

Local Communities and Collaborative Forest Management in West Bugwe Forest Reserve, Eastern Uganda

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Abstract: Bureaucratic controls over natural resources when tightened world over Uganda inclusive have often led to heightened conflicts amongst apparent stakeholders. This has furthered assault on the ecosystem rather than conservation in developing countries. Collaborative Forest Management (CFM), an all inclusive approach on agreement is ostensibly an effective conservation strategy for the protected forest resources openly accessed in most developing nations. A study of 225 households in the proximity of West Bugwe Forest Reserve (WBFR), Busia district in Eastern Uganda revealed that many respondents agreed that poverty (93.2%) and pressure on land (92%) were cardinal push factors into non-compliance with the forestry policy at WBFR while the illegalities carried out were charcoal burning, fuel wood collection, construction material exploitation and farming in the forest reserve; the local communities were ready to conserve the WBFR through out the three parishes where H was $4.1 < \chi^2 = 15.5$ and using a Likert scale the local communities living adjacent to WBFR were positive towards their relationship with National Forestry Authority (NFA) officials in CFM. This was manifested in their scores of response viz. very much willing (370), willing (272) and a close to two thirds positive response (63.1%). Contradictorily less than half (40.5%) trusted NFA in the CFM despite a relatively high rating as very trustworthy (235) and trustworthy (176). In collaboration the local communities agreed to be active in conservation and protection of WBFR. The researchers therefore recommended that CFM be adopted in the area, communication be improved, energy saving stoves be used, government to be positive in poverty alleviation country wide, the local communities engage in commercial farming and trait transformation amongst the NFA officials.

Key words: Co-management, forestry policy, house holds, illegalities, national forestry authority

INTRODUCTION

In the developing world Uganda inclusive, the colonial governments viewed the forest reserves as established projects where traditional systems of resource management were criminalised. These reserves were out of bound for exploitation by the communities living adjacent to them without permits and fixed fees. Stipulated items could be extracted without payment such as fire wood and poles (Hamilton, 1984; Kantwi, 2001). The first research of the forestry department in its inception, 1917 was the exploration of the forest resources including wild rubber in Uganda. The forests were state controlled through various Quasi-legal agreements signed between Protectorate Government under Britain and native

authorities at the time such as Toro Agreement in 1900, Ankole Agreement in 1909 and later Bunyoro Agreement in 1933 (Olet, 1977; Hamilton, 1984; Mupada, 1997; Mugenyi *et al.*, 2005). This early detachment, later adopted by post independent states of the many silent communities from the resources in their proximity was the genesis of conflicts in resource management in these states, Uganda inclusive.

Olet (1977) continued to assert that in 1900 the Forestry Regulations giving effect to the agreements were enacted and in 1907 they were replaced by the first Forestry Ordinance. Thus, by 1910, sound foundations had been laid and the way lay open for the creation and development of a permanent forest estate. Mugenyi *et al.* (2005) has that by 1940 forest boundaries

had been identified, evidenced by marks on the ground with numbered posts or some other form of boundary mark ostensibly as they currently stand in Uganda. Hamilton (1984) claims that these estates were carefully watched over by the foresters and warden, men with guns licensed to shoot. Thus, the valuable resource once accessible to the local communities in their proximity were lawfully placed in the hands of the powerful and as far as possible excluded the silent but dissatisfied majority.

The beginning of effective forest development in Uganda was attributed to the first Forestry Policy of 1929 passed after the 1929 Nicholson Report which recognised the vital role of trees and forests in general (Olet, 1977; Mugenyi *et al.*, 2005). Other forestry policies of 1948 and 1988 laid emphasis on conservation, directing benefits to local authorities, extension and training. In this case the forest products were to be grown by farmers under control of the local authorities. The 1988 added regular research and the importance of non-consumptive uses of forests such as ecotourism (Mupada, 1997). In all these policies the local community involvements in the management of the 506 Central Forest Reserves (CFR) in the country was negligible if any. To that effect the current Uganda Forestry Policy 2001 included the local communities in the management of the CFRs as policy statement 5: on collaborative forest management (Republic of Uganda, 2001; NFA, 2003).

Co-management of protected areas has emerged in recognition of the need for a different approach in most countries, Uganda inclusively. Poffenberger (1996) has it that protected areas cover a small portion of the earth's surface creating a need for conservation measures within and outside these areas in order to protect a greater proportion of the earth's biodiversity. Many researchers agree that CFM is a situation in which the local communities living adjacent to forest reserves take responsibility for protecting and managing the resources within their proximity. Through it there is clear definition of stakeholders their interests and representation, agreed conservation and management objectives, the rights and responsibility of each stakeholder. All these are done through agreement between the lead agency, NFA for Uganda's case and an organised body of the local communities living adjacent to a forest reserve (FAO, 1995; Fisher, 1995; Hoefsloot, 1997; Kiyangi and Driciru, 2006; Otieno and Buyinza, 2010). CFM makes an assumption that each protected area has its own specific conservation objectives, management needs and socio-political circumstances (Mupada, 1997). CFM evolved from different situations and contexts, namely, co-management in Eastern and Southern Africa, Community Forestry in Nepal, Joint Forest Management

in India, Extractive Reserves in Brazil (Hoefsloot, 1997). Elsewhere, it has been introduced and shown success in Ghana and Tanzania. Kiyangi and Driciru (2006) reported that CFM in protected areas in Uganda started as early as 1995 and by 1996, national guidelines for CFM for wildlife had been developed paving way for opportunities and potentials for it in forestry. Ogwal (2000) added that for a more participatory forest management approach in Uganda, a CFM committee was formed in 1996/7 and a coordinating unit established in February 1998. It has been implemented with some success in the following forest reserves in Uganda; Mt Elgon National Park, Mabira Forest Reserve and Budongo Forest Reserve (Mupada, 1997; Hoefsloot, 1997). It failed at Butto-Buvuma Forest Reserves in Uganda at experimental stage (Gombya-Ssembajje, 1998).

Despite the many challenges faced by NFA on CFM related to guidelines for revenue and power sharing, funding of the local communities implementing CFM and others peculiar to the management, several applications are channelled towards it (Kiyangi and Driciru, 2006). NEMA (2004/5) reported that over 6,498 ha were under collaborative initiatives and 1,757 households were engaged in collaborative initiatives. NFA was committed to simplify the approach in order to enable it cover a wide area and a greater number of communities. The researchers' specific objectives to this study were:

- To establish reasons for non-compliance with parts of the forestry policy at West Bugwe Forest Reserve, Eastern Uganda
- To assess the local communities' plans to conserve West Bugwe Forest Reserve, Eastern Uganda
- To establish the local communities' attitude towards collaborative forest management of West Bugwe Forest Reserve, Eastern Uganda

Description of the area of study: West Bugwe forest reserve is a small forest reserve (31 km²) with an altitudinal range of 1113-1235 m, located between 00°30'-00°33'N and 30°56'-34°05'E in Busia district Eastern Uganda, covering parts of the following parishes; Bubango, Bulumbi and Busitema. The first two parishes are within Bulumbi sub-county and Busitema is in Busitema sub-county. It comprises three blocks viz. Amonikakineyi (Busitema parish), Sidimbire (shared by all the parishes) and Sitambogo (Bubango parish) (Davenport *et al.*, 1996). The area receives a total annual rainfall of about 1080 mm with two rainy seasons; a mean annual maximum temperature of 28.7°C and a mean annual minimum of 16.2°C (Meteorology Department cited in

NEMA, 1999). It has ferrallitic soils and deep sandy loams. This therefore makes the area favourable for vegetation growth manifested in the savanna forest reserve much less in woody species except for Mvule Melcian Excelsa.

The forest reserve is generally medium altitude moist semi-deciduous with broad-leaved grass susceptible to fire. NEMA (1999) added that the forest has thorny shrubs as Capparies Erythrocarpus, Toddalia Asiatica, Harrisonia Abyssinica and Antiaris Toxicaria. The neighbourhood of the area is predominantly agricultural at subsistence level, growing; finger millet, maize, sorghum, cassava, sweet potatoes, beans, groundnuts and cotton-major traditional cash crop. Besides the following animals were kept for both consumption and commercial purposes; cattle, goats, poultry and sheep (NEMA, 1999). NEMA (1999) added that there was gold mining at Tiira in Busitema sub-county discovered and production started in 1937.

MATERIALS AND METHODS

This was a case study conducted through a cross-sectional survey research design. It was concerned with assessing the local communities' attitude towards collaborative forest management at WBFR, Busia district Eastern Uganda. The design enabled the researchers to obtain information that described existing phenomena with respect to one or more variables (Mugenda and Mugenda, 2003). Given its nature as viewed by many researchers including the researchers, triangulation was used (Gay *et al.*, 2009; Bailey, 2007; Amin, 2005; Morse and Richards, 2002; Nachmias and Nachmias, 1987). A total of 225 respondents participated randomly selected from the stratified neighbourhood households in terms of parishes in the proximity of WBFR. This number especially of the households was chosen in line with Krejcie's and Morgan's sampling size for research activities determination table (Amin, 2005). There was also triangulation of sampling techniques thus both probability and non-probability sampling techniques were concurrently used (Bailey, 2007; Amin, 2005). The techniques applied for both sampling and data collection were stratified sampling; snowballing, purposive and convenience techniques.

Researchers used questionnaires, interviews, observation and document analysis as the main tools for collecting data. They were mainly concerned with views, perceptions, opinions, attitudes and behaviors of the respondents. Most authors including the researchers agree that such information could be best collected using the given tools (Bell, 1999; Cauvery *et al.*, 2007). The percentage distribution technique was used to show the

particular frequencies of respondents preferring a particular alternative to give the face value implications of non-compliance, illegalities and attitudes. Statistical Package for the Social Sciences Version 10 was used given the number of respondents and carrying out cross tabulations which could not be done either manually or using Excel (Fisher, 2007; Fraenkel and Wallen, 2008). The attitude of the local communities in the proximity of WBFR towards CFM was tested using Likert scale. Non-parametric measures such as tests (χ^2 -test) and Kruskal-Wallis test (H-test) were used to determine the significance of the local communities' activities and conservation strategies (Kothari, 2004).

RESULTS AND DISCUSSION

Interviews, observations and documentary analysis were transcribed to flesh up the questionnaire data tabulated. These were in line with the objectives of the study as presented in the tables.

Demographic and socio-economic characteristics of the households living adjacent to West Bugwe Forest Reserve:

This was tabulated from the questionnaires giving the bio-data of the respondents besides the occupations. It also had the educational background of the respondents their view on CFM, attitude towards illegalities and their proximity to WBFR as in Table 1.

More than three quarters of the household respondents (78.7%) according to Table 1 were male, this was an apparent reflection of the social set up of families which were patriarchal in nature (Otieno *et al.*, 2012). The mean age of 33.5 of the household respondents authenticated the responses given the Ugandan age of consent of 18 years (The Republic of Uganda, 1995). There was a high dependent rate where many respondents (89.9%) had atleast 1 to over 10 dependants (Table 1). This justified the deforestation of WBFR given the notion that man is a resource utilizing animal (Simon, 1981). The notion was further exemplified by more than half of the households (52.9%) claiming to have utilized the forest resource from WBFR (Table 1).

About two thirds of the household respondents (62.2%) as per Table 1 were willing to stop illegalities viz. charcoal burning, commercial fuel wood collection, grass burning, timber extraction, cultivation, settlement and the next in WBFR (The Republic of Uganda, 2003). Though a third (33.3%) of them was unwilling to stop illegalities, 14.2% of the respondents were non-committal.

This number of the respondents who were unwilling to stop illegalities though was ostensibly negligible numerically but environmentally significant. This could be

attributed to the peasantry nature of slightly more than half of the respondents (52.0%) (Table 1). Other than the peasantry nature of most of the households in WBFR's proximity, the forest reserve was an open access and

accessible to more than three quarters of the respondents (78.7%) through the blocks viz. Sitambogo, Sidimbire and Amonikakineyi (Table 1).

Table 1: Socio-demographic characteristics of the household respondents engulfing WBFR (n = 225)

Characteristics	No.	Percentage
Gender		
Male	177.0	78.7
Female	48.0	21.3
Age		
Mean	33.5	-
Marital status		
Married	133.0	59.1
Single	71.0	31.6
Divorced	11.0	4.9
Widowed	10.0	4.4
Dependants		
0	25.0	11.1
1-4	114.0	50.7
5-9	67.0	29.8
10 and over	19.0	8.4
Exploited the forest resources		
Yes	119.0	52.9
No	74.0	32.9
Neutral	32.0	14.2
Awareness of CFM		
Yes	83.0	36.9
No	126.0	56.0
Neutral	16.0	7.1
Stop illegalities in WBFR		
Willing	140.0	62.2
Unwilling	75.0	33.3
Neutral	32.0	14.2
Educational background		
None	55.0	24.4
Primary	57.0	25.3
Secondary	106.0	47.1
Post secondary	7.0	3.1
Occupation		
Peasantry	117.0	52.0
Civil servants	53.0	23.6
Business/casual	30.0	13.3
Students	25.0	11.1
Parish of residence		
Bubango	78.0	34.7
Bulumbi	73.0	32.9
Busitema	74.0	33.9
Accessible block in WBFR		
Sitambogo	26.0	11.6
Sidimbire	128.0	56.9
Amonikakineyi	23.0	10.2
None	48.0	21.3

The idea of CFM was still deemed in the area manifested by a slightly higher than a third of the respondents (36.9%) being aware (Table 1). This apparently made WBFR an entity outside the psyche of the local communities, manifested in some of them unwilling to stop illegalities and indiscriminate utilization of the forestry resources leading to deforestation of the forest reserve. Most researchers agree that the irresponsible utilization of the forest resources could be attributed to arbitrary gazettement and apparent selective exploitation of the forest reserve without the local community (Loefler, 2000; Karimi, 2001; Kantwi, 2001; Mugenyi *et al.*, 2005; Otieno *et al.*, 2012). All the respondents were from the neighbourhood of WBFR viz. Bubango, Bulumbi and Busitema therefore were apparent stakeholders in the management of the forest reserve (Table 1).

The local communities living adjacent to West Bugwe Forest Reserve's non-compliance with the Uganda Forestry Policy: Non-compliance was manifested in illegalities within WBFR hence before testing their significance reasons for the activities were first sorted as in Table 2.

Table 2 portrays poverty as a cardinal reason for non-compliance with the forestry policy at WBFR by more than three quarters of the household respondent (93.3%). The Uganda Participatory Poverty Assessment Process (UPPAP) viewed poverty as the inability to satisfy a range of basic human needs and stems from powerlessness, social exclusion, ignorance, lack of knowledge and shortage of material resources (NEMA, 2008). This view transcends the usual focus on lack of money-poverty (NEMA, 2008). The results were in concomitant with the UNDP, 2005's perception; for the households viewed unemployment, a possible source of money deficiency as slightly above a quarter of their numbers (37.3%). Satisfaction of basic needs posted a slightly above half (53.8%) to justify poverty as defined by UPPAP especially the domestic needs (Table 2). Observably, poverty

Table 2: Reasons for non-compliance with the forestry policy at West Bugwe Forest Reserve (n = 225)

Reasons	Parishes			Total (%)
	Bubango (%)	Busitema (%)	Bulumbi (%)	
Poverty	73 (93.6)	71 (97.3)	66 (89.2)	210 (93.3)
Politicians' influence	7 (9.0)	7 (9.6)	2 (2.7)	16 (7.1)
Proximity and open access	16 (20.5)	14 (19.2)	17 (23.0)	47 (20.9)
Pressure on land	72 (92.3)	66 (90.4)	69 (93.2)	207 (92.0)
Domestic needs	37 (47.4)	44 (60.3)	40 (54.1)	121 (53.8)
Ignorance of both the law and policy	32 (41.0)	23 (31.5)	27 (36.5)	82 (36.4)
NFA's ineffective enforcement	37 (47.4)	19 (26.0)	22 (29.7)	78 (34.7)
Open Unemployment and demands of urban centres	35 (44.9)	30 (41.1)	19 (25.7)	84 (37.3)

amongst the households manifested in the structures of the homesteads adjacent to WBFR; for instance the habitats and domestic wares. This therefore made poverty a strong push to the forest reserve to eke a living.

Many of the households (92.0%) claimed that the non-compliance was attributed to pressure on land (Table 2). The land being inelastic compared to human population the claim was justifiable save for a protected area. Contradictorily China could be by now a desert given the population explosion in the country whose forest estate has drastically increased (Agrawal, 2007). Some of the respondents also claimed that gazettement of WBFR was arbitrary in line with Mugenyi *et al.* (2005). The forest reserve was located in the local communities' ancestral land. It was gazetted without the local communities' consent given the records and interviews. This was nursed by the Banamwaya clan of the Bagwe community on which Sitambogo block was established. This therefore was a point of conflict on perception of illegalities in forest resources exploitation at WBFR, Eastern Uganda.

The ancestral claim could be depicted from the etymology of the naming given to the blocks of the forest reserve for instance Amonikakineyi an Iteso dialect connoting a forest of goats as per the interview. To them the goats were left behind as the owners left for safety against an epidemic which affected the area. The goats multiplied in the forest in their absence. This view was also backed by the presence of traditional grinding stones observed in the forest reserve especially in Sidimbire block. Above all the number of dependants where more than half the house holds respondents (50.7%) claimed to have family sizes of (1-4) dependants (Table 2). This created landlessness making the forest reserve an alternative land for cultivation.

Table 2 clearly shows that very few households (36.4%) were ignorant of either the law or policy. This view was also backed by the fact that very few of them (34.7%) claimed that NFA's enforcement activities were ineffective. This was contrary to the situation at South Busoga Forest Reserve where despite the local communities being aware of the policy the NFA enforcement activities were ineffective (Otieno *et al.*, 2012). The situation in WBFR could not be influenced by politicians (07.1%) or proximity (20.9%) as seen country wide (Watasa, 2009). From interviews it was established that the forest reserve was once a military base to check on tensions between Kenya and Uganda. Thus, a no go area. Therefore, non-compliance factors at WBFR were more individual than external push as portrayed by Table 2. Illegalities at WBFR were statistically tested as in Table 3.

Table 3 shows that charcoal burning was the most significant activity leading to deforestation of WBFR at

Table 3: Summary of Chi-square statistic value of the local communities' activities and deforestation of WBFR, Busia district (n = 225)

Activities	Local communities' views			
	Observed	Expected	χ^2 -calculated	χ^2 -tabulated
Construction materials	119	225	49.3	9.21
Fuel wood collection	160	225	18.8	9.21
Pasture for grazing	79	225	94.7	9.21
Collection of medicinal herbs	23	225	181.4	9.21
Cultivation/Farming	115	225	53.8	9.21
Space for settlement	56	225	126.9	9.21
Charcoal burning	192	225	4.8	9.21
Timber extraction	80	225	93.4	9.21
Poaching/Gathering and collection of food	105	225	64.0	9.21

df = 2 at 0.01 = 9.210

($\chi^2 = 4.8 < 9.21$ at $df = 2$) compared to other activities. Domestically, though statistically insignificant, activities such as fuel wood collection ($\chi^2 = 18.8 > 9.21$ at $df = 2$), construction materials ($\chi^2 = 49.3 > 9.21$ at $df = 2$) and food gathering and collection/poaching ($\chi^2 = 64.0 > 9.21$ at $df = 2$). The food gathered and collected included among others white ants and mushrooms while the following animals were poached hares, antelopes and warthogs. Charcoal burning and fuel wood collection's deforestation could be attributed to either traditional or metallic cook stoves widely used in developing countries and with about 10% efficiency and a 90% heat lost to the open air hence wasted (McKinney and Schoch, 1998). That enormous heat loss boils down to exploitation of the forest reserve as seen in Table 3 and observed ferrying of these items on bicycles to Busia town along the highway transecting WBFR.

Farming though insignificant at $\chi^2 = 53.8 > 9.21$ at $df = 2$ as per Table 3 had a history of being permitted by the then Forest Department especially at Amonikakineyi block of WBFR. Through observation in this section maize and beans were intercropped with regenerating and planted young eucalyptus trees. Amonikakineyi block observably did not show the insignificance of $\chi^2 = 93.4 > 9.21$ at $df = 2$ depicted on Table 3. Unlike the rest of forest reserve this was a planted forest of eucalyptus manifested by the numerous stamps left in the apparent gardens within the forest estates. There could also have been an attribution of this situation to the defunct Ruwenzori Saw Mill for timber production, along Kampala-Malaba Highway to the proximity of Amonikakineyi block. Pasture for grazing was also seemingly misrepresented by the households statistically at $\chi^2 = 94.7 > 9.21$ at $df = 2$; grass was burnt during dry periods believed to produce succulent and nutritious pasture during the rainy season. The impact of burning through observation was indiscriminate and could spread in very large area of the forest patch thus very instrumental to deforestation of WBFR. Unlike other forest reserves where the locals settled with impunity; WBFR's case was different with an insignificance of

Table 4: The local communities' perception on future of West Bugwe Forest Reserve (n = 225)

Activity	Parishes			Total (%)
	Bubango (%)	Bulumbi (%)	Busitema (%)	
Plant more trees	64 (82.1)	71 (95.9)	63 (86.3)	198 (88.0)
Stop deforestation	58 (74.4)	65 (87.8)	58 (79.5)	181 (80.4)
Official poaching and killing non edible animals	5 (06.4)	-	5 (06.8)	10 (04.4)
Redistribution of the forest estate for farming	23 (29.5)	5 (06.8)	10 (13.7)	38 (16.9)
Stop illegalities in the forest reserve	56 (71.8)	70 (94.6)	35 (47.9)	161 (71.6)
Protect/conservate the forest reserve	23 (29.5)	11 (14.9)	28 (38.4)	62 (27.6)
Local council mobilization/sensitization	35 (44.9)	34 (45.9)	34 (46.6)	103 (45.8)
Make bye laws to conserve the forest reserve	15 (19.2)	8 (10.8)	14 (19.2)	37 (16.4)
Agro forestry in the forest reserve	33 (42.3)	32 (43.2)	27 (37.0)	92 (40.9)

$\chi^2 = 126 > 9.21$ at $df = 2$ (Table 3). Apparently there was nil observance of settlement in the interior of WBFR. This contradicted many researchers views of settlement in forest reserves in Uganda (Hamilton, 1984; Mugenyi *et al.*, 2005; Watasa, 2010; Otieno *et al.*, 2012). Medicinal utilization of forest products was the most insignificant at $\chi^2 = 181.4 > 9.21$ at $df = 2$ in deforestation of WBFR. This was so for traditional therapy involves the use of plant extracts or unique biological compounds in the forests which could not lead to immense deforestation. It has been used since time immemorial (Pickering and Owen, 1994; Warui, 1995). The local communities living adjacent to WBFR to that effect collected herbs from the forest reserve to cure; yellow fever, malaria, measles and boils. Therefore, given the nature of the extraction, collection of medicinal herbs was insignificant in deforestation of WBFR (Table 3).

An assessment of the local communities' plans to conserve West Bugwe Forest Reserve, Eastern Uganda:

Most of the local community members eking life from the forest resources in their proximity were the first beneficiaries of WBFR. This therefore made them nurse some hope of sustainable utilization of the forest reserve which was assessed.

More than three quarters of house hold respondents (88.0%) agreed that reforesting WBFR was cardinal in their future plan (Table 4). This idea was vehemently supported by 95.9% of Bulumbi parish respondents apparently because much of their Sitambogo Block was hilly. In attestation to this the local communities' living adjacent to WBFR rejected agro forestry practiced in the forest reserve by about two thirds of their numbers (59.1%) as per Table 4. This was despite the following factors; population pressure on their land and cultivation permits offered by the then FD of less than a dollar per acre and about \$8 per five acres annually according to the NFA officials interviewed. This contradicted the high profiled politicians in the country who used the opportunity to cultivate maize and beans without planting trees in their allotted acreages within other forest estates in Uganda (Lumu, 2007).

It therefore showed that the local communities in the proximity of WBFR were strong willed in the forest regeneration and reforestation.

Relatedly many of the households (95.6%) disagreed with the official poaching and killing of the fauna (Table 4). Besides according to Table 4 many (83.1%) also discarded redistribution of the forest estate for farming an idea that deforested Bahati and Emburu Forest Reserves in Nakuru Kenya through the mismanaged Non Residential Cultivation policy in Kenya (Gachanja, 2000). Contradictorily as per Table 4 the same households did not boldly accepted to generally protect/conservate WBFR by slightly more than a quarter of their numbers (27.6%). This could also be manifested in their unwillingness to make bye laws to that effect accepted by less than a quarter of their numbers (16.4%). Despite this, close to half of the households (45.8%) agreed on local council's mobilization/sensitization according to Table 4. Generally, from the data despite the slight differences conservation was cardinal among the future plans of the local communities living adjacent to WBFR as per Table 4.

Many of the respondents (80.4%) agreed that deforestation should stop. This was also accepted by close to three quarters (71.6%) disregarding illegalities in the forest reserve as per Table 4. The illegalities on this aspect included among others; charcoal burning, farming, settlement, pitsawing, grass burning and the next in the forest reserve without permission (The Republic of Uganda, 2003). The local communities' rejection of illegality contradicted the experience from South Busoga Forest Reserve in WBFR's neighbourhood in Eastern Uganda (Otieno *et al.*, 2012). This therefore made the researchers conclude that the communities living adjacent WBFR had a positive attitude towards conserving the forest reserve in their proximity even without the aid of NFA. This attitude was farther tested using the Kruskal-Wallis test (H-test) as in Table 5.

From the tabulations it was clear that H was 4.1. Therefore, at $\chi^2 = 15.5$ for 8 degrees of freedom at 5% level of significance we concluded that the local communities were ready to conserve the WBFR through out the three parishes where $H = 4.1 < \chi^2 = 15.5$ (Table 5).

Table 5: Summary of H-test on Local communities' plans per parish to conserve WBFR without NFA and corresponding rank

Activity	Bubango		Bulumbi		Busitema	
	N ₁	Rank	N ₂	Rank	N ₃	Rank
Plant more trees	64	4.0	71	1.0	63	5.0
Stop deforestation	58	6.5	65	3.0	58	6.5
Official poaching and killing non edible animals	5	24.3	-	27.0	5	24.3
Redistribution of the forest estate for farming	23	17.5	5	24.3	10	22.0
Stop illegalities in the forest reserve	56	8.0	70	2.0	35	9.5
Protect/conservate the forest reserve	23	17.5	11	21.0	28	15.0
Local council mobilization/sensitization	35	9.5	34	11.5	34	11.5
Make bye laws to conserve the forest reserve	15	19.0	8	23.0	14	20.0
Agro forestry in the forest reserve	33	13.0	32	14.0	27	16.0
Total	n ₁ = 9	R ₁ = 119.3	n ₂ = 9	R ₂ = 126.8	n ₃ = 9	R ₃ = 129.8

Table 6: Summated Likert scale for the attitude of the local communities towards NFA officials on CFM (n = 225)

Questions	Response (%)	Scores	Rate
Are you willing to work with NFA in the management of WBFR?			
Very much willing	74 (32.9)	74×5	370
Willing	68 (30.2)	68×4	272
Neutral	62 (27.6)	62×3	186
Unwilling	16 (7.1)	16×2	32
Very much unwilling	5 (2.2)	5×1	5
In your opinion do you think the NFA officials are trustworthy in CFM?			
Very trustworthy	47 (20.9)	47×5	235
Trustworthy	44 (19.6)	44×4	176
Neutral	66 (29.3)	66×3	198
Untrustworthy	46 (20.4)	46×2	92
Very untrustworthy	22 (9.8)	22×1	22

Local communities' attitude towards collaborative forest management of west Bugwe Forest Reserve: The attitude of the local communities living adjacent to WBFR reserve towards CFM was tested using a Likert scale as in Table 6. Expected activities in case of collaboration were tested in Table 7.

The local communities living adjacent to WBFR were positive towards their relationship with NFA officials in CFM (Table 6). This was manifested in their scores of response viz. very much willing (370), willing (272) and a close to two thirds positive response (63.1%). Contradictorily less than half (40.5%) trusted NFA in the CFM despite a relatively high rating as very trustworthy (235) and trustworthy (176). This was in line with the fact that NFA had not lived to its expected values; integrity, excellency and transparency (NFA, 2003). The organization was embroiled in corruption as the former FD (Hamilton, 1984; Nsangi, 2006). Through interviews the following aspects negating the relationship were revealed by the local communities living adjacent to WBFR about NFA officials besides corruption; participation in illegalities directly and by proxy, harsh, sectarian, poor managers and the next. Therefore, the CFM at WBFR was placed at a precarious situation which needed trait transformation amongst the country's forest lead agency. Many of the local communities (85.3%) claimed that collaborative protection and conservation of WBFR was

very positive (Table 7). Ironically very few (38.7%) were in for punitive enforcement leading to imprisonment of culprits. Traditionally, most local communities viewed imprisonments as a cultural abomination (Otieno *et al.*, 2012).

This therefore could contaminate collaboration. Protection and conservation could be attributed to the fact that most communities were aware of both ecological and anthropocentric values of WBFR as per the interviews. Therefore, many of them were interested in the sustainability of the reserve making protection and conservation statistically important aspect of collaboration at 4.84<16.81 at df = 6 at 0.01 as per Table 7.

Over three quarters of the local communities (82.7%) agreed that shared management function was an important aspect of collaboration (Table 7). This was in line with government's desire to adopt participatory approaches in natural resource management countrywide (Bikaako-Kajura, 2002). This could have also been induced by a negotiated forest management between forest officials for Nyangole forests in neighbouring Tororo as a pilot CFM village as early as January 2000 (Ogwal, 2000). It was also contradicted by the same communities' less than half (45.3%) support of mobilisation and sensitization of the wider community on sustainable use of WBFR (Table 7). Statistically as per Table 7 shared management was significant at 6.76<16.81 at df = 6 at 0.01.

Slightly above three quarters of the local communities (75.6%) agreed that collaborative decision making would enhance CFM at WBFR (Table 7). This was an additive to shared management for it is an important function of management thus when acknowledged by many could make CFM effective in the area. This was in line with the basic guiding principles especially having meaningful participation and shared analysis (NFA, 2003). Statistically, it was also considered important at 13.44<16.81 at df = 6 at 0.01. The following were also important though statistically considered insignificant as per Table 7 viz. effective boundaries maintenance accepted by more than two thirds of the house holds

Table 7: Summary of Chi-square statistic value of the expected activities in CFM at WBFR (n = 225)

Activities in collaboration	Local communities' views			
	Observed	Expected	χ^2 -calculated	χ^2 -tabulated
Sharing management functions	186 (82.7%)	225	6.76	16.81
Collaborative protection and conservation	192 (85.3%)	225	4.84	16.81
Effective boundaries maintenances	152 (67.6%)	225	23.68	16.81
Effectively stop illegalities in WBFR	129 (57.3%)	225	40.96	16.81
Collaborative decision making on WBFR	170 (75.6%)	225	13.44	16.81
Controlled punitive measures eg imprisonments	87 (38.7%)	225	84.64	16.81
Collaborative mobilization and sensitization	102 (45.3%)	225	67.24	16.81

df = 6 at 0.01 = 16.81

(67.6%) but insignificant at $23.68 > 16.81$ at $df = 6$ at 0.01 and effective stopping of illegalities by more than half the households (57.3%) but insignificant at $40.96 > 16.81$ at $df = 6$ at 0.01.

CONCLUSION

Poverty was the main driving force into WBFR claimed by many respondents (93.3%) thus more than half the respondents (52.9%) claimed to have exploited the forest resources at their proximity. Charcoal burning was the most significant illegality at $\chi^2 = 4.8 < 9.21$ at $df = 2$ hence detrimental to the sustainability of WBFR. Despite all these the local communities were ready to conserve the WBFR through out the three parishes where H was $4.1 < \chi^2 = 15.5$. It was unfortunate that more than half of the respondents (56%) were ignorant of CFM yet 63.1% were willing to work with NFA in the conservation of WBFR. Ironically, merely 40.5% of the respondents trusted the NFA officials in conservation collaboration much as close to two thirds (62.2%) were willing to stop illegalities in WBFR. In case of collaboration the local communities in the proximity of WBFR viewed collaboration in conservation and protection of WBFR as statistically significant at $4.84 < 16.81$ at $df = 6$ at 0.01.

RECOMMENDATIONS

Researchers therefore recommended the following based on their findings; the area was ripe for CFM given the willingness of the local communities and their establishment of community based organisations for the conservation of WBFR which were Namungodi United Development Association and West Bugwe Forest Conservation Project; communication from the NFA headquarters should be improved for CFM was introduced in Uganda more than a decade ago but surprisingly through poor communication has not reached WBFR; the government should revisit the poverty alleviation strategies in place so as to detach the locals from unsustainably eking life from protected resources in their proximity; the local communities should also actively

engage in commercial farming whose products were highly demanded in an apparent conurbation of two municipalities viz. Busia Uganda and Kenya in their proximity, separated by international boundary; the local communities should plant fast growing species of trees through; agro-forestry or establishment of woodlots such as *Markhamia lutea* (for charcoal production) and *Calliandra calothyrsus* (for fuel wood) these species are also multipurpose so can be used beyond this. Besides there is a need for adoption of energy saving stoves both in the rural areas and urban centres in Uganda. NFA should also undergo trait transformation to feather out corruption and mistrust from the local communities in their neighbourhood.

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