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The Roles of Socioeconomic, Social Capital, Households and Community Benefits on Participation in Conservation-Related Activities: A Case Study of Old Oyo National Park, Nigeria

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ABSTRACT

Stakeholders' participation in wildlife protection is viewed as one of the antidotes to successful nature conservation. The study assessed the influence of socioeconomic, social capital, households and communities' benefits on participation in conservation related activities in Old Oyo National Park, Nigeria. A multistage and random sampling technique was adopted for the selection of communities and households. The sample size was 302 household heads or their representatives drawn at random from 29 selected support zone communities of the Park. Data were obtained with the use of questionnaire. Data obtained were presented and analysed using descriptive statistics while hypotheses were tested using Chi-square, Pearson Correlation, and Logistic regression analyses. Results revealed that length of residency ($p < 0.01$) had the greatest impact on households' conservation engagement among the socioeconomic variables. Involvement in a work project with neighbours and others in the community ($p < 0.01$) had the greatest impact on participation. Provision of animal husbandry training and boreholes were the benefits that impacted most on household and community participation in conservation ($p < 0.01$), respectively. Government and conservation agencies should utilise community characteristics, social capital, and provision of more households and community benefits to enhance participation in conservation activities in the park.

Keywords: Wildlife resources - protected area - adjacent community – sustainability – stakeholders - benefits

INTRODUCTION

Despite the fact that Nigeria is one of Africa's most biologically diversified countries, wildlife conservation in both protected and non-protected areas is deeply entangled with socio-ecological issues. Conservationists and biologists are concerned about the long-term viability of species and their ecosystems, as well as the diminishing fortunes of wildlife populations. It's critical to recognize that the dwindling situation of wildlife resources necessitates adjustments at the community level in terms of commitment

to lifestyle modifications and biodiversity protection through proper engagement in conservation and management. Community involvement in conservation is an important factor in entrenching ownerships in the minds of local actors. However, there are many references to community participation and its importance for conservation, there is little evidence of positive consequences. Tjahjono *et al.* (2014) acknowledged that while public participation is a widely promoted concept, few governments have successfully implemented their programs, and, as Rolfe (2016) points out, "there is surprisingly little evidence which demonstrates the outcomes of the various kinds of participation." While public engagement in the re-building process draws on examples from affluent nations (Tosun 2000, Miraftab 2004), participatory approaches in the development process of developing countries do not appear to be taken into account as thoroughly (Tjahjono *et al.* 2014).

Stakeholder participation at the local level is quickly gaining international acceptance as a strategy for addressing complicated environmental issues (Prager and Nagel 2008). Due to the failure of the traditional system of managing natural resources, participatory conservation management has gotten a lot of attention (Ogunjinmi and Braimoh 2018). Participation is the involvement of individuals who are getting to be or are impacted by any developmental project or program. Participation in wildlife conservation and protected area management refers to the involvement of support zones and host communities who are affected and impacted by conservation programs, conservation choices, and conservation actions. It has been suggested that participation may be a procedure through which citizens can address and be a neighbourhood of implementation of their issues, needs, and monitoring processes in connection with political agenda and central/local government strategies (Rashidfarokhi 2016). Ife (2010) opined that participation seeks community ownership of community work through a genuine collaboration between community members and practitioners while improving community outcomes.

Participation is also seen as an empowerment method in which the agricultural poor are active in the development of their communities as well as their overall impact in the governance sector, including natural resource governance. Prabhakaran *et al.* (2014) stated that including the community can help with decision-making and that community participation can help people show and elevate their responsiveness by being more receptive. Participation of communities in natural resource management is critical for achieving positive livelihood outcomes, income, conflict resolution, and general community well-being. Sunkar *et al.* (2016) discovered that public participation is critical in the planning and administration of heritage sites in order to provide visitors with environmental education and historical context. According to Anderson and McFarlane (2010), when things are done for or to people, emotional involvement is limited, highlighting the necessity of participatory development. According to Kiss (2014), because people are considered citizens in their democratic country, they should have the capacity to make decisions that affect their own situations.

Social capital has been hailed as a critical component of community development, having the ability to bring people together to solve a common problem or achieve a common goal. Studies have raised concerns about the long-term viability of community development and conservation projects, implying that more attention should be paid to how diverse forms and stocks of social capital affect outcomes, implying that this is an ape-man within the

sustainable development agenda (Ostrom 2009, Woolcock 2010). Because of its ability to foster collective action for human benefit, social capital has been widely recognized as a critical contributor to human welfare (Barnes-Mauthe *et al.*, 2014), and it's also been viewed as a miracle concept capable of providing answers to a variety of phenomena beyond an economic lens (Poder 2011). Social capital dimensions such as social organization, shared understandings, and the form and quality of relationships (Claridge 2018) are fundamental components of community settings and rural livelihoods, and hence offer benefits to achieving conservation goals and objectives through collective action. Using social capital's inherent structures to promote positive environmental attitudes, raise concerns, and encourage involvement in on-site and off-site resource conservation programs could help ensure the long-term viability of animal resources. Krishna and Uphoff (2002) found a link between the social capital index and better results in watershed conservation and cooperative development initiatives in Rajasthan, India. In research of social capital and forest management in Bangladesh, Nath *et al.* (2010) discovered that social capital was linked to both improved livelihoods and better forest conditions, and that there was a positive association between social capital and forest conservation. Parisi *et al.* (2004) suggested that investing in social capital could be a key approach for marketing civically based environmental programs.

Residents who scored higher on Onyx and Bullen's (2000) social capital survey, particularly on the proactivity and neighbourhood connections subscales, expressed greater environmental concern and expressed positive environmental attitudes on recycling, growing trees, and renewable energy, according to a survey conducted in Australia by Onyx *et al.* (2004). Miller *et al.* (2006) found a link between social capital and community-level sustainable environmental action, reporting that residents who scored higher on the neighbourhood connections subscale of Onyx and Bullen's (2000) social capital survey were more likely to agree that their neighbours had taken action to address water and environmental conservation issues.

Household and community benefits have also been proposed as a counter-measure to increase local community conservation participation. Infrastructure improvements, such as roads, health centres, water, and schools, may boost local support and participation in conservation-related projects. According to FAO (1986), an incentive is a term used to describe a variety of state policies that encourage a farmer, or a group of farmers, to absorb all or part of the additional investment required and to shift income sources away from traditional land-use systems and techniques, to ensure continued and improved natural resource production, and/or to protect endangered goods and services. Because local actors are the "owners" of their resources, their conservation and long-term use are often dependent on the level of responsibility and empowerment they have earned or developed (BirdLife International 2010).

Understanding the elements that influence community engagement in conservation efforts in protected areas is important for the development and implementation of policies and practices that will ensure the long-term viability of the parks' natural resources. We chose the hypothesized explanatory factors that were used in the regression models, based on theoretical analysis and a thorough examination of the empirical literature on household conservation participation. Gender, age, education, number of years residing in the community, level of education of the family head, occupation, annual income, social capital, households, and community benefits were among the factors chosen. According to studies, numerous factors

such as socioeconomic status, social capital, household and communal benefits inform of infrastructure might influence rural residents' engagement in conservation. People's socioeconomic and demographic characteristics, for example, may influence their engagement in forest management, according to Mogoi *et al.* (2012), Engida and Mengistu (2013), and Mutune *et al.* (2015). As a result, the characteristics of individual community members may impact whether or not they participate in forest management (Wambugu *et al.*, 2017). To Musyoki *et al.* (2013), membership in a community forest association has a good impact on forest conservation. Bisong and Ogbonna (2018) discovered that age, gender, income, education, and family size are all determinants of residents' forest conservation participation.

The objectives of the study were to (a) assess the socioeconomic features of the local communities surrounding Old Oyo Park, (b) examine households' social capital, (c) determine the amount of household and community benefits from park conservation activities, and (d) describe households' participation in conservation related activities in the park. Despite the fact that there is a large body of literature and studies on public participation in conservation and its determinants, the importance of country and regional specific studies on participation in conservation cannot be overstated because factors and issues affecting public participation in conservation tend to be localized and vary depending on conditions and the influence of political, economic, and institutional factors. This research will reveal characteristics that encourage or discourage local engagement in conservation-related initiatives. The findings will aid researchers and policymakers in determining the kind of challenges that need to be addressed in order to enable and enhance local engagement in conservation, as well as providing crucial information for developing conservation initiatives to ensure their feasibility and success. Our findings could be applied to the developing countries, especially African countries with similar socioeconomic, political, and institutional structures. Overall, policymakers may be able to use the information gained from our research to increase public support for conservation and overcome the hurdles to local engagement.

MATERIALS AND METHODS

The research was carried out in the Support Zone Communities of Old Oyo National Park, Nigeria. The park was selected because it is the only federally administered wildlife reserve in Southwest of Nigeria. Old Oyo National Park is one of Nigeria's seven national parks, all of which are administered by the National Park Service in Abuja. The Park's Tede, Marguba, Sepeteri, and Oyo-Ile ranges were used as research sites. Old Oyo National Park is located in Nigeria's northern Oyo State and southern Kwara State. The Park is located in the southwest region of Nigeria, between latitudes 8^0 15' and 9^0 00'N and longitudes 3^0 35' and 4^0 42' E, and has a total land mass of 2,512 km^2 (National Park Service 2014). As a result of the scenario, the Park has a vantage point with plenty of land, unique fauna, and cultural/historical settings. Eleven local government areas surround it, ten of which are in Oyo State and one in Kwara State. The park is named after Oyo-Ile (Old Oyo), the Yoruba Empire's historic political capital, and it incorporates the ruins of this city. Upper Ogun and Oyo lle, two earlier native administrative forest reserves, were established in 1936 and 1941, respectively. In 1952, they were transformed to game reserves, which were eventually consolidated and upgraded to national park status (National Park Service Undated).

The park receives between 990mm and 1,500mm of annual rainfall, therefore the average daily temperature was between 25 0C (770.0 F) and 35 0C. (950.0 F) (National Park Service Undated). The rainy season runs from April through September, with the wettest months being July and August. The dry season runs from October to early April, with March and April being the driest and hottest months. From November to February, the park undergoes the harmattan season. Harmattan is characterized by a very cold–dry (9°C) and dust-laden wind, blowing northeast and west off the Sahara Desert into the Gulf of Guinea, towards the Caribbean and South America (Rosenberg and Burt 1999, Griffin *et al.* 2001). The park's animal species have been drastically diminished as a result of uncontrolled and uninhibited damaging human activities. However, some wildlife can still be found in abundance, particularly in the park's southern part. Roan antelope (*Hippotragus equinus*), Kobs (*Kobus kob*), Grey duiker (*Sylvicapra grimmia*), Patas monkey (*Cercopithecus aethiops*), Baboon (*Papio anubis*), and Water buck (*Kobus defassa*) are some of the animals seen in the area (Marguba 2002).

The vegetation of Old Oyo National Park is classified as southern Guinea savannah. According to research, the park's southern section comprises a forest savanna mosaic with wooded savannah, remnants of moist semi deciduous forest, grading northwards into drier mixed leguminous wooded savannah with a continuous lower stratum of perennial grasses (Marguba 2002, National Park Service undated).

Sampling design and sample size determination

We used a variety of socio-economic indicators, social capital, and household and community benefits from conservation in the park to undertake a quantitative analysis of local community participation in conservation-related activities. The information was gathered through a cross-sectional survey of support zone settlements in the vicinity of Old Oyo National Park in Oyo State, Nigeria. To draw a sample of households in the specified communities, a multistage and random sampling technique was used. In the first stage, we chose four administrative ranges out of the park's five administrative ranges, namely Tede, Marguba, Sepeteri, and Oyo Ile (Table 1), because they represented ranges with the most conservation activities. In the second stage, support zone communities (villages) (29 communities) in each of the selected administrative ranges that are within 0-5, 6-10, and 11-15 kilometres of the parks were chosen because they were the most affected by conservation operations in the park; participation may then be influenced by the impact of conservation on surrounding communities (Ogunjinmi *et al.* 2014). We chose 302 households in the third stage, including 78 from the Tede range, 72 from Marguba, 98 from Sepeteri, and 98 from Oyo Ile (54). At the fourth stage, household heads of between 5-10 were chosen in each of the selected communities as suggested by Sakurai (2006) for studies on social capital.

From February to October 2015, we conducted questionnaire administration in the selected households with the help of a ranger in each of the selected administrative ranges who is a native of the area, using a questionnaire modified from Nguyen (2007). We asked questions about sex, age, household, length of residency (the number of years the household has lived in the community), education, annual income, social capital indicators including group awareness and membership, and engagement in community activities with neighbours. Household benefit indices from conservation activities such as cash crop training, seedling distribution, animal husbandry training, and wildlife farming training among other variables. Community benefit indices, such as infrastructure provision to chosen communities and involvement in conservation-related activities, were also included. The questionnaire was first utilized in pilot research in the park's Yemoso range,

which was not chosen for this study. It took roughly 20-30 minutes to complete the questionnaire. All of the houses who were chosen were given the option to participate and decline to answer any questions. Other households took the place of those that declined to participate. We also used Cronbach's (1951) approach to calculate the instrument's dependability coefficient. The Cronbach's alpha coefficient was very good, and group awareness (0.82), group membership (0.90), participation in community activities with neighbours (0.85), personal benefits to households (0.94), infrastructure provision (0.80), and participation in conservation-related activities (0.81) were all very good. The accepted value of Cronbach's alpha is 0.7; however, values above 0.6 are also accepted (Griethuijsen *et al.* 2014, Taber 2017).

Measurements

Table 1 provides full description of data used in the inferential statistics.

Table 1: Description of explanatory and dependent variables used in logistic regression

Explanatory variables	Description
Socioeconomic variables	
Sex	Dummy, 1= male, 0 =female
Age	Interval level
Household size	Continuous (number)
No of years of residency	Continuous (number)
Level of education	Ordinal
Occupation	Dummy, 1= farming, others = 0
Annual income	Interval
Social capital	
Group awareness	Dummy, 1= yes, 0 = no
Group membership	Dummy, 1= yes, 0 = no
Participation in community activities with neighbours and others	1=Never, 2=once/year, 3=few times/year, 4= once/month, 5= few times/month
Households' benefits from conservation	Dummy, 1= yes, 0 = no
Community benefits from conservation	Dummy, 1= yes, 0 = no
Dependent variable	
Participation in conservation related activities	Dummy, 1= yes, 0 = no

Data Analysis Methods

In this study, descriptive statistics such as frequency, percentage, graphs, figures, and tables were used to summarize and show socioeconomic, social capital, household, and community benefits (data). The difference across communities in terms of social capital, household and community benefits, and engagement in conservation-related activities was compared using one-way analysis of variance (ANOVA). The correlation between socioeconomic status, social capital, household and community benefits, and engagement in conservation-related activities was determined using Chi-square and Pearson's correlation. In addition, logistic regression analysis (logit) was used to determine the determinants of household participation in conservation-related activities. The dependent variable (engagement in conservation-related activities) was represented by five statements: involvement in park protection training, conservation meetings, water management, land use planning, and agroforestry training.

RESULTS

Descriptive Statistics

The respondents' ages ranged from 18 to 120 years old, with the mean and median ages being 42.3 and 40.0 years, respectively. The highest age group was 25-54 years based on Nigeria's national age category. There were 224 male-headed households (74.2%) and 78 female-headed households (24.8%) in the sample. As a result, male-headed houses

were more than female-headed houses. The households in the communities had an average of 14.0 years of residency. Farming is the primary occupation of about 84% of the households' heads. Furthermore, 56.3% of household heads had received no formal education, 29.5% had received elementary school education, 11.9% had received secondary education, and 2.3% had received higher education. The average household size is 6.6 individuals. During the period of data collection, the mean and median household annual incomes were ₦215,764 (USD1,089.72, USD1=198) and ₦150,000 (USD757.58), i.e., ₦17,980 (USD90.81) and ₦12,500 (USD63.13) per month, respectively.

Year of residency in the communities ($F(15,286)=3.06$, $p < 0.01$), household size ($F(15,286)=2.70$, $p < 0.01$), and annual income ($F(15,286)=2.19$, $p < 0.01$) differ considerably by communities, according to one-way analysis of variance results. There were no significant differences in gender ($F(15,286)=1.54$, $p > 0.05$), age ($F(15,286)=1.15$, $p > 0.05$), occupation ($F(15,285)=1.30$, $P > 0.05$), and education ($F(15,286)=1.43$, $p > 0.05$) by communities (Table 2).

Table 2: Socioeconomic characteristics of the respondents

Variable	Frequency	%	Mean/Median	Df	F
Sex				15(286)	1.54
Male	224	74.2			
Female	78	25.8			
Age			42.3/40.0	15(286)	1.15
15-24	21	7.0			
25-54	220	72.8			
55-64	36	11.9			
65 and above	25	8.3			
Years of residency			14.0/10.0	15(286)	3.06**
1-5	85	28.1			
6-10	82	27.2			
11-15	32	10.6			
16-20	48	15.9			
21 and above	55	18.2			
Occupation				15(286)	1.30
Farming	254	84.1			
Others	48	15.9			
Education				15(286)	1.43
Non-formal	170	56.3			
Primary	89	29.5			
Secondary	36	11.9			
Tertiary	7	2.3			
Household size			6.6/6.0	15(286)	2.70**
1-5	120	39.8			
6-10	158	52.3			
11-15	13	4.3			
21 and above	4	1.3			
Annual income (Naira)			215,764/150,000	15(286)	2.19**
1,000-50,000	39	12.9			
51,000-100,000	93	30.8			
101,000-150,000	29	9.6			
151,000-200,000	50	16.6			
201,000-250,000	9	3.0			
251,000-300,000	29	9.6			
301,0000 and above	53	17.5			

**P < 0.01

Household's Social Capital

Group Awareness and Membership

According to the findings, 75.8% of people were aware of religious groups, 77.5% of farmers' groups, 43.0% of women's groups, 53.3% of youth associations, and 26.2% of credit groups. In addition, 73.8% belong to a religious group, 69.2% to a farmer group, 22.8% to a women's group, 43.0% to a youth group, and 21.5% to a credit group (Figure 1). Results from the survey show that household heads had a high level of awareness of farmers' groups and religious organizations, whereas youth groups, women groups, and credit groups had a low level of awareness. Religious and farmer's groups had high membership, whereas youth, women's groups, and credit groups had low membership.

Participation in Community Activities with Neighbours

Participating in community events (mean=3.61), gathering to address problems (mean=3.35), and community youth meeting (mean=3.22) are the three most popular activities involving neighbours or other individuals in the community, according to our findings in Table 3. Religious, farmers, and youth groups, as well as involvement in community events, meetings to address problems, and community youth meetings are the most important social capital indicators in the households and communities

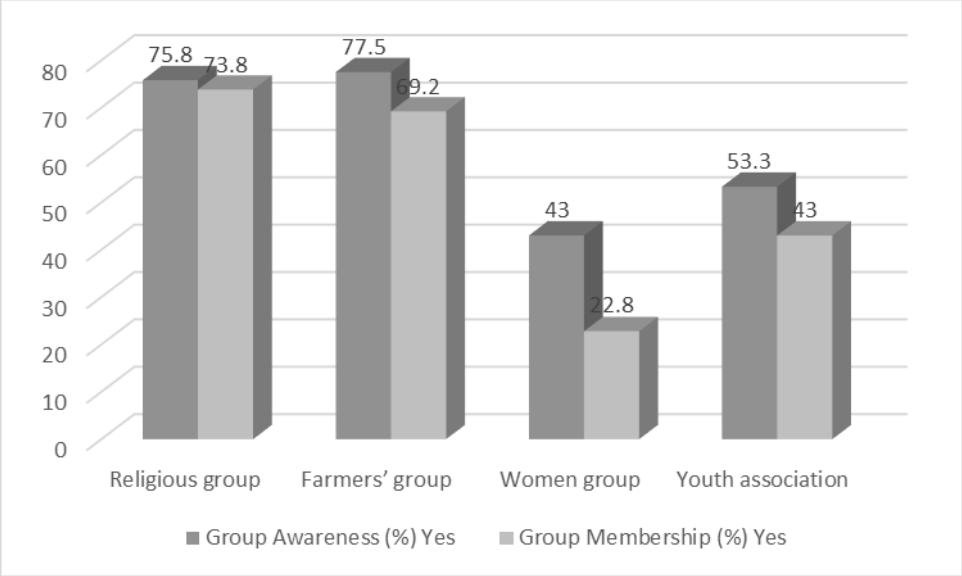

Figure 1: Households' group awareness and membership (%)

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Households and Communities' Benefits from Conservation

According to our findings, cash crop training benefitted 47.7% of household heads, seedling training benefited 41.1%, animal husbandry training benefited 43.0%, and wildlife farming training benefited 41.4% (Figure 2). According to the findings, household conservation benefits were below average, despite their importance in sustaining livelihood activities, notably

farming, which is the principal source of income in the communities. The study shows the extent to which conservation benefits the community, such as power, the construction of a flood dyke, road construction, the provision of hospitals, schools, and boreholes (Figure 3). The provision of schools received the largest percentage (64.2%), followed by the provision of boreholes (or water), road construction (16.2%), hospitals (15.6%), and electricity (2.6%), with the construction of flood dykes receiving the lowest percentage (2.6%). According to the findings, the primary benefit obtained from conservation by the communities surrounding the park was education.

Table 3: Households' participation in community activities with neighbours and others

Activities	Mean	Standard Deviation
Community events	3.61	1.55
Meeting to solve problems	3.35	1.36
Community youth meeting	3.22	1.51
Community development meeting	2.02	0.67
Training	1.89	0.93
Community work project	1.83	1.55
Sport event	1.70	1.14

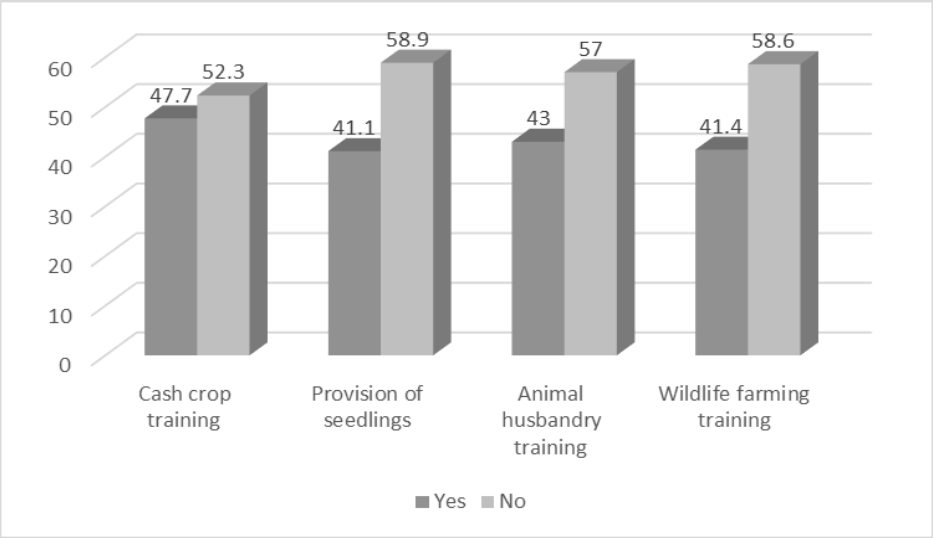

Figure 2: Benefits accrue to households from conservation (%)

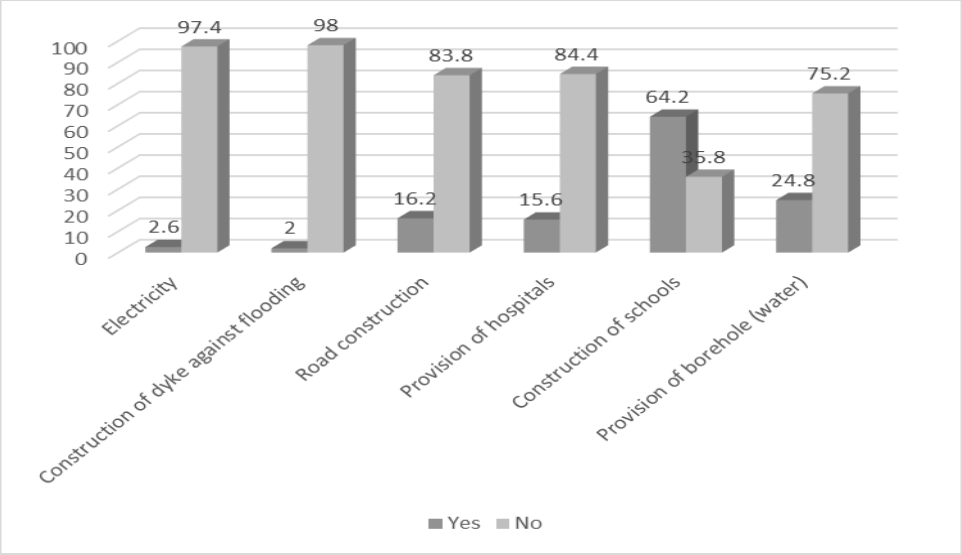

Figure 3: Community benefits from conservation (%)

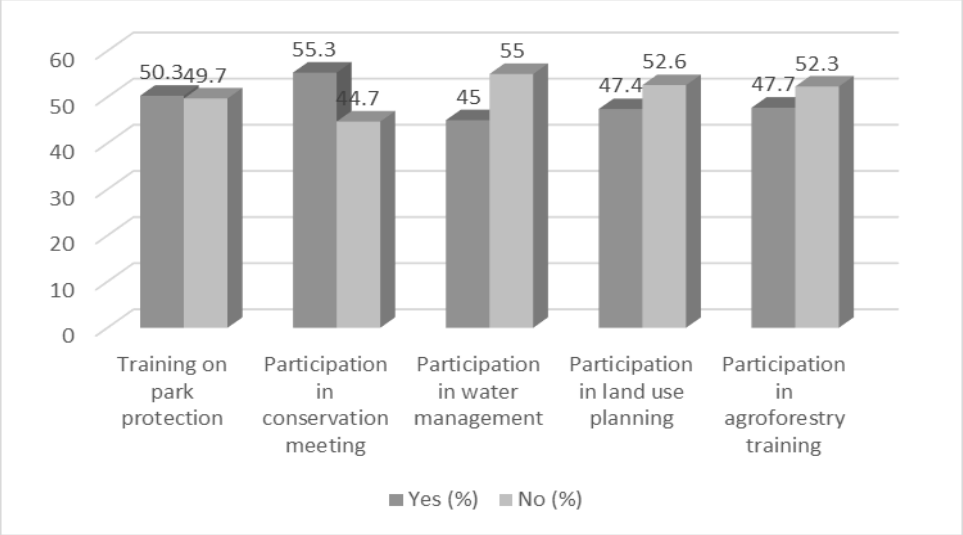

Figure 4: Households' participation in conservation related activities (n=302

Participation in Conservation-Related Activities

The findings show that household heads participate in two conservation-related activities in Old Oyo National Park: participation training on park protection (50.3%) and participation in conservation meetings (55.3%) (Figure 4). Water management (45.0%), land use planning (47.4%), and agroforestry rainfall (47.7%), on the other hand, were all below average (Figure 5).

One -way Analysis of Variance Result

The findings (Table 4) show that group awareness ($F(15, 286)= 3.44$, $p < 0.01$), group membership ($F(15, 286)= 3.77$, $p < 0.01$), participation in community activities with neighbours ($F(15, 286)= 2.03$, $p < 0.01$), household benefits ($F:15,286) = 2.76$, $p < 0.01$), and infrastructure provision ($F:15, 286) = 9.76$, $p < 0.01$) differ significantly by community.

Correlation Results

There is a significant link between respondents' age ($r= -0.15$, $p < 0.01$), length of residency ($r = -0.16$, $p < 0.01$), annual income ($r=0.12$, $p < 0.05$), involvement in community events with neighbours ($r= -0.30$, $p < 0.01$), and engagement in conservation-related activities ($r= -0.30$, $p < 0.01$). The size of the household ($r=0.07$, $p > 0.05$) has no statistical significance (Table 5).

Table 4: ANOVA results indicating differences in the selected variables by communities

Variable	Sum of Squares	Df	F
Group awareness	93.14, 525.74	15, 286	3.44**
Group membership	85.69, 433.73	15, 286	3.77**
Participation in communities' activities with neighbours	788.76, 7415.35	15, 286	2.03**
Households' benefits from conservation	128.05, 883.23	15, 286	2.76**
Community benefits from conservation	125.77, 245.59	15, 286	9.76**
Participation in conservation related activities	121.63, 1523.31	15, 286	1.52

**= P < 0.01

Table 5: Association between socio-economic variables, participation in community events with neighbours, and participation in conservation related activities

Variable	Correlation value (r)	P value
Age	-0.15	0.011*
Household size	-0.07	0.198
Length of residency	-0.16	0.007**
Annual households head income	0.12	0.038*
Participation in community events with neighbours	-0.30	0.000**

*= P < 0.05 **= P < 0.01

Chi Square Results

Chi-square tests show that occupation is strongly associated with park protection, training ($p < 0.05$), water management and land use planning ($p < 0.05$), and agroforestry training ($p < 0.05$) among the socioeconomic variables studied. The findings also show that religious group membership is favourably and significantly connected to participation in conservation meetings ($p < 0.05$), water management ($p < 0.05$), and agroforestry training ($p < 0.05$). Membership of farmers' group is favourably and significantly linked to participation in park protection training, water management ($p < 0.01$), land use planning ($p<0.01$), and agroforestry training ($p < 0.01$) ($p < 0.01$). In addition, involvement in park protection training, conservation meetings ($p < 0.05$), water management ($p < 0.05$), and land use planning ($p < 0.05$) is favourably and significantly connected to membership of youth association ($p < 0.05$). Participation in conservation meetings ($p < 0.05$), land use planning ($p < 0.05$), and agroforestry training ($p < 0.05$) are all positively and significantly connected to credit group membership. Hospital provision is positively and significantly connected to involvement in park protection training ($p<0.01$), conservation meetings ($p<0.01$), water management ($p<0.01$), land use planning ($p<0.01$), and agroforestry training ($p<0.01$) among the selected community benefits (Table 6).

Table 6: Chi square test of relationship between Socio-economic, group membership, households and community benefits and participation in conservation related activities

Variables	Participation in park protection	Participation in conservation meetings	Participation in water management	Participation in land use planning	Participation in agroforestry training
Socio-economic characteristics				0.30	0.55
Sex	0.04	0.05	1.05	5.71	2.00
Marital status	0.41	5.81	7.73	6.37	6.27
Education	2.59	4.41	4.71	4.50*	4.71*
Occupation	5.08*	1.26	4.38*		
Social capital					
Group membership				2.82	5.16*
Religious	3.14	5.23*	5.09*	7.59**	11.09**
Farmers	8.67**	2.60	7.43**	2.62	2.37
Women	0.83	0.95	2.05	3.86*	3.48
Youth	4.95*	4.54*	3.90*	5.32*	3.86*
Credit	3.10	3.95*	2.60		
Households' benefits				126.87**	140.24**
Provided cash crop training	100.58**	115.46**	124.33**	122.71**	141.96**
Provided seedlings	108.82**	99.65**	128.20**	178.77**	188.55**
Provided animal husbandry training	149.31**	121.28**	173.92**	158.54**	156.01**
Provided wildlife farming training	136.97**	106.31**	153.20**		
Community benefits				1.65	1.70
Electricity	2.11	3.45	1.33	2.31	2.36
Construction of dyke against flooding	2.78	4.95*	1.99	0.77	0.26
Road	0.17	3.44	2.40	11.67**	9.29**
Hospital	10.79**	10.21*	14.26**	8.52**	6.37**
School	4.03	5.51*	4.34*	2.14	0.75
Borehole	0.22	1.47	2.78	0.30	0.55

*= P < 0.05 **= P < 0.01

Logistic Results

The effect of socio-economic factors such as sex, age, education, occupation, length of residency in a community, household size, marital status, and annual income, social capital indices such as group membership and participation in community events with neighbours and others, households, and community benefits on participation in conservation-related activities was investigated using a logistic regression (Table 7). For park protection training, the logistic regression was statistically significant ($X^2(58) = 254.565$, $p < 0.01$). The model identified 88.7% of the components and explained 76.3% of the variance in households' involvement in park protection training (Nagelkerke R^2). Based on how long a household has settled in a community ($\beta = .064$, wald=6.827, $p < 0.01$), participated in animal husbandry training, ($\beta = -2.299$, wald=4.774, $p < 0.05$), participated in wildlife farming training, ($\beta = -2.350$, wald=4.825, $p < 0.05$), provision of borehole ($\beta = --2.035$, wald=7.108, $p < 0.01$), participated in community work project ($\beta = -5.351$, wald=6.788, $p > 0.01$), participated in youth meeting ($\beta = -4.579$, wald=6.267, $p < .01$), there is increase in likelihood in community participation in park protection training.

For participation in conservation meetings, the regression model was statistically significant, $X^2(58) = 238.696$, $p < 0.01$). The model explained 73.4% of the variance in household's participation in conservation meeting and correctly classified 88.3% of the dependent variable. Length of residency ($\beta = -0.056$, wald= 5.26, $p < 0.05$), provision of seedlings ($\beta = -2.460$, wald= 5.035, $p < 0.05$), participation in animal husbandry training ($\beta = -2.606$, wald=6.400, $p < 0.01$), construction of roads ($\beta = 2.209$, wald= 6.918, $p < 0.01$), provision of hospital ($\beta = 1.713$, wald= 4.615, $p < 0.05$), provision of borehole ($\beta = -2.075$, wald=6.756, $p < 0.01$), participation in community work project ($\beta = -5.217$, wald= 7.191, $p < 0.01$), and participation in community meeting ($\beta = -1.536$, wald=4.520, $p < 0.05$), households are likely to participate in conservation meetings. In addition, regarding participation in water management, the regression model was also statistically significant ($X^2(58) = 285.802$, $p < 0.01$). The model explained 82% 0f the variance in household's participation in water management and correctly classified 92% of the dependent variable. The explanatory variables that added significantly to the model are length of residency ($\beta = -0.068$, wald=4.546, $p < 0.05$), participation in animal husbandry training ($\beta = -3.976$, wald=12.774, $p < 0.01$), participation in community meeting to resolve problems ($\beta = -2.093$, wald=4.292, $p < 0.05$), and participation in community meetings ($\beta = 4.295$, wald= 5.424, $p < 0.05$).

Furthermore, for participation in the land use planning, the regression model was significant $X^2(58) = 294.669$ $p < 0.01$). The model explained 83.5% of the variance in household's participation in land use planning and correctly classified 92.7% of the dependent variable. The explanatory variables that added significance to the model are occupation ($\beta = -2.509$, wald=5.992, $p < 0.01$), participation in animal husbandry training ($\beta = -4.388$,wald=13.243, $p < 0.01$), participation in wildlife farming training ($\beta = -3.053$, wald=5.674, $p < 0.05$), participation in community work project ($\beta = -5.92$, wald=4.146, $p < 0.05$), participation in meeting to resolve problems ($\beta = 3.731$, wald=5.208, $p < 0.05$), and participation in youth meeting ($\beta = -6.568$, wald=7.291, $p < 0.01$).

With regard to households' participation in agroforestry training, the logistic regression was statistically significant ($X^2(58) = 315.391$, $p < 0.01$). The model explained 86.8% of the variance in households' participation in agroforestry training and correctly predicted 94.7% of the dependent variable. The explanatory variables that added significantly to the model are education ($\beta = 0.557$, wald=5.587, $p < 0.05$), occupation ($\beta = 2.815$, wald=5.693, $p < 0.05$),

length of residency (β=-0.089, wald=4.250, p < 0.05), participation in animal husbandry training (β=-8.158, wald=13.810, p < 0.01), provision of schools (β=2.001, wald=4.147, p < 0.05), participation in community work project (β=-9.221, wald=9.010, p < 0.01), participation in community meetings (β=5.669, wald=4.479, p < 0.05), and participation in youth meetings (β=-10.825, wald=8.885, p < 0.05).

Table 7: Summary statistics for logistic regression variables

Explanatory variables	Participation in Park Protection Training		Participation in conservation meetings		Participation in water management		Participation in land use planning		Participation in agroforestry training	
Socio-economic variables	β	**Wald**	β	**Wald**	β	**Wald**	β	**Wald**	β	**Wald**
Sex	-0.542	0.552	0.142	0.042	0.272	0.089	0.293	0.101	0.245	0.044
Age	-0.002	0.013	-0.017	0.955	-0.008	0.142	-0.010	0.147	-0.021	0.532
Marital status	1.147	2.530	0.668	1.042	-0.240	-0.088	1.037	1.462	0.858	0.701
Education	-2.478	1.828	2.379	0.841	-1.700	0.450	3.094	3.085	0.557	5.587*
Occupation	-1.096	2.109	-0.227	0.112	-1.061	1.363	-2.509	5.996**	-2.815	5.693*
Household size	0.012	0.047	0.011	0.042	0.011	0.023	0.065	0.668	0.559	0.298
Annual income	0.000	1.942	0.000	2.302	0.000	0.576	0.000	0.225	0.000	1.610
Length of residency	-0.064	6.827**	-0.056	5.726*	-0.068	4.546*	-0.047	2.117	0.245	4.250*
Social capital										
Group membership										
Religious	-0.813	0.386	-0.989	0.824	-0.372	0.071	-2.711	2.241	-2.694	1.582
Farmers	-0.194	0.042	0.932	1.132	-0.301	0.063	-0.792	0.312	-1.945	1.543
Women	-1.338	2.402	-1.214	2.003	-2.096	3.414	-0.548	0.291	-1.654	1.906
Youth										
Credit	-0.421	0.245	-0.410	0.243	-0.116	0.015	-1.897	2.430	-2.013	2.335
Participation in community activities with neighbours and others										
Community events	0.914	0.3496.788	-0.600	0.158	1.793	0.977	2.018	1.187	1.704	0.643
Sporting activities	-0.397	0.162	-2.775	2.203	0.545	0.197	-2.396	1.324	-0.778	0.300
Training	-1.086	0.668	-2.228	2.906	-3.004	2.427	-3.374	2.641	1.314	0.405
Work project	-5.351	6.788**	-5.217	7.191**	2.295	0.983	-5.592	4.416*	-9.221	9.010**
Meeting to solve problems	-0.342	0.069	-0.551	0.184	-2.093	4.292*	3.731	5.208**	-1.484	0.571
Community meeting	2.128	1.739	-1.536	4.520	4.295	5.424	-1.489	2.608	-3.156	6.256
Youth meeting	-4.579	6.267**	0.222	0.077	-1.414	0.342	-6.560	7.291**	-10.825	8.885
Households' benefits										
Cash crop training	-0.017	0.000	0.200	0.044	-0.390	0.054	-2.400	2.249	-2.330	1.881
Provided seedlings	-0.939	0.575	-2.460	5.035*	0.048	0.001	2.663	2.103	-1.394	0.525
Provided animal husbandry training	-2.299	4.774*	-2.606	6.400**	-3.976	12.774**	-4.388	13.243**	-8.158	13.810**
Provided wildlife farming training	-2.350	4.825*	-0.205	0.037	-1.324	1.674	-3.053	5.674*	1.921	1.269
Community benefits										
Electricity	-1.171	0.355	0.884	0.204	1.205	0.278	-0.446	0.033	0.131	0.004
Construction of dyke against flooding	-0.086	0.000	24.108	0.000	-0.309	0.002	-0.261	0.002	-2.169	0.008
Construction of road	1.016	1.587	2.209	6.918**	1.250	2.258	1.010	1.320	1.440	1.419
Hospital	1.586	3.350	1.713	4.615*	1.253	1.765	1.935	3.356	-0.585	0.213
School	0.090	0.024	-0.369	0.452	0.235	0.119	1.134	2.332	2.001	4.147*
Borehole	-2.035	7.108**	-2.075	6.756**	-1.097	1.822	7.634	0.611	-1.245	1.288
X^2 value	254.565		238.696		285.802		294.669		315.391	
Df	58		58		58		58		58	
%predicted	88.7		88.3		92.0		92.7		94.7	
-2log likelihood	161.323		174.187		126.666		120.139		99.644	
Nagelkerke R^2	0.763		0.734		0.822		0.835		0.868	

*= P < 0.05 **= P < 0.01

Discussion

Findings indicated that the respondents were in their active age (25-54 years). This finding supports prior research by Gatiso (2017), Subakanya *et al.* (2018), Ogunjinmi and Braimoh (2018), which found that they are in active age groups. Age has the potential to influence people's participation in conservation, particularly wildlife conservation because active age people are more likely to be involved in wildlife conservation activities than older people. There were more male-headed households in the study. Male household heads have the freedom of taking conservation decisions more than female household heads in local communities particularly among the Yoruba ethnic group due to traditions. Participation in conservation activities could be higher in male headed households than female headed households. This is in line with Toyobo *et al.* (2014), Nana and Tchamadeu (2014), Ogunjinmi *et al*. (2014), and Gatiso (2017). Results also showed that the households in the communities had an average of 14.0 years of residency. This implies that the communities' members have a relatively longer length of years in the communities. Longer length of years of residency could provide opportunities for people to be conversant with conservation activities in the park, the conservation challenges, and thus propensity to get involved in conservation activities. The primary occupation of the households' heads was farming. This indicates that farming is the primary occupation of the people who live near the park. Miranda *et al.* (2014), Gatiso (2017), Oduntan *et al.* (2012), and Nana and Tchamadeu all concur on this (2014). Individual that engages in farming as primary occupation are less likely to participate in conservation activities because of their tendency to perceive that parks deprived them of lands that could be used to carry out their farming and other livelihood activities.

Furthermore, 56.3% of household heads had received no formal education an indication that most household heads are illiterate, despite Nigeria's national literacy rate of 61.3% (CIA, 2015). This finding on education differed from those of Jayeola *et al.* (2011) and Miranda et al. (2014), who both said that primary education was received. The finding is also contrary to Vimal *et al.* (2018) who reported postgraduate education. Education can influence people's attitudes and behaviours towards conservation of wildlife resources since it makes them to be aware of conservation challenges and their roles in conservation, which could spur their involvement in conservation and protection of biodiversity. The average households' size indicated a relatively large family size, which is consistent with Gatiso's findings (2017). The larger the family size, the more the level of family dependency on wildlife resources and the less likely to participate in park conservation activities. The study showed that the mean and median income of the households' heads was lower than the country's minimum wage of ₦18,000 (USD90.91) per month. This indicates that the vast majority of the households were low-income. A low-income household would be willing to illegally exploit wildlife resources in the park to satisfy their needs and are less likely to participate in park protection and conservation.

According to the findings, majority of the households' heads were aware of religious and farmers' groups and religious and farmer's groups had highest membership. This implies that religious groups and farmers' groups were the important groups that the households in the communities were aware of and belonged to. This is consistent with Nguyen (2007) who observed that most of the household heads hold membership in various groups/organisation, their actual participation in the activities of these groups suggest otherwise. A collaborative value could be imbibed by local communities as a result of membership of community groups, this could have a positive impact on their willingness to take conservation decisions and collaborate with the park in the

conservation of park resources. The findings also revealed that participating in community events, meetings to address problems, and community youth meeting were the three most popular activities involving neighbours or other individuals in the community. Thus, this indicates that these are the most important households' social capital available to the communities. The study further showed that the selected household heads mostly participate in training on park protection and conservation meetings. The findings of this study are consistent with those of Sakala and Moyo (2017) and Lelegwe (2015). Stakeholders were involved in nature conservation, according to Martini *et al.* (2017). Participation in community events and meetings could engender trust, cooperation and collaboration between and among groups and conservation agencies with positive effects on the management of the protected area.

Findings further revealed that education, occupation, and length of residency had considerable impact on households' participation in conservation-related activities in the park. This corroborates Macharia (2015) who found that economic considerations have a substantial impact on forestry project involvement, particularly on implementation. However, this contrasts Nguyen (2007) who reported that age, gender, period of residence, education, and household size were not significant determinants of household engagement in conservation efforts. The findings is also consistent with Wambugu *et al.* (2017) that found that gender, household size, and income sources exhibited significant associations with participation in forest management.

Participation in agroforestry training is significantly influenced by household education. This is hardly surprising, given that agroforestry is a result of modern education and research, despite being a long-standing occurrence. These findings show that as a household's human capital grows, so does its willingness to participate in conservation. As a result, policies aimed at enhancing the education of residents in areas surrounding the park are desirable and should be enacted. According to the findings, occupation has a favourable impact on household engagement in land use planning and agroforestry training. This is significant since a big majority of the households are farmers who might benefit from land use planning and agroforestry methods, thereby improving their sustainable living, particularly because land is a major issue when it comes to farming near protected areas. Land use rules that affect household members' occupations, notably farming, could help to settle land use conflicts between communities and the park, resulting in increased conservation participation. According to the findings, households' length of residency in the communities has a beneficial impact on their involvement in park protection training, community water management training, and agroforestry training. This which could imply that those who have lived in the neighbourhood for a longer time are more familiar with the park's conservation initiatives over time and hence have a stronger desire to participate in conservation.

In addition, group membership was observed not contributing significantly to the household's engagement in conservation-related activities, implying that group membership is not an essential aspect of social capital that enhances households' conservation participation. It was also revealed that social capital predictors of participation in conservation-related activities in the park include participation in community work projects, meetings to settle problems within and outside communities, and community youth meetings. This is in contrast to Li and Tan (2019), who claimed that social capital heterogeneity does not always lead to increased community participation. Household benefits, such as seedling, animal husbandry training, and wildlife training, were predictors of household engagement in conservation-related activities, they are thus good

determinants of community participation in conservation activities. This could imply that the benefits of conservation to households may stimulate community participation in conservation.

Benefits derived by the communities from conservation are also important predictors of households and communities' involvement in conservation-related activities. This demonstrates that by providing essential infrastructure like as roads, hospitals, and schools, as well as reliable water sources such as boreholes could spur households and communities to participate in conservation-related activities. Community benefits are critical for overall rural communities' development. Meeting the developmental requirements of rural communities is critical to the park's long-term resource conservation success. It has the potential to ensure park solidarity in the face of external challenges. Such cooperation might take the shape of information exchange, which is critical for park protection, as well as the development of a local warning system in the event of threats to park resources and employees.

The findings also imply that participation in activities involving neighbours and community members is a good predictor of conservation-related activity participation. Engagement in a community work project, a meeting to solve problems, a community meeting, and a community youth meeting are all important social capital indices for home conservation participation. Utilizing social capital qualities could thus increase conservation support and engagement. As a result, the park's administration may use these social capital indices to encourage community engagement in its programs and to resolve or reduce tensions with neighbouring communities.

CONCLUSIONs

This study adds to the growing body of knowledge concerning community participation in conservation and the factors that influence it. Our findings shed light on how people, particularly in developing nations, participate in conservation efforts. To varying degrees, all the selected variables (socioeconomic characteristics, social capital, households and community benefits) influence households' participation in conservation-related activities. According to the findings, households conservation benefits were below average, despite their importance in sustaining livelihood activities, notably farming, which is the principal source of income in the communities. From the findings, the primary benefit obtained from conservation by the communities surrounding the park was education. This demonstrates that infrastructure supply in the areas surrounding the park has been minimal. It is recommended that government and conservation agencies, particularly Old Oyo National Park should utilise community characteristics, social capital, and provision of more households and community benefits to enhance participation in conservation activities in the park.

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