities, rather than problems and constraints. Combining SARAR with creative participatory tools, such as community resource and social mapping (figure 4) is useful for fostering and strengthening community skills in systematic action planning, monitoring and evaluation.

Figure 9 Participatory maps (Karambo village).



Through this process, all the four pilot communities have developed action plans with explicit objectives, activities, desired outcomes and defined roles and responsibilities of different stakeholders and partners. These pilot communities are at different stages of operationalising their action plans. One of the key components of the community action plans clearly specified the need to strengthen communities' capacities to review existing byelaws and to formulate new ones to facilitate collective action in the implementation of action plans for better management of watershed resources (see map in figure 5 below).

Figure 10 Planning map of Kyantombi watershed

membership of farmers' groups and in the policy task forces. Women have taken on active roles in decision making and on the policy task forces (chairing meetings in the absence of the chairman, attending regional workshops, exchange visits etc.). Local leaders also attend meetings and are part of the Policy task force committees.

Box 1: Steps in formulating byelaws in local government structure

- *Any community can initiate the process of formulating a byelaw or their councillor can draft a bill seeking to formulate a byelaw*
- *The draft bill is introduced to Council by one councillor*
- *Bill is then published and distributed to all councillors by clerk to council*
- *Bill can then be debated and approved within 14 days after publication (if there is no emergency)*
- *For municipal/division council, sub-county council or village council, if passed, the bill is forwarded to the relevant higher council for certification of consistency with constitution, ordinance and other laws after which it is returned*
- *If such a Bill is passed, it is forwarded through the line Minister to attorney general for certification*
- *Attorney General certifies for consistency with parliamentary laws and constitution after which it is returned.*
- *The certified bill is then signed by District Chairperson to become ordinance for district bill or byelaw for lower council bills.*
- *The ordinance or byelaw is then published in the gazette, in local media or any conspicuous place*

Interest has been expressed within the sub-county to upscale the process beyond pilot communities to other parishes and AHI is developing linkages and partnerships with NGOs to take the work forward.

Prior to the project, farmers' groups had been active in some of the pilot communities, mainly focusing on the testing of agricultural technologies. However, the organisational strengthening and development of broad based participation to discuss and develop byelaws and their implementation has been created through the project. The project has strengthened local capacity to review, initiate, formulate and implement byelaws and other local policies. The farmers in the pilot communities have also considered how these byelaws might affect different categories of people and have suggested ways of avoiding negative impacts. They have participated in exchange visits and field visits to learn from one another and share experience.

Following on from the community planning processes, the household case studies were generating evidence of social differentiation and different stakeholder interests relating to different resource endowments. These were also associated with differences in management practices on farms and patterns of participation in NRM initiatives. It became clear therefore, that some social groups would face constraints to adoption or compliance with byelaws. The task force committees and community meetings were encouraged to think about the response of different social groups to the byelaws.

Their analysis confirmed that some categories of farmers were likely to have difficulty in complying with some of the byelaws. These included older men and women, widows and orphans with limited family labour, or lacking money to hire labour or to buy implements such as spades and hoes needed to establish conservation measures. Farmers with alternative sources of income, which are more lucrative than farming, may not have time for putting up conservation structures on the plots they are using for food security. It was also revealed that small livestock owners, especially women, who have small farm sizes and do not own grazing land, will have problems with the controlled grazing byelaw. The byelaw may force the poor to sell their livestock, and could increase poverty and conflicts among farmers.

Rushebeya-Kanyabaaha Wetland Management Committee

Kitanga wetland is a swampy area in Kashambya sub-county, Rukiga county off Muhanga trading centre. Mr. Deezi Kamugyeragere is the chairperson of the committee and provided the following information in an interview. The management of Kitanga swamp dates back to 1994 when Kitanga Wetland Fish Farmers Association was started in order to protect the swamp and ensure sustainable fish farming around it. Later in 2000 the Rushebeya Kanyabaaha Wetland Management Committee was also formed. The Kitanga swamp crosses several parishes in Kashambya, Rwamucucu and Bukinda sub-counties in Rukiga county and is managed through community based organisations.

The management of Kitanga swamp is effected by use of uniform regulations and guidelines for sustainable harvesting of mudfish, grass-thatch, papyrus stems, medicinal herbs and water. The regulations include the following:

- No draining and cultivation in the swamp (and this is recognised by the administration at sub-counties).
- No setting fire onto the swamp vegetation. The Local Councils are mandated to arrest any person who disobeys this regulation.
- No indiscriminate harvesting of the wetland resources. The Rushebeya Kanyabaaha Wetland Management Committee who formulated the regulation recommended only harvesting for domestic use or sale within the villages neighbouring the swamp.
- Fish harvesting from fishponds can only be done when all fish farmers are present or represented - the ponds are registered.
- Fish farmers must meet every Thursday to maintain pond cleanliness. Absentees must pay fine of UShs. 1000/= the equivalent of a day's work. At the time of the interview, Kitanga Wetland Fish Farmers Association had 22 active members.

- The regulations were generated by members of the associations and forwarded to sub-counties, the district council and the Wetlands Management Project of Uganda. Community members felt that government enforcement of regulations was less effective and not closer to them. The area local councils now enforce the wetland management regulations. Community-based organisations and members of the community are sensitised and can report any offenders.

The project has generated a clear understanding of social differentiation among rural households and the practical implications this has for NRM decisions. Building on this analysis, the task force committees were encouraged to address the challenge of ensuring participation and compliance with the outcomes, by farmers with fewer resources, particularly women and the elderly. Compliance by the rich was also identified as problematic, especially when allied to political power. Mechanisms to encourage uptake and compliance were discussed. These included use of communal labour for construction of soil conservation works, exchange mechanisms for land and labour, facilitation of access to tools and loans, greater involvement of political leaders, community sensitisation, exchange visits and training. There is increasing demand for training and demonstration of alternative, more cost effective soil conservation techniques, particularly those with lower labour demand.

Through facilitated community meetings and individual interviews, local communities discussed the natural resource management problems, exploring issues such as:

- For whom is this a problem?
- What are the existing byelaws to address the problem and what additional byelaws should be proposed?
- Who benefits from the byelaw and how?
- Who loses out from the byelaw and how?
- Who will have difficulty in complying and why?
- What mitigating arrangements can be introduced for strengthening byelaw implementation?

On the last question, they discussed possible mechanisms for promoting collective action to facilitate the implementation of NRM byelaws and technologies. Social capital mechanisms (local institutions, norms of cooperation and collective action) can be drawn upon to encourage commitments by all who become involved, and for supporting mutually beneficial collective action, charitable involvement and local community participation in NRM activities.

MUGURI TURWANIISE OBWOORO GROUP (Muguli Let's Fight Poverty)

'Muguri Turwaniise Obwooro' is a farmers group formed on realising the dangers of soil loss, the related poor harvests and reduced income. The members are engaged in cultivation and poultry production for food production and income generation. Other activities include controlling soil erosion, coffee farming and tree planting. The group started with 40 members in 2000 but had dropped to 25 by 2002, because inactive members voluntarily terminated their membership. The regulations to be followed by members were not documented (except as minutes of meetings) but known to the members as requirements for active participation and retaining membership.

They included the following:

- Construction of horizontal trenches on the upper and lower boundaries. The trenches must be 2 ft deep and 2 ft wide for effective control of runoff
- Calliandra trees must be planted 1 ft apart, in lines and regularly weeded to control pests
- Pyrethrum, beans and Irish potatoes must be planted in rows 2 ft., 20 cm and 1 ft. apart respectively

The regulations were enforced by members who constituted a monitoring committee of six members amongst themselves, to follow up on trenching and farmers' compliance. The group owns a demonstration garden where all members meet once a week to work and learn new ideas (interventions brought in by research institutions and extension workers) hands-on. Participation is voluntary but there was strict enforcement on punctuality when working on the group garden.

However, compliance to these regulations is affected by non-members who were reluctant to cooperate in constructing trenches for controlling soil erosion, which then required the intervention from local administration. At the request of members of 'Muguri Turwaniise Obwooro' Rubaya sub-county local council permitted the recognition of a regulation on use of trenches for controlling soil erosion. Consequently the people of Muguri parish are now bound by the regulation, and offenders can be administratively handled.

4.3.3. Facilitating Policy Learning

As observed by Norse and Tschirley (2000), in many cases policy makers don't know what kind of information they can reasonably expect or ask for from the R&D community. The study revealed that majority of policy makers have a limited understanding of the policy process, and of policies and byelaws they are supposed to implement. On the other hand, researchers rely on passive communication channels to reach policy makers, producing policy briefs and other technical

reports that policy makers and political leaders do not read. The language of academic researchers is frequently inappropriate to a policy and development audience. To influence policy change, a more proactive role was therefore essential in assessing the information needs of policy makers and in developing effective communication strategies for guiding and informing debate and fostering public understanding of the policy process.

Many of the NRM technologies needed for the implementation of the soil erosion byelaw require some minimum inputs. Based on their experience with disseminating agroforestry technologies in the highlands of Kabale, Raussen et al. (2001) recommended a "minimum input strategy" to facilitate widespread adoption of agroforestry technologies. Other empirical studies in Ethiopia (Shiferaw and Holden 2000) showed that policies that link production subsidies with soil conservation could provide opportunities for combating soil erosion. Research could investigate the feasibility of developing a reward system to communities and farmers that are championing NRM issues and implementing the byelaws.

This system could be integrated into local government development plans and budgets to provide inputs such as seeds of improved varieties, small livestock, seedlings of high value trees to those communities and farmers that are outstanding in NRM innovations. Such communities could be selected as priority areas for new government interventions and other development initiatives. A "land management fund" could be institutionalized in local government development plans and budgets. Other studies have found that given good knowledge about local resources, appropriate institutional, social and economic conditions, and processes that encourage deliberation and participation, rural communities can work together collectively to use natural resources sustainably over the long term (Pretty, 2003). It is therefore important to provide incentives that encourage community participation in NRM policy process.

Reaching and influencing policy-makers depended on a number of key issues including: building effective networks of influence, identifying and supporting NRM champions at various levels of local government who champion NRM initiatives and demonstrate keen interest for advancing policies that promote NRM. These political and community leaders consistently played an important role in any policy and community initiatives. The NRM forum coordinated by AFRENA for the dissemination of agroforestry technologies could be broadened to other NRM and policy issues. The emergence of the coalition for effective extension delivery (CEED), a coalition of major NRM R&D organisations in Kabale is a right step in this direction.

The project initiated policy stakeholder workshops and other learning events (seminars, field visits, documentation) to increase the relevance of research to policy makers and to communicate research findings to policy makers. The first policy stakeholder workshop, held in 1999, identified a number of areas for collaboration and information sharing between research and policy makers. In addition to regular subsequent workshops and policy meetings, one strategy has been to organise and facilitate field visits to examples of successful village level implementation. This has had a great effect in convincing policy makers, local leaders and farmers, by allowing them to see things with their own eyes, and to share experience with more innovative farmers. We found that this process was very useful, not only for exposing policy makers and farmers to innovative NRM technologies, but also to build their confidence and capacity to engage in policy dialogue with other stakeholders.

Another important aspect of policy learning was to use policy narratives and developing NRM scenarios. These have the advantage of simplifying complex problems and making them amenable to better understanding and decision-making (Keeley, 2001). For example, the soil fertility and agroforestry narrative has been a powerful strategy for getting policy makers to learn about agroforestry and to support agroforestry policies and byelaws. These narratives, coupled with field visits to research stations and on farm demonstrations, have been useful for getting policy support for tree planting

4.3.4. Promoting and facilitating policy dialogue:

Despite considerable progress in local government reforms, it is only to a limited extent that policy makers seek information from key stakeholders in designing and formulating policies. Participation of farmers and local communities is often limited to the participation of a single representative and the small-scale poor farmer is often forgotten. The project used three complementary mechanisms for promoting policy dialogue: bottom-up community inclusive processes; sub-county representative policy meetings and district level stakeholders workshops.

The village is the basic level of decentralisation and of popular participation in byelaw formulation and implementation. Efforts to facilitate village level participation were based on the assumption that farmers and local stakeholders would be more likely to see byelaws on NRM as addressing their own needs and constraints and more likely to implement them, if they had participated in their formulation. Social capital mechanisms were drawn upon to encourage better deals and byelaws that would endure over time. At the local community level, byelaw committees were established and community-wide policy meetings held. Over the three years of the project, over 78 village byelaw committee meetings and 24 community wide meetings have been conducted to discuss byelaws and NRM issues in the four pilot communities. It is important to note that where the byelaw committees are integrated into other forms of social organisation, there have been many more opportunities to discuss byelaw issues. In communities where there are farmers' groups working on agriculture and NRM, they usually have weekly meetings for the group.

Despite progress made at the village level, it was recognised that the strengthening of community level processes cannot stand on its own. While the village is the ultimate level for byelaw formulation and implementation, the sub-county and the district constitute a critical aspect of the decentralisation system as they have important political and administrative powers to make bye-laws, prepare development plans and budgets and allocate resources. The sub-county is the basic political and administrative unit of local government that enacts byelaws and resolves disputes. This level has good potential for stimulating local organisations and democratic processes to deliberate on and influence policies from bottom up. The different byelaws initiated at the village level were presented and debated at the sub-county level for harmonisation and better co-ordination before they were enacted into byelaws. The District level dialogues were usually high profile events aimed at raising and refocusing the policy debate, building a network of actors who could influence the policy process with messages tailored and focused to gain attention and support. Five policy stakeholder workshops were held over the three years and brought together a large number of participants (80-100), district leaders and councillors, members of parliament, sub-county councillors, local government technical services, research and development organisations, and farmers representatives, and in the later years, representatives of neighbouring districts and national institutions.

To make these dialogues more effective and participatory, some specific efforts were necessary to strengthen the weakest stakeholders - the farmers. To prepare farmers to be effective partners in the policy dialogue with district-level stakeholders, we used a range of participatory techniques

(role plays, mapping and diagramming, mentoring, and other adult learning methods) for engaging and empowering local communities directly in the articulation of their policy needs, and in the analysis, design and implementation of policies and innovations. This has involved coaching and mentoring farmers' representatives to better articulate their policy needs and NRM visions with confidence. These committees are supported by a skilled community development facilitator (CDF). The CDF's roles include strengthening the self-organisational capacities within communities, motivating and facilitating people to participate in the process of action learning, reflection and negotiation on byelaws and NRM issues.

It has been particularly insightful to sequence policy dialogues with farmers' exposure visits and horizontal linkages between the different communities, where they harmonise their demands, share experience and rehearse their presentations. As a result, the most interesting moments during the policy dialogues were when farmers made their presentations and articulated their community visions and experiences with the byelaws.

A key indicator of project impact concerns the successful building of linking social capital – “improved linkages with policy makers and service providers and horizontal linkages with other communities”. It was recognised early in the project that communication and action was needed at different levels involving a wide range of stakeholders. In addition to the focused work at village level (78 village policy task force meetings), stakeholder interaction at sub-county and district level was necessary to ensure coherence between policies at district, sub-county and village level and to reach stakeholder consensus on the formulation of the byelaws.

Uniform byelaws were passed as recommended by the village policy task forces and have been presented to the local council for approval. Further achievements relating to improved linkages were the exchange visits between villages and the linking of local groups to other development NGOs with NRM interests and service providers. Villages where the policy work is taking place have acted as centres for learning for people from nearby villages and other visitors. Through workshops, seminars and meetings, other communities, farmers, villages and districts have requested the start up of similar work in their areas.

4.3.5. Supporting Policy Action and byelaw formulation

As a result of this process, the pilot communities have reviewed and formulated a number of byelaws for improving agricultural production and natural resources management. These include byelaws on soil conservation and erosion control; on tree planting, on controlled grazing, drinking and wetlands management. These byelaws were debated at the sub-county and harmonised for their general application to other villages and parishes. For example, the soil and water conservation byelaw states that:

- Nobody in the village is supposed to clear land for cultivation, whether a resident in the village or not, on a slope where erosion can easily take place, without establishing trenches. Nobody in the village is supposed to cultivate his or her plot without putting in a trench and planting stabilisers like elephant grass.
- Areas that do not accommodate trenches or where trenches cannot be accommodated, elephant grass and legume grasses to act as stabilisers should be planted.
- Every member of the community who accesses water from the community source is supposed to participate with the rest of the community in cleaning and fencing on an agreed routine and timetable.
- Any member in the village who wants to destroy a bund (Enkkiigo) should do it in the presence of a neighbour.

- Nobody in the community should wash near the source of water and anybody in the community who has land near the source of water or spring should leave some metres (1-2) before cultivating. Anybody who possesses land near a road reserve or where there is a trench or community path should leave at least 1 or 2 metres before starting to cultivate.
- Anybody in or outside the community who is to hire land from the owner or neighbour for cultivation should be able to first negotiate the conditions of hire and be able to abide by the rules and byelaws set by communities. Anybody in the village who attempts to exchange land with a neighbour in the village should be able to agree with the already formulated policies in the communities/villages.

The tree planting byelaw;

- Anybody in the village who cuts a tree should at least plant two and make sure that the existing ones are well protected.
- If any member of the village is to plant trees, they should plant only agroforestry trees like *Calliandra*, *Alnus* and *Grivellia* which add fertility to the soil and reduce erosion. They should replant the one that existed after failing to get agroforestry trees.

A controversial byelaw on drinking and men's idleness was formulated in two of the pilot villages motivated by the need to "bring men back into agriculture". The byelaw states that '*Nobody in the village who does beer brewing and selling as a business, is supposed to open the bar before 1.00pm during the day and after 10.00pm during the night.*'

Some of these byelaws have been implemented with different levels of success in the four pilot communities. For example, in Muguli and Karambo, farmers have dug more than 600 trenches for minimising soil runoff through erosion, while in Kagyera and Habugarama, the results have not been so impressive. An important aspect of the success in formulation and implementation of the soil erosion control byelaw in the four pilot communities was the linking of the byelaw to NRM technology innovations. .

In addition to trenches for controlling soil erosion and water run off, communities have initiated community agroforestry nurseries. It was reported that bush fires in the pilot communities significantly reduced during the last dry season, compared to previous years and to incidence in other villages. This was attributed to the VPTFs role in catalysing community participation in the formulation and enforcement of byelaws on bush burning, and sensitisation through meetings in the pilot communities. Villages where the policy work is taking place have acted as centres for learning for people from nearby villages and other visitors who come to study the policy, how they began and the achievements and challenges so far.

Beyond the achievement of institutional development and linkages and the passing of byelaws, there is the critical issue of actual implementation of the NRM practices enshrined in the byelaws. The byelaws on soil conservation, tree planting, controlled animal grazing, drinking of alcohol, wetland management and bush burning have been implemented with different levels of success in the pilot communities. The first step has been the development of community action plans in the pilot villages. Farmers in the pilot communities have developed and are implementing improved byelaws for NRM, such as combating soil erosion and land degradation, regulating bush fire and animal grazing, promoting tree planting and wetland management. Community agroforestry nurseries have been put in place in some communities. As a result of village policy task forces formulating and implementing byelaws, a total of 480 farmers in the pilot communities have established trenches and associated soil and water conservation measures according to the byelaws.

Each community group has established a monitoring and evaluation system to examine the effects of plans, regulations and byelaws on NRM issues. Monitoring committees have been established in all the four target villages to sensitise members to the byelaws and assess progress in implementation. Indicators have been defined by farmers and data are being recorded and reported by the committee. Indicators for the performance of groups have also been identified. The criteria used by the committees for monitoring progress and evaluating the impact of their activities include:

- The number of technologies adopted by communities to reduce and control soil erosion; e.g. the number of trees planted, how they are maturing, whether they are being grazed, whether the soils are still being heavily eroded; the number of trenches made in the community; the number and types of grasses planted for soil and water conservation and along trenches, community responses to prohibition of free grazing.
- The number of community meetings held; number and gender composition of community members who turn up for meetings.
- Records of what is taking place are kept, who is implementing byelaws, who is not and the reasons why.
- Communities are beginning to work together and to assist each other
- Numbers of people from other villages who have visited to learn from the process and how many have begun to implement.

4.3.6. Social capital and NRM byelaws

Detailed discussions with the case study households indicated a widespread awareness of changes in quality of their natural resources, particularly over the last 10 years. Most frequently mentioned factors were the decrease in soil fertility, reduction in yields, drought, over-cultivation and erosion. Several families mentioned a 30% reduction in yields over the last decade.

Discussions with both men and women showed that nearly all had detailed knowledge of past and present byelaws on burning, tree cutting, making terraces and the more recent discussions on controlling grazing on others land, planting agroforestry species and grasses, and management of woodlots and swampland. The extent to which the more recent recommendations were being implemented varied between households and there were similarly different views on enforcement.

Some saw the solution as more sensitisation for the community and more commitment to supervision and enforcement on the part of the local councils. “Local leaders should themselves set an example by abiding by the rules, especially on grazing on other land” (Habugarama).

The need for participation in byelaw formulation was also mentioned. Rather than just instructions to follow rules there is a need for developing awareness of the benefits of NR conservation; “people just call us and tell us what to do – not graze, not to burn, to have grannery etc, but don’t allow us to contribute to the byelaws.” (Muguli)

Poorer households with limited land, emphasised the constraints to accepting the rules. With respect to grazing - “not all people have enough land, and if you say ‘graze on your own land’, this will stop those who want to buy sheep or goats; people who may have no money to buy land - this encourages poverty” (Kagyera). Construction of terraces was also viewed as problematic by some; – “because of lack of land, people don’t want terraces; people end up hating those who are supposed to be implementing the law”. Others pointed out the negative aspect of enforcement which brought the risk of increasing conflict with the village leadership.

This implied that in order to change practices, understanding of the processes of land degradation, participation in formulation of byelaws and finding mechanisms to overcome the constraints were more important than simple information on the rules. Women's participation was vital since their interests were significantly different to men's.

4.4. The “5 INs” Model for Policy change in NRM

Drawing from Barrett et al. (2002), a five “INs” approach is suggested (i) strengthening local institutions; (ii) providing information; (iii) linking byelaws to NRM innovations; (iv) finding and promoting incentives, and (v) building a network of influence as effective mechanisms that research and development organisations can use to influence policy action for sustainable NRM. We briefly discuss each of the five elements.

4.4.1. Strengthening institutions (local institutions and local government)

Results of this research show that to be effective, decentralization must be supported by strong local institutions or mature social capital. Pretty (2003), Uphoff and Mijayaratna (2000), Woolcock and Narayan (2000) and many others have shown that social capital lowers the cost of working together and facilitates cooperation, trust, and collective action. Therefore strengthening social-capital i.e. the self-organisational capacities within communities, and creating conditions in which local people are able to formulate, review, monitor and implement appropriate byelaws, and engage in mutually beneficial collective action creates the foundations for decentralisation and local decision making.

One key achievement of this process has been the establishment and functioning of village byelaw committees and local institutions for managing the policy process and facilitating policy dialogues with local government structures and other key stakeholders. These village committees and local institutions have proved to be critical in building support for byelaw review and formulation, mobilising political, social, human and technical resources that are needed to sustain the participation of local communities in policy dialogue and action and for the adoption of NRM innovations. They are also supporting mutual beneficial collective action and other important dimensions of social capital such as exchange of information and knowledge, resource mobilisation, collective management of resources, cooperation and networking and community participation in research and development activities. They are increasingly becoming a vehicle through which farmers are pursuing wider concerns, initiating new activities, organising collective action among members and extending relations and linkages with external organisations. They are also increasingly taking the lead in catalysing the development process within their communities, and are increasingly making demands to R&D organisations.

Many other recommendations to make byelaws more effective require capacity building of different stakeholders, both local communities and decentralized local government structures. The inadequacy of human and social capital at the different levels of local government is a key constraint to policy formulation and implementation. Researchers can have an important influence on policy by helping to build the capacity of local councillors, helping their understanding of the situation, giving them credible data and evidence, and strengthening their confidence. Tailor-made capacity building events targeting those who make and implement policies are critical to have any sustainable policy change. Some of the needs for training identified during one of the policy stakeholder workshops include leadership skills,

communication, participatory planning, conflict management, policy process, and as well as technical NRM issues.

One key recommendation was to engage in a participatory action research mode to strengthen the social-capital within pilot communities, and to create conditions in which local people are able to formulate, review, monitor and implement appropriate byelaws that encourage mutually beneficial collective action. The steps included among others:

- Identifying and supporting farmers' organisations and local institutions in relation to NRM, building their organisational capacities
- Stimulating participatory visioning and planning through visualisation, diagramming and other relevant participatory tools; and stimulating collective reflection and analysis of policies and bye-laws, and their NRM practices;
- Strengthening local capacities (of both communities and government institutions) to initiate, review and formulate more integrative byelaws and local policies, for turning byelaws into use, monitoring and reporting their implementation, and sanctioning non-compliance.
- Building the capacity of different stakeholders in participatory approaches for alternative conflict management.
- Facilitating opportunities and space for collective action, and create common platforms and fora for negotiation of NRM issues.
- Linking community groups with higher level policy institutions, and organisations of influence to develop sustainable institutional arrangements for NRM at different levels.

4.4.2. Providing Information

The study revealed that majority of policy makers have a limited understanding of the policy process, and of policies and byelaws they are supposed to implement. On the other hand, researchers rely on passive communication channels to reach policy makers, producing policy briefs and other technical reports that policy makers and political leaders do not read. The language of academic researchers is frequently inappropriate to a policy and development audience. To influence policy change, a more proactive communication strategy and effective communication skills are essential to influence policy. Researchers need to develop alternative innovative communication and information strategies and processes in targeting people who make, influence or implement policy. Some powerful means used in this study are tailor-made policy learning events (workshops, seminars, exposure visits, field visits) that aim at disseminating NRM best practices or technologies, share lessons of experiences; and expose policy makers and other stakeholders to existing practices and knowledge that improve natural resources. An important consideration in communicating with policy makers is opportunistic timing: If researchers wish to influence policy, they must be able to diagnose the relevant policy environment to identify key points of leverage, and recognise short-term opportunities associated with related legislative calendars, planning and budgeting activities, changes in key leaderships, political appointments and government personnel. Identifying and capitalizing on crisis situations.

4.4.3. Linking byelaw to NRM innovations

It was evident that byelaws need to be supported by appropriate technologies that can increase agricultural productivity for resource-poor farmers with diminishing land resources. For example, the soil and water conservation byelaw emphasises the use of agroforestry technologies which have multiple purposes and advantages, controlling soil erosion, improving soil fertility, providing feed

for livestock, poles for staking and building, and other environmental services. The tree planting byelaw also encourages multipurpose trees, especially fruit trees that provide food and income, in addition to their other environmental services. An important aspect of the success in formulation and implementation of the soil erosion control byelaw was its link with NRM innovations. It is therefore as important to link any byelaw to NRM technologies that would provide sufficient incentives to farmers to implement the policies. In addition to technology innovations, mechanisms for encouraging collective action and farmers' innovations are the key to promoting and sustaining communities' interest and participation in NRM. Research and development organisations have a role to disseminate profitable technologies to farmers and provide minimum inputs that are needed to resolve some key constraints and bottlenecks.

4.4.4. Finding and promoting policy incentives

Many of the NRM technologies needed for the implementation of the soil erosion byelaw require some minimum inputs. Based on their experience with disseminating agroforestry technologies in the highlands of Kabale, Raussen et al. (2001) recommended a "minimum input strategy" to facilitate widespread adoption of agroforestry technologies. Other empirical studies in Ethiopia (Shiferaw and Holden 2000) showed that policies that link production subsidies with soil conservation could provide opportunities for combating soil erosion. Research could investigate the feasibility of developing a reward system to communities and farmers that are championing NRM issues and implementing the byelaws. This system could be integrated into local government development plans and budgets to provide inputs such as seeds of improved varieties, small livestock, seedlings of high value trees to those communities and farmers that are outstanding in NRM innovations. Such communities could be selected as priority areas for new government interventions and other development initiatives. A "land management fund" could be institutionalized in local government development plans and budgets. Other studies have found that given good knowledge about local resources, appropriate institutional, social and economic conditions, and processes that encourage deliberation and participation, rural communities can work together collectively to use natural resources sustainably over the long term (Pretty, 2003). It is therefore important to provide incentives that encourage community participation in NRM policy process.

4.4.5. Building effective networks of influence

To be effective, R&D professionals need to stay close to the policy process, and exploit opportunities that come along to get local community byelaws translated into political decisions or policies. Reaching and influencing policy-makers depends on a number of key issues including: building effective networks of influence, identifying and supporting NRM champions at various levels of local government who champion NRM initiatives and demonstrate keen interest for advancing policies that promote NRM. These political and community leaders consistently played an important role in any policy and community initiatives. The NRM forum coordinated by AFRENA for the dissemination of agroforestry technologies could be broadened to other NRM and policy issues. The emergence of the coalition for effective extension delivery (CEED), a coalition of major NRM R&D organisations in Kabale is a right step in this direction.

One key challenge is, however, how to sustain such processes and linking with national level policy structures. In order for the byelaw committees to become part of the policy making process, there is need to work towards mechanisms to institutionalise such participatory processes for policy formulation and implementation. The decentralization policy in Uganda offers good opportunities for achieving such participatory processes for policy change. Many districts and other decentralized local governments have legislative and executive powers to formulate and implement their own policies and byelaws in NRM. They need support from research and development organisations for using effective ways of engaging local communities in the formulation and implementation of

byelaws. At the national level, there are some opportunities that can be realized. Many national level institutions and programmes such as the National Environmental Authority (NEMA), the National Agricultural Advisory and Development Services (NAADS) and nationwide and international NGOs and civil society organisations within and outside Uganda could provide a fertile ground for scaling up such participatory policy action research processes for sustainable natural resources management.

4.5. Scaling Up and Dissemination Strategies

There has been a more widespread growth in awareness of NRM issues and technologies to solve SWC problems. During the policy task force discussions, farmers expressed clear expectations of benefits from application of the NRM byelaws and demonstrated a good understanding of the NRM issues, in particular the interactions between soil conservation measures, fertility enhancement, sustainable production and enhanced incomes. Farmers have begun to realise the relationship between poverty and problems of natural resource management and the potential of community action to tackle these issues. The task forces are developing criteria for monitoring and assessment of implementation of the NRM plans which can be measured against the baseline study of land degradation carried out in 2002 (Mbabazi et al 2003).

The decentralization policy in Uganda offers good opportunities for achieving such participatory processes for policy change. Many districts and other decentralized local governments have legislative and executive powers to formulate and implement their own policies and byelaws in NRM. They need support from research and development organisations for using effective ways of engaging local communities in the formulation and implementation of byelaws. At the national level, there are some opportunities that can be realized. Many national level institutions and programmes such as the National Environmental Authority (NEMA), the National Agricultural Advisory and Development Services (NAADS) and nationwide and international NGOs and civil society organisations within and outside Uganda could provide a fertile ground for scaling up such participatory policy action research processes for sustainable natural resources management.

There has been genuine interest and willingness of the sub-county to upscale the process beyond the pilot communities to the whole sub-county. Other parishes have expressed interest in forming village policy task forces to initiate and review byelaws to improve the management of natural resources. Initially this will need facilitation and technical support from research and development partners. Discussions were with NGOs and NAADS to provide technical support to selected communities, and to identify and train other service providers to facilitate VPTFs in other communities. Partnerships have been established with AFRICARE in Karambo and Muguli, with NARO in Kagyera, and with CARE-FIP in Habugarama. NAADS, facilitated by AHI in Rubaya, is also operating in all the target communities and many farmers are members of the sub-county farmer forum. Linkages with AFRENA on agroforestry technologies have been strengthened through training, exchange visits and provision of seedlings.

The results of the project have also been broadly shared in several scientific events, workshops and seminars in Uganda and elsewhere in Africa through scientific presentations and discussions. Some of the research products focus on methodology and empirical results of assessing and measuring social capital; participatory processes for policy change in NRM, participatory field assessment of land degradation; managing group dynamics and social capital, facilitating participatory diagnostics and community visioning, and methods for participatory byelaw analysis and formulation. A more proactive communication strategy is under development for uptake

promotion and communication of research results and products, and for tracking changes or policy action by stakeholders, that will ensue from this promotion.

The effectiveness of the project to date has undoubtedly been enhanced by synergies in the work of other CIAT, AHI and ECAPAPA projects. Our dissemination and scaling up strategies focused mainly on local stakeholders and local target institutions at different levels (micro level with the pilot communities; meso-level with the selected districts and NGOs operating in the districts, and macro-level with national institutions such as NAADS; regional networks such as AHI and ECAPAPA; and international institutions such as CIAT, ICRAF and DFID).

5. CONCLUSIONS AND LESSONS LEARNED

Natural resource management (NRM) is becoming a relatively new and expanding thrust in policy research on African agriculture. The new paradigms of integrated natural resource management “INRM” (Sayer and Campbell 2001), sustainable livelihoods approaches “SLA” (Carney, 1998); and integrated agricultural research for development “IAR4D” (FARA, 2003) emphasize the need to broaden natural resource management (NRM) research from technology solutions to include socio-economic and policy dimensions, with emphasis on participatory approaches that redefine the role of scientists, farmers and other stakeholders. All these approaches explicitly recognise that policy support is an essential ingredient for widespread adoption and scaling up of NRM technologies and innovation. However, despite the recognition that policy processes are important for sustainable livelihood outcomes and natural resources management, there is concern that NRM research and technology development have not been reflected in policy change, nor have they affected decision-making processes of wider communities.

The main objective of this action research was supporting and facilitating the integration of participatory approaches to policy decision-making by strengthening local-level processes and capacity for developing, implementing and enforcing byelaws and other local policies to improve natural resources management. It was hypothesised that through improving social capital, particularly aimed at increasing women’s involvement, and increasing dialogue between researchers, policy makers and local communities, local stakeholders are better able to understand NRM issues and actively improve local policies. Despite the relatively short time during which the development of community generated NRM policy formulation and byelaw implementation has been facilitated, the work has resulted in a number of achievements. These provide early evidence of the relationship between building social capital through establishing and linking village, sub-county and district level institutions, and the practical implementation of byelaws for improved natural resource management. The major lessons learned throughout this process are discussed below.

The project has increased understanding of ways to help strengthen social capital, improve local-level institutions and policies, support the integration of scientific and participatory approaches to policy development and implementation, and accelerate the adaptation of sustainable NRM technologies and practices. The initial research hypothesis that social capital is a necessary precondition for adoption of NRM innovations that require collective action and collaboration and for participation of resource poor farmers in policy formulation and implementation, is supported by the findings. The study has generated a deeper understanding of social capital and the inter-relationship of gender, social capital and NRM/livelihood strategies, through analysis of existing farmer groups and current organisational capacity, household case studies of livelihoods and social capital, linking with complementary data from other surveys and participatory rural appraisal exercises. They allowed the examination of the hypothesis that men and women have

different kinds of networks, experiences of collaboration and values associated with collaboration. Women were found to have a greater dependence than men on informal networks of everyday collaboration with neighbours and kinsfolk (bonding). Men had more formal networks across wider social groups (bridging) and more contacts outside the village (linking).

The main type of social capital characterising the household level was bonding social capital where relationship between kinsfolk, clan members and neighbours form a socially cohesive and mutually supportive network. Bonding social capital was important for clan based savings groups, for assistance between relatives and neighbours in accessing financial assistance, food tools, seeds labour sharing childcare, water firewood livestock grazing livestock products and land. These relationships were described in terms indicating high levels of trust and the values of mutual support and assistance to the poor (cognitive social capital) and were found across wealth ranks and age groups, although appear to be stronger in the lower wealth ranks. Bonding social capital was particularly important for the care of older people. Bridging social capital involving relationships and networks which are not based on clan or kinship was expressed through membership of village based groups without exclusive clan memberships, such as savings groups and farmers' groups organised around a common interest, e.g. pyrethrum growing, fish farming, bee keeping. Fewer households were involved in these latter type of organisations and were mainly from among the richer households. Involvement in linking social capital where people interacted with external agencies for resources or to influence policies was also found. Examples included membership of groups supported by NGOs . NAADS farmers' groups and political representation. Involvement in leadership positions in local councils was found in wealth ranks 1 and 2.

The informal social capital generated between kin and neighbours is very important for coping with poverty. However, from the case study households' experience it is the bridging and linking social capital that generates more dramatic and far reaching changes in livelihoods. One of the challenges for the project was to involve poorer households in the byelaw formulation process and the policy task force discussions as well as to ensure that the interests of the resource poor were not negatively affected. The evidence from the case studies shows the magnitude of the contrasts between the livelihoods of the rich and poor. This understanding assisted in discussions on the constraints to adoption/compliance with byelaws for different groups, particularly women, the elderly and the poor – those with limited access to land (small areas, limited rights of women and migrants) access to labour, time constraints etc.

Women were found to have a greater dependence than men on informal networks of everyday collaboration. Women's networks through which they accessed land, labour and other support were founded on kinship and neighbourhood relationships, irrespective of wealth rank. Where women marry into a village where their own clans people are present, this conveys an advantage. Otherwise women who do not have clanspeople in the village developed relationships based on friendship and neighbourhood. Men had more formal networks across wider social groups (bridging) and more contacts outside the village (linking). Several men in the higher wealth ranks made regular visits to Rwanda both for business and to visit relatives there.

While demonstrating the important role of social capital in NRM, the results suggest that social capital mechanisms alone do not possess the resources needed to promote broad-based and sustainable NRM innovations and policies. We therefore suggest the "synergy approach" of social capital (Woolcock and Narayan, 2000) and local policy for managing conflicts. The synergy is based on embeddedness and complementarity between formal mechanisms (policies, government institutions) and social capital (local organisations, and traditional institutions).

Embeddedness refers to the nature and extent of the ties connecting people and communities, with formal public institutions. Complementarity refers to mutually supportive relations between formal and social capital mechanisms, local government and local communities and can operationalise the decentralization policy, and devolution of NRM to decentralized structures. However, this synergy works only where there are high levels of social capital, social institutions and well functioning local policies that are coherent and credible. Achieving a positive synergy between social capital and policy would require effective facilitation to strengthen and build social capital and local capacity to master more participatory and collaborative methods to policy formulation and NRM management, and to transform NRM conflicts into opportunities for collective action.

The project has developed a methodology and a framework of steps towards analysing, strengthening and utilising social capital and for linking field level findings with policy and decision-making through participatory policy action research processes. The participatory policy process action research framework concentrated on five key elements: facilitating community visioning and planning of desired future conditions; participatory policy analysis; linking bottom-up processes to higher level policy processes through policy dialogue and policy learning events, and supporting policy action at different levels.

It was evident that byelaws need to be supported by appropriate technologies that can increase agricultural productivity for resource-poor farmers with diminishing land resources. It is therefore as important to link any byelaw to NRM technologies that would provide sufficient incentives to farmers to implement the policies. In addition to technology innovations, mechanisms for encouraging collective action and farmers' innovations are the key to promoting and sustaining communities' interest and participation in NRM. Research and development organisations have a role to disseminate profitable technologies to farmers and provide minimum inputs that are needed to resolve some key constraints and bottlenecks.

Results of this action research suggest that with current decentralisation in Uganda, there are significant opportunities that research and development can utilise to influence policies, and to translate research results into policy and decision-making of wider communities to accelerate wider-scale adoption and dissemination of NRM technologies. However, researchers need to develop alternative innovative communication and information strategies and processes in targeting people who make, influence or implement policy. Some powerful means used in this study are tailor-made policy learning events (workshops, seminars, exposure visits, field visits) that aim at disseminating NRM best practices or technologies, share lessons of experiences; and expose policy makers and other stakeholders to existing practices and knowledge that improve natural resources.

An important consideration in communicating with policy makers is opportunistic timing: If researchers wish to influence policy, they must be able to diagnose the relevant policy environment to identify key points of leverage, and recognise short-term opportunities associated with related legislative calendars, planning and budgeting activities, changes in key leaderships, political appointments and government personnel. Identifying and capitalizing on crisis situations.

To be effective, R&D professionals need to stay close to the policy process, and exploit opportunities that come along to get local community byelaws translated into political decisions or policies. Reaching and influencing policy-makers depends on a number of key issues including: building effective networks of influence, identifying and supporting NRM champions at various levels of local government who champion NRM initiatives and demonstrate keen interest for

advancing policies that promote NRM. These political and community leaders consistently played an important role in any policy and community initiatives. The emergence of the coalition of NGOs is a right step in this direction.

However, major challenges remain, particularly regarding the sustainability of local institutions for NRM policy formulation and implementation and their effectiveness in bringing about changes in NRM practice which do not disadvantage the poor. One key challenge is, however, how to sustain such processes and linking with national level policy structures. In order for the byelaw committees to become part of the policy making process, there is need to work towards mechanisms to institutionalise such participatory processes for policy formulation and implementation. A further challenge is for diverse stakeholders, including councillors and politicians and the judiciary to co-operate in supporting byelaw enforcement and managing conflict resolution.

The work described in this report constitutes a promising beginning. Although it is difficult to estimate, about 5 million poor rural people in Uganda live in similar physical environments (taken as the nearby districts of Kabale, Kisoro, Bushenyi, Mbarara, Rukungiri, Ntungamo, and eastern districts of Kapchorwa, and Mbale), at high population densities, relying on rain fed arable cultivation on steep slopes and valley-bottom wetlands. If the other highlands areas of Tanzania, Ethiopia, Rwanda, Madagascar are included, then the project is representing the conditions of at least 50 million people who live in the highlands areas, where social capital has been eroded. However, it is important to note that influencing policy is a long and complex process that needs perseverance, and a sustained programme of interventions and lobbying by different institutions and actors.

There is a need to establish cost effective ways of scaling up the approach, for example, through wider institutional partnerships. Understanding the effects of these initiatives on the status of natural resources, local livelihoods and local empowerment requires a longer-term perspective, however, the work described constitutes a promising beginning. An important consideration for the project remains to track the effects, and ultimate impacts of these measures, both on natural resources and on poorer households. This requires a long term and post-project tracking changes and outcomes of the project on improving NRM and rural livelihoods, and for assessing the conditions for sustainability of local processes for initiating and implementing byelaws and their effectiveness in bringing about changes in NRM practice which do not disadvantage the poor.

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