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Assessment of Community Participation in Forest Resources Management in Afi and Mbe Mountains, Cross River State, Nigeria

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Abstract: *This study examined the participation of adjoining communities in forest management activities in Afi and Mbe mountains in Cross River State towards the conservation of forest resources in the area. A semi-structured questionnaire was used to obtain data from 392 household heads and 88 key stakeholders involving community chiefs, leaders of associations, women and youth groups in Afi and Mbe mountains. Data collected was analyzed using descriptive likert scale rating and inferential statistics. Atleast 97.1% of the respondents in both communities were fully aware of forest benefits except in enhancing soil fertility for farmlands which 97% were ignorant. There was good participation in forest management practices in both communities except in afforestation which was embraced 100% in Afi due to the land degradation effects of a landslide but 75.2% of Mbe people refrained as the community-based approach supported protection to forest resources. The bottom-up community-based forest management approach in Mbe mountain supported a higher degree of participation (1.0) in all stages of participation while the Government-owned top-down management strategy in Afi affected community participation in planning(0.68), implementation (0.58) and monitoring (0.61). Good gender involvement existed in both communities as women were involved in planning, implementation and monitoring of forest management activities. The study recommends continued awareness, provision of alternative livelihoods and local infrastructure by public and private sector organizations to improve livelihoods and reduce pressure on forest resources.*

Keywords: *community participation, forest resources management, adjourning communities, Afi and Mbe mountains*

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I. Introduction

Community participation connotes the involvement of local people in decision making processes involving the management of forest resources within their area of abode (Enuameh-Agbolosoo *et al*., 2015). Dalton (2008) defined participation as the ability of people to share, influence, control, design, partake in decision-making and authority in development projects and programs that affect their lives and resources. The integration of people's preferences and expectations in the decision making process is a important aspect of sustainable natural resources management (De Meo *et al*., 2015), thus increasing the social acceptance of the decisions and reducing conflict among users (Beierle 1998, Kangas *et al*.,2006). According to FAO (2015), participation of rural communities in forest resources management is necessary to ensure the sustainable maintenance of the resources. Indigenous people and their communities have a vital role in environmental management and development because of their traditional knowledge and practices (UNCED, 1992). The involvement of rural residents who are closer to the natural resources enclaves is important as Forestry Departments, have limited financial and human resources to ensure sustainable use of several hectares of land under their sole jurisdiction (Enuameh-Agbolosoo *et al*., 2015). Osumba (2011) adds that community participation could enhance sustainable use of forest resources, support the establishment of community forestry associations and protect the traditional interests of local communities customarily resident in and around forests. Forest management initiatives in Nigeria vary from one state to another (Ogar, 2001). In Cross River State, Cross River State Forestry Commission (CRSFC) has taken the initiative to institutionalize participatory forest management and community forestry as a sustainable forest management option in Boki and other Local Government Areas (Takon and Titus, 2013). This study therefore assessed the involvement of adjourning local residents in the management of Afi and Mbe mountains in Cross River State, Nigeria.

II. Methodology

2.1 Study Area

The Afi-Mbe landscape in Boki Local Government Area of Cross River State, Nigeria lies between latitudes 06°10'N and 06°30'N and longitudes 08°50'E and 09°30E and covers an area of approximately 180,531 ha (Lateef *et al*, 2015). The Afi and Mbe mountains forest falls within the tropical high forest vegetation zone. The entire area falls within a broad annual rainfall zone of 3,000mm - 3,800mm (Agbor, 2003). Rainy season starts around late March/early April to September and the dry season from October to March, with a mean monthly maximum temperature ranging from 22.2^0C to 27.4^0C (Edet, 2010). Afi mountains is surrounded by 16 communities(Fig.1) with a population of approximately 27,000 people and managed by the Cross River State Forestry Commission with support from Wildlife Conservation Society and other partners such as the North Carolina Zoo and Pandrillus (WCS, 2016).

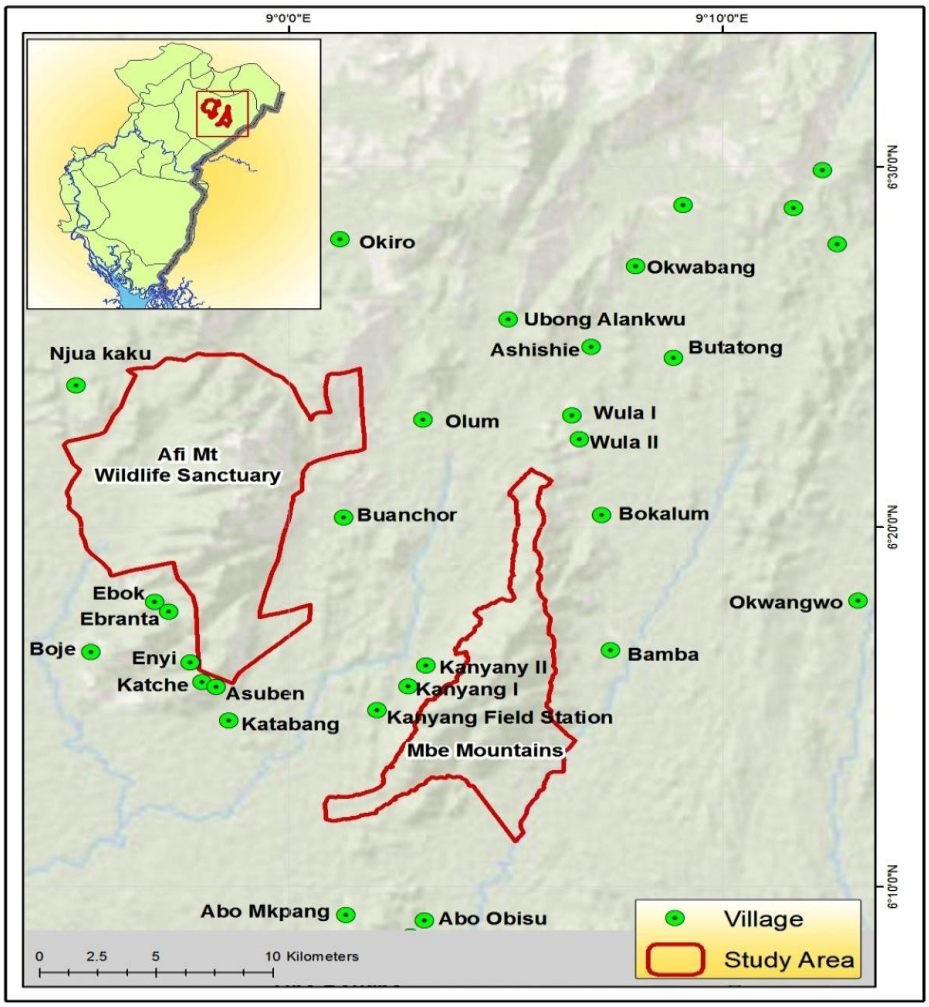

Fig.1: Map of adjoining communities around Afi and Mbe mountains, Cross River State

Mbe mountains constitute an important habitat corridor between the Afi mountains to the West and the Okwangwo Division of Cross River National Park to the East. Since 2007, the Mbe mountain, owned and by nine (9) communities (Fig.1) have been managed by the Conservation Association of the Mbe Mountains (CAMM), with support from the Wildlife Conservation Society (WCS) and the Cross River State Forestry Commission (WCS, 2016). The Afi and Mbe mountains are inhabited by notable endemic and endangered wildlife species. These include the Cross River gorilla (*Gorilla gorilla diehli*), chimpanzee (*Pan troglodytes vellorosus*) and drills (*Mandrillus leucophaeus*) (Edet *et al.,* 2012; Edet, 2011). The Afi mountain forest also habours the world's largest roosting site for migrating European barn swallows (*Hirundo rustica*), and also an important nesting site for the rare bare-necked rock fowl (*Picarthertes oreas*) (Edet, 2010). The target population for the study was the adjoining communities in Afi and Mbe Mountains, purposively selected based on the proximity of communities to the mountains as shown in Table 1 below.

Table1: Selection of study communities around Afi and Mbe mountains, Cross River State

Group	Community	Selection based on proximity to forest mountains	GPS Coordinates
Afi North	Bitiah	Esekwe	N06^0 46' E08^0 98'
	Kakwagon	Ndemenchang	N06^0 46' E08^0 99'
	Nkanya		
	Kakubok Esekwe Ndemenchang		
Afi West	Ebok	Ebok	N06^0 35' E08^0 95'
	Ebranta	Ebranta	N06^0 21' E08^0 79'
	Njua Kaku		
Afi South	Asuben	Enyi	N06^0 27' E08^0 92'
	Enyi	Katche	N06^0 25' E08^0 93'
	Katche		
Afi East	Katabang	Olum	N06^0 37' E09^0 04'
	Olum	Buanchor	N06^0 33' E09^0 00'
	Buanchor		
Mbe East	Bamba	Bamba	N06^0 27' E09^0 12'
	Bokalum		
Mbe North	Wula II	Wulla II	N06^0 37' E09^0 11'
	Wula I		
Mbe West	Kanyang II	Kanyang II	N06^0 27' E09^0 05'
	Kanyang I		
Mbe South	Abo Ogbagantie	Abo Mkpang	N06^0 15' E09^0 05'
	Abo O|bisu		
	Abo Mkpang		

2.2 Sampling Techniques

The study data was collected using a multi-stage sampling technique involving selection of household heads and key stakeholders involving community chiefs, leaders of associations, women and youth groups in Afi and Mbe mountains. Fifty percent of adjourning communities were purposively selected based on their closeness to reserve boundary. According to Obua (2006), local communities living within a range of five (5) kilometers from forest boundary directly affects or were affected by the forest and its state of control affected attitude towards management of the forest resource.

A semi-structured questionnaire, modified from Ajake and Anyandike (2012) was administered to household heads and key stakeholders (community chiefs, leaders of associations, women and youth groups) to elicit information on participation of community members in the management of the forests. A systematic sampling of household heads was adopted due to the linear fashion of households in the selected communities. The first household in a community was picked and followed by every third household until the total number of respondents per community was exhausted. Data collected were subjected to likert scale rating and inferential statistics using Statistical Package for Social Science (SPSS version 20). The Participation Index (PI) for key stakeholders in the various stages of forest management was obtained for each of the stakeholders in line with the procedure by Kamnap (2003) and Adams (2010).

III. Discussion

3.1 Forest benefits in Afi and Mbe mountains

Majority of study respondents in Afi and Mbe mountains were fully aware of forest benefits except for the provision of soil fertility in farmlands which atleast 97% were not aware of as shown in Table 2. In both mountain communities, the respondents were 100% aware of forest benefits such as conversion of forestlands to agricultural lands, water/soil conservation, fuel wood, wild vegetable/mushrooms, hardwood for construction/sale, and honey. This awareness was attributed to the conservation awareness programmes organized by NGOs/MDAs in the area which could enhance the conservation of the forest resources. According to Julius and Paul (2015), if indigenous and local communities have been increasingly acknowledged for being important stewards of forest estates and are aware of its benefits, they would ensure that forest utilities and these environmentally crucial resources are exploited sustainably. Arowosoge (2015) also agreed that local people are generally more positive towards forest resources conservation.

Table 2: Awareness of Forest Benefits in Afi and Mbe Mountains, Cross River State

Forest benefits	Afi		Mbe	
	Yes F (%)	No F (%)	Yes F (%)	No F (%)
Aesthetic/Tourism	255(100)	0	133(97.1)	4(2.9)
Conversion of forest land to Agriculture	255(100)	0	137(100)	0
Water/soil conservation	255(100)	0	137(100)	0
Medicinal Plants	255(100)	0	136(99.3)	1(0.7)
Fuel wood	255(100)	0	137(100)	0
Wild Vegetables/mushrooms	255(100)	0	137(100)	0
Bushmeat	243(95.3)	12(4.7)	129(94.2)	8(5.8)
Hardwood for construction	247(96.9)	8(3.1)	137(100)	0
Hardwood for sale/income	255(100)	0	137(100)	0
Fruits	255(100)	0	136(99.3)	1(0.7)
Honey	255(100)	0	137(100)	0
Soil fertility for farmland	8(3.1)	247(96.9)	4(2.9)	133(97.1)

3.1.2 Participation in Forest Management Practices in Afi and Mbe mountains

Afi mountain communities were more actively involved in Afforestation (92.2%) and Reforestation (100%) practices compared to Mbe mountain's involvement in Afforestation (73%) and Reforestation (92.7%) as shown in Table 3. This was observed to be due to the level of degradation of land in Afi mountain. Results of Avoidance of hunting, Avoidance of bush burning, Logging and Avoidance of farming were contrary to the 2016 Annual Report of WCS and the work of Philip *et al.* (2014), which revealed that logging, hunting, farming, fire, industrialization, fuelwood collection were threats to forests in Cross River State. This can also be linked to the report of a landslide in Afi mountain on July 14th 2012, which swept the access bridge to Buanchor and other communities, affecting 40% of the mountain, and a primary and secondary school, resulting to degradation of the land, loss of vegetation, migration of Gorillas and other wild animals. The results of spearman correlation of forest management practices such as avoidance of farming and bush burning had a negative correlation with poaching in Afi and Mbe mountains. This implied that once avoidance of farming and bush burning increased, poaching in both mountains reduced. These management practices had a strong influence on poaching as a constraint to forest management.

Table 3: Participation in forest management practices in Afi and Mbe Mountains, Cross River State

Forest management practices	Afi		Mbe	
	Yes F (%)	No F (%)	Yes F (%)	No F (%)
Afforestation	255(100)	0	34(24.8)	103(75.2)
Reforestation	255(100)	0	131(95.6)	6(4.4)
Avoidance of bush burning in or forest mountains	255(100)	0	136(99.3)	1(0.7)
Avoidance of logging in or around forest mountains	255(100)	0	137(100)	0
Enlightenment campaign	255(100)	0	137(100)	0
Avoidance of farming in forest mountains	255(100)	0	137(100)	0
Avoidance of hunting in forest mountains	255(100)	0	137(100)	0
Avoidance of fishing in forest mountains	20(92.2)	-	23(16.8)	-

3.1.3 Extent of Participation in Forest management

Mbe mountain communities had a higher degree of participation (1.0) in forest management involving planning, implementation and monitoring while Afi mountains had 0.68 in planning, 0.58 in implementation and 0.61 in monitoring (Fig.2). This was due to the bottom up community based management approach adopted in Mbe mountain management as against the top-down State Government management approach in Afi, limiting the participation of community people in forest management. In Mbe communities, key stakeholders such as chiefs, village heads, youth leaders and women leaders were more involved in forest management which supported lobbying for more participation of their various communities towards forest management especially in decision making and conflict resolution. The decision making process in Afi mountain was majorly the top-down approach where the upper level and central decision makers still initiated managerial and technical decisions for implementation by the Cross River Forestry Commission officer with little involvement of local

people which could affect sustainable management of forest resources. Eshun (2008) and Adams (2010) reported that community participation has a significant influence on achieving positive long-term sustainable forest management.

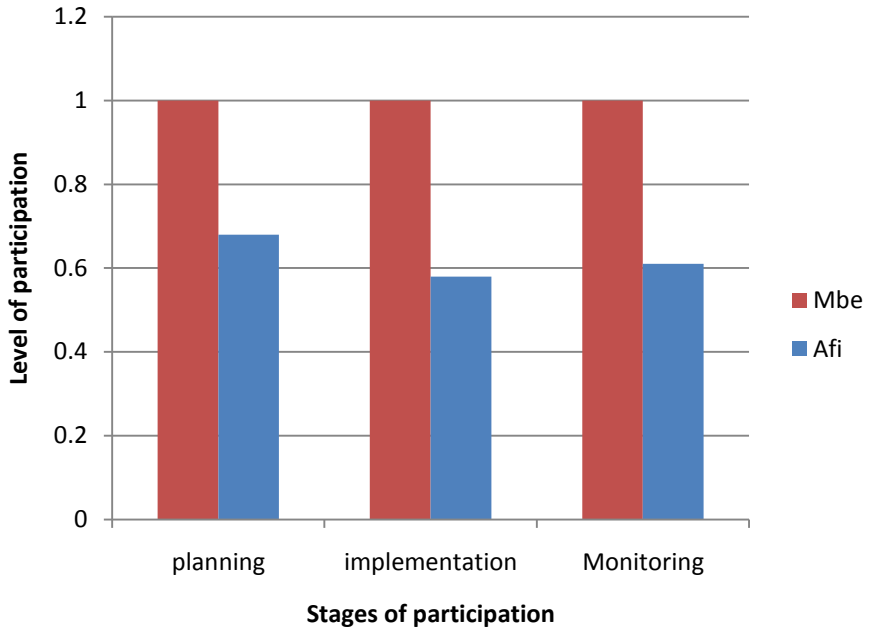

Fig. 2: Stages of participation in Mbe and Afi mountains, Cross River State, Nigeria.

3.1.4 Gender Participation in Forest Management in Afi and Mbe Mountains

There was no significant difference in the level of gender participation in Afi and Mbe mountains, although the mean values of male participation in Afi and Mbe mountains (30.95 and 16.26 respectively) were observed to be greater than that of females (23.96 and 13.00 in Afi and Mbe respectively) as presented in Table 4. A similar trend was observed in planning, implementation and monitoring. According to Agarwal (2009) and Upendra (2011), this was due to the role of various NGOs and MDAs working in the communities surrounding the mountains who promoted the involvement of women in decision making and forest management activities. This also reflected in the good gender composition in Mbe mountains management committee.

Table 4: Gender participation in forest management in Afi and Mbe mountains, Cross River State

Stages of Participation		Afi		Mbe	
		Male	Female	Male	Female
Planning	Mean	30.95	23.96	16.26	13.00
	U	275.00		80.50	
	P	0.96		1.00	
Implementation	Mean	29.58	29.58	15.50	15.50
	U	202.00		74.500	
	p	0.13		0.77	
Monitoring	Mean	31.11	23.33	15.76	14.64
	U	209.50		63.00	
	P	0.18		0.43	

U = Mann Whitney u test *p* = p value

3.1.5 Constraints to participation in forest management

Poor funding posed a severe constraint to participation in forest resources management in Afi and Mbe mountain while poaching, wildfires and land acquisition were mild constraints in both mountains. Also, political instability severely affected participation in Afi mountain since its Government owned but was mild in Mbe mountain, a community based management system as shown in Table 5.

Table 5: Constraints to participation in forest management in Afi and Mbe Mountains, Cross River State

	Afi			Mbe		
Constraints	Index mean	Rank	Decision	Index Mean	Rank	Decision
Poaching	1.04	5	Mild	1.38	2	Mild
Wildfire	1.28	3	Mild	0.38	5	Mild
Land Acquisition	1.10	4	Mild	1.17	3	Mild
Poor Funding	2.26	1	Severe	1.92	1	Severe
Political instability	2.08	2	Severe	1.05	4	Mild

IV. Conclusion

Most community people in both communities were fully aware of forest benefits facilitated by the awareness programs of NGOs and Government MDAs. This led to good participation in forest management activities such as afforestation and reforestation especially in Afi mountain due to the land degradation effects of a landslide in the area. The community-based forest management approach in Mbe mountain attracted a higher degree of participation compared to the top-down Government-owned approach in Afi mountain as it affected community involvement in planning, implementation and monitoring of forest management activities in the area. Poor funding posed a great constraint to forest management in both communities while political instability was a severe constraint in Afi mountain communities. There was gender equity in both communities and women were involved in decision making and resolution of conflicts in forest management activities. The study recommends continued awareness, provision of alternative livelihoods and local infrastructure by public and private sector organizations to improve livelihoods and reduce pressure on forest resources.

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