ATTITUDES OF LOCAL COMMUNITIES TOWARDS REDD+ INITIATIVES IN TANZANIA. A CASE OF SELECTED COMMUNITIES IN KILWA DISTRICT

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Abstract

Climate change has turned to be a global issue which is no longer a concern of the environmental sector alone, but a cross- cutting and a multidisciplinary issue due to its economic, social, and ecological impacts to the global community, including smallholder farmers in low-income countries. While industrial development is acknowledged to have significant contribution to anthropogenic greenhouse emissions, 25% of all anthropogenic GHG emissions responsible for climate change come from deforestation and forest degradation. Thus reducing emissions from deforestation and forest degradation (REDD+) is important intervention that is necessary for sustainable reduction of emission and enhancement sink capacity using efforts manned by local communities. However, the extent to which local communities are aware of climate change and its impacts have not been studies in REDD+ project areas in Tanzania. A study was therefore conducted in Kilwa District to assess the community awareness and attitude towards REDD+ initiatives, with a particular focus on their willingness to participate in the implementation of REDD+. Data collection was done using both

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structured and semi-structured interviews. A Logistic regression model was used to determine factors influencing willingness to participate while Cross- tabulation and Likert scale were used to determine the level of awareness and attitudes between different sub- samples. Results indicate that 76% of local communities are aware of impacts of climate change but only 44.5% were aware of the REDD+ objectives and its potential benefits. The level of community awareness has a significant influence (p=0.000) on willingness to participate in REDD+ implementation. Other factors include: Attitude, Income and land size. The study concludes that, community's willingness to participate in REDD+ activities is influenced by many factors but to the greatest extent by awareness. It is recommended that, creation of a proper awareness of the REDD+ objectives to the participating communities is highly need.

Key words: REDD+, Community attitudes, Tanzania

Introduction

Reducing emissions from deforestation and forest degradation (REDD+) is considered to be an important intervention that is necessary for sustainable reduction of emission (Huberman, 2007; Hall, 2008; Oestreicher *et al*., 2009). Due to concerns over negative socioeconomic consequences of REDD+ projects (St-Laurent et al., 2013) the international community has called attention to the requirements for free, prior, and informed consent (FPIC) (defined as "the establishment of conditions under which people exercise their fundamental right to negotiate the terms of externally imposed policies, programs, and activities that directly affect their livelihoods or wellbeing and to give or withhold their consent to them ([Anderson, 2011]") of all relevant local REDD+ actors. Therefore, community participation is one of the critical components of success of REDD+ objectives (Howlett and Nagu, 2001; Ratsimbazafy *et al*., 2012). For many years tropical countries have been struggling to conserve their forests, but unfortunately most of these approaches have been protectionist oriented and are characterized by extensive state control, without involvement of the local people. The community exclusion from decision making has resulted into the persistence and even worsen of the deforestation and forest degradation problem in these countries in recent years (Hamza, 2007; Epps and Benbow, 2007; Guthiga, 2008). REDD+ initiative which is an incentive- based approach is expected to generate substantial benefits in reduction of greenhouse gas emissions, biodiversity conservation, poverty

reduction and strengthening indigenous people rights (Van der Werf, *et al.*, 2009; Angelsen, 2008). The focus of the REDD+ project is community involvement in the implementation of the project. However, for local communities to participate effectively in REDD+ activities, they must have a positive attitude towards the project (Mehta and Heinen, 2001). Recent studies on community attitudes indicate that, attitude is influenced by many factors including economic improvement, perceived or felt real benefits of the project, dependency on forest resource, and socio-economic factors such as; distance from the forest, farm size, membership in social groups and livestock ownership (Mehta and Heinen, 2001; Baranzin *et al.*, 2007; Epps and Bonbon, 2007; Guthiga, 2008; (Ratsimbazafy *et al.*, 2012). However, limited literature is available on awareness as an important component of attitude and that both have a reciprocal relationship with the community's willingness to participate in the implementation of the project. For example, previous surveys on willingness-to-pay conducted in Europe, the United States and Japan have confirmed that there is indeed a significant interest in the conservation of biodiversity from outside the tropics (Kramer and Mercer, 1997; Horton *et al.* 2003; Baranzini *et al.*, 2007). Although these studies have showed promising figures for public interest in developed countries for financing the conservation of tropical forests through REDD+, information on public attitudes, awareness and Willingness to participate towards biodiversity conservation through REDD+ in developing countries and particularly Tanzania is still limited. A study was therefore conducted in Kilwa District to assess the community awareness and attitude towards REDD+ initiatives, with a particular focus on their willingness to participate in the implementation of REDD+.

The main purpose of the study was to assess the level of community awareness and attitude towards the existing forest conservation initiatives including REDD+ and determine the willingness of the local communities to participate in REDD+ projects (REDD+ acceptance). The study was guided by the argument that, willingness to participate in the implementation of REDD+ activities is linked to awareness of the local people about the objectives of the project and the perceived or felt benefits that would be accrued to them as a result of their implementation of the project, their attitude towards the project and the socio-economic and demographic characteristics of the local people. The study intends to provide a way forward for formulating future strategies for addressing the challenges of REDD+ as it is expected to

contribute an information base which is urgently needed and which can be translated into effective policy tools.

Methodology

Description of the study area

The study was conducted in Kilwa District where by four villages were sampled for data collection. These villages were Mandawa, Mchakama, Mtandi and Mavuji. The District is located in Lindi Region in southern Tanzania. It lies on latitude $8^0$20 to $9^0$56 and longitude $38^0$36 to $39^0$50 east of Greenwich, with a total area of 13 347.50 Km^2 of which 12 125.9 Km^2 is surface land while 1 221.52 Km^2 is occupied by the Indian Ocean. Kilwa has a total vegetation cover of about 1 334 750 ha, of which only 207 590 ha (15.6%) of the total area is designated forest reserves, including the Serous National Game Reserve. The rate of deforestation is high despite the wide range of the vegetation cover. The annual rate of deforestation is estimated to be 1600m^3. The deforestation drivers include charcoal demand; expansion of subsistence and commercial agriculture; uncontrolled fires and illegal logging (Campese, 2010). Farming is the main economic activity engaging about 81% of the total labours force. Major crops grown are coconuts, cashew nuts and sesame, sorghum, cassava, rice, sweet potatoes and cowpeas. A few people are engaged in off-farm activities such as petty cash trade, carpentry, fishing and some are either government or private employed.The per capital income of Kilwa residents is 150 000 TZs (District Profile, 2007). This demonstrates a high poverty level of the residents in the area.

Sampling procedure

The study used purposive sampling technique to select one ward, four villages, key informants and Focused Group Discussion members. The selected villages included two villages implementing REDD+ project (REDD+ villages) which were Mandawa and Mchakama and two Non-REDD+ villages considered as control. These were Mtandi and Mavuji villages. All villages were sampled from Mandawa ward. Selection of villages from one ward was based on the existence of the REDD+ project in two villages and the near future plan of implementing REDD+ project in the other two villages. A total of 200 respondents were selected from the four villages by simple random selection from the village registries (50 respondents from each village).

Data collection

Data were collected using questionnaire survey, Focused Group Discussions (FGDs) and Key informants interviews. The questionnaire was administered to assess community awareness of deforestation and its impacts and investigate the willingness to participate to conserve their forests. Eight FGDs were conducted in all villages, each comprised of 10 members. The study also involved interviews with 14 key informants. A household was used as the unit of analysis.

Data analysis

Data from FGDs and key informants were analyzed using content analysis techniques and Pair wise ranking. Cross- tabulation was used to determine relationships between variables such as the relationship between attitude and demographic variables including age, sex, marital status and socio- economic variables such as income, education level occupation and land ownership. A Likert Scale was used to gauge views of respondents on the biodiversity conservation through State-based and REDD+ initiatives. Finally a Logistic regression model was used to determine factors influencing respondents' willingness to participate in the implementation of REDD+ activities (as a Dependent variable) and awareness, attitude and the demographic and socio-economic variables (as independent variables). A logistic model in this case was developed and a number of factors (income, land size, occupation, marital status, sex, education level and age) were modelled against the dependent variable (if the respondent was willing to participate). A $p \leq 0.05$ was considered statistically significant. The model is presented in the following equation:

$$Z = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Whereby;

$$Z = \begin{cases} 1 & \text{if the respondent is willing} \\ 0 & \text{if the respondent is not willing} \end{cases}$$

β = coefficients for the independent variables

Results and discussion

Characteristics of respondents

The characteristics of respondents included main socio- economic and demographic characteristics. The parameters for demographic characteristics assessed included age, sex, and marital status, while socio-economic characteristics included income level, education level, land size and the main occupation of the respondents. These parameters provided the general overview of the respondents' composition for possible association on their influence towards REDD+ and the willingness to participate in the implementation of REDD+ initiatives. Results showed that 68% of the interviewed respondents were men with the rest being females. The results further indicated that, nearly half 49.5% of the respondents were between 31 and 50 years of age which is the most productive age group (Table 1). The table also indicates a small variation in household income. About half (53%) of the respondents generate income below TZS 50 000 per month, which means they live below 1 US$ per day while only 4.5% generates income above TZS 300 000 per month. The average household income was TZS 225 192 per year. Those data are relatively higher compared to aggregated data from the Kilwa District Socio-economic Profile of 2007 which reports an average household income of about TZS 150 000 per year. However, both data are lower than the World Bank records of 2004 in which the Tanzanian Per Capita average was US$330 which is about TZS 390 000 per year. The study revealed a reasonable literate rate in the area in which 61.5% of respondents had attained primary education whereas 18% had no formal education, 13% had completed secondary school education while 7.5% attained college education (Table 1). The findings therefore suggest that majority of the community members had basic education. Farming was the main economic activity in which 71.5% of respondents engaged direct in subsistence agriculture while 13% engaged in both farming and business making a total of 84.5% of respondents at least engaging in agriculture. This conforms to the PHDR (2009) which asserts that, agriculture as the mainstay of the Tanzania national economy employs more than 80% of the population.

Table1. Demographic and socio-economic characteristics of respondents

	Characteristics	Mandawa	Mchakama	Mtandi	Mavuji	df	X^2
Age	≤ 30	14	16	8	12	9	0.637
	31-40	13	10	13	15		
	41-50	12	11	16	9		
	>50	11	13	13	14		
Sex	Male	32	29	32	43	3	0.017
	Female	18	21	18	7		
Income	<50,000	37	26	21	23	12	0.024
	50000-100000	9	11	15	17		
	101000-200000	2	7	4	7		
	201000-300000	2	4	4	2		
	>300000	0	2	6	1		
Number of year at school	0	7	11	5	13	15	0.051
	7	36	31	31	25		
	12	7	6	8	5		
	14	0	2	6	7		
Occupation	Farming	41	35	27	37	9	0.003
	Farming and business	3	11	12	5		
	Business	3	1	6	4		
	Wage employment	3	3	5	4		
Land size	<5 ha	30	20	34	25	12	0.001
	5-10	18	15	15	16		
	11-16	2	6	1	6		
	17-22	0	3	0	3		
	>22	0	6	0	0		

Community awareness of the deforestation problem and the forest conservation initiatives

Respondents' Awareness on Deforestation

Results showed that there were relatively high level of awareness of deforestation and its impact on the environment in all four villages (Table 2). However, the general assessment showed that the awareness differed slightly between villages.

Table 2: Awareness of local people towards deforestation

		Name of the village of the respondent				
		Mandawa	**Mchakama**	**Mtandi**	**Mavuji**	**Total**
	Aware	41(82%)	48(96%)	49(98%)	45(90%)	183(91.5%)
	Not aware	9(18%)	2(4%)	1(2%)	5(10%)	17(8.5%)
Total		**50**	**50**	**50**	**50**	**200 (100%)**

$\chi^2 = 0.012$ df = 6

91.5% of the interviewed respondents affirmed that they aware of deforestation and its impact on the environment (Table 2). The findings from this study conform to the findings by Baranzin *et al.* (2007) who recorded a high level of awareness on deforestation in developing countries. Similarly FAO (2012) report recorded a generally high awareness of the changing climate among the respondents from Africa and NGOs, whereby 91% of studied communities agreed to have noticed changes over the last few decades. Results further showed that a good proportion of the respondents know the role of forests in regulating environmental variables (Table 3). The main perceived contribution was the protection of the water sources while reduction of carbon emissions was ranked as the least important contribution of forests. However, studies have shown that different communities perceive or prioritise the role of forests differently depending on their geographical positions which may be attested by their interactions. For example, a study by Baranzin *et al.* (2007) showed that communities in industrialised countries ranked carbon storage as the most important contribution of tropical forests to the environment. It was further learned that the communities in the study area finds preservation of biodiversity and support to local communities livelihoods was the third most ranked contribution of forests. This implies that the forest communities in industrialized countries value the contribution of forests concomitantly with the REDD+ objectives which are reduction of carbon emissions, protection of biodiversity and reduction of poverty in local communities (Angelsen, 2008).

Table 3: Contribution of Forests on Climate change Mitigation

Contribution	Frequency	Percent
Rainfall formation	113	56.5
Reduce carbon emissions,	5	2.5
Biodiversity conservation	7	3.5
Access to non-timber products	16	8.0
Increase income from tourism	16	8.0
Create employment	14	7.0
Protects water sources	193	96.5
Have grazing land	18	9.0
Prevent desertification,	187	93.5
We get income forest products	115	57.5

Respondents' awareness on existing forest conservation initiatives in their area

Results showed that, the local communities were aware of the existing biodiversity conservation initiatives taking place in their area. The most known to majority were the state-based forest protection (Serous National Game Reserve), the Participatory Forest Management and the REDD+ project (Fig 1). However majority of them perceived these initiatives as eternally imposed. For instance 100% of the interviewed respondents asserted that they were not involved in the formulation of rules which restrict their access to the state protected forest while 67% were not involved in the formulation of the REDD+ project. On the other hand the communities showed not to be much affected with those rules as there were plenty of forests which are not under the state protection or the REDD+ project (open access forests). This is likely to increase the leakage effect as previously cautioned by Angelsen (2008), that communities may leave the forests under REDD+ project and cause deforestation in places which are not under the project.

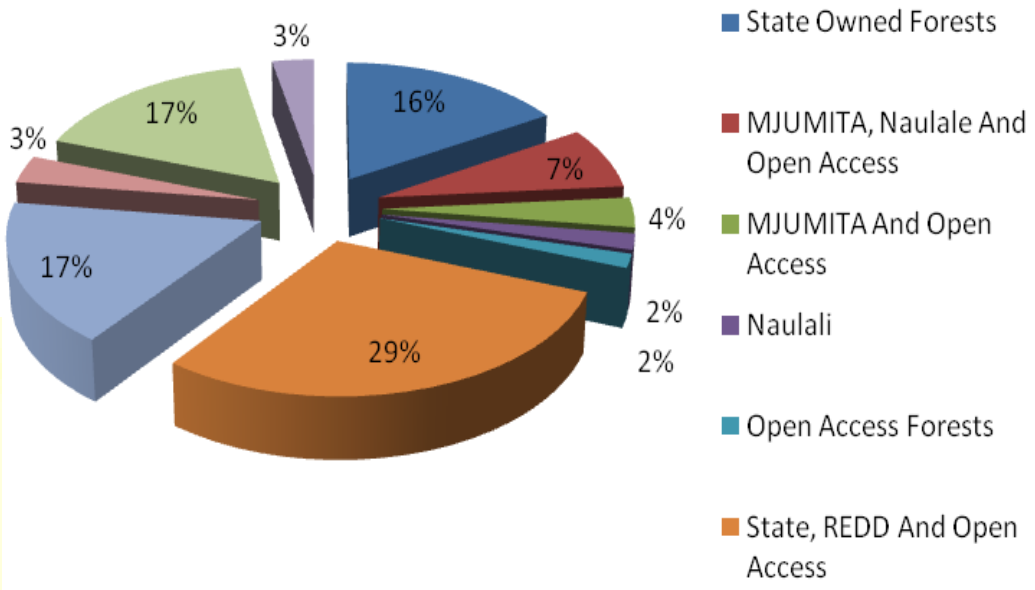

Figure 1.Types of forests found in Kilwa District

Community awareness on REDD project

Findings from the study revealed that, awareness on REDD+ project differed significantly ($p = 0.000$) among communities in different villages with the highest level (43.8%) in Mchakama village and least level (6.7%) in Mtandi village (Table 4). It was learnt from the study that, REDD+ awareness rising was not sufficiently and unequally done, leading to differences in awareness among individuals in different villages (Table 4).

Table 4: Respondents' awareness about REDD+

Description	Mandawa	Mchakama	Mtandi	Mavuji	Total
Aware	14	39	6	31	89
Not aware	36	11	44	19	111
Total	50	50	50	50	200

$\chi^2 = 0.000$

The means through which the information was transferred (channel) had a significant contribution to the precision of the information. Fig. 2 shows that village meetings were the major means used to convey the information about REDD+ initiatives to the local people in the

area. Other means included radio, television, trainings/ seminars and workshops, news paper/magazines, leaflets, posters, drama/dances and concerts. These were rarely done and to some villages they were not done, financial problems were the major obstacle reported by the project coordinator.

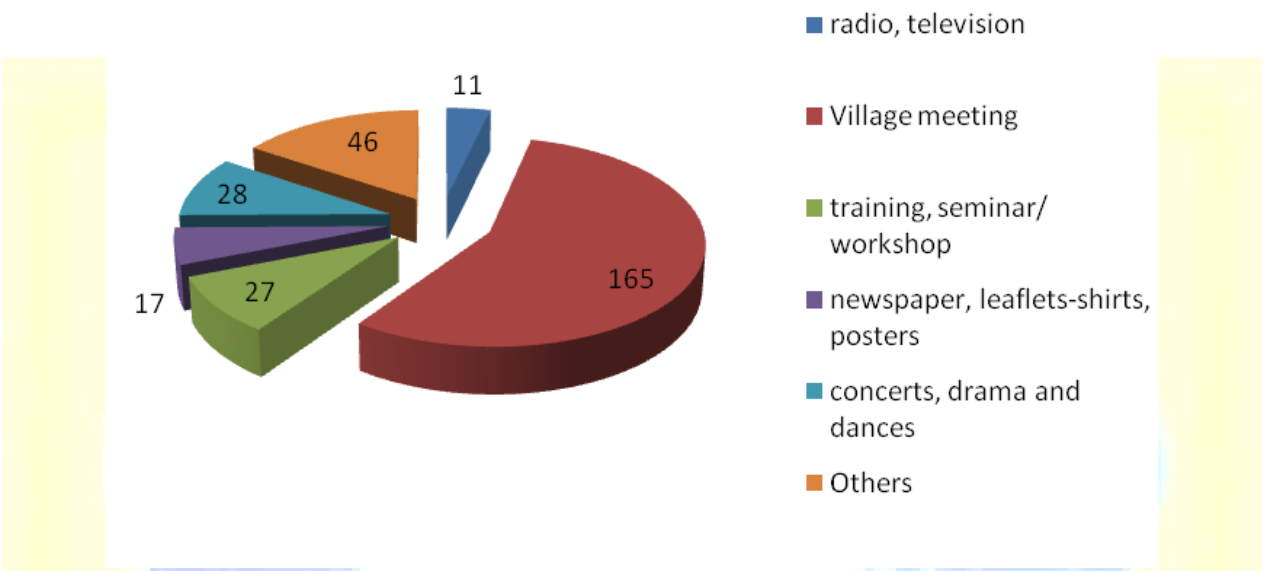

Figure 2: Means by which Respondents got information about REDD

However findings show that, trainings and seminars/workshops had a greatest potential on awareness rising among the communities. A small proportion of respondents had a correct definition of REDD+. Those respondents acknowledged attending trainings and seminars/workshops while majority who perceived REDD+ as a project which would completely burn the use of forests indicated to receive information from village meetings, radio and television. The findings further indicated that, awareness about REDD+ had a greater influence on a person's attitude towards REDD+. For example a large proportion (69.7%) of respondents who were aware of the project objectives had positive attitude towards REDD+, while 90.9% of respondents who were not aware of the project had negative attitude towards the project (Table 5). These findings conforms to the findings by Cameron and Englin (1996) and Nunes & Bergh (2001) who assert that, previous levels of awareness and information on the issue at hand have a significant influence on the public attitudes and perceptions on that issue. Other reasons for the negative attitude towards REDD+ include; too much dependency on the forest, the question of

the permanence of payments, inequality in distribution of benefits, poor community involvement in formulation of rules that govern the utilization of the forest resources, corruption, poor conflict resolution mechanism and the poor management and coordination of the conservation activities.

Table 5: Influence of Awareness on Respondents' Attitude towards REDD+ Initiatives

Awareness on REDD+	**Attitude towards REDD+**		
	Positive	**Negative**	**Total**
Aware	62	27	89
Not aware	10	101	111
Total	**72**	**128**	**200**

$\chi^2 = 0.000$

Community motives towards REDD acceptance

Compensation by payments revived more attention by respondents whore were ready to stop clearing forest land for agriculture/stop harvesting wood resources from the forest than other types of compensation (Table 6). Conversely, 85.5% or interviewed respondents preferred compensation by payments over other types. It was learnt from the study that, due to lack of alternatives local communities in the study area do not attach environmental conservation as part of their cotangential responsibility unlike in the industrial developed communities who feel a responsibility for ecosystem services payments.

Table 6: Pair Wise Ranking of Types of Compensation

	Payment	**Employment**	**Social Services**	**Livelihoods**	**Scores**	**Grade**
Payments	X	Payments	Payments	Payments	4	1
S/Services		X	S/Services	S/Services	3	2
Employments			X	Employments	2	3
Livelihoods				X	1	4

However, compensation was limited to some uses of the forest resources. For example most of respondents (94%) disagreed with the commitment of stopping harvesting fire wood as it is the main source of energy for cooking in majority (98.5%) of respondents' households and charcoal production as a source of income among youth in the area. The observation is inconformity with findings by Campese (2007) which indicate that, the exploitation of forest resource is primarily

for fuel, building, agriculture and Logging which is becoming widespread following the flourishing market of timber within and outside the country and the fewer prospects in income generation offered by agriculture. These are perceived as instrumental in forcing the youths to look into logging and charcoal production as an alternative employment opportunity. Management of the funds for carbon offset payments for the preservation of the forests was one of the key issues of concern of the communities. NGOs were preferred by majority (65%) of the intervened responds over the Village Governments and the Village natural resource committees (VNRCs) (Fig 3). The major reasons given for the choice of NGOs included; trustworthy, commitment, capacity to solicit funds and the ability to control corruption.

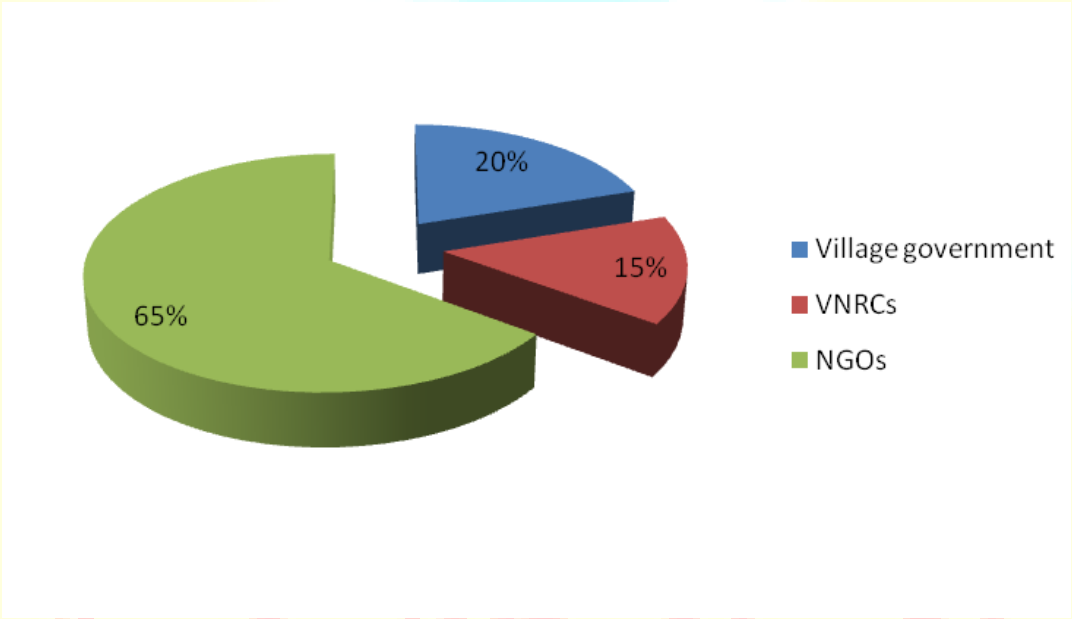

Figure 3: Management of Funds for carbon offset payments

The findings imply that, good governance is perceived to be important in the forest conservation and management. Similarly Huettner (2012) reports that, majority of stakeholders viewed governance challenges as the largest risks to REDD+ implementation.

Logistic regression model

In this analysis, the dependent variable (willingness to participate) was modelled against independent variables indicated in Table 7.

Table7. Logistic regression results for factors influencing willing participate in REDD+ activities

Variable	B	S.E.	Wald	df	Sig.	Exp(B)
Sex	-.505	.535	.892	1	.345	.604
Age	-.014	.024	.375	1	.540	.986
Education	-.391	.398	.963	1	.326	.676
Occupation	-1.379	.743	3.449	1	.063	.252
Type of business	-.018	.015	1.392	1	.238	.982
Income	-.238	.286	.696	1	.404	.788
Land size	-.069	.059	1.370	1	.242	.933
Marital status	1.241	.464	7.155	1	.007	3.458
Awareness	3.686	.557	43.825	1	.000	39.870
Attitude	.117	.055	4.566	1	.033	1.124
Constant	-1.064	3.624	.086	1	.769	.345

-2 log likelihood = 129.518; Cox & Snell R2 = 0. 480; Nagelkerke R2 = 0. 659;

The 'P- value' was used to check whether the independent variables were significant. Results show that three independent variables (marital status, awareness and attitude) were found to be significant at $p \leq 0.007$ $p \leq 0.000$ and $p \leq 0.033$ respectively. The findings imply that the positive signs attached to the estimated coefficients of the variables indicate that, the greater the values of these variables the higher the willingness to participate in the implementation of REDD+ activities. The negative signs indicate that the greater the value of the variable the lower the probability of a respondent to be willing to participate in the implementation of the REDD+ activities. Therefore, from the regression analysis, it is concluded that willingness to participate in the implementation of REDD+ activities was influenced by marital status, awareness and attitude towards the project. Generally variables such as income, land size owned, age and education would be expected to have an influence on Willingness to participate however, they showed controversy results. Therefore empirical work is required to assess the impact of such variables on respondents' willingness to participate (WTP). These variables would definitely have to be included in a multivariate analysis to be able to draw conclusions about their influence on WTP.

Conclusions and Recommendations

Local communities have a high level of awareness on the deforestation problem, its impact and the contribution of forests to the climate change. Data from the study indicate that, a large proportion of local people in the study area had negative attitude towards REDD+ initiatives recommended as a solution to deforestation. Reasons given included the high community dependence on forest resources, lack of proper information about the key objectives of the REDD+ project and the benefits that would be accrued as a result of its effective implementation, issues of governance, and the permanence of the payments. Awareness and attitude towards REDD+ had a greater influence on the respondents' willingness to participate in the implementation of the REDD+ activities. Most of the respondents who were aware of the REDD+ objectives indicated a positive attitude towards REDD+ and also they were participating or willing to participate in the implementation of REDD+ activities. Efforts should be directed towards educating and sensitizing community members about the objectives and the potential benefits of REDD+ activities and also more skills on land use plan specifically the use of modern farming methods as the local farming methods results to low production and they need more land. This will enhance their participation in implementation of the REDD+ activities. Secondly, capacity building should be done to the VNRCs members so as to create active and empowered environmental committees for purposes of enhancing participation at lower levels. Lastly, structural and governance circumstances such as land tenure security and enforcement as well as corruption reduction should be ensured in the implementation of REDD+ activities. This would lead to success in poverty reduction and enhance community trust on the project management activities.

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