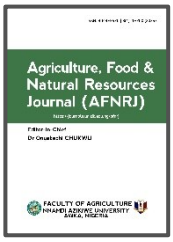
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Original Article

Joint forest management approach as a prospective option for salvaging Omo-Shasha-Oluwa forest complex, Nigeria

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ABSTRACT

Rare experiences exist in Nigeria on the framework to fully incorporate local community stakeholders into options to restore and sustain forest reserves under a Joint Forest Management Approach (JFMA). This study, thus, investigated the prospects of JFMA through collaboration of the local community members with the state forestry service as well as factors, constraints, and incentives that will influence the community stakeholder's willingness to participate in forest management planning, decision-making and was carried out in Omo-Shasha-Oluwa Forest Complex, Nigeria (OSOFCN). Fifteen (15) enclave and migrant communities adjoining OSOFCN were randomly selected. Community stakeholders' oral interviews, questionnaire surveys, and focus group discussions were used for data collection. Data were analysed using descriptive statistics, a multinomial logistic model at α = 0.05, and content analysis. The result revealed that the majority of the respondents (78.5%) were willing to collaborate with the State Forestry Service in the JFMA. Nativity status (OR = 7.22), derived benefits from the forest resources (OR = 5.467), non-financial incentives (OR = 4.349), provision of social amenities (OR = 4.023), awareness (OR = 3.734), years of experience (OR = 3.227), customs guiding the community people (OR = 2.78), gender (OR = 2.060), and occupation (OR = 1.456) were the determinant factors that tend to influence the communities' stakeholder participation in JFMA. The incentives identified by the local communities that would prompt their interest and participation in JFMA include equitable benefit sharing (19%), involvement in decision-making (26%), and government support in provision of amenities (13%). Joint forest management has high potential to foster sustainable management of forest reserves..

KEYWORDS: *Community-stakeholders, Constraints, Incentives, Willingness to participate*

INTRODUCTION

Forest reserve (FR) must be overseen by apt management approach for effective restoration and conservation so as to be pool of benefits in perpetuity (Forest Declaration Assessment Partners, 2025). It is however obvious, that, most Forest reserves in Nigeria are not adequately manage and protected by the State Forestry Service sole management approach being currently operated which are insufficiently funded, staffed and lack adequate facilities (Jimoh and Falade, 2003; Olaleru *et al.*, 2020); this has hitherto necessitated a shift in management approach. The forest estate in Nigeria has been shrinking with reports showing that between 1978 and 2002; the size of (FR) decreased from 23,298,100 ha (25.7% of the country) to 15,097,900 ha (16.6%) (Forestry Management Evaluation and Coordinating Unit (FORMECU), 2002). In Nigeria, FR is forest areas that have been gazetted by the government to remain as forests in perpetuity. These forests are up to date solely managed by the state governments. However, because state forestry departments lack the capacity to effectively manage and protect these forests, the authority of use has often been left to informal and insufficiently controlled logging companies and individuals (Ministry of Environment, Nigeria 2013). Furthermore, communities living in or adjacent (FR)

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have little interest in the protection or sustainable use because there are no adequate collaborative arrangements. Many programmes by states and international agencies on reforestation in the study site failed due to little or no consultation with local community, decline in public trust (Jimoh and Falade, 2018) couple with the fact that, factors that can encourage or promote local people participation in JFMA are not sufficiently understood or not given adequate consideration. Giving consideration to "Joint Forest Management approach (JFMA)" as an arrangement wherein State Forestry authority collaborate with the local community to restore and conserve forest reserve, may constitute a viable option for more restoration and management scheme. In this approach, State forestry departments act no longer as policing officers but serve as facilitators working together with the local communities to protect and regenerate the forests. Joint forest management approach has recorded positive impacts on the (FR) in terms of forest cover and biomass, increase in other climes (Blomley *et al.,* 2008; Liu *et al.,*2016); For instance, (Makatta *et al.,* 2015), reported that jointly managed forest had higher structural attributes than the government sole managed forests in Tanzania and Jointly managed forests had higher stocks than the State centric managed forests in Nepal (Casse and Milhoj, 2013). The difference was attributed to the fact that, the State Forestry Service solely manage, the government forest while the later were managed by the forest adjoining communities in collaboration with the State Forest Service; Also, the sharing of cost, benefits and mutual monitoring of forest under JFMA makes it more efficient as the risk involve is spread, while the State forest service's bear the cost and the risk alone. There is paradigm shift towards communities gaining forest use rights or ownership of previously state-controlled forests, as forest under joint management were more effective and community stakeholders were a powerful force (Makatta *et al.,*2015; Appiah *et al.,*2021). Omo-Shasha-Oluwa Forest Complex Nigeria (OSOFCN) (cutting across Omo Forest, Shasha Forest and Oluwa Forest Reserve in Nigeria) is home to rich flora and fauna species with high endemism within the West African sub-region (Obayelu *et al.,*2017). Despite the biological and scientific values of OSOFCN, its resources are under threat due to human encroachment and uncontrolled logging (Adedeji and Adeofun, 2014; Olaleru *et al.,* 2020). Knowledge of the potential of JFMA in OSOFCN will foster better decision making and help enhance that the resources and services which the forest provides are sustained. This study thus investigated the potential of JFMA through collaboration of the local community members with the state forestry service as well as factors, constraints, incentives that will influence the community stakeholder's to participate in forest management planning, decision making in the study area.

METHODOLOGY

The Study Area

The study was conducted at OSOFCN in the tropical rainforest of Southwestern Nigeria; located within latitude 6º35' N and 7º10' N and longitude 4º 12' E and 4º 48' E (Figure 1). Until 1925, the study area was one contiguous forest before it was split into the Omo, Oluwa and Shasha Forest Reserves which are presently located in Ogun, Ondo and Osun States of Nigeria respectively (Adepoju and Salami, 2017). The area is about 2,462km^2 and comprises of contiguous forest collectively referred to as the Omo-Shasha-Oluwa Forest Complex, from the names of the three Forests: Omo (1325 km^2), Oluwa (827 km^2), and Shasha (310 km^2), (Amusa *et al.* 2017). These forests are of considerable biological, cultural and scientific interests as it is home to many species of global and local conservation concerns, provide important wildlife corridor and home for herds of forest elephants and chimpanzee (Olaleru *et al*. 2020).

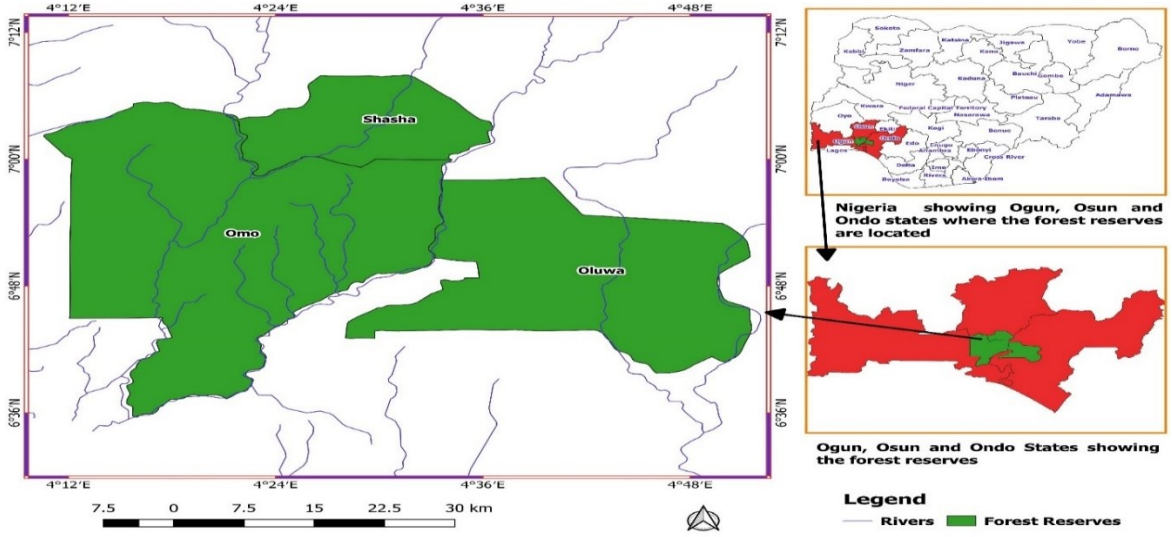


Figure 1: Map of Omo-Shasha-Oluwa Forest Complex (OSOFCN) * *Note: the contiguous forest between Ogun, Ondo and Osun States)*

Data Collection

Preliminary information on the community stakeholders and the forest complex was gathered through discussion with the OSOFCN Management Committee comprising members from each of the three (3) adjoining State officials in charge of the forest, zonal forestry officials, the community leaders, and State Forestry Departments.

Data collection from the community stakeholders was done through interview survey (using structured questionnaire and oral interview) in the communities and focus group discussions (FGDs), to harness information on the current state of the forest, how dependent the people are on OSOFCN resources, the challenges confronted, awareness of JFMA, willingness to participate in the JFMA, factors that could enhance their participation in the JFMA and constraints to JFMA.

Fifteen (15) communities out of the fifty-three 53 indicated by OSOFCN Management committee (2017) were randomly selected.

Sampling based on proportion approach by Diaw *et al.,* (2002) was used to select 10, 5, and 2.5 percent sampling intensities of the respondents in the communities with population less than 500, 1000 and over 1000, respectively. The fifteen (15) communities selected and the number of stakeholders that were interviewed in each are listed in the table (1).

Focus Group Discussions (FGD); In the communities, a range of 3–5 people participated in the five (5) FGDs conducted, where Community leader and other stakeholders were interviewed in group. These people were selected based on their knowledge of the forest, experience and vested interest in the resources. The FGDs were conducted to obtain information on the respondents' perception of the forest, the constraints, incentives and enabling factors that could enhance their involvement in sustainable management and restoration of the forest.

Data were analyzed using descriptive statistics, inferential statistics (multinomial logit regression) and content analysis.

Data Analysis

Data collected was subjected to descriptive statistics and Multinomial Logistic Regression (MLR). MLR was used to assess whether the community stakeholder's willingness to participate in the JFMA would be influenced by socio-demographic factors such as Gender, Age, Educational level, Nativity status, Incentive requirement, Beneficiary status and awareness of the state of the forest in the community. The form of the multinomial logit model is expressed as:

$$Y(k,i) = \beta 0_k + \beta 1_k X1,i + \beta 2_k X2,i + \cdots \beta m,_k Xm,i \quad (1)$$

The predictor function Y(k,i) predict the probability that observations i has outcome k. i.e Y = (respondents' willingness to participate in the joint management of the Forest Complex)

Where, $\beta_{m,k}$ is a regression coefficient associated with the Xth explanatory variable and the kth outcome. X_m = vector of prediction or independent variables (i.e educational level, Nativity status, Incentive requirement, Beneficiary status, awareness of the state of the forest and membership of community association in the community).

The regression coefficients and explanatory variables are grouped into vectors, so that the predictor function can be written more compactly:

$$Y(k,i) = \beta k \ .Xi \quad (2)$$

Where β_k is the set of regression coefficients associated with outcome k, and Xi (a row vector) is the set of explanatory variables associated with observation i. To describe the MLR model, let Y denote a variable taking on the values {1,2…. K} for choices k, a positive integer, and x denote a set of conditioning variables. In this case, y represents the respondents (community stakeholders) willingness to participate in JFMA and x represents the socio-demographic factors.

Table 1 : Sample distribution of Sellected Communities, number of stakeholders interviewed in the study site

S/n	Name of Communitie randomly selected	Total Population in each community by	Percentage Sampling intensity (Diaw *et al.*,2002)	No. Of community stakeholders randomly interviewed
1.	Eseke	70	10	7
2.	Sojukorodo	62	10	6
3.	Baoku	20	10	2
4.	Etemi	70	10	7
5.	Temidire	60	10	6
6.	Osoko	503	5	24
7.	Abeku	82	10	8
8.	Lapete	50	10	5
9.	Mokore	64	10	6
10.	Erinla Basiru	90	10	9
11.	Eleyele	40	10	4
12.	Ajelanwa	81	10	8
13.	Aba Baale	40	10	4
14.	Aba Gerald	50	10	5
15.	Aba Paun	60	10	6
Total				107

Source: Adapted from OSOFCN Management committee (2017)

RESULTS AND DISCUSSION

Socio-demographic characteristics of Local Community stakeholders that can Influence involvement in JFMA.

It is vital to look into the socio-demography of the respondents in the community, since JFMA is a management approach that

involves the local community (stakeholders) collaborating with the State forestry department. Result of the socio-demography of the community stakeholders is presented in Table 2.

The result (Table 2), showed that the number of respondents with formal education (i.e primary 15.9%, secondary 58.9% and tertiary 20.6%) were more than those without formal education. The literacy level of the population in the communities are quite high (more than 80%). This might serve as an impetus for the JFMA adoption as Educated individuals tends to be better enlightened in conservation compare to people with no formal education that may find it difficult to adopt new initiatives. About 76% of the stakeholders in the communities are indigenes-whose large number are willing to be involved in JFMA, this thus revealed sense of belonging and concern for the improved condition of the forest, whereas for non-indigene, the concern will be that either directly or indirectly they will be affected by the state of the forest. It must be noted that the people (the indigene in most cases) were the original owners of the forest land as pointed out by Bada (1984), the land had been persuasively taken from them by the colonial masters and in extension the state government, thereafter constituted into forest. The people would be eager to be involved in the restoration of the forest with the aim of achieving a sense of belonging and probably benefit from the output of the forest management. Occupations of the local community stakeholders were mostly forest reliant. They are in variant way involved in forest resource utilization or operation. Large proportion (81.3%) of the stakeholders affirm the degrading state of the forest, while 90.7% are aware of collaborative management of forest and (78.6%) are willing to participate in the JFMA of the forest. Majority of the respondents attested to deriving several benefits from the forests, these various benefits enjoyed by the local communities are important factors for the adoption of JFMA. Appiah *et al*., (2021), reported that benefits derived by community stakeholders in adjoining forest in Ghana stimulate adoption of JFMA and in return it contributes to sustainable human resource provision and improve the degraded forest.

Table 2: Socio-demographic Characteristics of Local Community stakeholders

S/N	Socio-demographic Characteristics	Response			Mode
		Categories	Frequency	Percentage (%)	
1	Educational level	No formal Education	5	4.7	Secondary
		Primary	17	15.9	
		Secondary	63	58.9	
		Tertiary	22	20.6	
		Total	107	100	
2	Nativity	Indigene	81	75.7	Indigene
		Non-indigene	26	24.3	
		Total	107	100	
3.	Occupation (of Stakeholders in the community)	Farming	22	20.6	Sawmillers
		Hunting	5	4.6	
		Traditional chiefs	2	2.8	
		Firewood collection	12	11.2	
		Harvesting of NTFPs	11	10.2	
		Charcoal production	7	6.5	
		Sawmilling	32	29.9	
		Forestry officials	8	7.5	
		NGOs staff	7	6.5	
		Total	107	100	
4.	Years of experience	1- 5yrs	23	21.5	above 10yrs
		6 -10yrs	21	19.6	
		Above 10yrs	63	58.9	
		Total	107	100	
5.	Derive benefits from the forest	Yes	99	92.5	Yes
		Undecided	2	1.9	
		No	6	5.6	
		Total	107	100	
6.	Aware of Joint Forest management approach	Yes	97	90.7	Yes
		Undecided	4	3.7	
		No	6	5.6	
		Total	107	100	
7.	Willingness to participate in the joint management of the forest	Yes	84	78.6	Yes
		Undecided	13	12.1	
		No	10	9.3	
		Total	107	100	

Constraints and incentives to participate in JFMA

The probable constraints to JFMA as itemized by the community stakeholders in the study site were presented below in figure (2). Constraints to JFMA to the forest (Fig 2) includes: Neglect/ Weak monitoring by forest officials (17%), lack or weak collaboration with local community stakeholders by state forestry department (16%), Encroachment by farmers (12%), illegal/uncontrolled logging (12%), inconsistent policies (12%), Poaching/illegal hunting (10%), and insufficient amenities (10%). Most of the listed constraints are directly rooted in frail management approach. This is supported by the findings of Chaman *et al*. (2016) who reported that ineffective collaboration and coordination by forestry officials was among the top factors that affect people's participation in JFMA. Forest management approach which is exclusionary of local communities' stakeholders, has failed to improve and sustain OSOFCN and its benefits.

Incentives that can encourage participation in JFMA

Offering incentives to involved local people in the management of the forest will helps to build trust as well as makes them feel valued. Incentives identified by local communities' stakeholders that can foster participation in JFMA is presented in Table 3.

The incentives pinpointed by local stakeholders during the FGD includes involvement in decision-making, benefit-sharing, Provision of alternative livelihood, Land availability for Taungya farming, government's support in terms of providing essential amenities and legal access right to collect NTFPs. Incentives to involved local people in the management of the forest makes them feel valued and their opinion reckon with, which thereafter increase their willingness to participate, reduce forest degradation and the cost of managing the forest (Macharia, 2015). Some of the stakeholders opined during the FGD, that they were not offered any incentives for their voluntary support towards the forest management in time past nor were they carried along in the governance. Exclusion of local people need to be appropriately addressed for JFMA to be successful. According to Madhya (2015), in India, alternative source of livelihood and basic amenities were provided for villagers under the JFMA program to dissuade them from illegal logging, encroachments and to reduce pressure on forest resources. This is a major aspect, that the communities identified during the FGDs of this study where the government intervention is very pertinent.

Community Stakeholders willingness to participate in JFMA

The survey investigated the local community's stakeholder's willingness to participate in JFMA and the result is presented in table 4 below. Majority of the stakeholders (78.50%) are willing to participate in the collaborative management of the forest (table 4).

It was observed that the farmers recorded the highest willingness (72.7%) after the forest officials and NGOs with (100%) which may be an indication of their relative knowledge and experience of reforestation project during Taungya agroforestry system (i.e. an agroforestry approach where the farmer is delegated to manage forest seedlings together with his agricultural crops on an allotted forest land for both the farmer and forestry department benefit).

Substantial stakeholders in the community are ready to be involve in JFMA by providing protection, raising seedlings of indigenous species, collaborate with government on reforestation and volunteering in other forest management task. The forest officials during the FGD also attest that there is high possibility of the state to collaborate with the local people to restore degraded forest as similitude of it was done during a small-scale plantation establishment. Akinyemi *et al.* (2019) pointed out that, it is increasingly clear that government alone cannot manage FR sustainably; in view of its inability to provide the required funding, personnel and facilities to ensure appropriate, while the population demand for and technology to extract resources from the forests continue to expand. Effective forest management considers the forest adjoining communities so as to properly understand the people-forest interactions (Svenja *et al.,*2015).

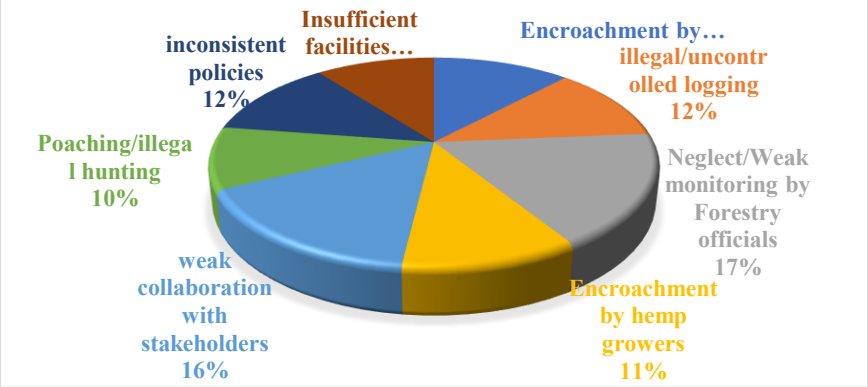


Figure 2: Constraints to participating in JFMA

Table 3 : Incentives identified by stakeholders that can encourage participation in JFMA

S/N	Stakeholders	Preferred Incentives					
		AN	LTF	PAL	GS	IS	BS
1	Farmers	3	1	2	6	3	1
2	Hunters	-	-	2	-	1	2
3	Traditional chiefs	-	1	-	-	1	1
4	Firewood collectors	1	1	-	-	4	2
5	Harvesters of NTFPs	-	1	2	-	4	1
6	Charcoal producers	1	1	3	-	2	-
7	Sawmillers	3	2	5	1	4	7
8	Forestry officials	-	4	-	1	2	1
9	NGOs staff	2	-	-	3	1	1
Total		10 (11.9%)	11 (13.1%)	14 (16.7%)	11 (13.1%)	21 (26%)	16 (19.2%)

Sources: *Field Survey, 2025 (Where, AN – Access right to NTFPs collection; LTF - Land availability for Taungya; PAL-Provision of alternative livelihood; GS - Government support; IS - Involving stakeholders in decisions making; BS - Benefit Sharing)*

Table 4 Community stakeholders' willingness to be involved in JFMA

s/n	Community stakeholders	Response			Total
		Yes	No	Undecided	
1	Farmers	16 (72.7)	5 (22.7)	1 (4.5)	22 (20.6)
2	Hunters	5(100)	0	0	5 (4.6)
3	Traditional chiefs	2 (75)	0	1 (25)	3 (2.8)
4.	Firewood collectors	8 (66.7)	1 (8.3)	3 (25)	12 (11.2)
5.	Harvesters of NTFPs	9 (81.8)	0	2 (18.2)	11 (10.2)
6.	Charcoal producers	7 (100)	0	0	7 (6.5)
7.	Sawmillers	22 (68.8)	4 (12.5)	6 (18.8)	32 (29.9)
8.	Forestry officials	8 (100)	0	0	8 (7.5)
9.	NGOs staff	7 (100)	0	0	7 (6.5)
Total		84 (78.50)	10 (9.35)	13 (12.15)	107 (100)

Sources: Field Survey, 2025 (Percentages in the bracket)

Influence of the community stakeholder's socio-demographic factors on their willingness to participate in JFMA of the Forest Complex

Multinomial Logistic Regression (MLR)- was used to assess whether the community stakeholder's willingness to participate in the JFMA would be influenced by socio-demographic factors, and the result is presented in table 5. The logit regression model result revealed that nativity status had the highest odd ratio (7.223), followed by derived benefits from the forest resources (5.467), non-financial incentives (4.349), Provision of social Amenities (4.023), awareness (3.734), years of experience (3.227), community customs and norms (2.789), gender (2.060) and occupation (1.456) respectively were the socio-demographic factors of the community stakeholders that significantly influence their willingness to participate in JFMA (Table 5) in OSOFCN. The logistic model provides information on the influence of the factors.

Nativity may influence the willingness of the people to participate in JFMA of the study site, thus showing their sense of belonging, concern for the improved condition of the forest land which originally was in the custody of their fore-fathers before it was released to the government and constituted into forest reserve. The indigene would thus be eager to be involved in the management of the forest land which originally belong to them. Similarly, benefits derived by the communities' stakeholders may likely influence their willingness to

participate in JFMA as multiple benefits such as herbs collection, snail collection, fuel wood gathering, leaf collection, honey collection etc apart from timber harvesting are derived from the forest complex. This can also portend eagerness of those who have been alienated from decision making to get involved for the possibility of deriving some benefits from the forest complex. The result obtained indicated that provision of non-financial incentives will motivate communal people participation in the JFMA, thus provision of seedlings, technical assistance, provision of alternative source of income should be integrated and effectively implemented in the JFMA planning. The strong social inclusion of stakeholders at the community level combined with the reliance of community members on the forest for livelihood support will be a positive factor for involvement in JFMA. There is thus a good background to build on for JFMA schemes from the community angle. The result also shows that gender of the community stakeholders may influence their willingness to participate in JFMA. This may be due to the physical strength required for Forestry work, therefore less strenuous work such as seedling raising and other Nursery operations should be vehemently reserved for the female stakeholders. Factors such as a high awareness at the community level, presence of recognized rules and norms guiding the people at the village, consensus on forest importance among communities, and the people's inclination to be involved in the forest restoration and management tasks are potential success factors that will aid the adoption of JFMA by these forest communities. Benefits which improve communal welfare should be given priorities, as it has been reported that equitable benefits derivation has long-term positive effect on management of forest as well as reduce the pressure on resources (Seta *et al*., 2018).

Potentials of communities' stakeholders to collaborate in JFMA

Findings of the study revealed that bulk of the communities' stakeholders (78.5%) were willing to collaborate with the State Forestry service in the JFMA if the enabling condition is provided. The incentives which the forest communities highlighted- were similar to incentives highlighted by local communities in Tajikistan (Svenja *et al*.,2015) and in Cross River Forest reserve, Nigeria as reported by Ogana (2022). The stakeholders opined during the FGD, that the incentives will only motivate them while the absence of it will not deter them if the enabling environment is provided by the State Forestry department, as they were not offered any incentives for their voluntary support in the forest operations in the past, not minding the fact that, the forest land were relinquished to the State in trust by their fathers *ab initio.* Local people feel valued when their views are respected, when they are involved in decision making which thereafter increase their willingness to collaborate (Madhya, 2015). Factors like nativity status, derived benefits, years of experience, awareness, non-financial incentives and Occupation, were found to significantly influence the people`s willingness to participate in JFMA. Genuine involvement of the local people in the decision-making process and management of the forest resources helps to build trust and transparency in forest management (Nurrochmat *et al*., 2019).

Table 5: Multinomial Logistic Regression showing the influence of socio-demographic factors on willingness to participate in JFMA

S/N	Socio-demographic Factors	Coefficient (B)	Std error	P-value	Odd-ratio (Exp B)	DF	Wald
1	Age	0.214	0.771	0.781	1.239^{ns}	1	0.077
2	Gender	0.723	0.318	0.023	2.060 *	1	5.18
3	Nativity status	1.977	0.745	0.008	7.223*	1	7.042
4	Education level	0.364	0.468	0.436	1.440 ^{ns}	1	0.606
5	Years of Experience	1.172	0.379	0.002	3.227*	1	9.580
6	Derived benefits from Forest resources	1.699	0.672	0.012	5.467*	1	6.382
7	Awareness of the state of the forest	1.316	0.536	0.014	3.734*	1	6.028
8.	Occupation	0.376	0.185	0.042	1.456*	1	4.131
9.	Household size	-0.095	0.339	0.779	0.909^{ns}	1	0.079
10.	Non-Financial incentives	1.470	0.476	0.002	4.349*	1	9.537
11.	Provision of social amenities	1.392	0.507	0.006	4.023*	1	7.538
12.	Community customs and norms	1.026	0.401	0.011	2.789 *	1	6.526

Source: Field survey, 2025 (= Significant; ns = not significant at p ≤ 0.05;*

Forest under JFMA will potentially culminate into sustainable resource and benefit obtainable with time

Active collaboration of community members in JFMA has the potential to conserve the resources and salvage the study site with time; This opinion was expressed during the FGD by the community stakeholders and this is supported by Svenja *et al.* (2015) findings that when communities willingness and effort was harnessed to jointly managed forest in Tajikistan; such forest were more protected, restored, thereafter culminated to increase in the stand composition with time. Seta *et al*., (2018),

also reported that forest under JFMA in Ethiopia, experience improvement in status of resources and benefits derived with time as well providing income safety nets in times of income decline for the rural dwellers. According to Ogana (2022), JFMA improve self-value of the local community dwellers, create job opportunities for villagers so that they can dissuade from illegal logging, forests encroachment likewise reduce threat to life encountered by forest officials. The present State centric management approach in the study site, which is partially or completely exclusionary of community stakeholders has failed to sustain the forests; Hence, the strategies aimed at providing forest dependent people with a equitable stream of benefits will be to design/adopt appropriate JFMA which in return would enhance sustainable benefits, responsibility sharing and interface between the State and the locals.

CONCLUSION AND RECOMMENDATIONS

The findings of the study revealed high willingness of the community stakeholders to involve in JFMA and identify associated influencing factors and incentives. Adoption of JMFA has the prospect to conserve the FR and bring a shift from the current deficient sole, centralized management style to one where all stakeholders' benefits will be catered for without degrading the forest. The success of forest management depends on the involvement of stakeholders for comprehensive, equitable benefits and efforts adequately directed towards JFMA. The essence of community involvement should be a genuine participation in the forest operations and decision-making process through JFMA, as this will engender keen interest in administrative and conservation activities in the study area. High willingness of local community to participate in conjunction with well-structured JFMA framework for collaborating with the stakeholders employing the identified incentives suggests that JFMA could serve as a feasible option for sustainable management the forest.

It is recommended that community stakeholders' involvement in JFMA should be put in place and structured with prompt collaboration with all stakeholders so as to conserve the forest and effectively manage its resources, given high dependence on the forest resources. In the planning and operation of JFMA, provision of incentives should be explored in a way that will cater for and involve all stakeholders in the communities adjoining forest reserves.

The forestry staff should be motivated through relevant training and incentives that will enable them to act as facilitators to participating communal stakeholders in the JFMA. Participation in the JFMA can be achieved through devolution of central authority and direct involvement of the people. To encourage people`s participation in effective management and regeneration of the resources, review of or institutional changes in forest right may be necessary so as to better organize community members for Forest restoration and sustainable management.

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Authors contributions

SOSJ and SOJ conceptualized the study and designed the Methodology. SOSJ and SOJ performed literature searches and reviewed data collected. SOSJ collected data, performed the analysis, and wrote the first draft of the manuscript. SOJ provides Supervision. All authors read and approved the final draft of the manuscript.

Ethical Statement

Not applicable.

AI Declaration Statement

The authors declare that no Artificial Intelligence (AI) tools were used in the generation, analysis, interpretation, or writing of this manuscript.

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