Full Length Research Paper

Factors determining community participation in afforestation projects in River Nyando basin, Kenya

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Factors determining community participation in afforestation projects were investigated. Data was collected from 150 respondents who were selected from a sample population of 1,928 households using systematic random sampling technique. Data was collected using a standardized questionnaire, focus group discussions and key informant interviews. Chi-square (X^2) test was used to establish the relationship between community participation (dependent variable) and socio-cultural, economic and environmental factors (independent variables) and also to test the strength of the relationship. The results of the study indicated that there was a strong positive relationship between community participation and the benefits obtained from the afforestation projects (X^2 α 0.05 = 0.000). There was also a positive relationship between environmental degradation and community participation in the afforestation projects (X^2 α 0.05 = 0.001). However, there was no relationship between community participation and cultural factors (X^2 α 0.05 = 0.824). There was also no relationship between respondents' household status and community participation in the afforestation projects (X^2 α 0.05 = 0.156). The study concluded that for conservation projects to succeed, socio-economic benefits must be tangible to the project participants/ beneficiaries.

Key words: Community participation, afforestation projects, Nyando river basin, Kenya.

INTRODUCTION

Project approaches to development remain a vital instrument by development agencies to reach and assist poor communities in the developing world. Development interventions in the past have tended to focus on resource and knowledge transfer to beneficiary communities through the 'top-down' approach (FAO, 1991). Several decades of development funding have demonstrated the failures of the 'top-down' approach to reach and benefit the rural poor (Cernea and Ayse, 1997). This realization has led to the adoption of the 'bottom-up' approach to development. However, despite the recent upsurge in the 'bottom-up' approach to development, project beneficiaries are still not fully participating in the identification, planning, implementation and monitoring and evaluation of projects that are

meant to improve their lot (Blackman, 2003). Even when an element of 'participation' is built into projects, it is all too often largely in terms of local investment of labor and not in real decision-making. Beneficiary communities are only informed after plans have been made and that this is done through formal meetings where the officers justify their plans but modification is not considered (APO, 2002). Limited community participation in the implementation and management of projects means that the projects have few chances of sustainability (Rahmato, 1991). Lack of reliable data on effective community participation in development projects constitutes a major constraint to rural development practitioners such as policy-makers, planners and managers. This frequently leads to incorrect assessment of the development needs of rural people hence, making it difficult for governments and development agencies to properly measure progress achieved by development projects in improving livelihoods of rural communities (FAO, 1991; Karki, 2001). This often leads to poor performance of the projects

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and eventual failure. Recognizing the central role of communities in the project cycle, it is important for project donors/sponsors (Government, Private or Non-Governmental) to involve all stakeholders in the design and implementation of afforestation projects so as to ensure beneficiary ownership and also to instill virtues of accountability, transparency and sustainability. Active participation of beneficiaries in project design and implementation will also enable donors/sponsors to identify and address the factors leading to poor community participation in afforestation projects.

Poor community participation in afforestation projects, for instance, could be attributed to a number of socio-cultural, economic, and environmental factors. According to Victor and Bakare (2004), many people participate in afforestation activities if they are able or expect to get important livelihood sustaining products from the forests. A number of studies indicate that factors such as socio-economic benefits, age and education influence people's participation in afforestation projects. But more important, households participate in afforestation activities if they are able to get important livelihood sustaining products from the forests, example, fuelwood and fodder (Victor and Bakare, 2004; Maskey et al., 2003). Chowdhury (2004) argues that majority of farmers participate in afforestation projects because of anticipated economic benefits, environmental benefits and/or because of social status. He observes that poor socio-economic back-grounds of farmers in terms of occupation and level of income influences the extent of their participation in afforestation projects. He also observes that people's level of education influences their participation in afforestation projects.

Age is also one of the factors that have been observed to determine community participation in afforestation activities. While Victor and Bakare (2004) observe that most young farmers participate in afforestation activities because they are able to plant trees and harvest them within their lifetime, Maskey et al. (2003) argue that older people tend to participate more in afforestation activities than younger people because they are retired and have free time to participate in meetings. Maskey et al. (2003) further observe that landholding significantly determines community participation in forestry activities; the hypothesis being that wealthier people are more likely to participate in higher levels of environmental management and the assumption that they have to maintain their influen-tial status and perceive higher benefit with less opportunity cost of participation.

The objective of this study was to investigate the factors determining community participation in afforesta-tion projects in River Nyando basin. It was hypothesized that community participation in afforestation projects in River Nyando basin is significantly determined by anticipated benefits from the afforestation projects. Understanding factors determining community participa-tion in afforestation projects is important for planning and implementation of sustainable afforestation projects:

projects that are based on the needs of the beneficiaries.

MATERIALS AND METHODS

Study area

River Nyando basin is located in Western Kenya (Figure 1). It is situated between Lake Victoria to the West, Tinderet Hills to the East, Nandi escarpment to the North and Mau escarpment to the South. The basin is centered on the equator at $35°10'E$. Altitude varies from about 1000 m above mean sea level (AMSL) at Lake Victoria to over 2000 m AMSL in the uphill regions. The basin extends over an area of 3,600 km^2 and supports an estimated population of 800,000 people (Noordin and Bashir, 2000). Due to environmental degradation, the basin has been identified as one of the main sources of sediment into Lake Victoria. Sediment load from River Nyando is 423 tons/km^2 (Chin et al., 2000). As a result, local, regional and international organizations such as Homa Lime/Nyando Valley Development Trust, Western Kenya Integrated Environmental Management Project and Swedish Cooperative Centre-VI Agroforestry Project have initiated afforestation interventions to address this degradation.

Homa Lime/Nyando valley development trust

Homa Lime/Nyando valley development trust is a partnership between Homa Lime Company Limited and local farmers. Homa Lime/Nyando valley development trust is promoting tree growing and sustainable environmental activities within Nyando, Kericho and Nandi South Districts (Ouko, 2007).

The Swedish co-operative center-VI agro-forestry project

The Swedish Co-operative Center (SCC)-VI agro-forestry project is an international Swedish funded afforestation project with a vision of establishing a green belt of vegetation cover around Lake Victoria basin with small-scale holdings. SCC-VI agro-forestry's mission is to integrate agro-forestry within the farming systems of small farm holders in the Lake Victoria basin through increased fuelwood availability, increased food and nutritional security and increased incomes (Barklund, 2004).

Western Kenya integrated ecosystem management project

The Western Kenya Integrated Ecosystem Management Project (WKIEMP) is a regional World Bank/Government of Kenya funded project implemented in Nyando, Yala and Nzoia River basins. WKIEMP seeks to improve the productivity and sustainability of land use systems through adoption of an integrated ecosystem management approach. The project supports on-and off-farm conservation strategies through interventions focused on improving soil fertility, afforestation, agroforestry and introduction of value added cropping systems (Njuguna and Aore, 2004).

Sample and sampling procedure

The study population consisted of 1,928 households from which the researcher selected a sample of 193 respondents using the 10% procedure (Gay, 1981). However, the researchers interviewed 150 respondents instead of 193 because some of the respondents resided in the urban centres and were not fully engaged in farming

Figure 1. Location of River Nyando basin within the larger Lake Victoria basin.

activities and hence would not give valuable data. The researchers used systematic random sampling technique to select the respondents. Thus, the researchers selected one household randomly from among the first five households through the 'lottery technique' (Bless and Higson-Smith, 1995) and then selected the next and subsequent households based on the interval established.

Data collection

Data was collected using a standardized questionnaire, key informant interviews and focus group discussions. The questionnaire contained structured and unstructured questions. Structured questions were accompanied by a list of all possible

Table 1. Cross-tabulation of community participation and benefits obtained from the afforestation projects.

N=150	Nature of benefit obtained by beneficiaries			Total
Benefits from participation	Materials	Funds and materials	Other benefits	
Yes	123	2	13	138
No	8	0	4	12
Total	131	2	17	150

N = Total number of households.

Table 2. Cross-tabulation of major environmental problem and reason for planting trees.

N=150	Major reason for planting trees					Total
Environmental problem	Control erosion	Fuelwood production	Income generation	Home beautification	Other reason(s)	
Soil erosion	49	18	23	5	9	
Water pollution	3	3	10	4	3	
Deforestation	0	4	6	0	1	
Other problem(s)	0	3	7	1	1	
Total	52	28	46	10	14	150

N = Total number of households.

alternatives from which the respondents were able to select the answer that best described the situation. Where it was impossible to exhaust all categories, the study included a category 'other specify' to take care of those responses. In unstructured questions, the respondents were given the freedom of responses. The researchers used interview guides to collect data from 14, purposively, selected key informants. The researchers also conducted two focus group discussions with 30, purposively, selected community members using the following participatory rural appraisal (PRA) tools: Problem analysis, resource use and control, stakeholder analysis and group interviews. The PRA tools were used for triangulation of data collected using the standardized questionnaire.

Data analysis

Data analysis was done using descriptive statistics. The Chi-square (X^2) test was used to establish the relationship between community participation (dependent variable) and socio-cultural, economic and environmental factors (independent variables) and also to test the strength of the relationships between the independent and dependent variables.

RESULTS

Majority (N=138) of the respondents indicated that they participated in the afforestation projects because of anticipated project benefits. This was corroborated with information from key informants who also indicated that members of the local communities participated in the afforestation projects because of anticipated project benefits. Cross-tabulation between community participation and the benefits obtained from the afforestation projects indicated the existence of a relationship between

the two variables (X^2 α 0.05 = 0.000) (Table 1). Not only did the relationship between the two variables exist, but it was also strong and positive (X^2 measure of association = 0.628).

It was also observed that majority of respondents had planted trees in their farms to control soil erosion (Table 2). Cross-tabulation between major environmental problem experienced by the farmers and the reasons for planting trees revealed a relationship between the two variables (X^2 α 0.05 = 0.001). The relationship between the two variables was also found to be positive (X^2 measure of association = 0.468). However, the relationship was rather weak meaning that farmers had other reasons for planting trees, example, income generation and fuelwood production.

It was observed that culture did not determine community participation in the afforestation projects (Table 3). Cross-tabulation between cultural taboos on tree planting and community participation in the afforestation projects revealed no relationship between the two variables (X^2 α 0.05 = 0.824) and (X^2 measure of association = 0.068).

The researchers also carried out cross-tabulation between the respondent's household status and community participation in afforestation projects. The intention here was to find out whether the respondent's status in the household had any influence in their participation in the projects. Majority of the respondents indicated that their household status had not determined their participation in afforestation projects (Table 4). Cross-tabulation results indicated that there was no relationship between the two variables (X^2 α 0.05 = 0.156) and (X^2 measure of association = 0.344).

Table 3.Cross-tabulation of cultural taboos and community participation in afforestation projects.

N=150	Influence of cultural taboos on participation		Total
Cultural taboos	**Yes**	**No**	
Yes	5	53	58
No	7	85	92
Total	12	138	150

N = Total number of households.

Table 4. Cross-tabulation of respondent's household status and community participation.

N=150	Influence of respondents household status on participation		Total
Household status	**Yes**	**No**	
Household head (Male)	27	38	**65**
Household head (Female)	23	57	**80**
Household head child (Son)	0	4	**4**
Household head child (Daughter)	0	1	**1**
Total	50	100	150

N = Total number of households.

Table 5. Cross-tabulation of land tenure and community participation in afforestation projects.

N=150	Influence of land tenure on participation		Total
Land tenure	**Yes**	**No**	
Free hold	57	84	141
Communal	1	3	4
Trust land	1	1	2
Government	0	1	1
Other(s)	0	2	2
Total	59	91	150

N = Total number of households.

The study was also interested to find out whether land tenure determined community participation in the afforestation projects. Majority of the respondents indicated that land tenure had not determined their participation in afforestation projects (Table 5). Cross-tabulation results indicated that there was no relationship between the two variables (X^2 α 0.05 = 0.653) and (X^2 measure of association = 0.407).

Apart from the above variables, the researchers were also interested to find out whether age, level of education and size of land of the respondents had determined their participation in the afforestation projects. In relation to age, 78% of the respondents indicated that age had not determined their participation in the projects. About level of education, 79% of the respondents indicated that their level of education had not determined their participation in the projects. The sizes of the farms were also found to have no influence on their participation in the projects as indicated by majority (81%) of the respondents.

DISCUSSION

The results indicated that only two factors significantly determined community participation in afforestation projects in River Nyando basin, that is, benefit factor and environmental degradation. However, the benefit factor seemed to be overriding. The research findings agree with those of other researchers who have published on community participation in forestry. For example, a study carried out in Zathila and Betaga villages in Gazipur, Bangladesh, observed that majority (100%) of the respondents participated in social forestry projects because of anticipated benefits from the projects (Chowdhury, 2004). Similarly, a study carried out in Ludi-damgade, Nepal, observed that people participated in forest management because of anticipated benefits such as fuelwood and fodder (Maskey et al., (2003). A study in Ondo state, Nigeria, also observed that farmers participated in the Taungya afforestation system because

of benefit factor. Through the Taungya system, farmers were able to get important livelihood sustaining products from the forests hence, enhancing their continued participation (Victor and Bakare, 2004). A study by Jakariya (2000: unpublished MSc. Thesis) in India also observed that peoples' participation in water catchment projects was influenced by economic benefits. Unfortunately, Jakariya (2000) did not indicate which particular economic benefits influenced people's participation.

A study by Chowdhury (2004) in Zathila and Betaga villages in Gazipur, Bangladesh, observed that 69% of the respondents participated in social forestry because of anticipated environmental benefits. The current study's findings favorably compare with those of Chowdhury (2004) because it was also observed that 68% of respondents in River Nyando basin were participating in the projects because of the need to control soil erosion: a serious environmental problem in their locality. Thus, community participation and environmental degradation were strongly related ($X^2 \alpha$ 0.05 = 0.001). However, unlike the Bangladesh study which indicated that majority (100%) of respondents had planted trees for speculative reasons, only 15% of the respondents in the current study indicated they had planted trees for income generation. This supports the view that environmental degradation is a major concern in the River Nyando basin.

A study by Deji (2007) on local women's associations' participation in rural community development projects in Nigeria observed that provision of rewards to women's associations highly influenced their participation in development projects. Deji (2007) recommended that self-help efforts should be mobilized and encouraged through award of rewards for active beneficiary participation. Deji (2007) claimed that this would enhance sustainable development at the community level. Unlike Deji (2007) who recommended that participation should be encouraged through rewards, the current study argues that participation in project activities should not be pegged on rewards but rather on beneficiaries' self-initiative, which should arise out of a genuinely identified problem, and only aided with external facilitation. The current study argues that encouraging rewards for participation would encourage the dependency syndrome characteristic of most rural communities and which is not conducive for project sustainability.

While a study on community participation in social forestry in Zathila and Betaga villages in Gazipur, Bangladesh, by Chowdhury (2004) found out that people's level of education influenced their participation in forestry projects, and while a study on community participation in projects in India by Jakariya (2000), similarly, observed that peoples' participation was influenced by educational level, the current study's observation was that education did not determine community participation in afforestation projects. The difference between the research findings and those of

Chowdhury (2004) and Jakariya (2000) could be due to the fact that the studies were carried out in different socio-cultural settings.

Unlike a study in Ludi-damgade, Nepal, which revealed that landholding was positive and statistically significant (Maskey et al., 2003), the current study observed that there was no relationship between land tenure and community participation in the afforestation projects ($X^2 \alpha$ 0.05 = 0.653) and (X^2 measure of association = 0.407). However, unlike Maskey et al. (2003), the researchers attempted to find out whether household land size determined community participation. Majority (81%) of the respondents indicated that the sizes of their farms did not determine their participation in afforestation projects.

The current study observed that age did not determine community participation in afforestation projects. This finding, however, contrasts with that of Maskey et al. (2003) on a study in Ludi-damgade, Nepal. Maskey et al. (2003) observed that older people tended to participate more in the community forestry programmes than younger people. This was attributed to the fact that older people were retired and had free time to participate in meetings. A study in Ondo state, Nigeria, also observed that most farmers within the (35 to 54) years age bracket participated more in the Taungya forestry system than other categories because they were able to plant trees and harvest them within their lifespan (Victor and Bakare, 2004). The difference in findings between the current study and, particularly, those of Maskey et al. (2003) could be due to the fact that the inhabitants of River Nyando basin are peasant farmers and agriculture is just about the only source of their livelihood. This may not be the case with Nepal where many people could be in salaried employment and/or business hence, the reason why it was observed that older people were retired and had free time to participate in project meetings.

Conclusion

The findings indicated that there was a strong positive relationship between community participation and the benefits farmers obtained from the afforestation projects. The results also indicated that there was a positive relationship between community participation in afforestation projects and environmental degradation. However, the relationship between the two variables was rather weak meaning that, apart from environmental degradation, there were other reasons for community participation, example, planting trees for income generation and fuelwood production. Factors such as culture, land tenure and household status did not determine community participation in the afforestation projects. It was concluded that anticipated benefits from the afforestation projects strongly determined community participation in the projects. This is a sad scenario because if the benefits are withdrawn, the farmers may

not be able to sustain the afforestation projects.

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