

BEST PRACTICES FOR PROMOTING PARTICIPATION AND LEARNING FOR SUSTAINABILITY: LESSONS FROM COMMUNITY-BASED ENVIRONMENTAL ASSESSMENT IN KENYA AND TANZANIA

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This paper establishes best practices for community-based environmental assessment (CBEA) in Kenya and Tanzania and examines what participants in community-centered approaches to environmental assessment have learned. Three CBEA cases involving water supply projects were studied using interview methods and action research. Findings show that best practices for encouraging meaningful community involvement include providing access and adequate notice to participants, fairer cost sharing, broader representation of women and youth, participant understanding of the CBEA facilitator and culturally appropriate sharing of findings. Learning outcomes attributable to the CBEA process included technical skills for erosion control, new information about environmental assessment (EA)

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regulations and shared values of environmental sustainability and community unity. An application of selected best practice approaches in a test case, in order to encourage greater participation and learning, had mixed success. For example, attempts at providing early notice still resulted in it being far too late for most participants and only about one-third of the participants were women. However, a pictograph functioned as an effective tool for reporting CBEA results to the community and demonstrating learning outcomes.

Keywords: Environmental assessment; participation; learning; Kenya; Tanzania.

Introduction

The idea of Community Based Environmental Assessment (CBEA) evolved out of a necessity to adapt conventional environmental assessment (EA) to the local sustainability needs of communities in the developing world. A major factor driving this process has been government and international aid policies that require EA of community developments projects aimed at poverty alleviation (CIDA, 2005; Pallen, 2002; Spaling, 2003; Spaling and Vroom, 2007; USAID, 2007).

Since its pragmatic origins, the conceptual and methodological bases of CBEA have evolved through the steady development and testing of innovative models, processes and tools although this advance has occurred mostly in developing countries where the focus is typically on assessing the sustainability of local projects aimed at meeting basic human needs and improving resource-based livelihoods. Conceptually, CBEA integrates the constructs and methods of community development theory and practice into EA (Brown and Jacobs, 1996; CIDA, 2005; Pallen, 2002; Spaling, 2003; Spaling and Vroom, 2007). Notions of self-reliance, democracy, local environmental values and knowledge, and people-centered processes for assessment and decision making are key constructs for assessing sustainability. Methodologically, interactive participation is the key component of CBEA (Sinclair *et al.*, 2009; Spaling, 2003; Spaling and Vroom, 2007). Participation is more than just being involved in the sharing or receiving of knowledge from outside experts or agencies (Harrison, 2002; OECD, 1996). The community enters into a relationship where its participation involves the generation of knowledge and where its values and needs help set the direction of the CBEA itself.

CBEA does not displace EA of mega-projects for resource and infrastructure development and may actually supplement it through enhanced local understanding of EA (law, agencies, processes), avenues for meaningful participation and incorporating traditional environmental knowledge. It follows the same steps as conventional EA but, unlike an expert-based process, it is the community that conducts scoping, considers alternatives, identifies impacts, assesses significance, selects mitigation measures and decides on the environmental management plan,

all guided by a facilitator. (Spaling, 2003). CBEA practice also differs from conventional EA in a number of other ways. The scale for which CBEAs are most appropriate are small community projects such as water supply, latrines, fish ponds and construction of small bridges, schools and clinics (CIDA, 2005; Pallen, 2002). Unlike the sophisticated, data-intensive tools of conventional EA, methods for data gathering in CBEA are largely derived from the community development toolbox, namely participatory rural appraisal (PRA) (Beebe, 1995; Chambers, 1994, 1997; CIDA, 2005; Doylea and Krasnya, 2003; Mosse, 1995; Pallen, 2002). PRA offers highly participatory, qualitative tools for participants to gather, analyse and interpret information for their own benefit. Transect walks, community mapping, semi-structured interviews, focus groups, among others, make up the diverse tool kit associated with PRA. But participation in CBEA is more than technique. CBEA intentionally re-positions communities in the EA process so that they are in a power sharing relationship with other stakeholders (non-governmental organisations (NGO), donors, government) and have considerable ability to effect end decisions. This type of participation enables a community to take on more responsibility for assessing project sustainability — after all, sustained benefits are in the community’s self-interest — and it builds capacity for local environmental management long after other stakeholders have left.

Further, if community participation is to be meaningful, avenues must be created for learning to occur among participants (Beekes, 2006; Keen *et al.*, 2005). An assumption of this research is that learning is a necessary ingredient for a community shift toward sustainability. Learning is critical for developing capacity in communities to conduct EA so that project benefits are sustained (Sinclair *et al.*, 2008). Some researchers are now considering the individual learning that occurs through involvement in resource and environmental decision making by applying transformative learning theory (Fitzpatrick and Sinclair, 2003; Kerton and Sinclair, 2009; Marschke and Sinclair, 2009; Sinclair and Diduck, 2001; Sinclair *et al.*, 2009). Transformative learning is an adult learning theory that challenges a learner to critically examine assumptions of their beliefs, revise their belief system, and adopt new behaviors to coincide with these revisions (Christopher *et al.*, 2001). Ultimately the end goal for adult learners “is to become autonomous, responsible thinkers” (Mezirow, 1997, p. 8). This theory has been applied to conventional EA processes to determine what learning outcomes are produced through participation and if such learning contributes to sustainable development (Fitzpatrick and Sinclair, 2003; Sinclair *et al.*, 2008; Sinclair and Diduck, 2001). This paper extends this research by examining learning outcomes attributable to participation in CBEA.

Finally, numerous researchers have reported a lack of local participation as being a major deficiency of EA policy and practice in developing countries, including

many in Sub-Saharan Africa (Adomokai and Sheate, 2004; Appiah-Opoku, 2001; Chowdhury and Amin, 2006; Ebisemiju, 1993; Kakonge and Imevbore, 1993; Lado, 2004; Okello *et al.*, 2008, 2009; Olokesusi, 1992; Pierce, 1990). Reasons include perceived priority of pressing national economic needs that override local concerns, inadequate environmental legislation or regulations governing participation, lack of training in public participation among EA experts, and shortage of financial resources to facilitate community participation. Despite these challenges, progress has been made in applying CBEA to proposed community projects in countries such as Kenya. However, these have yet to be extensively studied for their best practices and lessons for improving participation and learning.

The purpose of this paper is to establish key aspects of CBEA practice that might help to facilitate more meaningful participation aimed at promoting learning for sustainability and projects with sustained community benefits. The focus is on the relationship between learning and best practices for participation. It builds on but is distinct from other ways of examining good practice in CBEA such as evaluating the efficacy of the CBEA process or the effectiveness of an impact management plan or the influence of CBEA in project decisions. The research took place in two phases. First, best participation practices were identified through interviews with participants in two CBEA processes and EA professionals in Kenya. In phase two, selected best practices were applied and tested in an actual CBEA case in Tanzania. The linkage between best participation practices and learning are examined in all cases with a special emphasis on distinguishing instrumental and communicative learning (discussed below).

Identifying CBEA Best Practices for Participation

For a better understanding of CBEA best practices that promote participation we interviewed professionals who had experience with community assessment and carried out a post-hoc analysis of two community water supply projects in Kenya — the Mwasima Nuru water project (Taita-Taveta District, completed 2005) and the Chumvi water project (Nanyuki District, completed 2007). A qualitative approach using semi-structured interviews, document reviews and participant observation provided key methods for data collection. From the professional community, 13 interviews were conducted with individuals from the Canadian International Development Agency, the World Bank, United States Agency for International Development and various Kenyan agencies such as the National Environmental Management Authority (NEMA) and the Water Resources Management Authority. For the post-hoc analysis of the water cases, a total of 26 community participants were interviewed; 19 in Mwasima Nuru and 7 in Chumvi. The main selection

Table 1. Best practices for participation in community-based environmental assessment.

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- i. Access
 - ii. Adequate notice
 - iii. Broader representation
 - iv. Understanding the CBEA facilitator
 - v. Fairer cost-sharing
 - vi. Participatory tools
 - vii. Sharing findings
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criterion was that interviewees had been participants in the completed CBEA, which was confirmed by the CBEA facilitator. The difference in number of interviewees in each community is due to fewer CBEA participants in Chumvi and field constraints (participant’s availability, researcher’s time). Results from the professional and community interviews revealed a number of best practices for meaningful participation that should be implemented in CBEA (Table 1) in concert with other CBEA practices (e.g., Spaling, 2003). These best practices are subsequently presented.

Access Bringing CBEA to the people was identified as an important strength — the assessment is always carried out in the community. Locating the CBEA in the same location in which the project was conceived and planned provides a direct context for connecting the project to the local environment. For example, it facilitates opportunities for interactive data gathering whereby community participants themselves identify impacts, assess significance and evaluate mitigation options.

A community-based process reduces cost and travel time for local participants. This is especially important for the rural poor as time taken away from life strategies such as water hauling and food production is minimised. CBEA activities also can be easily planned with seasonal considerations in mind (farming, fishing) and be sensitive to the time participants are able to commit.

Another important aspect of access identified was language. Respondents felt that it is essential to undertake as much of the CBEA as possible in local languages. CBEA participants in Mwasima Nuru and Chumvi communities found that they were accommodated by having their own languages being spoken. They indicated that this facilitated understanding, helped them feel more involved in the decision making process and built a foundation for them to interact with other stakeholders in the CBEA.

Location, timing and language are more than convenience for local participants. They set the context for a community-based process and begin to devolve the power differential that exists between “elite” professionals and rural communities (Chambers, 1994; Ellis and Biggs, 2001).

Adequate notice

Giving adequate notice to people was a serious weakness identified in both communities studied. Many people said they either did not know about the CBEA process to review the water projects or were not given appropriate notice that allowed them to plan to attend the activities.

Were you invited to spend time with the visitors for the EA?

I was welcomed. I was given a letter from the secretary. I was told the very day the visitors were coming. I failed to attend the meeting due to this amount of notice. I would need at least 5 days, roughly one week to attend a meeting. (Mandy, female non-participant)

Participants and professionals indicated that a critical first step for effective participation is to make sure that community members receive adequate notice of the CBEA. They noted that ideally, notice should be given at least one week in advance. Further, they said that the mode of communication may involve a mix of modern technology (cell phones) and traditional channels (messengers, house-to-house). Adequate notice is sufficiently vital for the success of the CBEA process that it should be followed up and validated before the CBEA begins. While this may seem like a simple step, ensuring adequate notice seems to be overlooked by many aid and government agencies.

Broader representation

The local elite in Mwasima Nuru and Chumvi communities generally dominated CBEA participation. The interests of other, often marginalised groups (e.g., women, youth) were not fully represented. A reason given for this skewed representation is that participants are readily drawn from the Project Management Committees that are usually the first point of contact for EA professionals and facilitate entry into communities requiring a CBEA. Committee representatives are viewed as desirable participants because they have a direct stake in the project, they are often the most knowledgeable about the project and they actively support the CBEA. However, this knowledge and authority, when carried over into the CBEA process, easily creates a power structure that can marginalise other participants. Committee representatives may even be in a conflict of interest as their primary mandate is the design and implementation of the project.

Ignoring marginalised voices is contrary to the democratic and empowerment ideals of CBEA. Many interview participants felt that participation should strategically target representation from marginalised groups. Women, youth and children are often marginalised in rural communities, but are also potential

beneficiaries from water projects that improve their health and save hauling time. Women and the girl-child may have useful knowledge about water sources, seasonal supply and domestic use. Youth and children may have learned about sustainability in school and could advocate for it in a CBEA process, thus developing future leaders. Some participants indicated that social structures such as schools, youth clubs and women's groups provide a ready opportunity for more inclusive representation. In some cultural contexts, special precautions may be necessary for incorporating marginalised community members such as private consultation sessions for women or focus groups for youth in which they can feel free to offer their input (Spaling and Vroom, 2007).

Understanding the CBEA facilitator

Like most others, the communities studied had not been involved in any prior CBEA. Among other things, results revealed misunderstandings about the role of the outside CBEA facilitators. A Kenyan professional conducted the CBEA in Chumvi whereas Mwasima Nuru experienced a North American facilitator. Some participants reasoned that the visitors to their communities must be donors for the project. Both cases showed an increased expectation of project funds, especially from the non-Kenyan. When this did not materialise, corruption in the Project Management Committee surfaced as the only explanation among community members.

EA professionals felt that CBEA facilitators must minimise their perception as financial donors by engaging in cross-cultural training (for foreigners), conducting awareness and information sessions about the purpose and activities of CBEA, and clearly communicating their role to the community. It was suggested that the community's NGO partner could be quite helpful in providing outsiders with orientation to a specific community and also communicating to the community the role of visitors, including what they are not there for.

Fairer cost-sharing

Typical costs of a CBEA include facilitator fees and expenses, regulatory fees and licenses, and the purchase of food and accommodation for community meetings. However, participants said that CBEA costs are not always included in the project budget. Rural communities in Kenya not only lack financial resources, but their priority is often fundraising for the project itself, not the assessment and approvals process. This weakness was also recognised among officials of NEMA who are required to enforce EA legislation in Kenya. They realised that there is a discrepancy between what is required of communities by law (e.g., fee for an EA license) and what they are capable of paying.

It was suggested that the common practice of including in-kind contributions for community projects might be valued in some way. For instance, sand, stone and labour are often valued as local contributions to water projects. Participant time and local environmental knowledge could be similarly valued in a CBEA. These need not be monetised, but acknowledged as an in-kind contribution, perhaps even equal to that of the time and expertise of a CBEA facilitator.

Participatory tools

The research confirmed the utility of PRA tools as a best practice for promoting participation in CBEA. PRA tools allowed community members to actively generate knowledge for the CBEA and gain new skills and knowledge themselves, a finding also supported by the work of Spaling (2003). Rather than simply retrieving information from community members, facilitators actually involved participants in information gathering and decision making using transect walks, community mapping and focus groups. Community participants were able to identify anticipated impacts and discuss mitigation options for the project through this type of interaction.

The PRA exercises especially allowed communities to gather, organise and display local environmental knowledge and integrate it into the CBEA process. Some information such as the location of medicinal plants, seasonal springs, land tenure patterns and deforestation for charcoal production can only be obtained through local interaction. Participants reported that they felt important in being able to generate knowledge and ideas for the CBEA. Some participants even reported that they retrieved knowledge that they never even knew others had, which is important to building confidence in the PRA tools and the CBEA process.

Participants also indicated that they enjoyed the PRA exercises, which in turn helped to encourage their further participation.

Can you tell me about the mapping exercise you did on the ground?

We had a drawing from tank to borehole and where water would go.

Did you like the exercise?

[I] liked it, we had all the hills, towns.

Why else did you enjoy it?

Because it was in ourselves, put it in another form from what was in us.... that map was actually teaching us not to destruct the environment. (Alan, male participant)

Did you enjoy this [transect walk] exercise?

I enjoyed it, though it was hard. I had never before walked the pipeline. It was quite enjoyable we could see, discussing measures to be taken.

Also during mapping we thought it was a short distance, we could just map [the] line, but when actually on ground we could really walk and walk, it was [a] really long journey. (Markus, male participant)

PRA activities stood out as important memories that participants associated with the CBEA process. They remembered having fun and interacting with their local villagers and other stakeholders in a way that they had never done before. Some described these as eye opening experiences because they became aware of the details of their project, how other community members felt, and how the project would ultimately affect their way of life. All this was attributed to the hands-on interaction that the PRA tools enabled.

Sharing findings

Kenyan EA legislation requires an EA report, including an environmental management plan for the project, and follow up in the form of an environmental audit (Government of Kenya, 2003). At the time of our field research, participants in both Kenyan communities were unaware of the status of their EA reports. Even though the CBEA for Mwasima Nuru had been completed almost two years earlier and a report existed for community members to access, project leaders had yet to review it. The Chumvi community had just completed their CBEA process and were eagerly waiting for the report, but had not yet received it after four months. A CBEA process that concludes with a timely report is more likely to sustain the momentum and commitment needed for implementing the environmental management plan and follow up.

EA professionals suggested a pictograph for supplementing the formal EA report. This is a visual representation (e.g., photos and captions in booklet or poster format) of the main findings that are shared with the participants soon after the CBEA has been completed. A pictograph may also provide additional feedback and verify findings. It may be particularly useful for participants with low literacy skills and disseminating information to those that did not participate in the CBEA.

Interactive Participation that Promotes Learning

Because of the relationship between meaningful participation and learning, and because of the potential for learning for sustainability, as outlined in the literature reviewed above, we also examined the sort of learning outcomes participants experienced through their involvement in the two CBEA cases.

Learning outcomes are described below using two categories recognised in the transformative learning literature, instrumental and communicative learning.

Instrumental learning

Instrumental learning deals with information that can be gained through controlling or manipulating one's environment such as through empirical testing (Mezirow, 1994). It involves assessing truth claims through deduction and task oriented activities for solving problems (Mezirow, 2003). This means that new information and skills are gained through interacting with one's physical or social environment.

Instrumental learning was an important outcome of the CBEA process. Of the 26 community participants interviewed, 22 (85%) reported that they had gained some new type of information or skill that could be associated with instrumental learning. The importance of burying pipes for the project in order to protect them from being damaged and maintenance of the tank and pipes were popular responses (Table 2). Though fewer in number, there were other participants that claimed they gained new information about erosion, Kenyan law, EA, the NEMA, water conservation techniques, and the importance of land agreements.

Several participants applied their new knowledge or skills for the benefit of the project, community or themselves. Participants also reported that new information affected their thinking about the environment. Altered perspectives and changed behaviours are consistent with a learner critically examining the assumptions underlying their beliefs and adopting new behaviours consistent with them.

Table 2. Instrumental learning outcomes attributed to community-based environmental assessment of rural water supply projects.

i. New information	a. water pipe protection
	b. soil erosion control
	c. tree planting
	d. environmental assessment
	e. National Environmental Management Authority
	f. water legislation
	g. water conservation techniques
	h. understanding land agreements
ii. New skills	a. pipe maintenance and repair
	b. storage tank construction

Has your participation resulted in new ways of doing things on your farm?

In my farm I have made terraces to conserve the soil and also have grown a lot of grass on terraces to protect soil from running way. (Maria, female participant)

How did this information change your thinking?

In a way that for any future projects we have to consult regulatory bodies. We first thought NEMA was only an environmental thing. Now we saw that they do community based studies and are fully involved. Then after the EA I went to NEMA office to help get our registered environmental group some info. We wanted to ask them our role as an environmental group in the project. (Linden, male participant)

Although most participants experienced some form of instrumental learning, they often showed a lack of knowledge in regards to key concepts related to CBEA. Learning about the water project was more common than that of the CBEA process. Many interviewees were left not understanding what EA is and why it is important. For example, there was very little awareness in regards to the NEMA as a regulatory body or the legislation that created it and established the process for EA in Kenya. Of the 26 participants interviewed, 23 (88%) were familiar with the term EA, while 15 (58%) actually knew what it was.

Are you aware of the term environmental assessment?

I only know about the environment, but environmental assessment is a new term I heard in the seminar

What is it?

I can't say. (Devdi, male participant)

What does environmental assessment mean?

I know it to some extent, (facilitator's name) has added a lot to my understanding.

What does it mean?

First in anything we do we should look at the positive and negative side of what we want to do. (Jon, male participant)

One possible explanation for why people did not learn about EA is that more attention needs to be paid to the fact that community members typically participate in many processes related to the project, such as design consultation (location, water rates), establishing a Project Management Committee, fund raising activities and meetings with the NGO, donor, and government agencies. Participants may not clearly distinguish among processes, especially over the time it takes from project conception to approval and development. As well, CBEA

facilitators have to be willing to take the time to share information and knowledge with participants — not just collect their local knowledge.

Communicative learning

Whereas instrumental learning is important for gaining new information and skills, communicative learning deals with “understanding purposes, values, beliefs, and feelings” (Mezirow, 1997, p. 6). Learners may be introduced to a new concept, such as sustainability, and then are challenged to assess their current values and beliefs to determine if sustainability is a valid goal. With certain learning conditions met, the learner will be able to determine whether their previous belief, that may not contain sustainable actions, is a valid belief.

CBEA participants had opportunities for such learning to occur. Ideas such as environmental sustainability, creation stewardship and community unity were all introduced in some form or another during the CBEA processes and challenged their thinking. Five interviewees revealed communicative learning outcomes attributable to their participation.

Did the new information change your thinking in anyway?

For people to develop they must think and act together. Acting alone will not work, you can't develop your own proposal. (Linden, male participant)

Did the EIA (Environmental Impact Assessment) help you personally?

Yes. Because once I saw this place with no trees, it is a desert, nothing can survive there. Cliffs due to erosion, so after then I started taking environment as a friendly thing and a lot needs to be done to improve environment of this place. (Oliver, male participant)

Made me think what God created shouldn't be disturbed ... creation has a purpose. (Linden, male participant)

Participants also reported that their behaviour changed as they formulated new beliefs and values. After their involvement in the CBEA, they were able to actualise their new beliefs by informing other community members, approaching government bodies, and adopting new behaviours in community activities.

Has this information changed your actions in any way?

Yeah, when I see a problem I tell people. One day I realised there was no water, so I went and did something about it, so I went and spoke to neighbours and chief about fixing it. Also there were rumors that the pipeline was going to be dismantled and sold for scrap metal, so we alerted the government, they then took action. (Linden, male participant)

How have your actions changed as a result?

Yes ... when a decision needs to be made I should make it participatory and include community or like in a baraza (public meeting) I should make it more participatory and not decide things on my own. Then it becomes easier, even the learning becomes easier. Like during my farmer training I used the participatory method of training. So when meeting farmers I ask them how we can solve this problem. I don't take for granted that it is me that can solve the problem, but I let them see that they can also solve. So in FFS (Farmer Field School) we start generating information, you let the learning be taken by everyone in that class, it becomes very interesting because load is carried by participant themselves. (Edward, male participant)

Dialogue is critical to communicative learning outcomes and may help explain why evidence of communicative learning is considerably less than that of instrumental learning. Through dialogue learners engage in understanding, questioning, and negotiating cultural and normative values. Participants commented that they were able to interact and speak with others in their community, but other conditions such as time for critical reflection or sustained discourse may not have been sufficient for communicative learning to occur. Furthermore, these conditions may be inhibited because of resource constraints (time, money) and an inherent bias of CBEA toward instrumental learning because of its pragmatic focus on environmental problem solving.

Field Testing Best Practices

Selected best practices for CBEA, derived from the Kenyan case studies, were chosen to improve community interaction in an actual case. Two of the co-authors (Spaling, Montes) facilitated the CBEA process using guidelines for EA of community projects and professional experience from ten previous CBEA applications, including in Africa (CIDA, 2005; Pallen, 2002; Sinclair *et al.*, 2009; Spaling, 2003; Spaling and Vroom, 1997; USAID, 2007). For the purpose of our research, we also applied and tested four selected best practices for participation in CBEA. We selected four that our NGO partners would readily understand, that would be possible in the context of a CBEA to implement and would potentially have an impact on participant learning. The four practices were: providing adequate notice, inviting women and youth representatives, understanding the facilitator's role and providing a pictographic presentation of the CBEA findings.

The case involved applying a CBEA to a community water supply project in Mkonze, Tanzania which is climatically (semi-arid, drought-prone) and agriculturally (rainfed, small subsistent holdings) similar to the two Kenyan cases. Mkonze has a population of roughly 8,000 people and is situated just south of Dodoma, the capital city. CBEA activities took place over four days in a local church in Dodoma as well as within the Mkonze community. Although the focus is on Mkonze, the water project extended to another three communities that also participated in the CBEA. A total of 48 participants from four communities, including 10 from Mkonze, were involved in various CBEA activities such as transect walks, community mapping, semi-structured interviews, small groups and workshops. As Mkonze was to be the first recipient of the water project, and the CBEA process from which other communities would also learn, nine of the ten participants from Mkonze were interviewed for this research.

Notifying participants

Since the analysis above indicated that adequate notice would be one week in advance of the CBEA, we tried to implement this through our local NGO partner. The CBEA facilitator communicated by email with the NGO partner and community leaders to inform participants of the dates, venue, purpose and draft itinerary for the CBEA. However, when asked how far in advance they had been told about CBEA meetings, participants commented:

I got information on the seminar two days before, the chairman from Mkonze told me about it. (Jasmine, female participant)

I got information from one of the assistants to the MP. Just a day before the seminar, so I was told that tomorrow I should attend the seminar. (Jordan, male participant)

A participant who did receive adequate notice also commented on the notice given to many others:

So when were others told?

Because I was waiting for information to be contacted, hard to find them so they got their letters 3 days before the seminar.

How were the letters sent out?

We have an office messenger and he took the letters, he knows where most of these people live, he is a local man. (Ruth, female participant)

Despite best efforts, the practice of providing one week notice to all participants failed. While the facilitators, NGO and local leaders had a common understanding of dates and activities this was not fully conveyed to the participants. Possible

reasons range from delayed letter preparation to unavailability of the messenger to cultural interpretations of time. Alternatively, early understanding of and commitment to CBEA may be lacking within a community and not given high communication priority, regardless of the notice time. In the end it became clear that more attention must be given to local customs and forms of communication to convey both adequate notice and the rationale for CBEA. It is worth noting, however, that despite the short notice, all participants graciously accepted their late invitations and were active participants throughout. This may imply a research need to further test a one-week notice as a best practice.

Inviting women and youth

The CBEA facilitator worked closely with the NGO and community leaders to ensure representation of women and youth. Prior to CBEA activities the facilitator corresponded through email as well as face-to-face meetings with NGO partners and described the rationale behind obtaining a broader representation from these groups within the community. The partners were asked to communicate and advocate for such representation through the project management committee, women's groups and school teachers. A gender ratio of 50% female was strived for — 40% (4/10) from Mkonze and 35% (17/48) from all four communities was achieved. Women proved to be active participants, especially in PRA activities, and frequently took lead roles in group activities, presentations, and question and answer sessions. Their active participation may be attributable to a general increase in gender awareness among development agencies, but was also likely influenced by the intentional engagement of women in the CBEA process such as singling women out for specific types of information (hauling time, medicinal plants) and organising small groups by gender for determining impact significance and evaluating mitigation options.

Youth participation was not achieved as originally conceived. The facilitator asked community leaders to ensure that youth could be involved in the activities and were ready to engage youth through a local school and involve teachers. Youth was assumed to be the standard age cohorts in primary and secondary school (e.g., 5–18). However, it was discovered that “youth” in Tanzania is interpreted to be individuals between the ages of 13–25. Communities selected a few participants nearer the upper age range, but no individuals below the age of 20 were involved leaving the younger group unrepresented.

Understanding the facilitator's role

Intentional steps were taken to minimise the perception of CBEA facilitators as donors. Prior to the CBEA process, the facilitators underwent a cultural

introduction offered by the NGO partner to better understand local customs and behaviours. Attention was given to issues directly relevant to the CBEA such as customary land and water rights, but also social protocols related to gender relations and community meetings. Misperceptions among participants were minimised during introductions and reminders throughout the process by distinguishing the facilitator's role from that of a donor, NGO staff or government official. Participants demonstrated that they largely understood the role when asked to explain why the CBEA facilitators came to their community:

What was (the facilitator's) role?

(They) came to help us understand the situation we have with the environmental assessment. Hilda, female participant

It was important, he taught us on environment and things on water project, taught us things we didn't know. Jon, male participant

He helped us by educating us as a community on issues about the water project. (Mindy, female participant)

A picture is worth ...

A standard CBEA report is limited in conveying results to community participants who often do not understand English and may be illiterate. For this reason, the facilitators developed a pictograph consisting of photos taken throughout the assessment and then arranged to 'tell a story' of key findings. Short captions in Kiswahili were also included, although they were used sparingly in order to accommodate community illiteracy. Photographs showed participants gathering information through PRA exercises, identifying environmental impacts on site (e.g., bank erosion) and selecting mitigation measures (e.g., terraces). A total of 13 photographs and captions were printed in a six page coloured document, which was presented to community participants. Each Mkonze participant was given a copy of the pictograph. When asked to comment on the pictograph participants responded as follows:

What do you think about this document [pictograph]?

Very good, it looks the same as what we learned. These things that we learned are in here. (Hannah, female participant)

It is a good explanation because it talks about being strong in caring for the environment. (James, male participant)

When asked to comment on their favourite picture, interviewees often referred to an important concept that they remembered learning or the commitment of the community to improve their project.

Did you enjoy looking at this?

Mostly I liked the picture showing us drawing the map on the ground. The reason is because it shows that Mkonze knows our area so well, it can show us and lead us to a point in our community. I also like the picture of the professor teaching because it shows people listening to his teaching. Is a sign that we are eager to get knowledge on the project. This other one with the professor teaching, and the translator by his side, it shows that you are caring for us to use our language and shows your understanding. (Anna, female participant)

Can you say more on the pictures you saw?

The picture that I like is the one with the child under the mosquito net because it shows that mosquitoes will be breeding when the sand dams are put in place. So that calls for more education about using mosquito nets that have been treated. (Jessica, female participant)

When asked to comment on the effectiveness of a report that did not contain photographs, interviewees responded in the following way:

Would this document [pictograph] still be effective without the pictures?

The pictures make it more attractive and prompts one to read. (Jessica, female participant)

Message might be there, but the pictures make people understand things faster. If you read without the pictures you understand, but...they make it easier to understand. (Linden, male non-participant)

All participants responded very positively to the pictograph. This visual and interactive style of community reporting was not only enjoyable for participants but findings are readily understood and learning outcomes reinforced.

Individual Learning Outcomes in Mkonze

Once the CBEA was completed, nine Mkonze participants were interviewed about their learning outcomes so that we could see if the new measures had any effect. Most reported instrumental learning. An understanding of cause-effect relationships was especially well-demonstrated in new information and skills relating water contamination to soil erosion, pesticides and manure, including a commitment to mitigate them.

The [facilitator] was asking, once sand dam was built what will be the negative effects from it. One thing I learned was if you use chemicals for killing insects, and when it rains and percolates, it can be harmful to

people. Also fertiliser, it can be harmful. Another thing, if you don't want chemicals to penetrate to the water source then you can build terraces.

Will this change your actions in anyway?

Anytime we do some farming, we have to build terraces. (Daniel, male participant)

Was the idea that they (cattle) are a source for contamination new to you?

We didn't know this in the past, this we know because of the (CBEA) seminar.

How will that change your actions?

We don't need to contaminate the water, it isn't acceptable to allow cows to go there. (James, male participant)

Further understanding of cause-effect and the CBEA process was evident from the pictograph. Participants were asked to select pictures representing environmental impacts that would be the easiest and most difficult to mitigate.

Which impact will be the easiest for the community to control?

We will be able to curb erosion along the river because when we get water we will be able to plant trees ... I think when there is a lot of (river) water they (children) might drown so we must do something about it and tell them to stay away from it. And if possible we can even put in place a fence around the sand dam to prevent contamination and people playing around it. (James, male participant)

Which impact will be the hardest?

The influx of people (in-migration) will be the hardest because it is hard to control people in large numbers. (Jessica, female participant)

The one about livestock and people finding separate places (for drinking), so we need education about that. (James, male participant)

Outcomes related to communicative learning were also reported although less frequently. Some participants adopted new concepts such as sustainability and altered their beliefs to include caring for creation.

What are your first impressions of (the pictograph)?

What I like is about the issues to do with water. What I have learned is that if we get water I'll appreciate if it is a sustainable source of water. If the project keeps running, this will be very important, we will use and our kids will use also and benefit also, because if it is sustainable.

Where did you learn about this term sustainability?

We were taught it in the [CBEA] seminar.

What is your favourite picture?

The one I like is one showing us attending seminar and the (facilitator) teaching us. Here you can see people attentive showing that we understand what is being taught. Like we should take care of the creation that God made. The participants of the seminar are now advocates of good care of God's creation. (Amy, female participant)

Other participants claimed new ways of thinking about the project and its impacts and committed to acting on them.

Did this change your thinking in any way?

First I should not eat raw tomatoes from the garden and that terraces are important because they prevent chemicals from going down into the sand dams. (Jessica, female participant)

It has really touched me and I learned that it is dangerous and would like to educate others about using those chemicals in the community. I as a local leader, there is a time when I call people, I'll call the people of my area and talk about the issue of using these chemicals and harm that it causes. (James, male participant)

Communicative learning is also reflected in changes to traditional water access, which privileged a few in the community. Socio-cultural structures limiting water access will now give way to water for all:

The livestock looking for water because we can be told to keep aside livestock because someone will be offended that they have to wait. They may feel embarrassed and strive to have their livestock go first. But we will follow the rules, but we will be using the village rules ... some people have water holes along the stream that they've inherited from generations. When the dam is in place they will cease being one's property and will be for the entire village. (James, male participant)

Conclusions

This research is among the first to examine CBEA best practices for participation and learning in Sub-Saharan Africa. Providing access in the community, adequate notice to participants, fairer cost sharing, broader representation of women and youth, understanding the facilitator's role, and sharing findings in culturally appropriate ways are all lessons for best practices that should also improve participation in and learning outcomes from CBEA. Some practices such as adequate notice and representation of women and youth have longstanding acceptance

although this research has demonstrated the ongoing challenges of implementing them. Others such as using a pictograph to share findings locally and cultural training to clarify a facilitator's role are useful additions to the CBEA toolbox.

Opportunities to apply and test best practices in applied CBEA cases are rare. The four practices tested in this research had mixed success. Notice was given far too late for most participants and only about one-third of the participants were women. Youth (<20 years) were not represented. On the contrary, the cultural orientation for facilitators and clear explanation of their roles among participants minimised misperceptions (as donors), which enhanced the facilitation process. The pictograph functioned as an effective tool for reporting CBEA findings to the community and demonstrating learning outcomes. Future CBEA research is needed to refine these and other best practices in additional applied cases so that participation and learning are continually advanced.

Both instrumental and communicative learning are catalysts for sustainable community development and participatory processes like CBEA can be important platforms for learning (Sinclair *et al.*, 2009; Webler *et al.*, 1995). Learning outcomes are evident in all the cases studied although more participants reported instrumental learning than communicative learning. This may be attributable to the pragmatic nature of environmental problem solving that dominates CBEA and all environmental assessments. CBEA may not satisfy all conditions required for communicative learning and individual transformations, such as sustained discourse, critique and negotiation. Communicative learning also involves higher levels of learning (new beliefs, changed values) that rarely have the immediate utility of instrumental outcomes. While instrumental learning outcomes are certainly desirable in CBEA, communicative outcomes also hold much potential for sustainable community development and should be strived for. CBEA activities could be designed for more discourse on competing environmental values or negotiating resource conflict to balance the current focus on impact mitigation, for example.

Learning about CBEA varied among participants despite a community-centered approach in all the cases. Participants from Mkonze were generally able to explain CBEA and why it was conducted, but few participants in the two Kenya cases could. Time since completion of the CBEA may be one reason and difficulty distinguishing CBEA from other project-related processes may be another. This not only reinforces the need to clearly explain the purpose and role of CBEA but also that CBEA has its own terminology, approach, technique and process, all of which must be learned by participants. Further, it takes time to build community capacity for CBEA. A one-shot approach is not likely sufficient and the cases studied for this research are among the first applications. A community may need to go through a CBEA more than once before its full potential is realised in decision making for sustainability.

Learning is also culturally determined. One of the criticisms of transformative learning theory is that it is focused on adult learners becoming autonomous, responsible thinkers (Mezirow, 1997), which is more reflective of western culture. The theory has been criticised for its lack of empirical evidence in other cultures (Merriam and Caffarella, 1999). This research contributes to the growing literature on cross cultural applications of the theory (Sinclair *et al.*, 2009; Sims and Sinclair, 2008). While an analysis of cultural determinants underlying learning outcomes is beyond the scope of this paper, the cases clearly provide empirical evidence of instrumental and communicative learning described by the theory.

The pictograph is a significant methodological contribution to CBEA practice. It is a highly visual and interactive tool for recording and sharing CBEA findings, and reinforcing learning outcomes, which should support implementation of the environmental management plan. The pictograph is easily understood and enjoyed by participants and may even create an avenue for non-participants to engage CBEA findings and promote learning outcomes. From a research perspective, the pictograph is a very useful device for identifying and following up participant learning after the CBEA is completed. Future research may be interested in exploring the pictograph for use in community-based social learning, environmental monitoring or environmental audits and possibly alternate formats such as video or web-based display where appropriate.

Project sustainability is enhanced through interactive participation and learning outcomes derived from community-based best practices. These are urgently needed for sustainable community development in Sub-Saharan Africa.

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