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The Use of Stakeholder Analysis in Integrated Watershed Management

Experiences From the Ngeenge Watershed, Uganda

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In the Ngeenge watershed, at Mt. Elgon in the eastern Ugandan highlands, agricultural practices cause serious soil erosion problems and subsequent decrease in soil and water quality. Attempts to manage soil erosion through policy

interventions have not been successful, because existing policies and legislation for natural resource management are inadequate and often formulated without consulting local communities. In the Ngeenge watershed, an integrated watershed management (IWM) program was initiated to foster sustainable land and water management solutions. Experience shows that successes in IWM programs depend on effective participation by all relevant groups of stakeholders. The present study investigates the usability of a

stakeholder analysis (SA) and how it has to be linked with participatory problem identification and participatory formulation of action and work plans to build a base for effective IWM. The SA considered the following criteria: (1) stakeholders' commitment to implement IWM, (2) their power to influence policy-making and implementation processes, and (3) the expected impact of the IWM program on the stakeholders. The SA allowed identification of key groups of stakeholders who participated in workshops and jointly developed concrete action and work plans. These workshop outputs, together with the positive feedback of the stakeholders and the commitment of policy-makers to continue the process, are good indicators that SA is a useful means for supporting the development of IWM strategies.

Keywords: Integrated watershed management; stakeholder analysis; key stakeholders; policy-making; Mt. Elgon; Uganda.

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Introduction

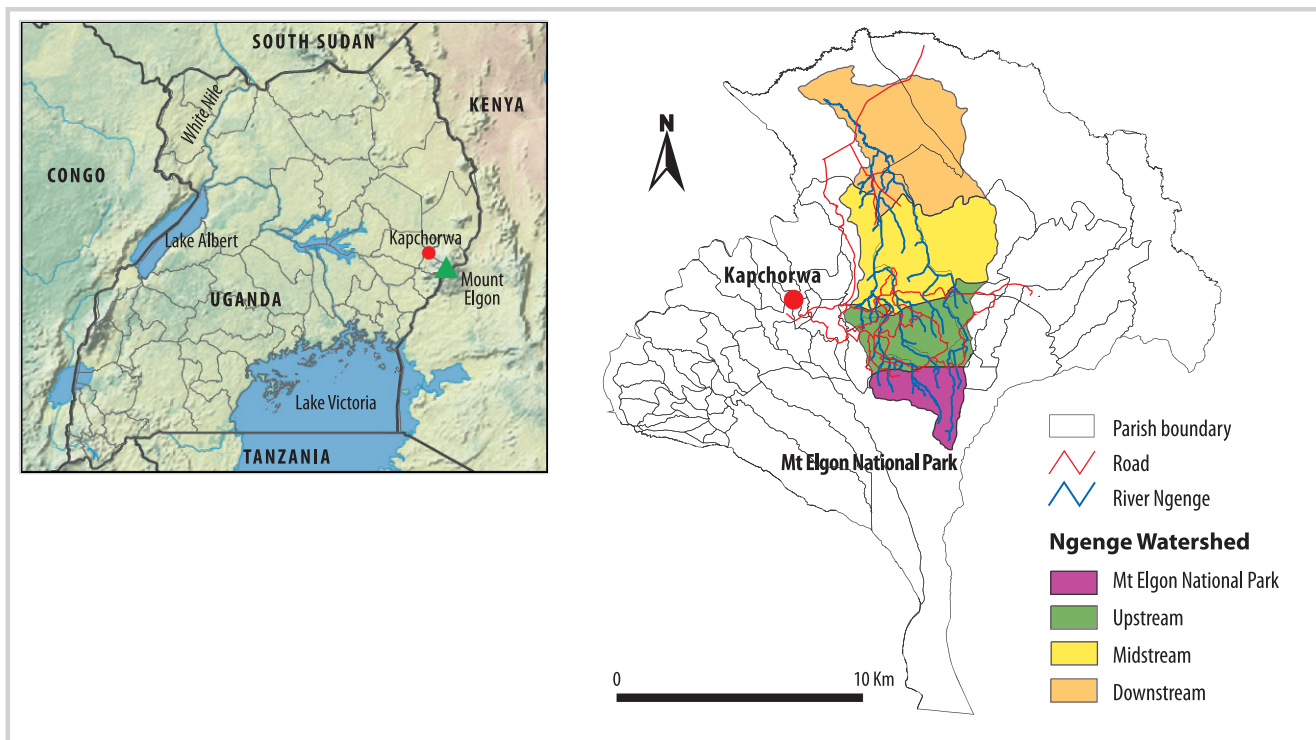
The Uganda highlands, with their fertile volcanic soils and abundant rainfall, are among the most densely populated areas in the country, according to the National Environment Management Authority (NEMA 2008). Current agricultural practices in the highlands have resulted in severe soil erosion, affecting 60 to 90% of the total land area (Opondo et al 2006). Erosion results not only in persistent reduction in crop yields but also in river sedimentation and flooding in the downstream areas (NEMA 2002). Policy interventions, due to their top-down character with little or no input from local-level stakeholders, have not been successful in making natural resource management (NRM) more sustainable (NEMA 2005). However, in the last decade, the government has opened up the policy debate with the Local Government Act (Uganda Government 1997), which gives decision-making power to the people, to solicit stakeholders' views. Democratically elected local councils (LCs) at various administrative levels are empowered to develop and implement policies (Siriri et al 2005). Bylaws have been

passed by LCs on agriculture and food security, but complementary policies are needed concerning the use of soil and water resources (Opio et al 1998; NEMA 2008). This approach has created new opportunities for integrated watershed management (IWM) programs in Uganda.

IWM can be defined as the process of planning and implementing NRM strategies in watersheds, with the full involvement of all stakeholder groups (Bewket 2003). This calls for collaboration and watershed management plans that are "owned" by all stakeholders (Reed 2008). To foster this collaboration, stakeholder analysis (SA) has received universal appreciation as a useful tool, being suitable to avoid inflaming conflicts and to represent diverse interests (Prell et al 2009).

SA can be defined as a holistic approach used to gain an understanding of a system, and to assess the impact of changes to that system, by identifying the key stakeholders and assessing their respective interests in the system (Grimble and Wellard 1997). One of its limitations is that too many stakeholders might limit effective collaboration and meaningful dialogue (Prell et al 2009). SA also tends

FIGURE 1 Map of Kapchorwa District showing the Ngenge River watershed. (Map by Fiona Mutekanga)



to be area specific: For example, civil unrest may compound management issues, and the findings of a study in an area where such unrest does not exist may not sufficiently explain circumstances elsewhere (Rastogi et al 2009). Moreover, within one stakeholder group, diversity of perception occurs, making possible further breakdown of other groups and thus bringing other factors into play (Rastogi et al 2009). Although in SA all stakeholders and their viewpoints should be analyzed, SA should focus on identifying key stakeholder groups when it comes to crucial decision-making; otherwise, stakeholder involvement—and thus IWM—becomes unmanageable (Billgren and Holmen 2008).

The objective of the present study was to discuss the usability of the application of SA for the identification of who should participate in effective decision-making for IWM in the Uganda highlands. The Ngenge watershed (1°25'N; 34°30'E) in Kapchorwa District (1°28'N; 34°29'E) on Mt. Elgon in eastern Uganda (Figure 1) was selected for this study because it represents the typical environmental circumstances that occur in the highlands of Uganda—soil erosion resulting from deforestation for arable cropping.

The Ngenge watershed is particularly interesting because its history of erosion problems emerging after highland deforestation for farming is recent, occurring less than 3 decades ago. Although, as in other watersheds, the upstream and downstream problems within the catchment area are physically interrelated, in the Ngenge

watershed these problems also depend on sociopolitical developments, such as insecurity from cattle rustling and nature conservation measures on Mount Elgon. Serious conflicts (BIC 1998) have arisen from gazettement of the forest on the mountain (Mt. Elgon National Park) for preservation by eliminating human activities. There is severe soil erosion (Figure 2) and river sedimentation (Figure 3) during the rainy season (KDLG 2004; Mutekanga et al 2010). The problems caused by erosion and sociopolitical developments have necessitated new approaches for NRM, which call for the involvement of stakeholders in decision-making.

To realize our objective to assess the usability of SA for effective decision-making in IWM, we evaluate and discuss the outcomes of the following three steps of the study:

1. Identification of NRM problems and stakeholders involved;
2. Selection of key stakeholders to be involved in decision-making for IWM;
3. Workshops at community and watershed levels to formulate concrete action and work plans.

Methodology

Study area

The 665-km² Ngenge watershed lies between 1000 and 3000 masl on the northern slope of Mt. Elgon. Mt. Elgon (1°8'N; 34°33'E), with its extensive forest, represents a

FIGURE 2 Typical hillslope field undergoing soil erosion, Mt. Elgon, Uganda. (Photo by Katia Leber)



watershed of international importance. It is an important catchment for some of the major rivers that feed the lakes in the Nile River system in Uganda and Lake Turkana in Kenya. A large rural population depends on the ecosystem goods and services of the forest (Muhweezi et al 2007). Smallholder subsistence farmers with a mixed crop and livestock production system are typical in the area: the average farm size is 0.8–1.6 ha (KDLG 2006). The watershed encompasses 5 subcounties adequately

corresponding to the 3 sections of the watershed: Benet and Kwasir upstream, Binyiny and Kapraron midstream, and Ngenge downstream. The total population in the watershed is approximately 55,100 people. The population density is 262 people per km² (UBOS 2002), but it is concentrated upstream, followed by the midstream area. Downstream, population density is very low due to earlier insecurity caused by cattle rustlers (Karamojong) from the neighboring Karamoja region. The very high population density upstream is caused by the resettlement of forest dwellers, people from the downstream plains, and land seekers from outside the watershed.

Identification of NRM problems and stakeholders

Data was collected in 2006–2008 through a range of different activities:

1. A literature review of relevant policy documents and reports;
2. A community participatory rural appraisal meeting held in each section of the watershed and aimed to (1) get an overview of the history of NRM in the area, (2) identify the most important problems and issues concerning NRM, (3) ascertain potential key informants for further interviews, and (4) obtain information on the stakeholders in the watershed;

FIGURE 3 River Ngenge heavily silted with eroded soil, Uganda. (Photo by Fiona Mutekanga)



3. Semistructured interviews with key informants to obtain in-depth information on the prevailing problems concerning NRM, their causes, and possible interventions;
4. Direct field observations and transect walks in the watershed guided by the district environment officer (DEO) and forestry officer (FO) aimed at obtaining an overview of the physical, socioeconomic, and political setting of the watershed.

This data collection was complemented by other studies concerning erosion risk mapping (Mutekanga et al 2010) and household perceptions and expectations (Mutekanga 2012).

Stakeholder analysis

From the data collected, an assessment of natural resource problems was made, including all stakeholders involved. Following Grimble and Wellard (1997), a stakeholder was defined as “any individual or group of people, organized or unorganized, who share a common interest or stake in land and water management in the watershed.” Further analysis revealed the roles, interests, and objectives of each stakeholder and their degree of importance to the implementation of IWM. The key stakeholders in the decision-making process were identified using a set of criteria established by means of an in-depth analysis of literature on SA (Sanginga et al 2004; Kirsty and Richards 2007; Rastogi et al 2009).

Workshops

Multistakeholder workshops were used to exchange views and insights, build shared understanding, and stimulate collaborative action. Considering the up-, mid-, and downstream sections of the watershed and their specific problems, a community workshop was organized in each section. These first-level workshops aimed to capture the opinions of local key stakeholders on the most appropriate interventions for their area and motivate them to become involved in the decision-making process (Figure 4). The community workshops' outputs were formulated into concrete action and work plans in the second-level and final workshop, organized at district level, representing the whole watershed, and aiming to involve the policy-makers and powerful donors.

An evaluation questionnaire consisting of open- and close-ended questions was carried out at the end of each workshop to find out whether the participants had found the workshops useful for deliberation, decision-making, learning about other stakeholders' perceptions, and enabling individual expression. An additional survey questionnaire was sent to the district workshop participants after 5 months to evaluate the impacts of the workshop and to provide insights into medium-term outcomes of the deliberation processes.

FIGURE 4 Participatory process in the Binyiny community workshop, Uganda. (Photo by Fiona Mutekanga)



Results

The results of the use of SA in IWM in the Ngenge watershed are presented according to the three steps of the approach.

Step 1: Identification of NRM problems and stakeholders involved

Background information on NRM in the Ngenge watershed:

When the forest was converted to a national park in 1992, the Uganda Wildlife Authority (UWA) established a new border that included parts of the already-settled area. With threats of eviction continuing until now, people lack tenure security. In addition, lack of access to the forest has made it impossible for people to use forest products such as fuelwood and grazing land, thus causing conflicts with UWA.

Counteracting soil erosion and yield decline, NEMA; nongovernmental organizations (NGOs), such as the Food for the Hungry Initiative (FHI); and community-based organizations (CBOs) such as the Kaseko Soil and Water Conservation Group train people in sustainable farming methods. Most NRM initiatives start at the subcounty level (LC3), with input from all villages (LC1s), and are then scaled up to the district level (LC5).

Identified NRM problems and the stakeholders involved: The following main NRM problems, considered to be of equal importance, were identified (Table 1):

- *Land tenure insecurity:* With no tenure security, upstream farmers have no incentive to invest in soil and water conservation (SWC). So far, the UWA and LC5 leaders have not assured people of land ownership. Nevertheless, the district and subcounty technical staff are supposed to provide training and information on the importance of SWC.

TABLE 1 NRM problems in the Ngenge watershed on Mt. Elgon, Uganda.

NRM problem	Affected area	Stakeholders involved
Land tenure insecurity	Upstream	Local communities, LCs, subcounty technical staff, district natural resource and agriculture officers, UWA
Lack of access to forest resources		Local communities, LCs, UWA, tourists, donors and NGOs
Soil erosion on farmland	Up- and Midstream	Local communities, LCs, subcounty technical staff, district administration, private sector, outside farmers, donors and NGOs, CBOs
Riverbank erosion		Local communities, natural resource officers, NEMA, NGOs
Loss of livestock due to earlier cattle rustling	Downstream	LCs, natural resource officers, defense force, Karamojong

Sources: Key informant interviews, community PRA meeting data, and field observations.

- *Lack of access to forest resources:* With the UWA prohibiting human activity in the national park, there is increased forest encroachment, causing clashes with the UWA. The population is denied access to grazing land, firewood collection, and livelihood options such as the sale of non-timber forest products. Thus, LCs and NGOs face the challenge of improving livelihoods.
- *Soil erosion on farmland:* Soil erosion is causing serious problems: fertility loss, water siltation, landslides, and flooding and sedimentation downstream. The district and subcounty administration, LCs, donors, NGOs, and CBOs need to work together with the farmers to manage this problem.
- *Riverbank erosion:* Due to increasing land pressure, farmers cultivate land right to the riverbank, causing riverbank erosion and contributing to serious flooding and sedimentation downstream. The NEMA enforced an uncultivated border of 30 m from the riverbank, which caused the eviction of farmers.
- *Loss of livestock due to earlier cattle rustling:* In the downstream area, violent cattle rustling in the 1970s forced people to the upslope area. Because government intervention brought security in 2002, people are resettling in this area. But as they have lost their livestock, they now depend on fuelwood production and rice farming in the nutrient-enriched wetlands.
- Had the power to influence the outcome of a project (Rastogi et al 2009);
- Was directly affected by the project to be implemented (Sanginga et al 2004; Kirsty and Richards 2007).

Table 2 shows the criterion by which each key stakeholder qualifies, and Figure 5 shows the level of influence a stakeholder has on the success of the decision-making and collaboration processes for IWM. The chosen key stakeholders may fulfill all three criteria but to a different extent:

Step 2: Selection of key stakeholders

After identifying all NRM problems and stakeholders, the next step was to select the key stakeholders that should be involved in IWM. A key stakeholder was selected if it complied to a high degree with at least one of the following three criteria (Kirsty and Richards 2007):

- Showed a high level of commitment to the IWM program, assuring effective collaboration;
- *Local community:* Community members will be affected by IWM. Their commitment, however, depends on the expected benefits.
- *LCs:* Elected by the people from among themselves as political leaders and policy-makers, they are important for any developmental initiative at any administrative level: village (LC1), parish (LC2, for a group of villages), subcounty (LC3, a group of parishes), county (LC4, a group of subcounties), and district (LC5). They have the power to influence decisions and work through committees.
- *Subcounty technical staff and district administration:* Holding responsibility for policy implementation, they have the power to influence but are only committed when facilitated logistically.
- *National government departments:* Because they advise the government on policy and oversee policy implementation, they have high influence.
- *Donors and NGOs:* Although not affected by the implementation of IWM, they have the needed finances and thus have high influence.
- *CBOs and farmers' associations:* Composed of community members, they are highly committed to the decision-making process and are crucial for implementation of interventions.

TABLE 2 Identification of stakeholders involved in NRM and their role in policy for IWM in the Ngege watershed on Mt. Elgon, Uganda. (Table extended on next page.)

Stakeholder category	Stakeholder	Stake in NRM	Objectives and role in IWM program implementation
Local community	Community members	Resource users	Improve livelihoods
Local councils (LCs)	LC1–LC5 and committees	Resource users; policy-makers for NRM	Improve livelihoods; mobilize people for policy implementation
Subcounty technical staff	Subcounty chief, CDO, health inspector, and NAADS coordinator	Resource users; implementers of policy	Act as technical advisers; oversee policy implementation
District administration	Chief administration officer; natural resources, environment, forestry, agriculture, fisheries, and water officers	Implementers of government policy	Act as technical advisers; provide training and sensitization; mobilize resources; monitor
	District engineer	Implementer of policy	Engineer water sources and roads
	Technical officers for community development and gender	Involvement of vulnerable groups	Livelihood options; mobilize and sensitize vulnerable groups
	Health inspector	Technical adviser	Improve water quality; improve health
National government departments	NEMA and UWA	Policy advisers on NRM	Implement government policy
	Agriculture (NAADS), water (DWD), and roads (UNRA)	Implementers of government policy	Provide services and infrastructure: agricultural, water, and road sectors
External stakeholders	Defense	—	Provide security against Karamojong
	Karamojong nomads	—	Cause insecurity
	Outside farmers	Resource users	Utilize land for farming for profit
	Tourists and tourist organizations	Resource users	May support biodiversity conservation
Private sector	Traders from other districts	Resource users	Purchase goods for outside markets
	Food processing: Uganda Breweries (barley); Job Coffee (coffee)	Resource users	Promote production of barley and coffee; provide credit; purchase harvest
	Seed companies	Resource users	Promote new seed varieties
Donors and NGOs	Donors: IUCN, UNDP, AHI, SNV, and HORIZONT; NGOs: church and FHI	Donors: financiers; NGOs: implementers of policy	Support policy implementation and sustainable management of resources according to their individual mandates
CBOs and farmers' associations	CBOs and associations	Empowerment of members	Training and education of the people on better agricultural practices

Sources: Key informant interviews, community PRA meeting data, and field observations.

CDO, Community Development Officer; DWD, Directorate of Water Development; HORIZONT, HorizonT 3000; IUCN, International Union for Conservation of Nature and Natural Resources; NAADS, National Agricultural Advisory Services; SNV, Stichting Nederlandse Vrijwilligers (Foundation of Netherlands Volunteers); UNDP, United Nations Development Programme; UNRA, Uganda National Roads Authority; √, fulfills the criterion to a high degree.

During the initial SA, the outside farmers and private sector were found to have a stake in the watershed as well. These people come from outside the watershed with the main aim of profit-making and are neither affected nor committed

to the IWM policy. Therefore, they were not selected as key stakeholders. The local farmers these outsiders deal with are the ones affected and committed to the IWM policy, because they own the land. In addition, the Karamojong cattle rustlers

TABLE 2 Extended. (First part of Table 2 on previous page.)

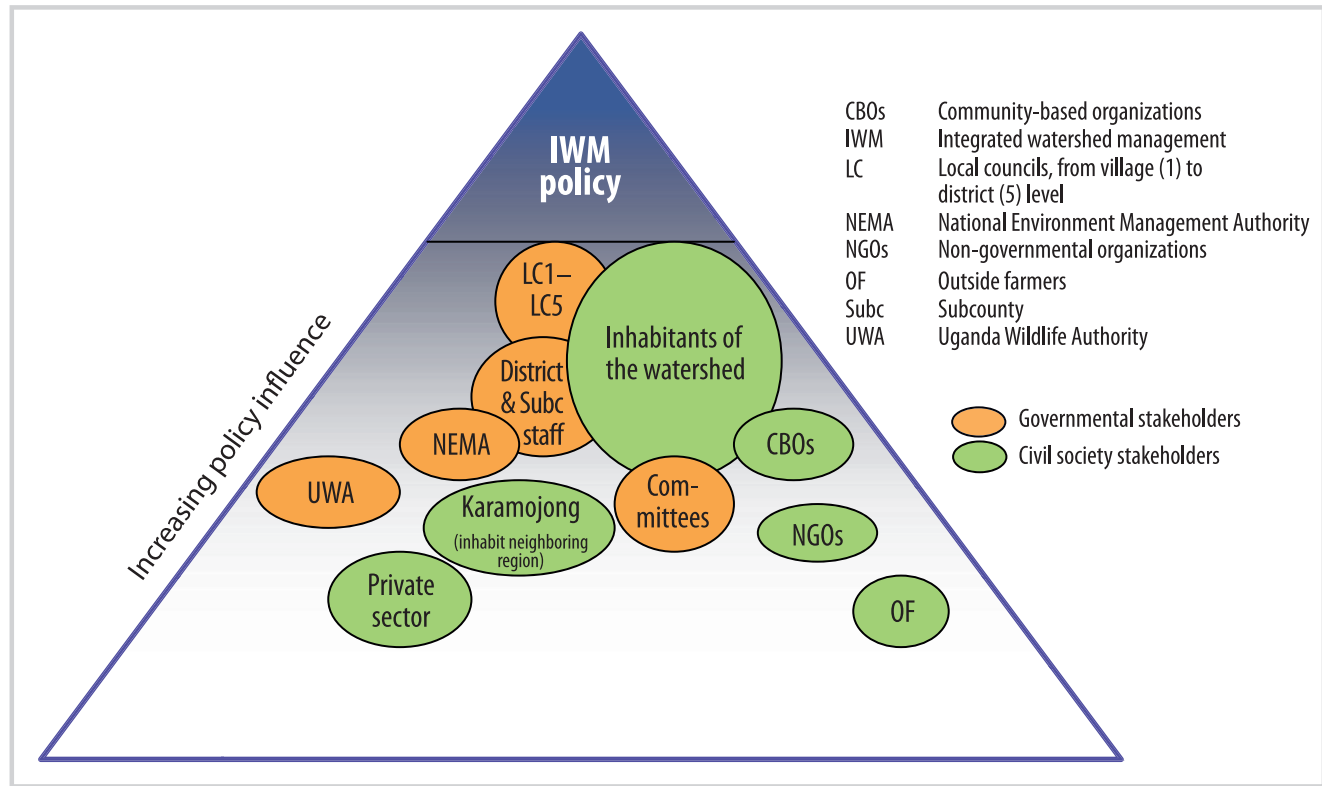
Selection of key stakeholders			
Criterion fulfilled			Key stakeholder
Level of commitment	Power to influence	Affected by policy	
		√	Yes
√	√	√	Yes
√	√	√	Yes
	√		Yes
	√		Yes
			No
			No
	√		Yes
	√		Yes
			No
			No
			No
			No
			No
			No
	√		Yes
√		√	Yes

were described as stakeholders, because they had influenced the lives of the local communities. They were not selected either, because their harmful activities in the region had been stopped by the defense forces.

Step 3: Workshops at community and watershed levels

In the community workshops, most of the key stakeholder groups were represented. Farmers included landlords, tenants, rich farmers, and poor farmers. Two women

FIGURE 5 Map of relative influence of stakeholders of the Ngeenge watershed. The sizes of circles refer to the sizes of the groups, and the closeness of the circles refers to the degree of cooperation among the stakeholders. (Based on Mayer and Vermeulen 2005)



farmers represented those who apply SWC (this is mostly done by women). The LC leaders, subcounty chief, the NGO FHI, and the DEO and FO all attended the workshops. Some key stakeholders could not attend the workshops due to logistical and financial problems and were not invited: the chairpeople of committees, CBOs, and associations. In the watershed workshop, the community was represented by their leaders at the subcounty. The district leaders were the LC5 Woman Councillor, women's leaders, and departmental heads. Only UWA and NEMA and the donor African Highland Initiative (AHI) participated.

Developing the action plans and concretizing them in work plans enabled the stakeholders to collectively agree on practical solutions to the problems in the watershed. Once these plans are incorporated into the district development plan (DDP, a 5-year management plan for the district), the ground for eventual incorporation into IWM policy will be cleared. Due to the limited time span of the research project (data collection ended with the survey 5 months after the district workshop), however, it was not possible to measure the extent to which the work plans were successfully implemented or to establish whether changes in the views and activities of the stakeholders had occurred in the years after the workshops were held. However, from the findings during the workshops and the questionnaire responses, we can make some inferences about plausible short-term outcomes; from the questionnaire administered

5 months afterward, we can assume some medium-term outcomes. Thus, there was deeper understanding among participants of land and water management issues; moreover, they desired that the information obtained be shared with the rest of the community and that such workshops be conducted more often and include more people, because they saw the necessity of having more sensitization regarding conservation.

The results of the survey 5 months later confirm the positive appreciation of the participants during and directly after the workshop: 14 of 16 respondents stated that the workshop and the development of action plans was a good base for further policy-making, and 7 respondents indicated that they had undertaken activities in the field of capacity building and sensitization as a follow-up to the workshop. One participant noted cooperation with other participants "during work planning process in the district with an ultimate aim of integrating the action plan into the DDP for 2009/10."

The research project was limited by time. To fully realize the potential of learning processes, a longer-term engagement would be needed, including a new workshop to evaluate the progress made in work plans after a year, as 5 participants rightly suggested. Because no further meetings could be organized, the follow-up of the learning processes fully depended on the commitment of the participants.

Discussion

Step 1: Identification of NRM problems and stakeholders involved

According to Prell et al (2009), to identify stakeholders, it is first necessary to define the issue under study. This important initial step is rarely considered explicitly in SA. Without knowing the issues, it is difficult to know which stakeholders should be involved (Prell et al 2009). Prell et al (2009) also proposed initial scoping interviews and focus groups to guide the selection of issues. In the Ngeenge watershed, such participatory, bottom-up problem identification was applied by community meetings, interviews, and the SA.

Step 2: Selection of key stakeholders

The 3 selection criteria enabled identification of key stakeholders from the all-inclusive group of stakeholders. Still, the number of stakeholders identified turned out to be relatively big, and due to funding limitations, not all identified key stakeholders were invited to the workshops. Prell et al (2009) suggested another approach in such a case: analyze existing social networks to determine which ones are the most important with regard to participation in NRM initiatives, because stakeholders are greatly influenced by these networks in their decision-making. This leads them to categorize the stakeholders into various groups, such as those with similar views, those who communicate effectively with one another, and those who are highly influenced by an individual (Prell et al 2009). In the Ngeenge watershed, apart from associations, farmers mainly interact through farmers' groups that are not successful except in a few areas midstream. Facilitating these groups and building capacity for cooperation is thus necessary. Another important strategy is to form partnerships within the watershed and link farmers to other stakeholders who have the knowledge they need (Kessler 2006).

The success of collaboration processes in the workshops, resulting in action and work plans, and the general satisfaction among the participants with the whole workshop process points to the adequacy of the SA in identifying the key stakeholders. However, two categories within the community were missed: (1) Opinion leaders who can mobilize the people, that is, highly influential people such as elders, religious leaders, retired civil servants, and the security forces, and in the upstream area, the leaders of the Ndorobo (indigenous forest dwellers evicted from the forest when it was gazetted), and (2) specific types of farmers living under various socioeconomic conditions, such as tenant farmers, who may not be interested in SWC because they do not own the land, and landowners, who may not be very involved in land management because they mostly hire out their land. These individuals were discovered as

additional potential stakeholders while preparing the invitations for the representatives of the community members. Because it had focused only on stakeholder groups directly involved in land and water management issues, the SA could not have identified these 2 categories, whose influence is indirect. However, it became apparent that the perspectives of these stakeholders would be important; thus, they were represented in the workshops.

Step 3: Workshops at community and watershed levels

The SA described in this paper laid the foundation for follow-up workshops and more collaboration among the different stakeholders in the watershed. With improved knowledge on land and water management issues and the need for collective action to solve them, there is better potential to collaboratively work on these problems in future. Through the workshops, the different stakeholder groups had the opportunity to express their opinions and learn about others' opinions—an important step toward building a common vision of what needs to be done (Schwilch et al 2009). Social learning was stimulated. The participants realized that it is possible to collectively agree on the best way to manage their resources and important to involve different stakeholders in decision-making, because they have much to learn from one another. Even though not all key stakeholders attended, the active contribution and participation exceeded previous expectations. Shortcomings are inherent to this kind of workshop but do not affect the generally positive feelings of participants and the added value of having been able to come together and express opinions (Schwilch et al 2009). Jepsen and Eskerod (2009) argued that SA should not be seen as a resource-demanding activity but rather as a learning process and opportunity to dialogue with the stakeholders to consider their thoughts at an early stage.

Organizing the workshops at two levels—community and watershed—helped to involve many stakeholder groups. According to Sanginga et al (2004), despite considerable progress in local government reforms in Uganda, policy-makers seek information only to a limited extent from the communities in formulating policies. They recommend promoting participation by facilitating platforms where community members can engage in dialogue with the leaders and other stakeholders.

Conclusion

From the results of the SA, the policy-makers have a guideline on how policy- and decision-makers can identify key stakeholders for effective decision-making for IWM in other Ugandan highland watersheds. Given that the success of IWM programs heavily depends on stakeholders' participation and their ability to make decisions, there is a need to establish which stakeholders should take part in the design and implementation of

IWM. This study has discussed a three-step approach employed in SA to enable identification of key stakeholders and how they should be involved in the policy-making process in the Ngenge watershed.

Identifying the prevailing natural resource problems in the watershed and the stakeholders involved laid the foundation for bringing together the stakeholders in workshops to think about and collectively agree on practical solutions to these problems in the watershed. Experiences in the workshops and their outcomes, namely, action and work plans, not only indicated the usefulness of the application of SA in identifying who should participate but also proved that the stakeholders were willing to work together to come up with agreeable solutions to the conflicts. The action plans present joint ideas for policies and measures to manage the watershed, and the work plans provide a practical approach to implementation of the agreed-upon solutions concerning

NRM in the watershed. They are ideal requisites for consideration in the development of policies and programs to prevent degradation in the watershed.

Therefore, these processes can be applied to other watersheds for identifying stakeholders for decision-making for watershed management. Other watersheds have their particular pertinent issues, such as being transboundary and thus requiring collaboration across borders. With all these other watersheds, the SA as outlined in this paper provides an effective means of establishing who should participate and how they can be brought together to collaborate. In the transboundary ones, the first level would involve stakeholder deliberations within borders and the second-level workshops would involve stakeholder representatives across the borders. SA does not offer universal solutions but helps people analyze issues and appreciate different perspectives (Rastogi et al 2009).

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