

## Multi-Criteria Assessment of Community Forestry Program in Uganda

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**Abstract:** In Uganda, a large diversity of community initiated forest management systems have evolved recently in response to severe degradation of forests and grazing land and biomass shortages. Forestry professional, forest user group and farmers were organized in June 2004 to develop commonly agreed indicators of success community forestry Program in Uganda. Indicators, such as access to fuel wood, incidence of forest fire and amount of community funds raised through the sale of forest products are commonly agreed at local level. Women's participation in forestry related meetings and taste of drinking water in the watershed area are also important. Equitable benefit sharing by the community forest users serves as an indicator of better access to forest products. Socio-economic changes such as women's participation in forest related decision-makings, income generated from community forests and equity of benefits from community forests also, reflect the program's success.

**Key words:** Community forestry, indicators, participation, socio-economic, Uganda

### INTRODUCTION

In Uganda, the concept of Community Forestry Programmes (CFP) was adopted in the early 1980s as a major strategy to manage the country's forests. It was expanded nationwide following the government's 1989 endorsement of a 25 years master plan for the forestry sector. The plan emphasized community forestry as a major program and was expected to absorb almost half of the total budget allocation to forestry through the year 2010 (MPFS, 1988). As of June 2004, Uganda had already handed over one million ha of forestlands to over 13,238 Community Forest User Groups (CFUGs), involving 1.49 million households (MWLE, 2001b). CFP operate from a policy that stresses local participation in developing and managing all accessible forests through transferring management responsibility to the local community if they are willing and able to assume the responsibility. Over 80% of the population in Uganda lives in rural areas (UBOS, 2002) and the majority depend on forests for fuelwood as a source of energy for cooking and heating. Forests supply timber, fuelwood, fodder, grasses, leaf-litter, foods and other minor forest products, necessary for daily household use and agriculture production. CFP aims to fulfill the basic needs of forest products such as fuelwood and fodder of rural people and encourages them to become self-sufficient in such products.

Several studies argue that CFP has been successful in eastern Uganda in improving people's livelihoods and the condition of the forests (Gombya-Ssembajwe and

Banana, 2000). Despite the success, there are indications that the poor may have not fared well under community forestry. Leadership is one of the factors that made the community forestry programs successful and the succession of leadership is seen as a potential problem in Uganda's community forestry programmes (Buyinza, 2002). At present the program's success is an issue for debate because the measure of success varies depending on how it has been defined. Success of forest user groups in Uganda is closely related to expression of user satisfaction with the results (Gombya-Ssembajwe and Banana, 2000). User satisfaction is essential where users are invited to work voluntarily in program management.

The use of indicators is a common phenomenon in the assessment of performance of a program (Kamugisha, 1993). The perspective of success varies not only from one individual to another but also from one community to another i.e., success, like beauty depends largely on the eyes of the beholders. Further, the emic perception of success is often different from the etic perception of the same phenomenon. Community forestry may be about trees for a forester and it may be about bio-diversity for an environmentalist. However, both of these may be less meaningful to the local people. The local perspective is the key to community forestry (Buyinza, 2002; MWLE, 2001a) because they are the main beneficiaries of the community forestry program. As a main beneficiary, local people's (emic) perspective for measuring success of the community forestry programs should always be the main focus.

This study was designed to understand local perspectives on indicators of a successful CFP. The study borrows the definition of the program's success perceived by local people as any forestry program that provides maximum benefits to local residents by fulfilling their forestry needs such as fuelwood, timber, fodder, foods and leaf-litter. The study focuses on documenting indicators and identifying ways of measuring the indicators as perceived by the local people to measure the success of the community forestry program in Eastern Uganda.

### **MATERIALS AND METHODS**

A one-day research workshop was organized in June 2004 by the Department of Community Forestry and Extension, Makerere University, Uganda to prepare a list of indicators for determining the success of CFP. The workshop's main purpose was to generate a set of indicators for measuring the success of Uganda's CFP as perceived by local people especially those living adjacent to the forests in the Albertine rift valley. Altogether, 13 (four female and nine male) FUG representatives from areas adjacent to forests of the Albertine Rift valley and 5 representative from the National Forest Authority (NFA) participated.

A systematic random sampling technique was applied to select FUGs for participation in the workshop. After the participants' self introductions, the purpose and objectives of the workshop were explained. The participants were divided into 2 working groups, which were balanced in terms of size, gender and ethnicity.

Each group was given a set of questions related to defining, from an emic perspective, a successful community forest, indicators of a successful community forestry program and ways to measure these indicators to make sure they properly understood the point for discussions. Each participant was asked to make an assessment as to what constitutes a successful community forestry program. To help the participants think about indicators, they were asked to assume that the program was successful. They were encouraged to think about the indicators as comprehensive, practical and easy to use. The local term sign for indicators was used to make sure all participants understood the meaning of an indicator in the same way.

Institutional studies involving Participatory Rural Appraisal (PRA), group discussions and household surveys were conducted at the village level in addition to information obtained from secondary sources. Various topics were addressed ranging from motivation for protection to features of the informal committees and sets of protection mechanisms adopted.

Vegetation studies involved use of a quadrat method where the various ecological parameters like bio-diversity, DBH distributions, canopy cover and regeneration modes and methods were recorded. Quadrats were laid in protected plots as well as in unprotected areas (control plots) and plantations to enable comparison.

Non-Timber-Forest Products (NTFP) studies included preliminary household surveys for obtaining basic information regarding the family size, land holding, livestock holding etc, were done to help identify sample households after categorization of the households on the basis of their land holding as large farmers, small farmers, landless and artisans (where available). Further, a detailed household survey was conducted for obtaining all information regarding the NTFPs collected, their quantities, human efforts for gathering and also the gender aspects of gathering.

### **RESULTS AND DISCUSSION**

The participants listed self-sufficiency in forest products and physical condition of the forest as basic factors for considering the program as successful. Based on these factors, they discussed and developed a list of indicators and also suggested ways to measure them. The list of indicators agreed on by the participants to determine the success of a community forestry program and the agreed and accepted ways for measuring the indicators are presented in Table 1.

Access to fuelwood, fodder and timber, forest condition, plant diversity in the forest, amount of community funds and occurrence of landslides were used as indicators of the programs' success by several authors (Falkenberg and Sepp, 1999; Tumuhimise and Kuteesakwe, 2003; Scott, 1998; Hoefsloot, 1996). The participants also agreed on these as indicators to measure the program's success. The forest products, such as fuelwood, timber and fodder are the common products derived from community forests and they are considered as major benefits to the local communities. Community funds are important for local development, however, in many cases, FUG funds are being used for community development works such as temple construction, road maintenance and school building renovation.

Suggestions are made that counting the number of people benefited and the annual incomes derived from community forests as a measure of access to forest products and the amount of community funds, respectively (Moyini and Muramira, 2002; Falkenberg and Sepp, 1999). The findings suggest that frequency of landslides in a year, occurrence of natural regeneration/crown cover/tree shape, types of plant species available in the forest and the percentage of

Table 1: Indicators and ways to measure the indicators

Indicators	Ways to measure the indicators
Access to fuelwood	Percentage of users obtaining fuelwood; amount of fuelwood collected in a year
Access to fodder	Percentage of users obtaining fodder; frequency of fodder collection in a year
Access to timber	Percentage of users obtaining timber; volume of timber collected in a year
Incidence of forest fires	No. of forest fires occurring in a year
Amount of community funds	Annual income from the forest
Women's participation in forestry related meetings	Percentage of women in forest user group committees; percentage of women participating in users' assembly and forest user group committee meetings
Use of compost	Percentage of users collecting leaf-litter in a year; Frequency and amount of compost used in farm lands
Trees on private land	No. of trees available on farmland
Condition of Forests	Occurrence of natural regeneration in the forest; tree canopy status; shape of trees in forests
Plant diversity in forests	Types of plant species available in forests
Availability of wildlife in forests	Frequency of appearance of wildlife in the area
Availability of NTFP in forests	No. of livestock killed/attacked by wildlife in a year
Greenery in the area	No. of users collecting NTFP; Frequency of collecting NTFP
Occurrence of landslides	Percentage of naked hills and barren area covered by vegetation
Water sources	Frequency of landslides occurring in a year
Availability of water	No. of springs/volume of water available in the area; travel time for fetching water; use of water for irrigation
Taste of drinking water	Duration of water available in the area
	Cleanliness and chilliness of water

denuded hills and barren area covered by vegetation as effective indicators for occurrence of landslides, forest condition, plant diversity and greenery in the area, respectively.

The incidence of forest fire, number of women participating in forestry meetings, use of compost in farm land, trees on private land, number of wildlife in the forest and taste of drinking water are perceived as additional indicators and therefore, these are recommended to be included in assessing the program's success (Kaboggoza, 2000; Jacovelli and Caevalho, 1999). The local people previously used to go and set fire in forests, but at present if someone sees fire in the forests, they inform others and go collectively to control the fires. Counting the number of forest fires occurring in a year, percentage of women participating in forest users' assembly and forest user group committee meetings, percentage of users collecting leaf-litter, number of trees on farmland, frequency of wildlife appearances in the area and cleanliness and chilliness of water are suggested ways to measure the indicators (Table 1).

Restrictions on grazing and collection of firewood and green wood is very critical although it is difficult to prescribe any strict rules, especially regarding the extractable limits and the modes and rates of extraction and the stage at which this can occur. However, about a third of the current Marginal Annual Increment (MAI) could be considered for extraction assuming that one third of MAI will be in the twigs and small branches and two thirds would be in the main trunk and large branches. Over extraction of seeds, flowers and fruits will affect long-term forest regeneration and sustainability. There is therefore a need to generate information on yields as well as sustainable modes and rates of extraction of NTFPs.

The self initiated forest management systems have evolved in response to local needs and are compatible with the local socio-economic situation. The protection and sharing of benefits is seen to be equal rather than equitable. For long-term sustainability of institutions, gender and equity issues have to be addressed.

Fire has been perceived as the biggest threat to community forests and an enemy of the forest, however it is believed that fire enhances forest growth if it is burnt in a controlled way. Women are recognized as an important resource for the program's success as they pass on their knowledge to younger generations and also take care of the forest in a better way than do men. This finding is consistent with those of Mupanda (2002), Onyango (1996) and Falkenberg and Sepp (1999).

The impact of protection and management on forest regeneration is assessed in comparison to nearby community forestry plantations and unprotected lands. It is revealed clearly from our studies that the longer the period of protection, the better the regeneration, i.e., more trees in the lower DBH classes (about 91% in Mbale district in <10 cm diameter class). There is selective promotion of economically important species like Teak in the northern part of Mbale district and the tree species' diversity is higher in the regenerating forests as compared to plantations and unprotected forest.

The standing biomass and age of the forest relationship is a fair indicator of the impact and effectiveness of protection. Maximum growing stock is in the forest found on northern hills of Mt. Elgon with >100 years of protection (160-270 t ha<sup>-1</sup>) while in areas with shorter periods of protection it ranges from 5-32 t ha<sup>-1</sup>. Degradation occurs when extraction levels exceed the annual biomass production. In Mbale district, the

extraction levels vary from 0 -50% of biomass production to more than the sustainable level of 36% (MWLE, 2001b). However, in most locations, communities extract only about 25% of the Mean Annual Increment (MAI). In areas which extract more than the current MAI, the extraction could be termed as unsustainable. However meeting firewood requirements is one of the critical goals of management and it is necessary to develop simple methods to help communities make decisions on the quantity of fuelwood to be extracted.

Data regarding traded goods, such as sawlogs, sawn timber and charcoal would normally be more accurate than that for un-traded goods for subsistence use. However, it was noted that less than 10% of the wood removed from forests is recorded and documented in the appropriate way. Thus, the majority of the removals are not recorded and it becomes unwise to rely on data provided by the District forest service. The annual growth of each type of forest is provided in Table 2.

Leaf litter is perceived as an important product from the community forest and is used as manure, which is one of the major sources of soil nutrient in the hills of Uganda (Jacovelli and Cavalho, 1999; Scott, 1998). The participants perceived trees on private farmlands as an important reason for making the program successful, because it reduces the pressure on public forests in areas where most people are heavily dependent on forests for their daily supplies of forest products.

Participants strongly felt that taste of drinking water had improved, as it was clean and cooler after improvement of forest conditions and therefore, it needs to be considered as an indicator for the program's success. Some of the participants stated that clean and chill water had a better taste in drinking than unclean and warm water. Such water gives more satisfaction while drinking when someone is thirsty. They believed that improvement in the taste of drinking water meant improvement in water quality that might help to reduce water-related diseases in the area.

Demonstration factor has proved to be an important force in the spread of CFP. Ecological conditions, social factors, community dependence, political support and institutional arrangements could be attributed to the

large-scale spread of CFP, especially in states like West Bengal. The committees under CFP have the same structure and function as dictated by the central Government order. But the CFPs have a diverse structure as well as functioning modes. These systems have evolved over time in tune with the local socio-economic conditions. The selection procedure for example could be by consensus or election and the term of the members varies from one year to three years. However participation of women is minimal or nil in all of the committees.

The committees have unique sets of rules and regulations especially with regard to grazing and firewood collection. Grazing being considered as one of the dominant factors leading to degradation, the committees either have banned grazing in the initial three years or there is restricted grazing. This has adverse impacts for the landless and marginal farmers with livestock holdings who have no private source of biomass. The methods of protection are unique and it varies from social fencing to paid guards or patrol systems. In all places, first time offenders are warned and repeat offenders are fined. However in some villages, repeat offenders are socially boycotted and their goods as well as implements confiscated. The regulations on firewood collection are very strict as compared to those for NTFPS, except in some locations like Mt. Elgon National Park where there is controlled access to economically important species like Teak.

Sustainability of vegetation: It is difficult to suggest any standard prescription given the variation in vegetation type, precipitation, soil fertility, grazing and extraction pressure from location to location. Thus, Adaptive Forest Management (AFM) needs to be explored. For this purpose there is a need to promote participatory forest monitoring. Generally, the condition of community forests in Uganda varies considerably over a short distance therefore it is important to take account of this variation as much as possible to reduce the standard deviation of estimates of ecological criteria. Communities could be trained to monitor a few key parameters periodically through simple methods. Based on the analysis of parameters to assess the status of vegetation or impact of a practice, the communities could

Table 2: The annual growth of each type of forest

Land cover	Area (ha)	(%)	Stock ('000 ton)	(%)	Stock (t ha <sup>-1</sup> )	Growth (tha <sup>-1</sup> year)
Plantations (soft and hardwood)	35,000	0.2	4,000	1	114	16
Tropical high forest (intact and degraded)	924,000	5.0	164,000	35	177	15
Woodland	3,974,000	19.0	126,000	27	32	5
Total forest	4,933,000					
Bushland (low woods and farm fallow)	1,422,000	7.0	14,000	3	10	<1
Subsistence farmland	8,401,000	41.0	112,000	24	13	2
Other land*	5,709,000	28.0	48,000	10	8	0-1
Total land**	20,465,000	100.0	468,000	100		

\*: Grasslands, wetlands, commercial mono-crop (tea, sugar, tobacco), built up areas, rock; \*\*: Excluded water bodies of 3.69 m ha Source: National Biomass Study (2002)

Table 3: Vegetation type and condition categories for community forestry

Vegetation type	Condition class	Characteristics
Grassland	Degraded	Very sparse to sparse grass cover (<50%) Extensive exposed soils
	Stocked	Moderate to high grass cover (> 50%) Soil mostly covered with vegetation
Shrubland	Very degraded	Low stocking of shrubs (< 10,000 ha <sup>-1</sup> ) Very sparse crown cover (< 20%) Soils mostly covered with vegetation
	Degraded	Low stocking of shrubs (< 10,000 ha <sup>-1</sup> ) Sparse crown cover (20-50%) Soils mostly covered with vegetation
	Stocked	Moderate stocking of shrubs (> 10,000 ha <sup>-1</sup> ) Moderate crown cover (50-75%) Few or no seed trees present (< 100 ha <sup>-1</sup> )
Mixed forest	Fully stocked	Moderate stocking of shrubs (> 10,000 ha <sup>-1</sup> ) High crown cover (> 75%) Adequate seed trees present (> 100 ha <sup>-1</sup> )
	Very degraded	Very sparse crown cover (< 20%) Extensive exposed soils
	Degraded	Sparse crown cover (20-50%) Soils mostly covered with vegetation
	Stocked	Moderate crown cover (50-75%) High crown cover (> 75%)

modify their practice. For example, in Buginyanya village of Mt. Elgon National park, the vegetation is very dense with a closed canopy suppressing the grass growth. People could open up the canopy by pollarding or selective removal of trees.

The participants agreed to subdivide the forests into blocks based on major differences in vegetation type and forest condition, delineate the blocks on a sketch map using identifiable natural features and then estimated the area of each. These blocks became the basic unit for future monitoring. The recommended basis classification of community forests is outlined in Table 3.

### CONCLUSION

Access to fuelwood, fodder and timber, amount of community funds, greenery in the area and availability of water in the sources are commonly agreed indicators for measuring the success of CFP. In line with these, many other studies have reported access to fuelwood, fodder and timber, greenery development, amount of community funds, incidence of forest fires and water sources as indicators for the programs' success. There appears to be a congruency between the local people and the scientific communities on the listed indicators; hence indicating some commonalities between the emic and etic perspectives of success of CFP. Some indicators such as taste of drinking water, women's participation in forestry meetings, trees on private lands and use of compost are new indicators for measuring the success of CFP. Increase in number of trees on private lands and women's participation in forestry meetings are often reflected in the studies however, they are not used as indicators to measure the program's success.

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