

OUTPUT 2. STRATEGIES AND ORGANIZATIONAL PROCEDURES FOR PR, DEVELOPED

Strengthening social capital for improving decision-making in natural resource management in the highlands of southwestern Uganda

Researchers: Pascal C. Sanginga,³⁵ Adrienne M. Martin,³⁶ Rick N. Kamugisha³⁷

Introduction

Social capital is one of the five capital assets (natural, financial, physical, human and social) that form the asset pentagon of the sustainable livelihood framework (Carney, 1998). Social capital is defined as the features of social organizations (social networks, social interactions, norms, social trust, reciprocity, cooperation) that facilitate coordination and cooperation and that enable people to act collectively for mutual benefit (Narayan and Pritchett, 1999; Woolcock and Narayan, 2000). It encompasses the nature and strength of existing relationships between members, the ability of members to organize themselves for mutual beneficial collective action around areas of common need and to manage the social structures required to implement such plans; and the skills and abilities that community members can contribute to the development process (Uphoff and Mijayaratna, 2000).

Recent research has shown the importance of social capital foundations for successful policy interventions, NRM and community development (Pretty, 2003). Efforts to examine the theoretical and methodological aspects of measuring social capital are still relatively recent (Grootaert, 2001; Narayan and Pritchett, 1999; World Bank, 2000). Obtaining a single measure of social capital is difficult given the comprehensive, multidimensional and dynamic aspects of social capital. A key objective of this study was to contribute to the literature on empirical assessment and measurement of different levels and dimensions of social capital.

Diagnosis and assessment of social capital

The project's exploration of social capital involved a combination of research approaches. Household case studies have been analyzed and interpreted in conjunction with complementary data from household surveys and participatory rural appraisal exercises. This has generated understanding of the:

- ✓ Different dimensions, levels and types of social capital
- ✓ Strength of social capital and potential for community joint action
- ✓ Differentiation in livelihood patterns
- ✓ Forms of inter- and intra-household support, village level interactions and wider scale linkages
- ✓ Gender roles, responsibilities and resource access

³⁵ Research Assistant and Senior Research Fellow, CIAT-Africa, PO Box 6247, Kampala, Uganda

³⁶ Natural Resources Institute, Chatham, UK. - adrienne.martin@nri.org

³⁷ African Highlands Initiative.

- ✓ Patterns of participation and interest in NRM initiatives and norms formulation by different stakeholder groups.
- ✓ Constraints to adoption/compliance with bylaws for different groups, particularly women, the elderly and the poor

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 were 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 that are not often 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 NRM and of the gender implications of NRM policies, bylaws, 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. From 5-7 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 how social relationships and social capital influence access to assets, natural resources, food security, loans, information, job opportunities and sourcing labor. Discussions were held concerning the social relationships involved in NRM decisions; e.g., between the owners of neighboring plots on a single hillside.

The design of a flexible checklist used on repeat visits over a 6-month period allowed for the build-up of trust and cross-checking information, which is difficult in one-off questionnaire surveys. It allowed discussion of more sensitive issues such as gender roles and responsibilities, group membership and credit arrangements, strategies for coping with poverty, and how short-term plans were put into action. It also allowed comparisons of attitudes to NRM expressed on an individual, private basis with those voiced in public discussions.

Types and dimensions of social capital

Pretty (2003) distinguishes three types of social capital: bonding, bridging and linking capital:

- ✓ Bonding social capital, which describes the relationships between people of similar ethnicity, social status and location, 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 a position of influence, either to draw on useful resources or to influence policies (Pretty, 2003).

At the individual and household levels, Uphoff and Mijayaratna (2000) distinguish 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 behaviors that exist within a community (Grant, 2001). Both structural and cognitive social capital must be combined to represent the potential for mutually beneficial collective action that exists within a community. Any analysis of NRM and policy needs to consider all these different aspects and dimensions of social capital as this will determine whether communities can act as a cohesive unit (bonding), whether it has links with other community organizations (bridging) and can access institutions with more power and resources (linking).

Results and discussion

Bonding social capital

The main type of social capital characterizing the household level was bonding social capital, where relationships between kinsfolk, clan members and neighbors form a socially cohesive and mutually supportive network. The basic social organization of the *Bakiga* people of Kabale uses the agnatic lineage structure based on the principle of patrilineal descent, which forms the core of social organization and permeates practically every aspect of life. The clan is an exogamous patrilocal unit. Clan identity is transmitted through the father, but women keep their own clans. Sons can marry from their mothers' clan, but a daughter cannot marry into her mothers' clan. Relationships between clansmen cut across neighborhoods. Neighbors may be from the same clan or mixed. There are several clans in each village although two or three may be dominant.

The responsibilities of a clan member are to help in emergencies, sickness, assist at burials and resolve conflicts and disputes between clan members. Clans play an important role as an important feature of social organization that facilitates coordination, cooperation and managing the social structures that are required to resolve conflicts. Clans form the basis of social networks, thrust and social norms of reciprocity and cooperation that facilitates bonding social capital. As we will see in the following sections, clan elders and members constitute the basis that facilitates traditional or customary conflict-resolution mechanisms. Historically, conflicts at the local level were often dealt with through customary and traditional dispute-resolution mechanisms. With the penetration of the state, urbanization, population pressure and market economy, other mechanisms for facilitation of collective action and resolving conflicts are emerging. These include formation of informal and formal social organizations.

Bonding social capital was important for clan-based savings groups, for assistance between relatives and neighbors in accessing financial assistance, food, tools, seeds, labor 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 is particularly important for the care of older people.

Nevertheless, tensions exist. Older people expressed some distrust of youth, and there were indications that economic success can bring perceptions that clansmen and neighbors are resentful or jealous, in some cases 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 husbands' family. A mixed picture emerged of how far clans provide support. Clan organization and influence was reported as strong in some villages, while in others (e.g., Habugarama), people perceived that their influence was receding and that linking capital and neighborly relations were more important.

Evidence from the case studies shows that both bridging and bonding social capital are important in a crisis—people draw on the support of kin and friends in the village and outside and seek financial support from savings groups.

Bridging social capital

Bridging social capital, involving relationships and networks which are not based on clan or kinship, was expressed through membership in village-based groups without exclusive clan membership, such as savings groups and farmers' groups organized around a common interest (e.g. pyrethrum growing, fish farming, beekeeping). One important indicator of social capital is diversity of membership in community groups and local organizations. We found that a considerable proportion of farmers belong to several groups. In Habugarama village alone, we identified about 10 local groups and organizations comprising labor parties, credit and savings groups, pig rearing, farming groups, swamp association, "Determined women," drumming and singing groups. There were also others including church-based groups, heifer group, mothers' union and another for nonlegally wedded women. About 40% of households interviewed are members of executive committees in different groups and as expected, with about twice as many more men than women.

Over 70% of the groups are mixed, and there are also exclusively women's groups, sometimes with one or two men who act as public relations officials, sponsors or advisers. Few men-only groups were found in Ikumba for beekeeping. Sanginga et al. (2001) analyzed the type and trend of participation in farmer research groups in Kabale. There were interesting gender dynamics in the life cycle of groups with women progressively forming the majority of membership in farmer research groups, while the proportion of male dropouts becomes considerable as the groups move from forming to the storming and norming stages (Sanginga et al., 2002).

Although groups and social organizations were equally present in all four subcounties, we found that there were notably many more groups and social organizations in Rubaya and Bubare than in Kashambya and Ikumba. In the first two subcounties, 74.5% of the households belonged to groups

and social organizations specifically concerned with NRM, compared to 56% in the last two. In the same vein, more households (84%) in Rubaya-Bubale participated in extension and dissemination activities in relation to NRM, compared to Kashambya-Ikumba (74.5). In Ikumba, however, a higher number of households were involved in NRM activities offered by external organizations such as CARE Development Through Conservation (CARE- DTC) project.

Collective action is a strong indicator of social capital. It translates thrust, cooperation and participation in community activities in more tangible outcomes: coordination and cooperation that enable people to act collectively for mutual beneficial collective action around areas of common need (Uphoff and Mijayaratna, 2000). The commonest form of collective action found in virtually all the villages was the community work “Burungi bwansi” and “Engozi.” Collective action related to agriculture and NRM tended to be limited to members of active groups only. This included rotating exchange labor or group labor for a number of farm operations such as planting, weeding and harvesting. Only one out of four farm households reported active participation in organizing collective action to improve NRM in their communities for the benefits of others.

The majority of households (83.6%) are increasingly sharing assets and resources within their communities. Table 1 shows the main resources being shared within the four subcounties. The resources commonly shared by the majority of farm households are labor (50%) and agricultural tools (50.7%) as well as money (47.6%) Sharing of land (both farmland and grazing land) and labor is more common in Ikumba than anywhere else, while wetlands seem to be more a common pool resource in Kashambya. There are complex arrangements, obligations and rights for resource sharing. In some communities specific bylaws have been formulated, while in others conflicts resulting for the management of common pool resources are intensifying.

Table 1. Resource- sharing issues in the study communities.

RESOURCE SHARING	Rubaya (%)	Ikumba (%)	Bubale (%)	Kashambya (%)	Total (%)
Agricultural tools	48.6	57.5	47.6	48.1	50.7
Labor	48.6	65.0	40.5	44.4	50.0
Money	47.2	50.0	50.0	40.7	47.6
Grazing land	10.8	37.5	23.8	29.6	25.3
Farmland	27.0	42.5	26.2	25.9	30.8
Seeds	13.5	25.0	9.5	25.9	17.8
Swamps/wetlands	16.2	12.5	2.4	22.2	12.3
Woodlots	8.1	15.0	14.3	14.8	13.0
Trees	5.4	10.3	11.9	14.8	10.3
Crops	16.2	15.0	4.8	7.4	11.0
Livestock	5.4	12.5	4.8	3.7	6.8

Different people and stakeholders are involved in sharing resources. Analyses showed that resources are generally shared with group members (66.1%), neighbors 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. In many cases neighbors are also relatives and friends, often belonging to the same groups.

The most common form of collective action in NRM was “*burungi bwansi*” or community collective work, reported in 72% of villages. The level of participation in collective action was generally high, except in Ikumba where only 66% of farmers thought it was regular. Other forms of collective action included tree planting, controlling bush fires, controlling flooding and making soil conservation structures. Collective action on agricultural activities for the benefits of individuals was restricted to group members only (22%). To assess the level of cooperation and collective action in the village further, we asked: “When you have a lot of work on your farm, how do you access additional labor?” In general most people rely on hiring casual laborers or on rotating exchange-group labor for group members, particularly in women’s groups.

In terms of institutional efficiency, the majority of farmers reported that the local council system (LC) is very effective and useful at the village level. About one third found it useful, but with some levels of corruption. The majority of male farmers (53%) have been members of the LC executive or have some members of their households in the LC system. However, the findings also show that only one-third of the village members have participated in discussing and making rules about proper NRM.

Linking social capital

Involvement in linking social capital, where people interacted with external agencies for resources or to influence policies, was also found. Examples included membership in groups supported by NGOs, NAADS (National Agricultural Advisory and Development Services) farmers’ groups and political representation. Involvement in leadership positions in local councils was found in wealth ranks 1 and 2.

The household survey attempted to break down social capital into its dimensions to generate appropriate measures of bonding, bridging, cognitive and structural social capital. 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. In Habugarama village (about 55 households), there are about 10 local groups and organizations ranging from labor parties, credit and savings groups, pig-rearing groups, farming groups, a swamp association, to “Determined Women” a drumming and singing group. Table 2 shows the results of a recent inventory of farmers’ groups commissioned by the NAADS, which identified over 500 groups with over 10,000 members in Rubaya subcounty.

Table 2. Number of farmers' groups in Rubaya subcounty.

Parish	No. of Groups	No. of Registered Groups	No. 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.

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 labor or group labor for a number of farm operations such as planting, weeding, harvesting, etc. Only one out of four farm households reported active participation in organizing collective action to improve NRM in their communities for the benefits of others. Analysis showed that resources are generally shared with group members (66.1%), neighbors 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.

The high density of local organizations may suggest a relatively high level of social capital and association life. However, studies of group dynamics have shown that groups have different levels of maturity and social capital (Sanginga et al., 2001), generally experiencing different cycles in the group development process. 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 organizations, mostly NGOs. Kabale is perhaps one of the districts where there is a concentration of NGOs and research organizations working on NRM issues (Fig. 1).

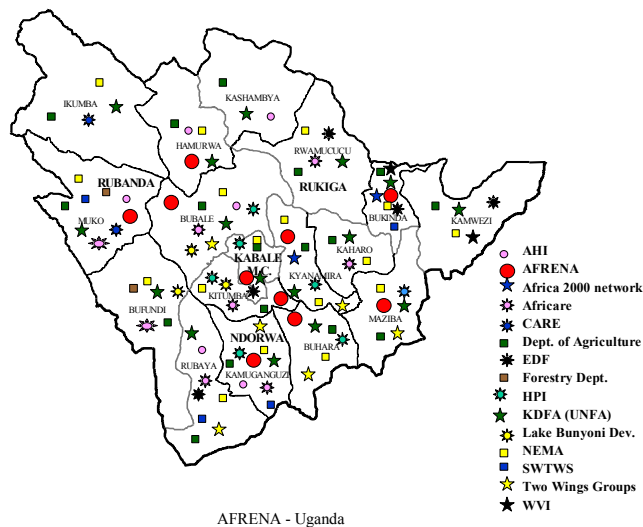


Figure 1. NRM organizations in Kabale.

two households having consolidated their land in a single area. Wealth rank 2 was more likely to hire land. Wealth ranks 3 and 4 households had from 1-8 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 labor and labor hire although there were different views. One wealthier household head commented that he avoided relatives when hiring labor 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 depends on income from crops and agricultural wage labor. Three households in this group depended on agriculture alone, while others coped by selling wage labor (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 wealthier households were characterized by multiple sources of income including nonfarm 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 artisan skills (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, beekeeping, 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.

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 neighborhood linkages.

The case studies showed marked differences in land access between the richest and poorest households. Wealth ranks 1 and 2 had between 5-30 plots, with

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

As 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 labor in which women take main responsibility for agriculture activities, while men are involved in nonfarm occupations.

Social capital and NRM bylaws. 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 bylaws 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 sensitization 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 bylaw formulation was also mentioned. Rather than just instructions to follow rules, there is a need for developing awareness of the benefits of natural resource conservation. "People just call us and tell us what to do—don't graze, don't burn, have a granary, etc., but we are not allowed to contribute to the bylaws" (Muguli).

Poorer households with limited land, emphasized 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; "for 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 bylaws 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 from men's.

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 3 shows the factors that positively and significantly influenced the use and adoption of agroforestry technologies. These included gender (men had higher probability of practicing 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 3. Determinants of use of soil conservation technologies by farmers' households.

	Agroforestry	Mulching	Making new terrace bunds
Gender	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
No. of plots	-0.059	-0.103**	-0.0883*
No. of livestock owned	0.070	0.0703	0.177**
No. of adult males	0.016	0.761	0.235
Subcounty 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%.

The role of social capital in minimizing NRM conflicts. The central hypothesis states that social capital is the essence of Common Property Resource (CPR) and conflict management and 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 subcounties in Kabale District. The results show that social capital mechanisms are an important resource for managing conflicts and improving NRM. Farmers and communities use a plurality of strategies, processes and avenues to resolve conflicts, from avoidance, negotiation, mediation, arbitration and adjudication to coercion and violence.

One of the traditional institutions for managing conflicts is the clan. Traditionally, the basic social organization of the Bakiga people of Kabale utilizes the agnatic lineage structure based on the principle of patrilineal descent, which forms the core of social organization 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 upon between the two parties is respected. The desire to avoid confrontation often outweighs the individual goals that the parties are trying to achieve. In 34% of the cases, conflicts between clan members are not reported and are handled in private. Avoidance is often used when the conflict is trivial, 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. 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, neighbors, 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 (LC) 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 have undermined the ability of local mechanisms, clan elders and community organizations to manage conflicts (Means et al., 2002). The decentralization process has established local councils at the village level, which concentrate both political and administrative powers on managing community life including arbitrating disputes and making bylaws 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 subcounty 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 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 organizations may suggest a relatively high level of social capital and association 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 for 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 policymakers 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 organizations, institutions and communities.

Strengthening social capital. One of the key objectives of this project was to strengthen social-capital (i.e., the self-organizational capacities within communities) and create conditions in which local people are able to formulate, review, monitor and implement appropriate bylaws, and engage in mutually beneficial collective action. One mechanism used for strengthening social capital has been to establish farmers' forums and policy task forces at the different levels, from the villages, the subcounty to the district. Village bylaw committees and policy meetings

have been established and are operational in the four pilot communities. At the subcounty level, there is a policy task force, and work is done through the council and the NAADS farmer forum. Workshops for the policy task forces and policy stakeholders have also been operational. In each pilot community, community land-user groups and farmer research groups were established and are dealing with specific NRM issues and conducting experiments with different NRM innovations. The majority of these groups are active and are increasingly taking on new responsibilities and activities. On average, women constitute over 67% of the membership of these groups and are increasingly taking on leadership positions in mixed groups and farmers' forums. Women represent between 34-50% of the membership in village by-law committees and policy task forces.

Measures to strengthen the social capital of local communities have included support to the organizational capacity of groups, leadership and group development training, conflict management and gender awareness training, creating opportunities for horizontal linkages through exchange visits, facilitating exposure visits and linking local groups to other rural service providers (NAADS, CARE-FIP, AFRICARE). Based on the results of this action learning process, the project has drafted a technical guide for managing group dynamics and social processes (Annex 9 Managing group dynamics and social processes).

Conclusions

The decision to conduct case studies in the pilot communities 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 studies have 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. They have also provided important insights into the interrelationships of gender, social capital and NRM/livelihood strategies. 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 neighbors and kinsfolk (bonding). Men had more formal networks across wider social groups (bridging) and more contacts outside the village (linking). The household case studies were analyzed and interpreted in conjunction with complementary data from other surveys and participatory rural appraisal exercises. This has generated understanding of:

- ✓ Strength of social capital and potential for community joint action, and the different dimensions, levels and types of social capital
- ✓ Differentiation in livelihood patterns
- ✓ Forms of inter- and intra-household support, village level interactions and wider scale linkages
- ✓ Gender roles, responsibilities and resource access
- ✓ Patterns of participation and interest in NRM initiatives and bylaw formulation by different stakeholder groups.

- ✓ Constraints to adoption/compliance with bylaws for different groups, particularly women, the elderly and the poor; limited access to land (small areas, limited rights of women and migrants) access to labor, time constraints etc.

Furthermore, the case studies of social capital and livelihood analysis were instrumental in:

- ✓ Finding creative approaches to bylaw formulation and implementation.
- ✓ Encouraging women's participation in policy domain.
- ✓ Reaching consensus around by-laws that have potential conflicts of interests
- ✓ Linking community groups with higher level policy institutions
- ✓ Developing sustainable institutional arrangements for NRM at different levels

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 organizations, 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 relationships between formal and social capital mechanisms, local government and local communities and can operationalize 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.

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 Mijayaradtna (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-organizational capacities within communities) and creating conditions in which local people are able to formulate, review, monitor and implement appropriate bylaws, and engage in mutually beneficial collective action creates the foundations for decentralization and local decision making. One key achievement of this process has been the establishment and functioning of village bylaw 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 bylaw review and formulation, mobilizing 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 mobilization, collective management of resources, cooperation and networking and community participation in R&D activities. They are

increasingly becoming a vehicle through which farmers are pursuing wider concerns, initiating new activities, organizing collective action among members and extending relations and linkages with external organizations. They are also increasingly taking the lead in catalyzing the development process within their communities, and are increasingly making demands to R&D organizations.

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 bylaws that encourage mutually beneficial collective action. The steps included among others:

- ✓ Identifying and supporting farmers' organizations and local institutions in relation to NRM, building their organizational capacities
- ✓ Stimulating participatory visioning and planning through visualization, diagramming and other relevant participatory tools; and stimulating collective reflection and analysis of policies and bylaws, and their NRM practices;
- ✓ Strengthening local capacities (of both communities and government institutions) to initiate, review and formulate more integrative bylaws and local policies, for turning bylaws 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 influential organizations to develop sustainable institutional arrangements for NRM at different levels.

References

- Carney, D. 1998. Sustainable rural livelihoods: What contribution can we make? Dept. for International Development, London, UK.
- Carney, D.; Farrington, J. 1998. Natural resource management and institutional change. Routledge, London, UK.
- Castro, E. Nielsen. 2003. Natural Resource Conflict Management Case Studies; an Analysis of Power, Participation and Protected Areas. Natural Resource Conflict Management Case Studies; an Analysis of Power, Participation and Protected Areas A.P. FAO Rome 268 By A.P.. FAO. Rome. Pp. 268.
- Coleman, J.S. 1988. Social capital in the creation of human capital. *Am. J. Sociol.* 94:95-120.
- Cornwall, A. 2003. Whose voices? Whose choices? Reflections on gender and participatory development. *World Dev.* 31(8):1325-1342.
- David, S. 2004. Poverty and rural livelihoods in Uganda, Malawi and Tanzania: A baseline study of BAPPA project sites. CIAT (Centro Internacional de Agricultura Tropical), Cali, CO.
- Dick, B. 2001. Action research: Action and research. In: Sankaran, S.; Dick, B.; Passfield, R.; Sewpson, P. (eds.). *Effective change management using action learning and action research: Concepts, frameworks, processes, applications.* Southern Cross University Press, Lismore.AU.

- Grant, E. 2001. Social capital and community strategies: Neighborhood development in Guatemala City. *Dev. Change* 32:975-997.
- Grootaert, C. 1998. Social capital: The Missing Link? The World Bank, Washington DC, US. (Social Capital Initiative Working Paper no 3)
- Grootaert, C. 2001. Does social capital help the poor? A synthesis of findings from local level institutions studies in Bolivia, Burkina Faso and Indonesia. The World Bank, Washington DC, US. (Local Level Institutions Working Paper no. 10)
- Hendrickson, D. 1997. Supporting local capacities for managing conflicts over natural resources in the Sahel. A review of issues with an annotated bibliography. International Institute for Environment and Development, London, UK.
- Molyneux, M. 2002. Gender and the silences of social capital: Lessons from Latin America. *Dev. Change* 33(2):167-188.
- Narayan, D.; Pritchett, L. 1999. Cents and sociability: Household income and social capital in rural Tanzania. *Ec. Dev. Cult. Change* 47(4):871-897.
- Omamo, S.W. 2003. Policy research on African agriculture: Trends, gaps, challenges. ISNAR, The Hague, NL. (Research Report. 21)
- Ostrom, E. 1998. The institutional analysis and development approach. In Loehman, E.T.; Kilgour, D.M. (eds.). *Designing institutions for environmental and resource management*. Edward Elgar Publishing, Cheltenham, UK. pp. 68-90.
- Pretty, J. 2003. Social capital and the collective management of resources. *Science* 32:1912-1914.
- Rasmussen L.; Meinzen-Dick, R.S. 1995. Local organizations for natural resources management: Lessons from theoretical and empirical literature. IFPRI, Washington DC, US.
- Rausser T.; Ebong, G.; Musiime, J. 2001. More effective natural resource management through democratically elected, decentralised government structures in Uganda. *Dev. Prac.* 11(3-4):460-470.
- Reason, P.; Bradbury, H. (eds.). 2001. *Handbook for action research: Participative inquiry and practice*. Sage, London, UK.
- Sanginga, P.C.; Lilja, N.; Tumwine, J. 2001. Assessing the quality of participation in farmers' research groups in the Highlands of Kabale, Uganda. *Global.* 19p.
- Scoones, I. 1998. Sustainable rural livelihoods: A framework for analysis. Institute of Development Studies, Brighton, UK. (IDS Working Paper No. 72)
- Uphoff, N.; Mijayaratra, C.M. 2000. Demonstrated benefits of social capital: the productivity of farmers organizations in Gal Oya, Srilanka. *World Dev.* 28(11):1875-1840.
- Wallis A. 1998. Social capital and community building: Part 2. *Natl Civic Rev* (87)4:317-336.
- Woolcock, M.; Narayan, D. 2000. Social capital: Implications for development theory, research and policy. *World Bank Observer* 15(2):225-249.
- World Bank. 2000. Let's talk social capital. World Bank discussion group on social capital. Available at: http://www.worldbank.org/research/growth/social_capital.html.

Strengthening the Local Agricultural Research Committees in San Dionisio, Nicaragua

Responsible: Clark Davis³⁸, Eduardo Hernández³⁹, Berta Jarquín⁴⁰ and Sinforiano Hernández⁴¹

Collaborators: Jorge Alonso Beltrán⁴² and Carlos Arturo Quirós⁴³

Highlights

- 3 new materials of maize, 5 of common beans and 2 of rice in production phase, evaluated in 10 of the 17 CIALs
- 4 CIALs formed by women and experimenting in rice, soybeans, sweet potatoes and common beans
- Exchanges at the local (meeting of CIALs), national (Farmer University, UNICAM) and international (regional meeting of CIALs-Honduras) levels
- Training the CIAL secretaries, treasurers and boards of directors for strengthening their internal activities
- Consolidation of the Commission of Funds for CIAL research (COFOCIC)
- Preparation of 2 research protocols for natural resource management (NRM) by the CIALs

Objective

Strengthen the capacity of the rural communities for decision-making and seeking agricultural and livestock alternatives and solutions to their problems on NRM through research.

Background / justification

Participatory research is a process whereby a group or community identifies a problem or topic of interest, finds out what is known about it, does research on the problem, analyzes the information generated, reaches conclusions and implements solutions (Braun and Hoddé, 1999).

The Local Agricultural Research Committees (CIALs), located in the Calico River watershed, San Dionisio, Nicaragua, since 1997, have been doing research on crops such as common beans, maize and soybeans. The results obtained quantitatively (yields) and qualitatively (selection criteria) have played a very significant role in the producers' final decisions. Other results—product of the monitoring and evaluation—have to do with the strengthening, consolidation and empowerment of the research groups.

³⁸ Technician - Communities and Watersheds Project

³⁹ Farmer Technician - Communities and Watersheds Project

⁴⁰ Farmer Technician - Communities and Watersheds Project

⁴¹ Farmer Technician - Communities and Watersheds Project

⁴² Liaison official – Communities and Watersheds Project - CIAT Nicaragua

⁴³ Project Leader – IPRA Project

Methodology

The CIAL involves the following stages:

- ✓ Motivation of the community
- ✓ Election of the committee members
- ✓ Diagnosis
- ✓ Planning of the experiments
- ✓ Establishment of the trials
- ✓ Evaluation and analysis of results
- ✓ Information for the community

For greater details on the methodology, see Braun and Hocde (1999) and Tijerino et al. (1997).

Results

Planting cycles

Table 1 summarizes the number of CIALs and the community to which they belong, the crops evaluated in the two cycles (first and second semester). To date there are 17 CIALs, of which 4 were formed in 1997, 4 in 1998, 3 in 2000, 4 in 2001, 1 in 2002 and 2 in 2003. One CIAL formed in 1998 with producers from a region with land tenure problems was dissolved for lack of their own land. The concentration of trials on basic grains reflects the importance that the producers give to these crops. Thus the municipality contributes with 1.24 and 0.78% of the national production of maize and common beans, respectively (Barbieri and Baltodano, 1999).

From 1997-2002 the CIALs have evaluated the maize crop (total 79 lots) in different years and in the first cycle, of which results are presented for 69 lots (87%). Of 118 lots of the common bean crop that have been evaluated, data from 82 (70%) are reported. This was due to the problems of Hurricane Mitch and irregular rains during the first-semester plantings of 1999.

Tables 2 and 3 give the maize and common bean yields in quintales /manzana. As shown in Table 2, the producers of the CIALs Jicaro 2, Las Mesas, Carrizal and Zarzal have selected the variety Catacama (NB 90-43), which has been delivered in small amounts to other producers of these communities for its adaptation to different soil conditions and altitude (from 380-750 m). Catacama had yields similar to the local check (NB-6); but given the good coverage of the cob, it was preferred by the producers as it tolerates rainy seasons. HQ INTA 993 is in the production cycle by the CIALs from Zarzal and Carrizal because of its high yield.

As can also be observed in Table 3, the variety Compañía 93 has been identified, selected and its seed distributed by the CIALs to producers in the communities of Wibuse, Zapote and Quebrachal. The reasons for its selection and especially its adaptation to different conditions are presented in greater detail in the column on selection criteria. Other varieties such as Tío Canelo and Estelí 150 have presented favorable conditions in the communities of Wibuse and Zapote. In Carrizal and Zarzal new materials such as EAP-9508-41, EAP 9509-29, EAP 9510-77 and the SRC 3-1-3 are in the multiplication phase.

In upland rice the CIALs from Jicaro (women) and El Zapote are in the final phase of research with the production of varieties such as IRAT 349 and IRAT 366.

Table 1. Cycles of evaluation and research in crops by the CIALs in San Dionisio, Matagalpa, Nicaragua.¹

Name and year initiated of CIAL	Community	2001		2002		2003	
		First	Second	First	Second	First	Second
Wibuse 1997	Wibuse	Rice		Rice		Rice	
San Jose 1997	Jicaro 1	Maize		Maize		Maize	
Mujeres Experimentadoras 1997	Jicaro 1	Rice		Rice		Rice	
Productores Unidos 1997	Piedras Largas	Maize		Maize		Maize	
El Progreso 1998	El Zapote		Common beans	Maize Common beans Sweet potatoes	Common beans	Maize sweet potatoes	Common beans
19 de Abril 1998	Jicaro 2			Common beans Sweet potatoes		Maize	Sweet potatoes
Productores Experimentadores 1998	Las Mesas	Common beans			Common beans		Common beans
Buena Esperanza 2000	Las Cuchillas		Common beans	Maize Sweet potatoes		Maize Sweet potatoes	Common beans
Las Nubes 2000	La Suana	Common beans				Maize	
Linda Vista 2000	Zarzal	Maize	Common beans	Maize Common beans Sweet potatoes	Common beans	Maize	Sweet potatoes
Los Girasoles 2001 ^a	Zapote			Rice Sweet potatoes		Rice Sweet potatoes	
Nueva Vida 2001 ^a	El Chile	Maize		Maize sweet potatoes		Maize Sweet potatoes	
Santafe 2001 ^a	Carrizal	Maize	Common beans	Maize Common beans sweet potatoes	Common beans	Maize	Sweet potatoes

Name and year initiated of CIAL	Community	2001		2002		2003	
Manos Que Ayudan 2001B	El Corozo			Maize Common beans sweet potatoes	Common beans	Maize	Common beans Sweet potatoes
Rio Seco 2002 ^a	El Corozo			Common beans	Common beans	Common beans Sweet potatoes	<i>Common beans</i>
Nuevo Amanecer	Jicaro 2					common beans Soybeans	<i>common beans</i>
La Amistad	Los Limones					Common beans	<i>common beans</i>

¹ Red = Test trial; blue = confirmation; green = Production.

Table 2. Yields of maize varieties (qq/manzana) in first-semester cycles.

<i>Variety</i>	Jicaro 2 ¹	Las Mesas ²	Carrizal ³	Zarzal ⁴	Chile ⁵	Selection Criteria (based on 100 producers)
NB-6 (TL)	52*	53.2*	35.5	33.8	20.0	Plant height (+), coverage of cob (+), resistant to moisture (+), little disease (+), thick cob (+), resistant to pests (+), coarse grain (-)
Catacama NB 90-43	54 *	50*	39.5	34.0	24.2	Plant height (+), thickness of stalk (+), coverage of cob (+), not tolerant to moisture (-), heavy cob full of kernels (+), little lodging (+), adapts to many places (+)
HQ INTA 993			37.8	55.0		Plant height (+), thickness of stalk (+), coverage of cob (+), heavy cob full of kernels (+), little lodging (+), adapts to many places (+)

¹ Average of 3 locations, 1997; ² average of 3 locations, 1999; ³ average of 7 locations, 2001/2002; ⁴ average of 6 locations, 2001/2002;

⁵ Average of 8 locations, 2001/2002.

* Average of 2 first-semester cycles.

1 quintal = 50 kg; 1 manzana = 0.706 ha.

Table 3. Yields of common bean and soybean (qq/manzana) varieties in first- and second-semester cycles.

Variety	Wibuse ¹	Zapote ²	Carrizal ³	Zarzal ⁴	Selection Criteria (based on 150 producers)
Door 364 (T)	20	20.2	14.5	20.7	Grain size (+), shape (+), color (+), shininess of grain (+), taste (+), market (+)
Estelí 150	20	37.0			Early maturing (+), grain size (+), shape (+). color (+), shininess of grain (+), taste (+)
Compañía 93	25.5	31.8			Grain size (+), shape (+), color (+), shininess of grain (+), taste (+), cooking time (+), adaptation to different conditions (+)
Tío Canela		28.8			Rapid growth (+), heavy grain (+), grain color (+), resistance to diseases (+), hairy and coriaceous (plants ligneous or herbaceous angiospermaes) leaves (+), market (+), resistance to drought
EAP 9508-41			18.2		Heavy grain (+), color of grain (+), resistance to diseases (+), hairy and coriaceous leaves (+), market (+), resistance to drought
EAP 9509-29			17.2	27.2	Rapid growth (+), heavy grain (+), grain color (+), resistance to diseases (+), grain shape (+), market (+)
EAP 9510-77			18.3	24.6	heavy grain (+), grain color (-), resistance to diseases (+), in rainy season loses color (-) market (+), resistance to drought
SRC 3-1-3			24.1	22.6	Rapid growth (+), heavy grain (+), grain color (+), resistance to diseases (+), market (+), resistance to drought

¹ Results averages of 6 locations, 1998-1999; ² results averages of 9 locations, 2000-2002; ³ results averages of 10 locations, 2000-2002;

⁴ Results averages of 6 locations, 2000-2002.

It should be mentioned that the interaction between the Supermarket of Options for Hillside (SOL) and the CIALs has made it possible for the latter to identify new technological alternatives; e.g., for upland rice and sweet potatoes, in addition to identifying new germplasm for basic grains.

This quantitative information, which is available in the database of the Participatory Research Project, is linked to the results of countries such as Honduras, Colombia and Bolivia, among others.

Meetings and workshops held by the CIALs

Activity	Technicians	Producers	Local Organizations & Institutions	Most Important Results Obtained
CIALs meeting at local level, San Dionisio	4	80	ACV ODESAR PCAC Mayor's Office MINSA (Ministerio de Salud)	Participation of all representatives of each of the 15 active CIALs Participation of ODESAR (NGO) and MINSA. (Ministry of Public Health)
Workshop management of fund for CIAL treasurers	1	16	ACV	Training of the CIAL treasurers in the management of funds
Workshop for training CIAL coordinators and secretaries, 30-04-2003	2	34	ACV	Improved knowledge of CIAL coordinators and secretaries with respect to the appropriate management of the format for PM&E
CIAL meeting, Honduras	2	6	CIALs	Presentation of results in crops such as maize, common beans and sweet potatoes Interest of other participants in this experience, particularly with respect to the preparation of byproducts (bread, small box, etc.) from these crops
Workshop for preparing format for PM&E indicators	3	21	ACV CFOCIC	Standardization of format forms for implementing the process of PM&E that will begin with the participation of 3 CIALs (El Zarzal, Corozo and Jicaro 1) and CFOCIC
Study tour to exchange experiences on PM&E, UNICAM (Esteli)	5	21	CIAL ACV CFOCIC	Better results obtained with our CIAL with respect to the PM&E process, as well as in the planning and mounting of field trials, than with the UNICAM producers.

References

- Braun, A.; Hocdé, H. 1999. [Investigación participativa con el agricultor en América Latina: Cuatro casos. In: Proceedings Trabajo con los Agricultores: La Clave para la Adopción de Tecnologías Forrajeras.](#) Australian Center for International Agricultural Research (ACIAR), Cagayan de Oro, Filipinas.
- Barbier, B.; Baltodano, M.E. 1999. Modelo de simulación bioeconómica para la subcuenca del río Calico, San Dionisio, Matagalpa, Nicaragua. Reporte para Informe Annual CIAT. 9 p.
- Tijerino, D; Baltodano, M.E; Vernoy, R. 1997. La formación de los Comités de Investigación Agrícola Local en la subcuenca del río Calico, municipio de San Dionisio, Departamento de Matagalpa. In Reportes de progreso 1997. Proyecto CIAT-Laderas. América Central. Managua. Nicaragua.

Indicators⁴⁴ System as a part of Participatory Monitoring and Evaluation

Researchers: Luis Alfredo Hernández Romero⁴⁵, Jackeline Ashby⁴⁶ and Susan Kaaria⁴⁷

Introduction

Indicators are like a “board of lights or signals,” not only for representing the state of each variable to be monitored and evaluated, but also for gathering information into an established Participatory Monitoring and Evaluation (PM&E) system. This “board” is considered a basic part of PM&E, ensuring the opportune gathering and flow of adequate information to the people involved in it (Quintero, 2004). Quintero (2002) has classified indicators as follows: profit indicators and management indicators (Fig. 1).

Profit indicators

Profit indicators respond to questions like: “What to do?” “How to do things correctly?” = effectiveness (Fig. 1). The information required to assess profits, success, failures and objectives can be captured through information at three levels: (a) products = results to be given (short-term results or outputs), (b) **effects** = use of products (medium-term results or outcomes), and (c) **impact** = development results (long-term results).

Management indicators

Management indicators determine the efficiency of projects and processes. In other words, it is the fulfillment of the activities and resources degree use to attain the objectives proposed.

Being efficient is to accomplish planned activities, using the methods and procedures established to achieve the objectives and products. Being efficient at the resource level is to use human, physical and financial resources to reach the planned objective.

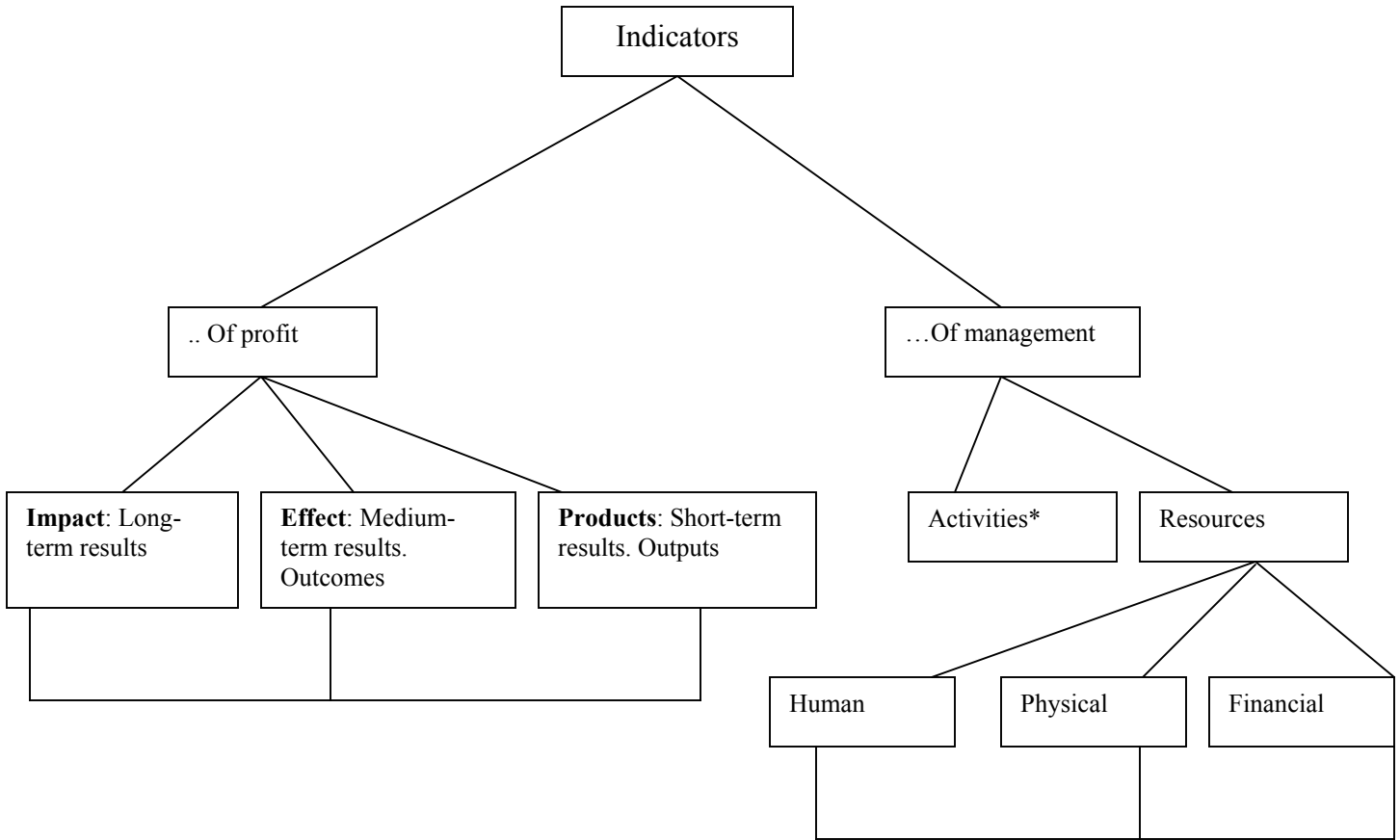
Management indicators respond to the question: “The best way to do it” = efficiency (Fig. 1).

This paper focuses on the profit indicators and presents a proposal of how to obtain them from a PM&E system. In some cases it could be a barrier. This proposal, based on the author’s experience in the Province of Cauca in southwestern Colombia (“contingent plan”), describes an alternative for resolving this barrier. More important is to find ways to explain how this apparent obstacle in the process can actually be exploited as an opportunity to enhance the PM&E methodology.

⁴⁵ Participatory improvement and research – IPRA Project - CIAT

⁴⁶ Director for Rural Innovation and Development Research - Rural Innovation Institute

⁴⁷ Agricultural economist – Senior Research Fellow – IPRA Project – CIAT - Africa



What to do ?
How to do things correctly?

Effectiveness

The best way to do it?

Efficiency

Figure 1. Indicators subsystem within a PM&E System model (Quintero, 2002).

* Process indicators generate activities.

Directions based on case study

The author analyzed the general objectives of the following CIALs with an established PM&E process: San Isidro-Women, Esmeralda 1 and 2, Las Tres Cruces, El Progreso-Women, Fortaleza Carpintera, El Pinar-Men and El Pinar-Women. The preliminary results permitted testing the following procedure given in Table 1.

Classifying and inferring the information

- *Associating data.* Information from specific objectives can be associated with outputs, outcomes and social impact, applying the “chain results” proposal (Hernández, R. 2003). This permits a better understanding of links and interrelationships among objectives, activities, products, effects and social impacts. For instance, San Isidro’s dream is to have an “*organized group.*” Collating and tabulating data is an activity that contributes to getting a better organization. A short-term result derived from this activity is that a PM&E commission should be able to record PM&E information. A medium-term result could be that everyone (CIAL members) should be able to record this information. Finally, this CIAL can improve reading and writing capacities, having a social impact in the future (see Table 1).
- *Key questions.* Following the same example described above, the information presented in Table 1 would be the result of questions such as:
 - ✓ What do you want from this meeting? (Exploring expectations). **Possible answer:** We want to improve our activities
 - ✓ What activities ongoing do you want to improve? **Possible answer:** This group needs a better organization (**specific objective**)
 - ✓ How do we know when you are getting a better organization? **Possible answer:** We know if the PM&E commission is able to record and tabulate PM&E information (**output**).
 - ✓ How do we know that you are achieving it? **Possible answer:** If everyone on the commission is fulfilling his/her assigned task (**outcomes**).
 - ✓ What would be the frequency for doing that? **Possible answer:** Monthly meetings of our community. Then we could design a monthly progress report (meeting)

Whether it is likely to get social, human and economic impacts (Table 1) depends on the objective.

Table 1. Relationships among objectives, activities, outputs, outcomes and social impacts in PM&E systems in Cauca, Colombia, June.

Objective	Activities	Outputs	Outcomes
Organized group... San Isidro-women	Collating and tabulating data	PM&E commission should be able to record information	Everyone (CIAL members) should be able to record information
	Sharing information at CIAL and community level	Ability to follow what is happening in the PM&E process established	Everyone (CIAL group) should be able to use PM&E information for his or her own purposes.
“CIAL group strengthened in order to increase bean production...” Esmeralda 1	Meetings to motivate other community members	Most CIAL members know and apply new technologies. Creating the habit for documenting information within CIAL group	Most community members are planting new bean varieties. Getting the entire group involved in the data collection process
“CIAL group strengthened...” Las Cruces	Do research on local seeds Training in management of new projects	Most CIAL members know and apply new technologies. Project supported	Most community members are using new technologies. Most community members are producing products such as health products.
“CIAL group strengthened in order to create an agroenterprise of maize...” Esmeralda 2	Meetings to motivate (We should increase participation...)	New motivated members (new CIAL, Women- Esmeralda 2)	Increase both people associated and levels of satisfaction

- *What information do you need to collect?* Tool(s) for data collection? How often will the information be collected? Some questions such as those described above can be answered on the basis of the PM&E philosophy. In fact, PM&E belongs to the people involved in it. It is self-help oriented, an effective means of increasing self-reliance while increasing people's control over their own destiny. PM&E involves farmers' groups in: (a) deciding what areas to monitor and evaluate, (b) selecting indicators for PM&E, (c) designing data collection systems, (d) collating and tabulating data, (e) analyzing the results and (f) using PM&E information for their own purposes (Participatory Monitoring, 1988).

Based on the information from the Cauca CIAL communities, members determined the following indicators (Table 2):

Table 2. Developing indicators for PM&E systems in CIAL(s) Cauca, May-June.

Outcomes	Outcome Indicators	Impacts	Information to Be Collected	Feedback to Community and Decision-making
Everyone (CIAL group) should be able to use PM&E information to improve the CIAL. San Isidro-women	CIAL members use PM&E information to adjust plans and activities	Capacity strengthened for analyzing, generating and expounding solutions to problems CIAL can demonstrate its PM&E to outsiders (empowerment) (human capital)	Recording information from indicators by CIAL members	What is happening with the indicator/output? What is going well? Why? What is not going well? Why? What do you need to improve?
Everyone (CIAL members) should be able to record PM&E information. San Isidro-women	Records on PM&E activities made by all members of CIAL commission (See Annual report 2003)	Reading and writing capacities improved (human capital) CIAL can demonstrate its PM&E to outsiders (empowerment)	Face formats	
CIAL experimental results are put to use for production in the community. San Isidro-women	People in the community plant/ grow soybeans using CIAL technology.	Community gets some benefits such as: Changes in the nutritional diet; e.g., soybean milk and bread Human capital	Testimony Survey by CIAL % users of CIAL technology	

Outcomes	Outcome Indicators	Impacts	Information to Be Collected	Feedback to Community and Decision-making
<p>Most community members is planting new bean varieties.</p> <p>Earn money from better bean production</p> <p>Esmeralda 1</p>	<p>Seed stocks include new varieties</p> <p>Improved homes (painted)</p> <p>Personal well-being</p>	<p>(health)</p> <p>Enough food for everyone</p> <p>Food security, independence levels and productive development, strengthened (economic impact)</p> <p>Productive development strengthened (economic impact)</p>	<p>Increasing areas and production through maps and recording information like one pound of beans produce 1 @” (before we did not register anything)</p> <p>Increasing levels of families’ satisfaction</p>	
<p>Earn money from alternative diets for chickens</p> <p>El Progreso-Women</p>	<p>Knowledge on management of diets for chickens</p>	<p>CIAL can demonstrate its PM&E to outsiders (empowerment).</p> <p>Can afford: shoes, medicine, TV, school</p> <p>Formation of intellectual capital</p> <p>(Organizational impact)</p>	<p>Testimonies</p> <p>Household surveys</p>	

References

- Quintero Victor Manuel Uribe. 2002. Sistemas de Evaluación para Organizaciones de Desarrollo. Una Propuesta en Constructo. Encuentro Sistemas de Seguimiento y Evaluación, políticas, programas y proyectos sociales y ambientales. Bogotá, noviembre 7,8 y 9 de 2002, p. 231.
- Hernández Romero L. A 2003. Annual Report. Learning from PME experiences in Latin America: A strategy to capture the results of development changes at the community level. pg 21-23
- Quintero, Víctor M (2004) Los Proyectos Sociales II. Guía para su evaluación y análisis de factibilidad. Instituto FES de Liderazgo, Cali.

Strengthening participatory monitoring and evaluation processes in KARI: Key strategies, challenges and preliminary results

Researchers: Jemimah Njuki⁴⁸, Susan Kaaria⁴⁹, Festus Murithi⁵⁰

Introduction

PM&E is a diverse constellation of approaches, methodologies and techniques. PME systems provide a framework for collaborative learning and involving project clients, participants and partners in the M&E process. PM&E produces important benefits including valid, timely and relevant information for management decision-making and project improvement within R&D institutions. In defining PM&E the World Bank (2002) indicates that it is a radical new way of assessing and learning. It involves the local people, development agencies and policy-makers, leads to improved accountability, examines assumptions on what progress is, and can lead to contradictions and conflict; but it can also be empowering by putting local people in charge, helping develop skills and showing all stakeholders that their views count. PM&E helps researchers and development agents to check whether inputs, activities and outputs are proceeding according to plan and are leading to the desired outcomes.

PM&E is not just a matter of using participatory techniques within a conventional M&E setting. It is about radically rethinking who initiates and undertakes the process, and who learns or benefits from the findings (IDS, 1998). At the heart of PM&E, however, there are four broad principles:

- ✓ Participation means opening up the design of the process to include those most directly affected and agreeing to analyze data together.
- ✓ The inclusiveness of PM&E requires negotiation to reach agreement about what will be monitored or evaluated, how and when data will be collected and analyzed, what the data actually mean, and how findings will be shared and action taken.
- ✓ This leads to learning, which becomes the basis for subsequent improvement and corrective action.
- ✓ As the number, role and skills of stakeholders, the external environment and other factors change over time, flexibility is essential.

The CIAT-KARI PM&E project is applying these PM&E principles to strengthen the M&E systems using five pilot KARI centers (Kitale, Kisii, Kakamega, Embu and Mtwapa).

⁴⁸ Social Scientists –Kenya Agricultural research Institute - CIAT Africa, P.O. Box 6247, Kampala, Uganda.

⁴⁹ Agricultural Economist – Senior Research Fellow – IPRA Project – CIAT - Africa

⁵⁰ Agricultural Economist - Head of Socioeconomics and Biometrics, Kenya Agricultural Research Institute, PO Box 57811, Nairobi.

The objectives of this work are to:

- Strengthen PM&E systems within KARI projects in order to be able to analyze critically and understand the institutional learning and change process, increase self- and cross-learning and evaluate impacts
- Establish an appropriate PM&E system at the community level that allows local people to analyze and interpret change, learn from their own experiences, adjust strategies accordingly and systematically evaluate progress
- Create a critical mass of KARI scientists, their partners and other stakeholders (extension, NGOs, farmers) with skills and expertise to establish and support PM&E processes

Methodology

There are nine main steps in the PM&E processes:

- ✓ Engaging with stakeholders
- ✓ Building stakeholders' capacity for PM&E
- ✓ Deciding what to monitor and evaluate
- ✓ Developing and formulating indicators
- ✓ Gathering information
- ✓ Managing and analyzing data
- ✓ Sharing and using results of PM&E
- ✓ Learning and change
- ✓ Closing the loop

Various activities and processes (Table 1) have been carried out in order to begin establishing PM&E processes.

- ✓ Assessment of the status of M&E in the five pilot KARI Centers to identify critical issues, opportunities and gaps in existing PM&E systems and document lessons and experiences in PM&E "best practices"
- ✓ Capacity-building activities to equip scientists with skills and develop action plans to strengthen PM&E systems in selected projects
- ✓ PM&E frameworks developed with pilot projects
- ✓ Mentoring activities carried out in pilot centers to establish and implement project- and community-level PM&E systems

Table 1. Activities and processes in establishing PM&E systems.

Activity/Process	Stakeholders Involved	Objectives
Stakeholder consultation	KARI Center directors, scientists, Socioeconomics Division; CIAT; NGOs; Rockefeller Foundation	<ul style="list-style-type: none"> ✓ Review project and make any necessary adjustments ✓ Develop work plans for project implementation
Project launch	KARI Center directors, Assistant Directors, Program leaders, scientists; CIAT; Rockefeller Foundation	<ul style="list-style-type: none"> ✓ Create awareness of project among KARI management and other scientists ✓ Create awareness of importance of PM&E ✓ Place project in context of KARI's other ongoing activities
3-day workshops in 5 pilot sites	All scientists at Centers, Center Directors, CIAT	<ul style="list-style-type: none"> ✓ Make an inventory of current M&E systems ✓ Conduct a SWOT analysis of existing M&E systems ✓ Assess how different stakeholders have been involved in M&E ✓ Identify critical gaps and opportunities in the current M&E systems ✓ Select pilot projects to act as learning projects on PM&E ✓ Select a project coordination team
Capacity-building workshop	3 scientists from each pilot project, one MOA extension officer per Center, Kenyatta University, CIAT, NGO partners	<ul style="list-style-type: none"> ✓ Build scientists' capacity to establish and implement project-level and community-level PM&E systems ✓ Build skills in facilitation, data collection, analysis and reporting ✓ Develop action plans for implementing PM&E systems in pilot sites
Establishment of PM&E in pilot projects	Scientists from selected pilot projects, MOA extension partners, NGO partners, technical staff attached to pilot projects, CIAT	<ul style="list-style-type: none"> ✓ Build the capacity of more scientists, extension agents and NGO partners for developing and implementing PM&E systems ✓ Build the capacity of farmer groups to develop expected results and indicators for measuring progress ✓ Develop PM&E performance frameworks for pilot projects ✓ Set up community-based PM&E systems ✓ Develop tools for data collection ✓ Develop mechanisms for feedback

Results and discussion

Assessment of the status of M&E in KARI

Twenty projects in the five centers presented their M&E systems in workshops attended by over 100 KARI scientists and partners from the Ministry of Agriculture (MOA). Each project identified the objectives of their M&E systems and some critical gaps and opportunities for improving their current system (Table 2).

Table 2. Critical gaps and opportunities in existing M&E systems and areas for intervention

Critical Gaps	
<p>Technical</p> <ul style="list-style-type: none"> ✓ Lack of systematic process in developing measurable indicators <ul style="list-style-type: none"> - Quantitative vs. qualitative indicators - Different levels of indicator development-resources, activities, outputs, outcomes, impact, processes and approaches ✓ Skills in integrating equity and gender considerations into the process ✓ Weak linkages among baseline, M&E and impact assessment ✓ Stakeholders not involved in indicator development and M&E ✓ Lack of inbuilt PM&E during project development and well-defined M&E frameworks ✓ Existing M&E systems may not give enough room for feedback and taking corrective measures/actions; sometimes the lag period is too long between data analysis and feedback so there are no opportunities for learning. 	<p>Institutional</p> <ul style="list-style-type: none"> ✓ Several projects identified donor inflexibility (e.g., adjusting projects once a budget was established) as a major limiting factor to the implementation of PM&E systems. ✓ High demand on the scientists' time hinders them from continuously monitoring and evaluating specific projects ✓ Irregular flow of funds for projects interrupts work plans and monitoring activities ✓ Opinion, especially among biophysical scientists, that baselines, M&E and impact assessment are the responsibility of social scientists <p>Other</p> <ul style="list-style-type: none"> ✓ Various scientists also found it difficult to involve farmers or local communities and other stakeholders such as extension agents in the PM&E process because of their lack of M&E skills.

<p>Opportunities</p> <ul style="list-style-type: none"> ✓ Some projects have existing institutional structures for M&E including logical frameworks and steering committees. ✓ There are committees that are involved in activities such as project reviews at center level e.g. CRACs ✓ A number of scientists have capacity in PR tools and gender analysis tools ✓ Wide range of partners (IARCs, CBOs, NGOs, Farmers, Private sector) and stakeholders involvement in project implementation in KARI ✓ Strong willingness by farmers to participate in project activities ✓ Scientists (biophysical and social) willing to get involved in PM&E 	<p>Key intervention areas</p> <ul style="list-style-type: none"> ✓ Build capacity of scientists in establishing and supporting PM&E systems, including the following topics: <ul style="list-style-type: none"> - Identification of different stakeholders and their roles in the PM&E process (including farmers and other community members). - Strategies on developing appropriate qualitative and quantitative indicators - Integration of gender and equity issues into the PM&E process - Facilitation skills for scientist/farmer/other stakeholder interactions - Capacity building for data analysis in PM&E at different levels - Data management, analysis, interpretation and use, including the synthesis of PM&E data to facilitate their use for decision-making at different levels and provide feedback and learning ✓ Facilitating scientists to build the skills of communities and other local stakeholders in PM&E ✓ Building skills for attitude change ✓ Action learning in implementing PM&E systems
--	---

Generally, all the projects were doing some form or other of M&E, had different levels of stakeholder involvement, as well as documentation of procedures. In addition to project-level M&E, centers have formal processes for M&E, which include Center Research Advisory Committees (CRACs) and Regional Research and Advisory Committees (RREACs).

M&E has been seen as a policing and supervisory tool and as an activity that is done by outsiders mainly donors and external experts to check on the accountability and the resource management by project implementing teams. Scientists have been able to change their perceptions and see M&E as an internal learning process. Discussions on the role of PM&E in the project cycle highlighted the importance of including PM&E during the planning and project development phase.

During the assessment workshops, ten projects from five centers were selected as pilot implementation projects (Table 3). Box 1 gives the criteria for their selection.

Table 3. Projects selected for pilot PM&E learning for centers.

Center	Project	Donor	Partners
Embu	Conservation Tillage	DFID	Monsanto, MOA FIPs, Kel Chemicals, Athi River Mining
	National Agroforestry Project	SIDA	ICRAF, MOA,
Kisii	Soil Management Project	Rockefeller	MOA
	Participatory Methodologies for crop protection technologies	DFID	MOA
Kitale	Soil management Project	Rockefeller	MOA
	IRMA	CIMMYT, Rockefeller and Others	CIMMYT
Mtwapa	Soil and Water Management project	Rockefeller	MOA
	Biotechnology to benefit small scale banana producers in Kenya	Rockefeller ISAAA, IDRC	ISAAA, JKUAT, MOA, Kwale Rural Support Project
Kakamega	Accelerated multiplication and distribution of healthy planting materials of improved cassava varieties in Western Kenya		MOA, IITA
	Oil palm production project	TCP/FAO	MOA, MUSCO, KIRDI

The critical gaps and opportunities identified by specific projects and also by the groups of scientists provided a good entry point for the PM&E project, which aims at strengthening these systems.

Box 1: Criteria for selecting pilot projects

- ✓ Projects at different stages of implementation
- ✓ Adequate funding to support other project activities
- ✓ Expressed interest of project team in participating
- ✓ Have on-farm activities in order to test both project- and community-level PM&E
- ✓ Projects that will be ongoing for the next 1½-2 years
- ✓ Diverse range of partners and stakeholders
- ✓ Projects dealing with a diversity of activities and approaches

Building scientists' skills to establish and strengthen project-level PM&E systems

The development of project-level PM&E frameworks was done through two main phases, each with various stages. The first phase involved a two-week intensive capacity-building workshop for scientists and stakeholders in the selected projects: social scientists and biophysical scientists

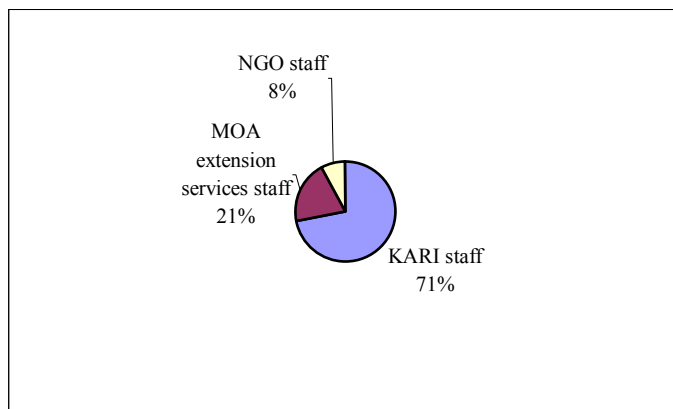
from KARI headquarters and the five Centers, research extension liaison officers from the MOA, NGO representatives, universities and CIAT. The key topics covered during the workshop were:

- ✓ Identification and analysis of stakeholders
- ✓ Monitoring results and processes
- ✓ Developing project-level and community indicators
- ✓ Tools for data collection-issues of sampling and baseline
- ✓ Community facilitation skills
- ✓ Action plan development

These were covered in plenary presentations, group discussions and field activities. Afterwards, the ten pilot projects developed action plans for integrating PM&E activities.

On-site capacity development and mentoring

Project implementing teams from KARI, partners from NGOs and the MOA were trained in establishing PM&E. From March-September this year, 120 people were trained in establishing and implementing project-level and community-based PM&E systems as shown in Figure 1 below. Of these, 71% were KARI researchers and technical officers, while 21% were from extension and 8% from NGOs.



The teams were facilitated to develop PM&E performance frameworks for the pilot projects. They were developed by small groups of scientists, extension officers and NGO partners according to themes and then harmonized to come up with project-level results, activities, processes and their indicators. These frameworks consisted of the following:

Figure 1. Proportion of staff trained on PM&E systems.

- ✓ Key results of the project (impacts, outcomes and outputs)
- ✓ The project activities
- ✓ Processes
- ✓ Indicators for measuring progress of key results, activities and processes
- ✓ Baseline data available on the indicators, targets or benchmarks for the indicators
- ✓ Tools for data collection and analysis
- ✓ Roles for data collection

Participatory monitoring recognizes the role that local people can play. In conventional M&E, local people are reduced to providing data or information required but not in deciding what

should be monitored (Abbot and Gujit, 1998). In PM&E, local people get involved in defining measures of progress and applying these measures to check whether they are making progress and then adjust activities. Community results and indicators were developed with selected groups of farmers. Within communities, there were differences by gender in the results and the indicators. These differences were more pronounced in the indicators. As a result, there was harmonization of indicators at the community level to reflect both male and female perceptions while at the same time avoiding divisions in the groups of whose indicators they were (Box 2).

Box 2: Men's and women's indicators	
Outcome: Increased income	
<u>Indicators from Men</u>	<u>Indicators from women</u>
✓ Income-generating activities initiated	✓ Children going to secondary school
✓ Increased ceremonies	✓ Good food (breakfast, good-quality tea)
✓ Good clothing	✓ Going to market weekly
✓ Good housing with iron sheet roof	✓ Better clothing (women wearing new <i>khangas, kodokodo</i>)
	✓ Join a merry-go-round (group savings scheme)

Key issues, challenges and lessons learned

Seventeen groups of approximately 340 farmers have been trained and are implementing community-based PM&E systems. The farmers have been trained directly by the CIAT team and indirectly by the scientists, extension and NGO staff trained.

Concretizing and harmonizing outputs, outcomes and their indicators

Comparing farmers and the research teams frameworks, it was clear that there were both similarities and differences in the expected results and indicators. Thus there was a need to integrate the two without losing the uniqueness of either group. For purposes of project-level M&E, the project-level frameworks were harmonized with the community frameworks. This was especially useful in the indicator development as indicators from the farmers enriched those of the scientists. The integration of community results and indicators in the project frameworks ensures that project progress is also measured from the communities' perspectives. A prioritization of indicators was done in order to strike a balance between the amounts and quality of the data collected and the resources available to collect them. An example of differences between farmer and research indicators and how these have been harmonized and prioritized is given in Table 4.

Table 4. Researcher and community indicators harmonized.

Outcome	Indicators¹
Improved soil fertility	<p><u>Quantitative</u> Nutrient levels (carbon, phosphorus, macronutrients) Increase in yields</p> <p><u>Qualitative</u> <i>Farmers' perception on change in soil quality (color, type & presence of weeds, texture)</i></p>
Increased food security	<p><u>Quantitative</u> Amount of food stored, no. of months with food / <i>Having food throughout the year</i> Increased production (acreage and yields)</p> <p><u>Qualitative</u> <i>Farmers' perception of food availability and composition(e.g., no. of meals per day, quantity & composition of meals, maize purchases, amount of relief, farmers looking for casual labor)</i></p>

¹ Indicators in italics are adapted from community indicators.

Key issues, challenges and lessons

Integration of PM&E into different approaches and methods

The project has had various experiences with integrating PM&E into existing research activities, especially in the Farmer Field School (FFS) processes. When PM&E is incorporated at the start of the FFS, there is better integration of PM&E as the different components get integrated into the different stages of the FFS implementation process; e.g., the development of results (outcomes and outputs) is integrated into the ground working process. In cases where PM&E is being integrated in the middle of the FFS implementation process, the integration process is more challenging. Change of attitude and perceptions of PM&E from viewing it as a separate activity to viewing it as part and parcel of good project management and project implementation can however play a big role in integrating it into the project implementation process.

Setting targets, baselines and sampling

In most cases, projects develop and carry out baseline surveys without an M&E framework, which provides a guide on the information that should be collected in a baseline survey. This ensures that the baseline is targeted and that the M&E data have a point of reference. Within an M&E context, baselines show whether the project is making progress toward achieving results or not. Baselines can be developed in different ways such as using existing secondary data, using PR tools and techniques and primary survey data among others. When using primary data to collect baselines, there is need to sample and target the baseline data collection so as not to make this a laborious and time-consuming exercise. Periods for data collection should be targeted to ensure a good reflection of changes in the indicator.

Targets are the levels of the indicators in the PM&E performance framework that the project realistically expects to achieve. Targets should be as realistic as possible even when they come from farmers, either through PR methodologies or through survey. These should be negotiated

so that they reflect what is feasible within the project's activities. Setting unrealistic targets can make both farmers and scientists feel frustrated because they are not achieving their objectives.

Integrating gender and equity into the performance framework

With PR, gender and equity concerns are central to the implementation process. More often than not, gender and equity have not been reflected in the PM&E performance frameworks. Gender and equity issues including participation, empowerment and changes in gender relations need to be negotiated by both the project teams and the communities so that they become part of the PM&E process.

Sharing roles for data collection

Data collection needs to be a shared responsibility between researchers, extension officers and farmers; however, teams need to be careful so that none of them become overwhelmed with this task. Farmers should not, for example, have to collect data that is of interest only to scientists. Moreover, information should be shared across all stakeholders. A common assumption with regard to data collection by farmers is that once they know the indicators they should collect data on, they will do it. More often than not, the farmers' capacity to collect and analyze data has to be built, but the researchers should not give farmers long complicated forms or data sheets on which to record the information as this may deter them from doing so.

Scaling up PM&E to more communities

How do we reach more communities with PM&E? One of the easiest approaches is to integrate PM&E into methodologies and approaches that projects are using in their implementation of activities, for example integrating PM&E into the FFS or Farmer Research Group (FRG) approach. This means that as project teams implement the FFS curriculum, PM&E is part and parcel of it. This will of course imply refining the process so that it is shorter and easier to apply. A second approach is to apply the indicators from one community in communities with similar characteristics (cultural, socioeconomic, ethnic, etc.) or use results and indicators from other schools with similar technologies and geographic area to introduce new schools to PM&E. This however has its shortcomings as the new schools or communities may not have as much ownership of the "imported" results as if they had developed their own.

Use of data, information from Community-Based PM&E (CB-PM&E)

It is important to have a committee (3-5 people) responsible for collecting information, analyzing and sharing it with the rest of the community (those collecting information and keeping records). Analysis of the information should be done in collaboration with researchers, extension and farmers so that all can reflect on it with respect to the outputs, outcomes processes and compare it to targets. Some useful questions to use in reflection are:

- ✓ What have we achieved this season/this year, etc.?
- ✓ What worked well?
- ✓ What did not work well?

✓ What do we need to change?

The results of the reflection should be used to make decisions and adjust activities if and when necessary so that M&E is a learning process.

Conclusions and recommendations

Establishing and supporting PM&E systems require skills, not only in establishing them but also in such areas as facilitation, analysis of qualitative data, gender analysis, using results of PM&E and project management. The key to successful application of the skills obtained from capacity-building activities is to provide mentoring and practical on-the-ground training as implementation of the process takes place. Attitude change is an important component if these systems are to work. For a long time, biophysical scientists have looked upon social scientists to carry out baseline studies, M&E and impact assessment. Given the current shortage of social scientists, not only within KARI but also in other R&D institutions, biophysical scientists will need to start looking at baselines, M&E and impact assessment as part and parcel of their projects and as activities that need to be funded within their projects.

In terms of institutionalizing PM&E within KARI centers, there was keen interest on the part of many scientists to acquire the skills in implementing PM&E systems. As the first group of Centers and scientists establish these systems, it will be important to put in place action plans for transferring these skills to other scientists, other projects at the Centers and other Centers not in the pilot phase and to KARI's partners. In addition, there will be a need to integrate PM&E into the approaches and methodologies that KARI is currently using for technology development and dissemination.

There are many challenges in setting up and implementing PM&E systems. One of the key ones is to ensure that PM&E does not become a technical process—develop results, indicators, collect data and analyze. The learning aspect of PM&E needs very strong emphasis so that there is a balance between focus on the implementation and on the learning and the use of PM&E data to take corrective measures and make decisions.

The PM&E process has shown that when stakeholders such as farmers and the extension are involved in all stages including the development of the results and activities to be monitored, the indicators that will be monitored, the type of data to be collected and how they will be collected, it leads to a more robust M&E. The involvement of stakeholders in PM&E, however, requires a lot of negotiation, prioritization of issues and strategic collection of data for PM&E. More often the question has been to what extent or at what level different stakeholders should be involved.

References

[Abbot, J.; Gujit, I. 1998. Changing views on change: Participatory approaches to monitoring the environment. SARL Discussion paper No. 2. Sustainable Agricultural and Rural Livelihoods. England.](#)

Institute of Development Studies (IDS). 1998. Participatory monitoring and evaluation: Learning from change. Policy Briefing Issue 12, Nov.

Kibel, B.M. 1999. What is “results mapping tool box?” Pacific Institute for Research and Evaluation. New York.

World Bank. 2002. Participatory monitoring and evaluation: Protecting The Vulnerable: The Design and Implementation of Effective Safety Nets, Dec. 2-13, Washington, DC
<http://www.worldbank.org/wbi/socialsafetynets/courses/dc2000/proceedings/pdfppt/participatory.pdf>

Coping with obstacles to successful partnerships: Lessons from a multi-institutional partnership that links smallholder farmers to markets in eastern and southern Africa

Researchers: Pascal C. Sanginga,⁵¹ Susan Kaaria⁵², Rogers Kanzikwera⁵³, Colletah Chitsike⁵⁴, Edward Ulicky⁵⁵, Roger Kirkby⁵⁶, Ibrahim Kawa⁵⁷, Robert Delve⁵⁸, Noel Sangole⁵⁹, Rupert Best⁶⁰, Linda Soko⁶¹, Fred Kabuye⁶², Charles Musoke⁶³, Ralph Rootheart⁶⁴, Andrew Daudi⁶⁵, Jemimah Njuki⁶⁶, Rachel Muthoni⁶⁷

Abstract

As participatory principles gradually gain general acceptance in agricultural research organizations, partnership is becoming a key principle for delivering services to the rural poor and achieving sustainable rural livelihoods. What is not so obvious, however, is how to sustain quality partnerships and cope with challenges of linking farmers to markets.

This paper is based on empirical experience and lessons learned with a multi-institutional partnership with a range of international and national agricultural research organizations, development organizations, government extension services, private sector and rural communities to make agricultural research more client-oriented, demand driven and market responsive. A number of factors that contribute to the success of partnerships are highlighted, and strategies used for coping with the obstacles to quality partnerships are discussed. The analysis suggests that critical success factors include the substance of the relationship based on complementarity to achieve a common goal; strong and consistent support from senior leadership; joint resource mobilization; evidence of farm-level impacts; institutional as well as individual benefits; regular communication and joint field visits. Building human and social capital through interpersonal relationships and friendships, regular training events and information sharing are critical in

⁵¹ Rural Sociologist (Senior Research Fellow), African Highlands Initiative (AHI) and PRGA Program, Uganda.

*Corresponding author: International Center for Tropical Agriculture (CIAT), P.O. Box 6247 Kampala, Uganda, Tel: +256 41 567670; Fax +256 41 567635; Email: P.Sanginga@cgiar.org

⁵² Agricultural economist – Senior Research Fellow – IPRA Project – CIAT - Africa

⁵³ Scientist, Potato Program, Kalengyere Research Station

⁵⁴ Development Specialist - Senior Research Fellow

⁵⁵ District agricultural development officer

⁵⁶ Coordinator for Sub-Saharan Africa and Agronomist Kawanda Agricultural Research Institute

⁵⁷ Director Traditional Irrigation and environmental development project

⁵⁸ Soil Scientist - Kawanda Agricultural Research Institute

⁵⁹ Community Development Facilitator

⁶⁰ Postproduction Specialist

⁶¹ Researcher

⁶² Researcher

⁶³ Production Officer, AFRICARE

⁶⁴ Crop and weed ecologist - International Livestock Research Institute – Ethiopia

⁶⁵ Principal Secretary in the Ministry of Agriculture – Malawi

⁶⁶ Social Scientist National Agricultural Research Laboratories Kenya Agricultural Research Institute PO 759-00606 Nairobi, Kenya

⁶⁷ Social Economist Kawanda Agricultural Research Institute PO Box 6247 Kampala, Uganda.

sustaining partnerships. Current reforms in agricultural R&D, emphasizing participatory approaches, farmer empowerment and linking farmers to profitable markets provide a conducive environment for quality partnership; however, sustaining quality partnerships is challenging. It requires creative strategies for coping with obstacles such as staff overcommitment and high turnover, changing expectations of individual benefits, sustainable funding mechanisms, imbalances between institutions and personalities. There are still important challenges of institutionalizing partnerships beyond individual personalities; maintaining quality during scaling up within partners institutions and attracting new partners. Overcoming the challenges of building effective public-private partnerships among agricultural research institutions, government services and the private sector, especially business services, will be critical for achieving success in linking smallholders farmers to markets.

Key words: partnership, research for development, market opportunities, partnership, scaling up, innovation

Introduction

In recent years, there have been significant shifts in agricultural research paradigms. A new paradigm termed Integrated Agricultural Research for Development (IAR4D) is gradually emerging to foster synergies among disciplines and institutions to achieve greater agricultural research impact. Championed by the Forum for Agricultural Research in Africa (FARA) and providing the backbone and operational framework of the sub-Saharan Africa Challenge Program, IAR4D is based on the conclusion that sustained improvement of the livelihoods of small-scale poor farmers requires a different type of research, aimed at enhancing the rural people's capacity to adapt to changing conditions, rather than at delivering 'finished' technologies (Sayer & Campbell, 2001; Ashby, 2003). IAR4D advocates and embraces institutional innovations with participatory action-oriented methods that drive research-for-development efforts to solve critical problems (FARA, 2003). As participatory principles gradually gain broader acceptance in agricultural research organizations, partnership is becoming increasingly important, as well as key principles and strategies in agricultural R&D to deliver services to the rural poor and achieve sustainable rural livelihoods. This view is supported by the innovation- system view of the innovation process (Douthwaite et al., 2002), which sees rural innovation as a complex process being produced by a network of actors and stakeholders that co-evolve with the technologies and processes they generate. Successful innovations result from strong interactions and knowledge flows within networks of actors and partners with strong feedback loops.

With the emergence of a broader agenda for agricultural research, coupled with the shrinking resource base for agricultural research organizations (Alston et al., 1995; Collinson and Tollens, 1994; Marthur and Pachico, 2003b), the need to engage with new stakeholders and build partnerships has become critical to enhance the impact of agricultural research. Research has shown that investment in building a strong foundation for partnership can yield significant benefits (Gormley, 2001; Huxham, 1996; Spink and Merrill-Sands, 1999). Partnership is also one of the eight mutually reinforcing Millennium Development Goals of the United Nations, which commit the international community to an expanded vision of development, one that vigorously promotes human development as the key to sustaining socioeconomic progress in all countries and recognizes the importance of creating a global partnership for development.

Despite the fact that partnerships have now become critical in funding and evaluating agricultural research, building and sustaining effective and quality partnerships can be quite challenging. A recent review of literature on partnerships (Merril-Sands and Sheridan, 1996) concluded that literature on partnership in agricultural R&D is still quite limited. Scientific efforts to improve the understanding of institutional partnerships and to find keys to their successes and failures in contributing to institutional learning and performance are still rare (Michelsen, 2003). Analyses of experiences with partnership are crucial for institutional learning and organizational performance to maximize the potential benefits and avoid pitfalls that many R&D institutions have encountered. As concluded by Gormley (2001), there is still much to learn from engaging in a partnership journey.

This paper is based on empirical experience and lessons learned from a multi-institutional partnership with a range of international and national agricultural research organizations, development organizations, government extension services, private sector and rural communities to make agricultural research more client-oriented, demand driven and market responsive. The Enabling Rural Innovation (ERI) project is pioneering innovative approaches and methodologies for empowering rural communities to identify market opportunities and develop sustainable enterprises that improve rural livelihoods while improving the management of resources from which production depends. ERI expands partnerships to community-based organizations and private sector to make markets work for the poor, in selected pilot learning sites in Uganda, Malawi and Tanzania.

The paper continues with an overview of the key steps and principles of the ERI approach. Section 3 describes the types of partnerships and criteria for selecting partners. Section 4 discusses critical elements of successful partnerships and distills lessons from strategies for coping with obstacles to successful partnerships. Issues of scaling-up potential with existing and new partners are briefly addressed in Section 5, while Section 6 presents frameworks and indicators for monitoring and evaluating partnerships. Lessons learned and their implications for enabling rural innovation in R&D are discussed in the concluding section.

Enabling rural innovation in Africa⁶⁸: Key principles and steps

Rural innovation can be defined as “the process by which various stakeholders generate, adapt or adopt novel ideas, approaches, technologies or ways of organizing, to improve on- and off-farm activities, so that the rural sector becomes more competitive in a sustainable manner” (CIAT, 2003. As observed by Smith (2002), “everybody is capable of innovation, and the first sign that it is happening is when people work together, excited because they want to be there, focused on finding a solution to a challenge they all understand.” We therefore define ERI as a multi-institutional partnership for empowering rural communities to make informed decisions and creating the capacity of communities to:

- ✓ Identify and develop sustainable enterprises that generate income and employment
- ✓ Generate and access information, knowledge and technology in support of their productive activities

⁶⁸ For details see Sanginga et al. (2004).

- ✓ Demand effective services to local support institutions and community organizations to provide an enabling environment that permits innovations to proceed

ERI offers a practical framework for integrating farmer participatory research (FPR) and participatory market research (PMR) in a way that empowers farmers to manage their resources (human, social, financial, natural) better and offers them prospects of an upward spiral out of poverty. It emphasizes integrating scientific expertise with farmer knowledge, strengthening social organization and entrepreneurial organizations through effective partnerships among research, development and rural communities. The broad principles and steps of ERI are described in a separate paper (Sanginga et al., 2004).

Types and criteria for selecting partners

The conventional form of partnership in agricultural research has been between international agricultural research organizations (IARCs) and national agricultural research institutes (NARIs). From this original base in NARIs, the institutional linkages needed to activate the concept of a functional national agricultural research and extension system (NARES) are improving rapidly. This includes government extension services, NGOs and civil society organizations. In Uganda, for example, the national agricultural research policy advocates for the need for various players to work in partnership for sustainable agricultural development (Government of Uganda 2003). Consequently, one of the five thematic areas of the National Agricultural Research Organization (NARO) explicitly focuses on enhancing innovation processes and partnership (NARO, 2004). The goal is to enhance the effectiveness, efficiency, relevance and ownership of research results through multi-stakeholder participation and partnership.

ERI is strengthening its partnerships with NARES in eastern and southern Africa while finding new partners in the NGO and private sector who can complement the objectives of linking small-scale farmers to markets (Table 1). From a limited number of partners at the start of ERI in 2001, the number has gradually increased to more than 13 boundary partners. Earl et al. (2001:1) define boundary partners as individuals, groups, organizations with whom the program interacts directly and with whom the program anticipates opportunities for influence. ERI's boundary partners comprise international and national agricultural research institutes, government extension services, NGOs, community-based organizations and the private sector.

Table 1. Types and categories of partners in ERI.

Types of Partners	Boundary Partners	Secondary Partners & Collaborators
NARS	Dept. of Agricultural Research Services (DARS), Malawi National Agricultural Research Organization (NARO), Uganda	Makerere University, Kampala, Uganda
Government extension services	Hai District Council (District Agricultural and Livestock Development Office) Lilongwe Agricultural Development Division (LADD)	
NGOs	<ul style="list-style-type: none"> • Traditional Irrigation and Environmental Development Program (TIP) • Plan International, Malawi • Africare Uganda Food Security Initiative • Africa 2000 Network • Integrated Soil Productivity Initiative through Research and Education (INSPIRE) 	Sanya Agricultural Development Program ActionAid
Farmers' organizations	21 farmer groups and communities (> 1000) Vision for Rural Development Initiatives (VIRUDI) Network of FFSS	
Private sector	Nandos Agro-Management Ltd.	
IARCs and (Sub-Regional Organizations) SROs	CIAT Africa Highlands Initiative (AHI) University of Natural Resources and Applied Life Sciences - BOKU, Vienna	IITA-Food Net ILRI-PRGA CIP-PRAPACE (Regional Potato and Sweet Potato Improvement Network in Eastern and Central Africa) University of Florida

These bring different strengths to the process, while new partners and collaborators are identified and involved in supporting specific objectives and outputs. These partnerships are increasingly expanding to new areas, new countries and bringing in a set of new partners. Partnership with agricultural universities is still limited to graduate students conducting thesis research within ERI. There are prospects for developing curricula on managing innovation process and partnerships.

ERI has attempted to establish partnerships with the private sector, with different levels of success. In Uganda for example, a partnership has been established with NANDOS, a fast food restaurant, for buying potatoes produced by farmers' groups in the southwestern part of the

country. Similarly, collaboration with Agro-Management Ltd., a private pyrethrum-processing plant in Kabale for buying pyrethrum and providing extension services to the farmers. In other countries, market and enterprise visits were made to hotels and agribusiness firms in an attempt to develop partnerships with the private sector; but these public-private partnerships need different skills and procedures. Although still expanding, it is clear that ERI partnerships need to involve a number of important stakeholders in agricultural R&D such as policy institutions and universities.

Building partnerships in ERI has been a “push-pull” process in that initiatives have come from both directions. In many cases, the partnership has been demand-driven in that the partners requested CIAT’s technical support in participatory approaches, participatory market research, rural agroenterprise development, and seed systems. In other case, the partnership was driven by CIAT recognizing the need to work with partners to develop and test ERI approaches. In only a few cases did the selection process follow a systematic process of institutional assessment of potential partners. It is not easy to have objective criteria for selecting partners. The selection is often intuitive or based on past relations and influenced by subjective judgments, personalities and past experience. However, one of the most common criteria used in selecting partners was the shared value of incorporating ERI to complement their ongoing research or development work. A key consideration for selecting partners was the potential for mutual learning and prospects for scaling out to more communities, partners and institutions.

Critical factors of successful partnership

Gormley (2001) observed that successful partnerships that create collaborative advantage contain two basic elements: foundation elements and sustaining elements. The foundation elements need to be addressed during the initial stages of partnership formation, while the sustaining elements are process elements that nourish partnership over time and are vital to the ultimate success of the partnership. Vernooy and McDougall (2003:120) provide a list of principles and guideposts or indicators of quality partnerships and collaboration in participatory research (Box 1).

Box 1: The R&D reflects a clear and coherent common agenda
<ol style="list-style-type: none">1. The R&D agenda has been set collaboratively and transparently.2. The research design allows space for the meaningful participation of local stakeholders including marginalized groups, taking into account potentially differentiated perspectives and interests.3. Partnerships among stakeholders have been created and strengthened through dialogue, joint action and mutual benefits (friendships and fun included).4. The research initiative respects commitments made with partners, and a follow-through strategy is defined.5. The research includes a clear strategy for action/change, defined in terms of expected outcomes and increased social capital or, more broadly, empowerment.6. There is good documentation of the participatory process, include the use of tools.7. The analysis of results and authorship of published materials are shared between research and other stakeholders.

The factors responsible for the success of the ERI partnership are distilled from the results of a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis conducted during joint reviews and planning meetings. SWOT is a participatory technique that allows different perceptions from different partners and individuals, helping them think about achievements and weaknesses, constraints and opportunities as part of a joint review and planning process. SWOT allows partners to take mistakes or weaknesses and transform them into constructive learning processes (Guijt, 1998). As a useful technique for self-evaluation, it encourages partners to make complex problems easier to deal with. Based on the results of joint reviews and reflections on partnership experience, the following factors were found critical to building and sustaining effective partnership for ERI.

Shared vision of sustainable rural livelihoods

All partners involved in ERI have a compelling vision and share the common goal of enhancing food security and rural livelihoods for the poor while protecting the environment. They all recognize the importance of empowering rural communities to innovate, increasing their incomes and protecting their resource base. It is important to note that in all three countries, there is a growing interest in linking farmers to markets, empowering rural communities to become able agents of their own change, building their capacity to identify market opportunities, and developing sustainable agroenterprise. Through various interactions and workshops, this shared vision of sustainable rural livelihood was translated into a common problem definition and common approaches internalized by different partners. ERI partners recognized the importance of participatory approaches for achieving their goals and objectives.

Interdependence and complementarity

Partnerships are most effective when organizations choose to work together because of their respective strengths. ERI partners are brought together by the ability to achieve something together that no organization could have produced on its own and the ability of each organization, through collaboration, to achieve its own objectives better than it could alone. Each partner brings different skills, expertise and resources to the partnership that complements those of other members. For example, while NARIs have expertise in developing improved technologies and innovative approaches for R&D, they need a range of development partners that are committed to ensuring that the research results reach farmers (GFAR, 2002). Partnership with NGOs and Community Based Organizations (CBOs) is particularly important when linking farmers to markets (Kindness and Gordon, 2002). However, many NGOs and their staff still have much to learn about how best to do this, and key NARS scientists have an important role in monitoring, learning and promoting these processes. The private sector brings special skills on business services that neither R&D organizations nor farmers have.

Strong endorsement and consistent support from senior leadership

Another critical element in sustaining quality partnership has been strong and consistent support from top leadership of partner organizations. From the start of ERI, leaders and managers of NARS and partner organizations demonstrated their eagerness to enter into partnership, and this has helped to build institutional commitment and a broad sense of ownership by their respective institutions. In the initial partnership-formation stages, senior leaders (directors and heads of

programs) were instrumental in helping staff members understand the different motivations, interests, outcomes of the partnership to individual staff members and to their organizations. In Malawi, ERI was introduced to the senior management of the Ministry of Agriculture (from the Permanent Secretaries to the Director General and heads of departments, to directors of research programs and managers of extension services). Similarly, in Uganda consistent support and commitment of the Director General of NARO and ARDC Center managers provided a good foundation and sustaining elements of partnerships. This was lacking in Tanzania and could partially explain some of the challenges faced in sustaining quality partnerships. Maintaining effective communication channels with senior leadership as well as with those at the operational level has been very effective for sustaining partnership. Frequent visits by senior management (including DGs) and senior staff to partners organizations, and joint field visits of senior leadership have been also important to sustain partnerships and maintain institutional commitments.

Resource sharing and mobilization

The availability of financial resources within partners' organizations has had a major influence on the success of partnerships. According to Gormley (2001), an organization that enters into partnership just for financial resources to aid its own survival will depend too much on other partners and create unrealistic expectations. Initial ERI project funds were from a donor agency to CIAT for working with NGOs. Operation funds were then transferred to and managed by partners' organizations. All partner organizations contributed financially with some internal resources. Increasingly, partners have contributed more resources than CIAT in financial, material and human terms. New project proposals are prepared to secure more resources for partners rather than CIAT. When resources are limited, as is often the case, the strategy has been to raise funds together with partners or helping partners raise their own funds. This has been successful in reducing financial burden and for mobilizing resources that partners can access. One innovation in ERI is the concept of "community research funds," which mature farmers' organizations can access and manage to support their experimentation and enterprise-development funds and scaling-out processes.

Strengthening social and human capital

Michelsen (2003) observed that individual personalities as well as institutions play a key role in sustaining partnerships. Rosebeth and Kanter (1996, cited in Gormley, 2001) noted that successful partnerships cannot be controlled by formal systems but require a dense web of interpersonal connections and internal infrastructures that enhance learning. Therefore, partnerships can go a long way if there is good personal relationship and friendships. Pretty (2003), Uphoff and Mijayaratna (2000) and many others have shown that social capital lowers the transaction costs of working together and facilitates cooperation, relations of trust, reciprocity and exchange, common rules and connectedness. Several actions have led to the development of bonding social capital among partners. Regular face-to-face communication, joint field visits lasting a few days provide the opportunity for nurturing interpersonal relationships (including friendship and fun) among different individual staff members of different organizations. Modern information and communication technologies, especially access to Internet and email systems (yahoo and hotmail), and mobile telephone networks have made long-distance communication

much easier, even with farmers. The fact that ERI has a critical mass of African scientists has been instrumental to maintaining relationships and minimizing cultural differences.

The various training workshops have been instrumental in building the necessary skills to sustain partnerships. Over the last four years, we have conducted over 15 workshops, reaching more than 400 R&D partners to enhance their skills for implementing an ERI process effectively. In addition to mutual learning, these workshops have the advantage of broadening partners' worldviews through traveling outside their own areas and countries. The presence of dynamic, motivated community-development facilitators, scientists and government staff with good skills in participatory approaches has been critical in achieving success.

Negotiating memorandums of understanding

Memorandums of understanding (MOUs) have the advantage of formalizing and institutionalizing partnerships between organizations. The MOU outlines how the partnership will work, and defines the strategic direction of the partnership, a shared view of the problem and a common definition of approaches and methodologies. However, rather than rushing into signing formal MOUs at the initiation of the project, a successful strategy has been to take time to develop and negotiate MOUs jointly when both partners have developed a common understanding of the modalities of implementing ERI, clarify expectations of different partners, their roles and responsibilities. Even in countries where CIAT had MOUs with NARS and Ministries of Agriculture, it was important to negotiate addenda to these formal MOUs in the form of project agreements. These are very specific and include expected outputs, mode of implementation of the project, budget and annual work plans. The MOUs have proven important in formalizing the partnership beyond individual relationships and are critical for mutual accountability.

Evidence of impact and mutual benefits

A major factor in sustaining motivation in partnerships relates to evidence of farm-level impact and a culture of sharing credit, explicitly recognizing partners' contributions in all public presentations, visits, publications or production of any material, including writings, films and tapes that result from this project. The SWOT results revealed a number of benefits that partners have realized through ERI including evidence of impact at farm level, increased visibility, recognition and self-esteem, increased skills and knowledge, sharing of experience, various opportunities for professional and individual growth, as well as a number of individual benefits. Farmers in pilot communities have improved their analytical and organizational skills, increased their self-confidence, and display evidence of empowerment. They have also accessed improved technologies through their experimentation. In some communities where the process is advanced, there is evidence that farmers have increased their income through better market opportunities. Success with farmers' groups has prompted partners to devote more resources to ERI and enhance institutional commitment to scale out in other areas.

The ERI partnership was awarded the GFAR 2003 merit award for the best poster on successful partnerships in agricultural research for development. Some partners in the three countries are increasingly recognized as having expertise in linking farmers to markets and rural agroenterprise development; and government organizations, other NGOs and the private sector

are actively seeking their services and support. Some partners have initiated the process of institutionalizing the ERI approach and expanding its application to new areas beyond the pilot sites. TIP, one of the development partners in Tanzania, has mainstreamed ERI in its “package,” and has developed its own Swahili training manual based on the ERI approach. TIP is also expanding the ERI approach to over 20 new communities in two new districts (Arumeru and Mwangi). The National Agricultural Research Organization (NARO) in Uganda has embraced various components of ERI as a methodology for its IAR4D in its six agricultural R&D Centers (ARDC) and in the ongoing reorganization of research programs.

Regular joint review, M&E of partnership experience

The joint review and planning meetings offer partners with opportunities to reflect on the partnership experience. For partnership to be sustained it is critical to integrate an effective PM&E system, to build in regular learning and reflection loops with communities and partners to ensure that lessons are documented and adjustments are made in a timely manner, providing critical feedback. This is valuable as it provides the opportunity to evaluate what works, how and why, for institutional learning and change, and eventually for scaling out and up.

Enabling environment

The renewed attention to agricultural R&D in sub-Saharan Africa provides an enabling environment and incentives for building partnerships. Agricultural research is increasingly under pressure to accelerate its impact and deliver technologies and innovations that alleviate poverty. In Uganda the Government Plan for Modernization of Agriculture provides a policy framework for transforming subsistence agriculture. The recent restructuring of NARO and the new national agricultural research policy emphasize the need for broad-based partnerships for making agricultural research demand driven, client oriented and market responsive. In Tanzania there are several nationwide government initiatives for promoting Agricultural Marketing Systems for Smallholder Project (AMS DP). Similar initiatives exist in Malawi and many other African countries. Agricultural research is increasingly under pressure to accelerate its impacts and deliver technologies and innovations that alleviate poverty. The growing acceptance of participatory approaches and the recent focus on linking farmers to markets provide a conducive environment for partnerships.

Coping with obstacles to effective partnerships

Available studies on partnerships indicate that a high proportion of partnerships or alliances either fail or have to be restructured (Berquist et al., 1995; Bleeke and Ernst 1991; Gormley 2001). Table 2 summarizes some common problems to partnerships and steps or actions to take in resolving them.

Table 2. Obstacles to effective partnership, based on Gormley (2001).

Obstacles	Steps to Take
Lack of attention to the process of building partnership and trust	<ul style="list-style-type: none"> ✓ Discuss potential barriers to partnership openly and establish norms for working together ✓ Be transparent; put all issues on the table (budget, expectations, etc.), avoid even the appearance of withholding information ✓ Be patient, flexible and willing to do things in different ways ✓ Confront conflicts quickly and directly ✓ Clarify roles and responsibilities ✓ Spend time in building social capital
Communication	<ul style="list-style-type: none"> ✓ Have project start up meetings at which all partners are present and work together for planning ✓ Hold progress meetings at regular intervals ✓ Agree on communication channels and protocols ✓ Find motivating ways to share information and to communicate successes ✓ Budget for communication expenses
Overcommitted partner; uncompleted work or missed deadlines	<ul style="list-style-type: none"> ✓ Make extra efforts to implement realistic resource planning and budgeting ✓ Discuss work plans with key staff to help them determine if they can realistically do the extra work ✓ Avoid unrealistic deadlines; give reasonable time for the work to be done so that staff can fit it into their work schedules ✓ Keep in touch regularly with the people doing the work; stay connected with them ✓ Don't overcommit yourself ✓ Build a sense of teamwork and mutual accountability by having periodic meetings
Not enough support for partnership	<ul style="list-style-type: none"> ✓ Involve senior managers in the formation of the partnership ✓ Keep senior managers informed ✓ Find motivating ways to share information and to communicate successes by holding progress meetings at regular intervals ✓ Be cautious about making commitments to partnerships that senior managers do not support
Lack of partnership competencies	<ul style="list-style-type: none"> ✓ Build your capacities in partnership ✓ Stay open to learning ✓ Ask for feedback ✓ Invite others to help with more partnership experience

A SWOT analysis of ERI showed that despite considerable success and positive outcomes of building effective partnerships, managing quality partnerships has been challenging. One of the critical challenges has been high rate of staff turnover and overcommitted staff, especially social scientists. In addition to their limited numbers, retaining social scientists in NARS has always been challenging. One strategy has been to use project funds to support an existing social scientist or community development facilitators within partner organizations or to recruit where they are lacking. This strategy has had mixed results: While seen as necessary to fill the gaps, in many cases project staff are seen and treated differently compared to core staff. This has led to frustration, delays in activities and even change of jobs. From the initial pool of field staff that were involved in establishing ERI in pilot learning sites, many of them have changed jobs and

employers for higher salaries. Staff turnover has been highest in Uganda, where all the partners' organizations lost at least one key ERI staff member in 2004 alone. This undoubtedly affects continuity. While it can be argued that staff promotion (outside their organization) is an indicator of success of the approach and gives prospects for scaling out; nonetheless it has considerable effects on project implementation. The strategy has been to build capacity of more than two people in any partner organization, not only to create a critical mass but also to ensure continuity. Another strategy has been to encourage and promote a wider partnership in the pilot learning sites among actual and potential R&D partners and other institutions that share ERI's broad objectives.

There have been cases of failed partnerships, while others have been difficult to manage. In one case, after about a year of collaborative work, one partner decided to move from sustainable development interventions to relief and humanitarian work and was therefore no longer able to partner in ERI. This affected momentum created within the pilot communities. It was urgent to find an alternative partner, in this case, government extension services, to take over the responsibilities and roles of the initial NGO. In another case, high individual expectations and perceptions of personal benefits from the project led to the failure of partnership. The perception of the divide between international and national staff can also be an unspoken obstacle to quality partnerships. It is difficult to ignore completely the divide between international research institutions (IARCs and NGOs) and national organizations, and between research organizations and extension services or NGOs; between NGOs and government services. In some cases, the partnership may be seen as donor-project relationships. As observed by Michelsen (2003), partnerships may fail because of imbalances in the availability of resources. Maintaining quality during the scaling-up process and reducing tensions between research (scientific rigor) and development (action-oriented) can be quite challenging.

Although the success of partnerships has been sustained by individual relationships and friendships, they have also had negative effects on partnerships in the form of uncooperative behaviors, attitudes and internal conflicts. Partners need the ability to understand and work in teams with other organizations, and many more people need effective skills in communication, group facilitation and participatory decision-making tools. The big challenge is how to institutionalize partnership beyond individuals within organizations so that partnerships can be sustained when these individuals eventually leave or their personal relationships are affected.

Monitoring and evaluating partnerships

Despite the growing number of literature and methodologies for evaluating and assessing the impacts of agricultural R&D programs (Alston et al., 1995; Collinson and Tollens 1994; Marthur and Gaiha, 2003; Marthur and Pachico, 2003b; Norton and Davis 1981), there is a paucity of methodologies and studies on evaluating successful partnership. Even the recent analysis of success stories in African agriculture (Gabre-Madhin and Haggblade, 2004; Haggblade, 2004) neglected partnership issues. Methodologies for evaluating the effectiveness of partnerships are still in their infancy. Michelsen (2003) identified a number of issues for characterizing partnerships by answering the following five questions:

- ✓ What is the purpose and the motivating factors of partnership (why collaborate)?
- ✓ Who is collaborating? (profile of partners institutions)
- ✓ What is the collaboration about? (function, scope, ownership, management, governance, formality, themes)
- ✓ How des the relationship develop over time (life cycle)
- ✓ What do institutions and individuals gain from the collaboration?

Cohen and Uphoff (1979) defined a number of indicators for assessing the quality of participation in development projects, which can be adapted for developing indicators and criteria for evaluating partnerships (Table 3).

Table 3. Indicators for evaluating participation and partnership.

Aspects of Participation (Questions)	Summary description of participation
1. <u>Impetus to participate</u> At whose initiative do partners and individual members participate?	
2. <u>Motivation for participation</u> What incentives do partners and individual members have for participation? Status/recognition, visibility? Personal benefit? Organization benefit? Other?	
3. <u>Status of people participating</u> Who is participating? What are their characteristics? Leaders/people of influence/ordinary person? Job status, experience Sex (male/female) Age (young/old) Education levels Residence (resident/visitor) Type of organization (local, national, international; research, extension, private sector)	
4. <u>Quality of participation</u> What activities are people participating in? Decision-making Leadership styles Roles and responsibilities Number and range of major and minor activities	
5. <u>Effective power with participation</u> What decisions are people involved in? Who is deciding what and who is controlling what? (See #3 for status of people) No power = no control over decisions & resources Some power = some control over decisions & resources Extensive power = control over decisions & all resources	

In the initial planning meetings and subsequent PM&E workshops, ERI partners identified the following indicators for monitoring and evaluating partnerships (Table 4). One innovative approach for monitoring partnership and institutional development is outcome mapping (Earl et al., 2001). Outcome mapping can be defined as a detailed description of the changes in the behavior relationships, activities and actions of individuals, groups, organizations, with whom a project works directly that can be logically linked, although not necessarily caused by a project, program or development actor. Outcome mapping assumes that as an external organization, development programs facilitate the process only by providing access to new resources, ideas or opportunities for a certain period of time. Outcome mapping seeks to characterize and assess the contribution made by stakeholders and development partners, projects or organizations to the achievement of specific outcomes. It helps answer four major questions: WHY? (vision statement), WHO? (boundary partners), WHAT? (outcome challenges and progress markers), and HOW? (strategy maps, practices). Outcome mapping uses progress markers as tools for monitoring achievements and challenges in the direction of the desired outcomes. A set of progress markers (milestones) are identified, outlining the levels of change leading to the desired outcomes among the stakeholders. The progress markers describe what one would expect to see the stakeholders doing and describes a pattern of behavioral changes taking place over time to reach the desired state.

Table 4. Performance indicators for monitoring and evaluating partnership processes.

Processes	Performance Indicators
Participation, collaboration and partnership	<ul style="list-style-type: none"> ✓ Level of harmony among stakeholders in partnership and collaboration ✓ No. of community cross-visits ✓ No. of joint workshops ✓ No. of participants at various levels of the process ✓ Level of sharing information ✓ Diversity of people making decisions in community based R&D ✓ No. and categories of stakeholders ✓ Level of partners' compliance to commitment ✓ Investment (financial and human) by different stakeholders
Capacity building and entrepreneurship	<ul style="list-style-type: none"> ✓ Extent community/groups plan their activities independently ✓ Ability of community leaders to assume more leadership roles in society ✓ Increased novel/innovative ideas in the community ✓ Increased skills in experimentation, market research and enterprise development ✓ Extent of men consulting women /wives in decisions on major investments and expenditures ✓ Ability of communities to form/establish their own financial institutions ✓ Women's increased ownership of resources (e.g., trees and land) ✓ Involvement of women in formulating and implementing bylaws ✓ Ability of communities and groups to make decisions collectively ✓ Regular flow of market information system
Group organization	<ul style="list-style-type: none"> ✓ Leadership structure (management committee), gender equity ✓ Constitution/rules/bylaws that govern group ✓ Group formalization (registration, name) ✓ Membership register, subscriptions, savings (account) ✓ Regular meetings, records of attendance, minutes book, accounts and visitors book ✓ Activity work plan, roles (by gender), responsibilities and collective actions ✓ Group cohesion, strength, conflict resolution, level of participation
Social capital	<ul style="list-style-type: none"> ✓ No. of groups and membership size ✓ No. of farmer participating collectively in various activities ✓ Extent of cooperation among the various categories of farmers within the group ✓ Extent of use, bylaws and norms ✓ No./frequency of group meetings ✓ Extent to which information/resources are shared with external community ✓ No. of leadership committees in the communities (group) ✓ Extent to which conflicts are resolved within the group and external community

Conclusions and lessons learned

This paper reflects on experience in building partnership in ERI and shows that ERI has followed the principles for good practice in participatory research and for quality partnerships and collaboration in research (Gormley, 2001; Vernooy and McDougall, 2003). Given the diversity of activities involved in ERI, the success of this work is highly dependent upon the development of effective quality partnerships with research and extensions systems, NGOs and farmer communities. The lessons learned suggest that greater attention to partnership formation and selection process is critical to ensuring success and sustainability. Investments in time and resources in the initial stage are critical for building a shared vision and a common agenda to ensure that all partners believe that they are reaping additional benefits from the partnership. Support of senior leadership is key, as is consistent engagement with committed field staff. It is important to build sufficient human and social capital to create institutional commitments and clarity in understanding of the roles, responsibilities and expectations of the different partners. However, retaining social scientists and staff with entrepreneurial skills is challenging. Governments and universities will need to assess how to make agriculture more attractive to the large numbers of social scientists who, in most countries of the region, currently go into urban and health fields or join international NGOs offering better conditions. Building the capacity of nonsocial scientists in participatory approaches is a key thrust in ERI.

There are still a number of unanswered questions, where more systematic and rigorous research is needed to document innovative approaches to partnership building and nurturing systematically and to develop simple, effective tools for monitoring and evaluating partnerships. One important consideration in assessing partnerships is the issue of transaction costs. It is generally considered that partnerships inherently result in high transaction costs. As Huxham (1996) pointed out, partnership is inherently time- and resource-consuming. On the other hand, it is hoped that the benefits may offset the initial high costs, which gradually decrease as partners build trust and continue to work together. However, there is no empirical evidence on the real costs of partnerships compared to the multiple benefits that partners may derive from collaborative activities. It is critical to develop a simple, functional PM&E system early in the project; build in regular reflection activities with partners; ensure that lessons are documented and adjustments made in a timely manner. Innovative tools such as outcome mapping and after review reflection, have the potential to complement the prevalent SWOT analysis. Achieving success in partnership requires that a scaling-up strategy be explicitly mapped out from the initial selection of partners and communities to sharing lessons with other partners and organizations, and to ultimately broaden development impact. The potential for scaling up, which is reaching more people and communities more quickly with quality benefits over a wider geographic area (IIRR, 2002), is an important criterion for selecting partners and pilot communities. There are encouraging signals as some R&D partners have initiated the process of institutionalizing ERI; while interest and demands from new partners who have considerable potential for scaling up are increasing. Opportunities for forging learning alliances with existing and new partners need to be explored further.

In the same vein, considerable efforts are still needed to forge effective partnerships with the private sector, particularly with business services. The biggest challenge lies in maintaining the interest of the private business sector in marginal small-scale farming, which does not normally

provide high and quick returns on investment. Any partnerships that aim at linking small-scale farmers to markets need concentrated efforts on improving market institutions, and making markets work for the poor. Public-private partnership for making markets work for the poor should include efficient market institutional innovations and support services such as microfinance, market information systems, business services, pricing policies, inputs marketing, extension advice and rural infrastructure. As concluded by Gormley (2001), there is still much to learn from engaging in partnership journeys.

Acknowledgments

We are grateful to our key collaborators and partner institutions in Malawi, Tanzania and Uganda for their invaluable contributions. We acknowledge generous financial support from the Belgian Department of International Cooperation, and the Canadian International Development Agency (CIDA).

References

- Alston, J.M.; Norton, G.W.; Pardey, P.G. 1995. Science under scarcity: Principles and practice for agricultural research evaluation and priority setting. Cornell University Press, Ithaca, NY.
- Ashby, J.A. 2003. Uniting science and participation in the process of innovation-research for development. In Pound, B.; Snapp, S.; McDougall, C.; Braun, A. (eds.). 2003. Managing natural resources for sustainable livelihoods. Uniting science and participation. International Development Research Center, Ottawa and Earthscan Publications, London.
- Bergquist, W.; Betwee, J.; Meul, D. 1995. Building strategic relationships. Jossey-Bass Publishers, San Francisco, CA.
- CIAT, 2003. Briefing Note for Discussion and Development of Proposal. The Rural Innovation Institute. CIAT, Cali, Colombia.
- Briefing note for discussion and development of proposal March 2002
- Collinson, M.P.; Tollens, E. 1994. The impact of international agricultural research centres: Measurement, quantification, and interpretation. *Journal of Experimental Agriculture* 30: 395-419.
- Douthwaite, B.; Keatinge, J.D.H.; Park, J.R. (2002). Learning selection: A model for planning, implementing and evaluating participatory technology development. *Journal of Agricultural Systems* 72(2):109-131.
- Earl, S.; Carden, F.; Smutylo, T.; Sander, C. (2001) Outcome mapping. International Development Research Center, Ottawa, Canada.
- FARA (Forum for Agricultural Research in Africa). 2003. Building sustainable livelihoods through integrated agricultural research for development. Securing the future for Africa's children. Vol. 1. Program proposal. Sub-Saharan Africa Challenge Program submitted to the Interim Science Council of the Consultative Group on International Agricultural Research, Accra, Ghana.

- Gabre-Madhin, E.; Haggblade, S. 2004. Successes in African agriculture: Results of an expert survey. *Journal of World Development* 32(5):745-766.
- GFAR. 2002. Strengthening the participation of farmers' organizations and of NGOs in Global Agricultural Research for Development (ARD). Rome, Feb.
- Gormley, W. 2001. Selecting partners: Practical considerations for forming partnerships. Tips and Tools Series: Collaborative alliances. The Organizational Change Program for the CGIAR Centers. TRG Inc., Washington DC.
- Government of Uganda. 2003. Plan for modernisation of agriculture: Eradicating poverty in Uganda, government strategy and operational framework. First draft, Sept. 1999. Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and Ministry of Finance, Planning and Economic Development (MFPED). Kampala, Uganda. 125.pp.
- Haggblade, S. 2004. Building on success in African agriculture. International Food Policy Research Institute. 2020 Focus 12, Washington DC, USA.
- Huxham, C. 1996. Creating collaborative advantage. Sage Publications, London.
- Kindness, H.; Gordon, A. 2002. Agricultural marketing in developing countries: The role of NGOs and CBOs. (Policy Series No 13). Social and Economic Development Department, Natural Resources Institute, University of Greenwich, London.
- Marthur, S.; Pachico, D. (eds.). 2003b. Agricultural research and poverty reduction. Some issues and evidence. Centro Internacional de Agricultura Tropical, CIAT, Cali, CO.
- Michelsen, H. 2003. Learning from partnerships. Experiences from the Cornell International Institute for Food, Agriculture and Development (CIIFAD). International Service for National Agricultural Research (ISNAR), The Hague.
- Norton, G.W.; Davis, J.S. 1981, Evaluating returns to agricultural research. *American Journal of Agricultural Economics* 63: 685-699.
- Pretty, J. 2003. Social capital and the collective management of resources. *Science* 32:1912-1914.
- Sayer, J.; Campbell, B.M. 2001. Research to integrate productivity enhancement, environmental protection, and human development. *Conservation Ecology* 15(2) [online] URL: <http://www.consecol.org/vol5/iss2/art1>
- Smith, T. 2002. Eden. Corgi Books, London.
- Spink, L.; Merrill-Sands, D. 1999. Successful collaborative partnerships: Key elements and self-assessment inventory. Simmons Institute of Leadership and Change Boston.
- Uphoff, N.; Mijayaratra, C.M. 2000. Demonstrated benefits of social capital: The productivity of farmers' organizations in Gal Oya, Srilanka. *World Development* 28(11):1875-1840.
- Uphoff, N.; Cohen M.J.; Goldsmith, A. 1979. Feasibility and application of rural development participation. A state-of-art paper. Rural Development Committee for International Studies. Ithaca, NY, USA, Cornell University.

Vernooy, R.; McDougall, C. 2003. Principles of good practice in participatory research: Reflecting on lessons from the field. In Pound, B.; Snapp, S.; McDougall, C.; Braun, A. (eds.). 2003. Managing natural resources for sustainable livelihoods. Uniting science and participation. pp. 113-141. International Development Research Center, Ottawa and Earthscan Publications, London.

Reorientation of research through participatory methodologies: Participatory research with milk producers in Roldanillo, Cauca Valley, Colombia, 1999-2004

Researcher: José Ignacio Roa Velasco⁶⁹.

Background

At the beginning of 1999, the National University implemented the project “**Monitoring and technology transfer in representative production systems for improving the production and sustainability of Creole (Hartón) cattle genetic resources of the Cauca Valley**” with a group of producers from the Municipality of Roldanillo, Cauca Valley, who were working with the University on the program to recover this race of cattle, given that it is tolerant of the high temperatures in the region.

The producers have a center for meeting on the farm known as “La Ondina,” loaned by one of the members of the group. One of the University’s objectives was to get the producers to keep records of the births and the milk production of their cattle in order to analyze the behavior of the race and improve its production. The formats were developed by the National University-Palmira campus.

After two years, the professors realized that the project was not advancing as expected and that the producers were unwilling to fill out the formats. Therefore the professors from the University, responsible for the Project, visited the Participatory Research Project (IPRA) at CIAT, where they presented their problem. As result of the meeting, it was agreed that IPRA would conduct a participatory diagnosis with the producers from Roldanillo to find out what their real needs were and why they were not systematizing the information requested by the professors.

After conducting the participatory diagnosis at La Ondina, on 22 June 2002, it was found that the producers’ interests were very different from what the professors thought.

Methodology

There were about 30 producers at the meeting held to carry out the participatory diagnosis, which consisted in recording the needs or demands of a stakeholder group. A facilitator from the IPRA Project recorded the different problems and training needs mentioned by the producers on a flip chart. Then a blank sheet of paper was given to each one in order to write down the most important problem that they felt needed to be solved first; in other words, the problem that most affected them. Then in a separate column, they recorded the topics that do not need research because they were a matter of training.

The problem mentioned by 90% of the producers was **scarcity of feed for the animals in the dry season**. The animals lose a lot of weight in the summer, the amount of milk produced

⁶⁹ Training in participatory methodology – IPRA Project -CIAT.

decreased too much, and later in the rainy season, the animals had to recover the weight lost in the summer in order to get through the next summer (January), given that the seasons in Colombia are bimodal.

At the end of the meeting, a researcher from the Tropical Forages Project at CIAT facilitated the scientific information about the work that they are doing with pastures in Central America, in regions similar to those of Roldanillo.

Results of the participatory diagnosis

The producers' demands

- ✓ Lack of information about systems for improving grasslands
- ✓ Scarcity of feed for the animals in the dry season
- ✓ Lack of rain in the zone
- ✓ Lack of information about superior bulls to improve the potential for milk production
- ✓ Deficient commercialization of milk and beef
- ✓ High cost of inputs such as salt, feed concentrate, veterinary drugs
- ✓ The Hartón cattle produce low levels of milk and beef.

Prioritization

The producers selected the following topics as the most important and urgent to solve in Roldanillo.

1. Selection of forage species adapted to the agroecological conditions of the region
2. Learning about the establishment of grasslands
3. Creation of economic systems of fertilization and organic manure
4. Motivating the producer to generate his own seed

Table 1. Request for training by the producers to develop in 2004.

Topics	Dates (2004)	Responsible	Entity
Pasture management and control of leaf-cutting ants	June 2 and 9	Luis Horacio Franco	Tropical Forages Project, CIAT
Evaluation of animals' preference for the forages established	June 23	Marino Valderrama José Ignacio Roa	Producer, La Ondina IPRA Project, CIAT
Silage and haylage	July 7	Patricia Ávila, Luis Horacio Franco	Tropical Forages Project, CIAT
Prevention of infectious-contagious diseases	July	Edgar Restrepo	ICA Sanitary Division
Results of netting to harvest water from the mist	Aug. 30	José Manuel Molina	National University-Palmira campus.
Genetic improvement (animals)	Sept. 22	Carlos Vicente Durán	National University-Palmira campus.

Explanation of the training topics

- **Silage**: The practice of cutting the grass and storing it for a time in hermetic packaging
- **Haylage**: Cutting the grass, letting it dry and supplying it dry
- **Control of leaf-cutting ant**: Different ways to control this pest
- Prevention of infectious-contagious diseases in cattle such as brucellosis, foot-and-mouth disease, symptomatic blackleg, anthrax and anaplasma
- Information about the results of using nets to harvest rain
- **Wind power**: Energy generated by the air currents and captured by a windmill is stored in a battery
- **Pasture management**: Calculate the availability of forage that a pasture has in order to determine how many animals and how many days a lot can be grazed, as well as the minimum fertilization that a pasture requires



Figure 1. Training visit to the producers to see pasture management in La Ondina.

Tours according to the stakeholder group

A total of three visits were made in accordance with the number of interests identified with the producers. (Photo 1)

- ✓ A farm where producers could observe pasture management, fertilization, use of an electric fence to separate animals in the pastures and make more efficient use of the grasslands
- ✓ See the new pastures that were mentioned as options for the region: the Brachiarias Toledo, Mulato and Guinea Mombasa and the legumes *Leucaena leucocephala* and *Cratylia argentea*. The producers wanted to observe the growth habits, leaf texture, seed production, color and their development in a soil inferior to that of Roldanillo. Said pastures were planted at the CIAT experiment station in Santander de Quilichao, Cauca Province.

- ✓ Learn about the results that the CIAT Tropical Forages Program has had in the research conducted on various farms in Central America. The visits to the Center's headquarters in Palmira were made from Oct.-Nov. 2002.

Planning

In January of this year, a meeting was held at La Ondina farm with the purpose of implementing participatory planning with the producers. The producers already had previous knowledge about the pastures that they had seen on their visit to Quilichao. Participatory planning is a meeting in which the producers, together with the researchers, agree upon several topics such as the varieties of grasses and legumes to sow, plot size, planting distances, number and time of evaluations to be done, and whether there is a need or not to fertilize.

Mounting of trial. Then 25-m² plots were established with each of the following materials on two farms with three replications per farm: *Brachiaria* hybrid cv. Mulato (grass), *Panicum maximum* cv. Mombasa (guinea grass), *Brachiaria dictyoneura* (grass), *Cratylia argentea* (legume) and *Leucaena leucocephala* (legume). The producers and the technicians took part together in the sowing of the trials on the farms. Two trials were established on two farms with three replications per farm in April 2003.

Participatory evaluation of the trial. Two months after the trials were established, the producers agreed to hold a field day on La Ondina farm to carry out a participatory evaluation of the materials planted.

Methodology. A member of the IPRA Project explained to the producers what a participatory evaluation involved and the type of format to be used. In this case it was the format for open evaluations, where the facilitator records the producer's spontaneous comments. Two groups of producers were formed; each one had a facilitator, one of whom was a member of the IPRA Project. Before beginning the evaluation, the producers had the opportunity to visit each plot in order to become familiar with each of the grasses or legumes.

Results of the open evaluation

Methodology in the field. In the field the producers expressed their opinions freely about what they were observing at that moment. The criteria that the producers mentioned with the most frequency were:

- ✓ Palatability
- ✓ Color
- ✓ Supply of forage (tillering)
- ✓ Resistance to low fertility
- ✓ Tolerance to drought
- ✓ Resistance to damage caused by the leaf-cutting ant
- ✓ Production of organic matter
- ✓ Coverage (aggressiveness)
- ✓ Rooting
- ✓ Persistence of the pasture (duration)



Figures 2 and 3. Producers and technicians compacting *Cratylia argentea* for silage.



Figure 4. *Cratylia argentea* covered with plastic to be ensiled for a period of 2-3 months.

Next evaluations

- ✓ Cutting to standardize the plots. Para evaluar cual de los materials crece más rapido.
- ✓ Evaluation of preference by the animals (six weeks after the standardization cut). Los animals entran nuevamente al ensayo y consumen los pastos, se evaluara que pasto lo consumen más y cuales menos.
- ✓ Evaluation of resistance to trampling, waste.
- ✓ Evaluation of capacity for regrowth in the dry season; fertilization trial (when the second cycle of rains begins in September)

Collaborating institutions

Follow organizations are involved in this research:

- ✓ Producers group La Ondina
- ✓ National University - Palmira
- ✓ CIAT
- ✓ Dept. of Agriculture and Fisheries (SAP) of the Cauca Valley
- ✓ Institute of Technical-Professional Education (INTEP), Roldanillo, Cauca Valley

Conclusions and future projections

- Continue with the effort to build strategic alliances with institutions such as INTEP, SAP, the National University-Palmira and the Municipal Unit of Agricultural and Livestock Technological Assistance (UMATA) of Roldanillo
- Exchange of experiences with other producers or organizations of other municipalities that have shown interest in working with similar research as is the case of the cooperatives of milk producers of the municipalities of Versalles, Bolívar, El Dovia and Sevilla, which are situated in different thermal floors than that of Roldanillo.
- Implement the project “Improvement of the productivity and adoption of participatory technologies in producers’ systems in the Cauca Valley” in the SAP- Governor’s Office in conjunction with the National University of Palmira, CIAT and INTEP.
- Publish the results obtained, useful as a means of feedback to the producers and entities of the agricultural and livestock sector
- Taking into account the comments of the producers on the different field days, Mulato grass stands out for the availability of abundant forage before and after the summer.
- Among the legumes, *Leucaena* stands out for being consumed preferentially by the cattle; *Cratylia* for its resistance to the summer.
- The willingness of the producers to work has been positive.
- The professors and producers highlight the degree of motivation over these two years in a project that had no resources assigned. The principal reason for this is that the work satisfies the concrete needs of the producers and that these were identified by means of the participatory methodology that identified these problems and other training needs of the producers.
- This participatory research transcended beyond what was expected. It reached other municipalities such as Versalles, Bolívar, Sevilla and El Dovia in the Province of the Cauca

Valley, Colombia. The producers of these municipalities began to attend the meetings at La Ondina and are requesting the same type of work in their municipality.

- It is also positive to highlight the approval of a project by SAP of the Cauca Valley Province to implement this research in the municipalities of Versalles, Bolívar, Sevilla and El Dovio.