Evaluation of Revenue Channels and Challenges in Sustainable Management of Oyo State Forest Reserves, Nigeria

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ABSTRACT: Forest revenue system is an instrument used by government to achieve various goals and objectives in forest management. This paper evaluates the various challenges of revenue collection and remittance in Oyo forestry service in Nigeria. A total of 94 forest officials were identified and reached (100%) in all the forestry administrative zones in Oyo State, including the headquarters through a set of structured questionnaire and data obtained were analyzed using descriptive statistics and logit regression at $\alpha_{0.05}$. Theaverage age of the respondents was 39.7±6.5 years, mostly male (71%), married (75.6%) and had secondary education (63%). Challenges confronting adequate revenue collection included lack of proper law enforcement, payment of cash by revenue collectors and inability of field officers to withstand armed illegal fellers with odds-ratio of 55694.85, 668.78 and 20.79 respectively. Problems facing adequate revenue remittance were remittance by field staff, inaccessibility of bank on time, lack of provision of incentives for running cost by the government and possibilities of field officers indulging in printing of fake receipts with odds-ratio of 140.18, 116.80, 3.65 and 3.44 respectively. The study exposed the various challenges facing adequate revenue collection and remittance in Oyo State forestry service, it is therefore necessary for the forest managers in the State to utilize this information wisely for the betterment of revenue generation.

The forest revenue system is an instrument used by government to achieve various goals and objectives in forest management. It is also a tool for obtaining maximum benefits from the management of forest resources (FAO, 2001).Since late 1970s, the collection of forest revenues has been primarily the role of the State Forestry Department in Nigeria. The structure of the forest revenue system in Nigeria must, therefore, be viewed from the different policies of the thirty six (36) individual States and the Federal Capital Territory (FCT). In other words, the structure of the forest revenue in each of the State necessitates due attention to their endowed ecological potentials since each State has legal and administrative freedom to manage its forests in any way it wishes.Generally, in defining the objective of a forest revenue system, the type of ownership structure and complexity of forest resources must be taken into consideration. However, whatever system of forest revenue is adopted, it is usually aimed at promoting a sustainable forest management, equity in the distribution of forest benefits to the community, promotion of rural development and stability of the forest revenue (FAO, 2001).FAO, (2005) identified that because of obvious administrative and management lapses, illegal harvesting of forest products is rampart and it is estimated that more than 90 percent of minor forest product producers and about 40 percent of timber producers avoid payment of forest charges. In view of these circumstances, the forest revenue system is not effective. For example, the forest monitoring system to control exploitation and transportation of forest products has broken down, because of a lack of patrol vehicles and an inadequate number of staff. Moreover, the uniformed forest staffs are not motivated and equipped enough to enforce the laws concerning forest exploitation. Most often, forest products are exploited by rural communities bordering the forests without paying the necessary charges for permits to collect the products. It was also pointed that another factor that contributes to poor revenue collection is the high overhead costs paid by a forest user. Also, the process of paying forest charges can be tedious and complex, while the tariff rate and the rules regarding payment and harvesting are not clear to most members of rural communities. However, in communities who have had their lands reserved or on whose native lands forest resources are being harnessed, the collection of forest

revenues does not go down well with the people.However, in South-West Nigeria, Oyo State can be considered or seen as one of its States endowed with enormous forest resources which when harnessed could support a wide range of economic activities in the State and even Nigeria at large. Therefore, this paper identified challenges confronting adequate revenue collection and problems facing adequate remittance, with a view to suggesting mitigations' strategy towards adequate revenue generation in the State.

MATERIALS AND METHODS

Study Area: The study area is Oyo State, located in the Southwestern geo-political zone (Figure 1). Oyo State, popularly referred to as the" pace setter" is one of the 36 States of the Federal Republic of Nigeria. It came into existence with the break- up of the Old Western State of Nigeria during the State creation exercise in 1976 and it originally included Osun State, which was split off in 1991. Oyo is bounded by the States of Kwara on the north, Osun on the east, and Ogun on the South and by the Republic of Benin on the West. Oyo State is traversed by the Yoruba Hills in the north. It lies within Latitude $7^{o}03'00.83''$N to $9^{o}10'48.29''$N and Longitude $2^{o}41'14.72''$E to $4^{o}33'10.04''$E. The State has some tropical rain forest in the South around Ibadan, the State capital, but is covered mostly by a "derived" savanna that is largely the result of clearing and burning the former forest cover to provide land for cultivation. The Ogun is the most important river. Oyo State is inhabited mainly by the Yoruba people. The economy of Oyo is based chiefly on agriculture and handicrafts.
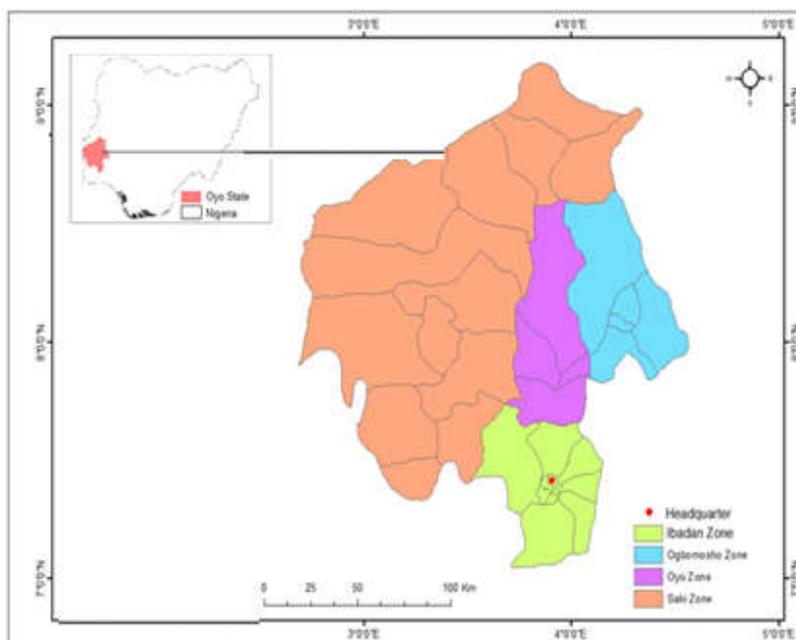

Fig 1: Map showing the Forestry Administrative Zones of Oyo State, Nigeria

Sampling Procedure: The target population for the study was core forestry officials in the Headquarters and all the forestry administrative zones in Oyo State forestry service.

This included the uniform, technical and professional staff.A total of 94 forest officials were identified in all the forestry administrative zones and headquarters in Oyo State: Ogbomoso (8), Oyo (11), Saki (30), Ibadan (38) and Headquarters in Ibadan (7).

A complete enumeration (100%) was done in which a total of 94 copies of questionnaire were retrieved from the field which represents 95.74% returns. Secondary data were also collected where necessary. Precisely, data on tapped forest revenue channels in the State.

Data Analysis: Data collected were subjected to descriptive statistics and Logit regression analysis (Inferential statistics), in which binary models were obtained.

Logistic regression: The logistic model of a response p between 0 and 1 is given as:

Logit (p) = Log [p/ (1-p)] = log (p) –log (1-p) (1)

The simplest form of logistic model is expressed as:

Logit (p_i) = a + bx_1 + ……..+bx_8 (2)

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RESULTS AND DISCUSSION

Table 1 showed the demographic characteristics of the respondents. Information on gender revealed that 71% of the respondents were male, while 17% were female. The average age of the respondents was 39.7± 6.5 years. The study on marital status of the respondents indicated that majority of the respondents were married (75.6%) while 12.2% were single. Information on the respondents' educational status revealed that 63% of them had secondary, 17% had tertiary and 8% had primary education respectively. Lastly, it was gathered that majority of the respondents had worked for over 5 years (39%, 36%).Several studies conducted in the past in South-west Nigeria on manpower in the forestry sector have revealed the predominance of male staff in forestry jobs than female.

Table 1: Demographic Characteristics of Respondents

Demographic Characteristics	Frequency	Percentage (%)
Sex		
Male	71	78.9
Female	17	18.9
No Response	2	2.2
Total	**90**	**100**
Age		
21-30	7	7.8
31-40	39	43.3
41-50	42	46.7
51-60	1	1.1
No Response	1	1.1
Total	**90**	**100**
Marital Status		
Single	11	12.2
Married	68	75.6
Divorced	6	6.7
Widowed	3	3.3
No Response	2	2.2
Total	**90**	**100**
Educational Distribution		
Primary Education	8	8.9
Secondary Education	63	70
Tertiary Education	17	18.9
No Response	2	2.2
Total	**90**	**100**
Work Experience (Year)		
1-5	13	14.4
6-10	39	43.3
>10	36	40.1
No Response	2	2.2
Total	**90**	**100**

Source: Field Survey, 2020.

For instance, a study conducted by Adejumo*et al.* (2018) reported the lower percentage of female participation in the State forestry service in Ogun State. Specifically, the study reported the low involvement of female in Ogun State forestry service to be 8.5% and attributed it to risk associated with women working in difficult terrain. In the same vein, another study of such was conducted by Kolade and Adejumo (2019) in Osun State and the same trend was observed as female representation was 39.1%. Although, the female representation recorded in Osun State could still be appreciated in comparison with Ogun and Oyo State (18.9%) experience. What is in vogue in the world today is the canvass by the female ones for gender equality in all the sectors of the economy. The question is that are women willing to do forestry jobs despite all odds? As a matter of fact, women are not supposed to be afraid of working in difficult terrain as tagged by many of them inasmuch as an appreciable number of them can be found in Nigeria army and Police force. With respect to age of the respondents, one could infer from the that most of the respondents were in theireconomic active age and this is in tandem with the report of NSSC (2011) which stated that economic active age is anticipated within the age bracket 35-50. As most of the respondents were married and mostly male, one could anticipate some high level of responsibilities in them and hence, increase in their productivity is envisaged. Gary (1991) argues that working longer and more regularly incentivizes a worker to increase his productivity (to further reap income benefits); hence we have one synergistic path to the marriage premium, a significant strength that is missing in most of the other family structure. The marriage premium is a general economic phenomenon and of course, it is the name economists give to the increase in husbands' productivity and earnings caused by their entering marriage. A study claims that married men make, on average, almost 30 percent more than their non-married counterparts in hourly wages. Hyunbae and Injae (2001) stressed that in accord with this, a study which controlled for all factors, including genetics, puts the marriage premium at 26 percent. As a matter of fact, since most of the respondents were husbands, the family obligations to be met by them are expected to be high which in turn may necessitate their efficiency and productivity at their various stations in order to retain their jobs. In terms of educational level, the forest officials were educated as most of them had secondary education. An appreciable percentage of them also had tertiary education which is also important for enhancement of productivity. ILO (2000) identified high level of education to be leading to more skilled and productive workforce, producing more efficiently a higher standard of goods and services, which in turn forms the basis for faster economic growth and rising living standards.One could infer from the result gotten on the work experience of the respondents that most of them were experienced as they have been in the job for over five years. Hence, it is presumed that reliable information must have been gotten from them. Also high

productivity and efficiency of the staff are expected to be guaranteed.

Challenges confronting Adequate Revenue Collection

Table 2: Logit Binary Nature of Challenges Confronting Adequate Revenue Collection in Oyo State Forestry Service
Dependent variable (CCERC) = Challenges Confronting Adequate Revenue Collection in Oyo State Forestry Service (Yes =1), (No =0)

Independent variables	Coefficient	Odd-ratio
Whether (PC) has been responsible for inadequate collection of revenue in Oyo State forestry service.	6.51	668.78*
Whether (FFS) has been responsible for inadequate collection of revenue in Oyo State forestry service.	77.33	0.01ns
Whether (TFO) has been responsible for inadequate collection of revenue in Oyo State forestry service.	3.73	0.02ns
Whether (IACN) has been responsible for inadequate collection of revenue in Oyo State forestry service.	2.178	0.11ns
Whether (IFOA) has been responsible for inadequate collection of revenue in Oyo State forestry service.	3.03	20.79*
Whether (LR) has been responsible for inadequate collection of revenue in Oyo State forestry service.	3.05	0.05ns
Whether (EF) has been responsible for inadequate collection of revenue in Oyo State forestry service.	16.60	0.00ns
Whether (LPLE) has been responsible for inadequate collection of revenue in Oyo State forestry service.	10.93	55694.85*
Model$_\chi^2$ (df, 8) = 10.90, Final loss = 0.00; p<0.05		

*= Significant at p <0.05; ns = Not significant

The Binary Models: Binary regression models obtained for the challenges confronting effective revenue collection in Oyo State forestry service (Table 2).

$$CCERC = -43.09 + 6.51PC + 77.33IFS - 3.73TFO - 2.178IACN + 3.03IFOA - 3.05LR - 16.60EF + 10.93LPLE \quad (3).$$

N = 90, Final loss = 0.00, Chi square (df; 8) = 10.90

Odd-ratio (Unit change). Constant (-43.09); PC (668.78); IFS (0.01); TFO (0.02); IACN (0.11); IFOA (20.79); LR (0.05); EF (0.00); LPLE (55694.85).

Where: CCERC = Challenges Confronting Adequate Revenue Collection in Oyo State Forestry Service; PC

= Payment of Cash; IFS = Insincerity of Field Staff; TFO = Transportation of Field Officers; IACN = Inadequate Communication Networks; IFOA = Inability of Field Officers to withstand armed illegal fellers; LR = Location of the Resources; EF = Executive Fiat; LPLE = Lack of Proper Law Enforcement

Model presented above for challenges confronting adequate revenue collection in Oyo State forestry service gave overall significant fit to the data judging from $_\chi$2value that was significant at p<0.05. Lack of proper law enforcement (LPLE) had the highest odd-ratio of 55694.85 followed by payment of cash by revenue collector (PC) with odd-ratio of 668.78 and lastly, Inability of field officers to withstand armed illegal fellers (IFOA) with the odd-ratio of 20.79 respectively. There was sufficient evidence that the estimated coefficients for the factors identified to be responsible for inadequate revenue collection were not zero. This implies that the regression parameters in the model were statistically significant. In other words the higher the value of odds-ration, the more likelihood the factors responsible for inadequate revenue collection in Oyo State forestry service. Hence, it clearly indicated the variable (s) i.e factors that mostly influence adequate revenue collection in the Oyo State forestry service. The implication was corroborated by Deeks (1996); Bland and Altman (2000) that the logit model provides information on the consequences of one variable on the other. Therefore, existence of these factors poses serious challenges to adequate revenue collection in Oyo State forestry service. This study is in line with Kolade and Adejumo (2019) who identified that lack of proper law enforcement is a factor responsible for inadequate revenue collection in Osun State.

Problems Facing Adequate Revenue Remittance
The Binary Models: Binary regression models obtained for the revenue remittance adequacy in Oyo State forestry service (Table 3)

$$ARRA = -8.54 + 4.94RFS - 4.32RAS + 1.24PFL + 1.30LPI - 1.23PMFS + 4.76BEA \quad (4)$$

N = 90, Final loss = 12.31, Chi square (df ; 6) = 13.77

Odd-ratio (Unit change). Constant (-8.54); RFS (140.20); RAS (0.01); PFL (3.44); LPI (3.65); PMFS (0.29); BEA (116.80)

Where, ARRA = Revenue remittance adequacy in Oyo State forestry service; RFS = Remittance by field staff; RAS = Remittance by account staff in the headquarters; PFL = Possibilities of field officers

indulging in printing of fake receipts; LPI = Lack of provision of incentives for running cost by the government; PMFS = Lack of provision for mobility of field staff (Revenue collectors); BEA = Banks not easily accessible

Table 3: Logit Binary Nature for Revenue Remittance Adequacy in Oyo State Forestry Service
Dependent variable (ARRA) = Problems Facing Adequate Revenue Remittance (Yes =1, No = 0)

Independent variables	Coefficient	Odd-ratio
Whether (RFS) has been responsible for inadequate revenue remittance in Oyo State Forestry Service	4.94	140.20*
Whether (RAS) has been responsible for inadequate revenue remittance in Oyo State Forestry Service	-4.32	0.01ns
Whether (PFL) has been responsible for inadequate revenue remittance in Oyo State Forestry Service	1.24	3.44*
Whether (LPI) has been responsible for inadequate revenue remittance in Oyo State Forestry Service	1.30	3.65*
Whether (PMFS) has been responsible for inadequate revenue remittance in Oyo State Forestry Service	-1.23	0.29ns
Whether (BEA) has been responsible for inadequate revenue remittance in Oyo State Forestry Service	4.76	116.80*
Model χ^2 (df, 6) = 13.77, Final loss = 12.31 ; p< 0.05		

= Significant at p<0.05; ns = Not significant.

Model presented above for Oyo State Forestry Service gave overall significant fit to the data judging from value $\chi 2$ that was significant at p<0.05. Remittance by field staff (RFS) had the highest odd-ratio of 140.18 followed by inaccessibility of bank on time (BEA) with the odd-ratio of 116.80, Lack of provision of incentives for running cost by the government (LPI) with the odd-ratio of 3.65 and lastly, possibilities of field officers indulging in printing of fake receipts (PFL) with odd-ratio of 3.44 respectively.There was also sufficient evidence that the estimated coefficient for the factors responsible for inadequate revenue remittance were not zero. This implies that the regression parameters in the model were statistically significant. In other words the higher the value of odd-ratio, the more likelihood the factors responsible for inadequate revenue remittance in Oyo State forestry service. Hence, it clearly indicated the variable (s) i.e. factors that mostly influence adequate revenue remittance in the Oyo State forestry service. Therefore, existence of these factors poses serious challenges to adequate revenue remittance in the study

area. Kolade and Adejumo (2019) had earlier identified indulgent of field officers in printing of fake receipts and lack of incentives for field officers as factors responsible for inadequate revenue remittance by Osun State.

Conclusion: The identified factors responsible for inadequate revenue collection in the study area were lack of proper law enforcement, payment of cash by the revenue collectors and inability of armed officers to withstand attack by armed illegal fellers, while those responsible for inadequate revenue remittance were insincerity in remittance by field officers, inaccessibility of bank on time, lack of provision of incentives for running cost by the government and the possibilities of field officers being indulging in the act of printing of fake receipts.

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