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Forest Degradation through Logging Activities: The Role of Spiritual Orientation among community members inthe environs of Onigambari Forest Reserve, Southwestern Nigeria

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ABSTRACT

Logging is a central element of forest degradation in developing countries including Nigeria. Yet, the investigation of motivators and/or inhibitors of logging outside non-economic factors seems non-existing. Therefore, this work was designed to examine the influence of spiritual orientation on logging activities among community members residing around Gambari forest reserve, southwestern Nigeria. Primary data were collected using an interviewer-administrated closed-ended questionnaire. Respondents were 190 proportionally sampled individuals. Simple percentile analysis, stacked/simple bar-chart, means/standard deviations as well as cross-tabulations were used for descriptive analyses. Chi-square and contingency co-efficient were used to assess the significance of associations between pairs of variables and the strength of significant associations respectively. The majority of respondents (70.5%)maintained a strong spiritual orientation while 27.4% of them engaged in logging at varying frequencies. Sex, education and age were not significantly associated with logging ($p> 0.05$) but religion was ($p< 0.05$). Spiritual orientation was also found to be significantly associated with logging ($p< 0.05$).Being a practitioner of traditional religion is significantly associated with a greater extent of logging but sex, education and age inconsequential in logging. Individuals exhibiting stronger spiritual orientation are significantly more likely to manifest a lower extent of logging. Spirituality begets positive implication for natural resource conservation in the study context. Conservation interventions could exploit spirituality in checking logging by forest-community members.

Keywords: Spiritual orientation, logging, deforestation, forest degradation, sustainable forestry.

Introduction

Although small-holder-driven deforestation is caused by a host of issues including economic, cultural, political, and demographic phenomenon (Chakravarty *et al*., 2012), the logging of wood for the satisfaction of human needs or greed is a central-contributory factor to forest degradation/deforestation by smallholders in Asia and sub-Saharan Africa (Amare *et al*., 2017).Unfortunately, deforestation causes the emission of about two billion tons of carbon (as CO_2) into the environment annually (Houghton, 2005). The forests are carbon sinks and when forests are depopulated, increased concentrations of greenhouse gases (GHG) will be released which will in turn increase global mean temperature (Sambe *et al*., 2018). Deforestation cause about 20% of global greenhouse gas emissions (Jamal *et al*., 2018). It therefore upsets the global carbon cycle and plays a notable part in global warming. Deforestation causes soil erosion and flood; half of the topsoil has been lost in the last one and a half century (Jamal *et al*., 2018). Deforestation is "by far the greatest threat to forest biodiversity (through the) loss of

habitats and species" (FAO and UNEP, 2020). Yet, biodiversity is indispensable to the adaptability of the ecosystem (Corral-Verdugo, 2009), which stands to guarantee sustainable development.

Despite the huge danger that deforestation poses to the environment, the logging of wood has continued unabated in many climes including Nigeria. According to the FAO, the contribution of timber logging to forest degradation is 32% in Africa (FAO and UNEP, 2020). Regrettably, logging begets further forest degradation which eventually causes forest loss (Lewis, 2006). Yet, forest management is very poor in several developing countries including Nigeria, which reflects on the rate of forest degradation. The report of Fasona *et al*. (2019) decried the poor state of forests governance and management in southwestern Nigeria. According to them, 85% of officials of the forestry and natural resources sector in governmental institutions felt that forests were improperly managed. The general perception was that the government was mainly interested in revenue generation as opposed to forest protection and regeneration. Individual land tenure is also precarious in communities of southwestern Nigeria such that the management of forests in communities is devoid of defined rules of exploitation, monitoring and enforcement of rules. No wonder deforestation occurs even more in community lands/forests when compared to forest reserves (Oyebo *et al*., 2010).

The consequences of prevalent individual land tenure include human conflicts and insecurity (Fasona *et al*., 2016). Fasona *et al*. (2019) further reported that the ideals of community forestry were hardly upheld in southwestern Nigeria. Hence, community members are not involved in forest management nor granted incentives to protect forests and its resources. This unpleasant character of forest management in the region and beyond bears unpleasant consequence for the state of forests in the region. Fasona *et al*. (2019) reported that the official stakeholders of the forestry sector described the state of forests and woodlands in southwestern Nigeria as "declined, deforested, degraded, depleted, over-exploited, threatened, encroached, poorly managed, lack of government interest". Similarly, Adekunle *et al*. (2010) asserted that logging "has been going on in the Nigerian forest ecosystem without any deliberate management programmes for more than fifty decades". It is therefore argued that forest degradation as perpetrated by human activities including logging require multiple approaches to tackle them.

Cultural and spiritual services are among the ecosystem services offered by forests (Endreny, 2018; Moffat, 2016).An important attribute of forests in the African settings generally is the idea that forests and trees are spiritual entities deserving of awe and utmost respect. Ikeke (2013) asserted that:

In African metaphysical ontology, the intrinsic value of the forests is rooted in its pantheistic-psychic foundation, which implies that the divine active force and spirit of the creator pervade all creation. It is this that gives value to all things, not simply on their utility.

In an exposition of the African philosophy of man's 'interconnectedness with nature', Okpoko (2020) asserted that Africans' preoccupation with resource exploitation from forests cannot be divorced from their colonial experiences. Before the colonial era, Nigerians maintained 'spiritual reverence' for forests. African cosmological perspective showcases belief in the interconnectedness of man, plants, and animals which are all endowed with divine force. For instance, Babalola *et al*. (2013) examined the socio-economic importance as well as attitudes towards *Milicia excelsa* (Iroko tree) in Ibadan metropolis, southwestern Nigeria. Among other

findings, they reported that 80% of their respondents "believed that some 'spirit' called *Oluwere* resides inside the trees and is worshipped by the traditionalists. To support this, fetish objects were seen on the trunk of some of the trees accessed in different locations within the city". Babalola *et al*. (2013) further reported that the perception that some trees harboured evil spirits was a reason they were felled or intended to fall such trees.

This indicates the possible role of spirituality in people's forest use behaviour even in contemporary society. Moreover, conservation scientists need to get themselves concerned about all factors that inspire human behaviour (St John *et al*., 2011). According to St John *et al*. (2011), economic factors have been focused on explaining human decision making for too long but humans are complex beings whose actions may not necessarily reflect financial rationality. It is argued, therefore, that spiritual orientation stands a good chance in explaining forest resource-use including logging. This orientation is the propensity to regard the life of man as sacred and beyond the ordinary. This work was therefore designed to examine the influence of people's spiritual orientation on their logging activities among community members residing around Gambari Forest Reserve, Southwestern Nigeria. This general objective was specifically addressed by assessing respondents' spiritual orientation; the frequency of respondent's engagement in logging; associations between socio-demographic variables (sex, religion, education and age) and wood logging; as well as the association between spiritual orientation and logging.

Methodology

Study area

The study area is the Gambari community and its environs, which adjoins the Gambari forest reserve. The reserve is located in the Oluyole local government area (LGA) of Oyo state. It is situated about 17km southeast of Ibadan city, along Ijebu-Ode road.Oyo State is a Yorùbá speaking community but people of varying ethnicity are resident therein. Gambari forest reserve is located around latitude 7º8'N and 7º3′N longitude 3º49′E and 3º22′E. It is made up of natural and plantation forests (Chukwu and Olajuyigbe, 2017) and it is largely degraded due to unguided human exploitation (Salami and Akinyele, 2017; Akinyemi *et al*., 2020). The common occupation of people in the study area includes farming, trading, and working in the civil service.

Research design/ Target population/Sampling procedure

This study is a cross-sectional survey, which was designed to target people residing in communities adjoining the Gambari forest reserve. Eight communities within a 1 to a 5-kilometreradius of the reserve were identified (see table 1). The specific population of each identified community could only be ascertained by using the older census report which provided information regarding community population. As such, the population of the communities as declared after the 1991 population census (National Population Commission, 1991) was used to estimate their population, using equation 1:

$$P = P_0 \times e^{rt} \quad \ldots \text{Equation 1}$$

P= final population, Po= initial population, e= exponential, r= growth rate, t= time interval. The communities' projected population as of2020 is 5477. This represents the total population (N). A modified version of the Cochran formula (equation 2) was used to determine the sample size:

$$n = \frac{Npqz^2}{e^2(N-1)+pqz^2} \quad \ldots \text{Equation 2}$$

Where n is the sample size,N, the population size = 5477, *p*, the (estimated) proportion of the population which has the attribute in question at the assumption of 50%= 0.5; *q* is 1–*p*; *z* is obtained from 95% confidence on *z* table as 1.96; and *e* is the desired level of precision (i.e., the margin of error) = 7% or 0.07. The required sample size was 189.3 ≈190.The selection of respondents from each community was proportional and was calculated using equation3 below:

$$\text{Cn} = \frac{x}{N} \times n \ldots \text{Equation 3}$$

Cn is the required sample size from each community, x is the projected population of each community as at 2020, N is total population = 5477 and n is the required sample size = 190. Table 1 shows the number of respondents drawn from each community.

Table 1: Projected and sampled population of study sites

Study sites	1991 population	Projected population (2020) @ 2.6% growth rate	Proportionally sampled population
Olubi	297	625	22
Onigambari	600	1,263	44
Oloowa	95	200	07
Busogboro	532	1,121	39
Onipe	410	862	30
Dalli	351	738	25
Olonde	215	453	16
Seriki	102	215	07
Total	1,934	5,477	190

Instrument of data collection

A structured questionnaire was the instrument of data collection. It was translated into the Yoruba language to enable easy conversation with respondents who do not speak the English language. The questionnaire was administered via structured interview.

Definition and assessment of variables

Spiritual orientation was operationally defined as the extent to which respondents are inclined to view man and his life as sacred and beyond the ordinary. It was measured using the transcendence conviction four-item sub-scale of the aspects of spirituality questionnaire (Büssing *et al*., 2014). Responses included "totally true (2)", "fairly true (1)" and "not true at all (0)". The possible total score was therefore 0 to 8. The higher the total score a respondent got, the stronger the spiritual orientation of the respondent. The scale was internally reliable given Cronbach's alpha score of 0.705.Logging was operationally defined as how frequently respondents cut/carried log(s) of wood from the forest in the month before the survey. The locale of logging could include reserved or open forest. A single-item, intensity-assessing index was used in its assessment. Responses were "0 time (0)", "1 to 5 times (1)", "6 to 10 times (2)", "11 to 15 times (3)" and "more than 15 times (4)". Socio-demographic variables including sex, religion, education and age were assessed nominally.

Data analyses

Data distributions were examined using frequencies and percentages. A stacked bar-chart was used to represent the distribution of responses to items in the scale of spiritual

orientation. Spiritual orientation was also summarized using mean and standard deviation while respondents were categorized according to the extent of this orientation (weak versus strong) using the mean score. These categories were represented using a bar chart while this chart was also used to show the distribution of the extent of logging among respondents. Cross-tabulations were used to show cross-distributions of socio-demographic variables; dimensions of spiritual orientation and logging. The significance of associations between pairs of variables was examined using chi-square. Contingency co-efficient was used to assess the strength of significant associations. Data were analyzed using Statistical Package for Social Sciences (version 23).

Results and Discussions

Socio-demographic characteristics of respondents

The distribution of socio-demographic characteristics shown in table 2 indicates that there is a preponderance of male over female respondents in the study. The age of about two-third (62.1%) of respondents ranged from 26 to 45, but all age sub-groups were well represented in the study. Respondents' mean ±SD age was 37.13±11.21, indicating the average respondent's closeness to middle-age. More than half of respondents (53.2%) had secondary education, while more than 1 in 10 respondents (12.4%) had tertiary education. This shows a good measure of formal education in the study area but the proportion of those not having formal education (14.5%) is quite high. Christians are more predominant (52.6%) but Muslims also constitute a large proportion of respondents (42.6%). Nine respondents (4.7%) identified with the traditional-religious faith. This shows some measure of cultural survival in the study area.

Table 2: Socio-demographic characteristicsof respondents (N = 190)

Socio-demographic characteristic	Sub-groups	Frequency	Percentage
Sex	Male	123	64.7
	Female	67	35.3
Age*	16-25	31	16.3
	26-35	57	30.0
	36-45	61	32.1
	46-55	28	14.7
	56-65	13	6.8
Highest education Attained	No formal education	27	14.5
	Primary	37	19.9
	Secondary	99	53.2
	Tertiary	23	12.4
	No response	4	2.1
Religion	Islam	81	42.6
	Christianity	100	52.6
	Traditional	9	4.7

*The mean ±SD of age was 37.13±11.21, minimum= 19, maximum= 64.

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Item and univariate analyses of spiritual orientation among respondents

The representation of responses to items in the scale of spiritual orientation is shown in figure 1. Respondents overwhelmingly upheld that the following spiritual ideas are true: 'man is a spiritual being', 'soul has his origin in a higher dimension', 'rebirth of man or his soul', 'existence of higher powers and beings'. This overwhelming endorsement ranged from 86.3% to 67.9%. Respondents' 'fairly true' reactions to the spiritual ideas ranged from 26.3% to 11.1%. Further, marginal proportions (5.8%, 2.1%, 2.6% and 4.7%) of respondents denounced the spiritual ideas. These distributions showcase a strong extent of spiritual orientation among respondents. Figure 2 is an attempt to visualize a summary of the respondents' spiritual orientation. About 3 of every 10 respondents exhibited weak spiritual orientation by scoring less than the mean score. On the contrary, about 7 of 10 respondents maintained a strong spiritual orientation. Indeed, spiritual orientation is strongly manifested by a majority of people in the study area. Ilesanmi *et al*. (2014) reported that 80% of their respondents were averagely or highly spiritual in their study among undergraduates of southwestern Nigeria. Strong spiritual orientation is a popular sentiment in the study area.

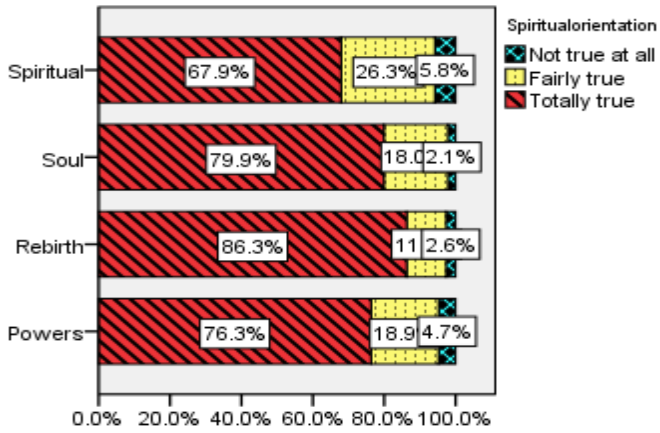

Figure 1: Distribution of responses to items in the scale of spiritual orientation. The items are: "I am convinced that man is a spiritual being (***spiritual***)"; "I am convinced that soul has his origin in a higher dimension (***soul***)"; "I am convinced of a rebirth of man or his soul (***rebirth***)" and "I am convinced of the existence of higher powers and beings (***powers***)".

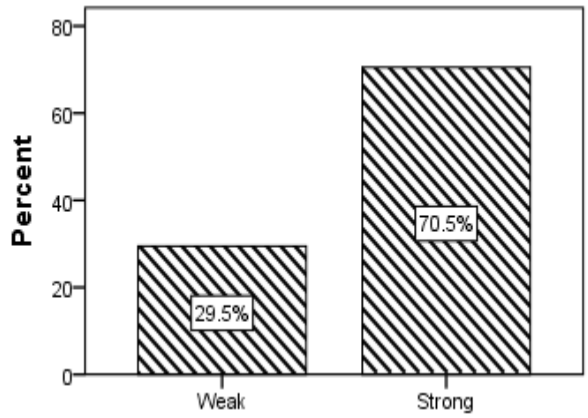

Figure 2: Dimensions of respondent's spiritual orientation. The mean spiritual orientation score was 6.94±1.41, minimum= 2, maximum= 8. Respondents who scored less than the mean were categorized as having weak spiritual orientation. Those who scored the mean and above were categorized as having a strong spiritual orientation.

Logging among respondents

Therepresentation of the frequency at which respondents cut/carried log of wood from the forest in the one month before the surveyis shown in figure 3. An overwhelming proportion of respondents (71.6%) did not engage in logging. However, 27.4% of respondents did. Roughly 1 in 10 respondents (9.5%) exploited log of wood between 1 and 5 times. Other distributions show that 8.4%, 6.3% and 4.2% of respondents exploited log of wood more than 15 times, within 6 to 10 times and within 11 to 15 times respectively.This reported frequency of logging is high and reflects a high rate of natural resources consumption. This high consumption rate also predisposes forests in the study area to damages. Adekunle and Olagoke (2010) asserted that "severe damage is usually inflicted on the forest ecosystem during logging activities, including forest soil compaction, damage to other trees and plants, cutting of seedlings, trampling, wildlife killing or chasing away". The study of Adekunle and Olagoke (2010) to examine post-felling damage caused to non-targeted trees and plants after professional logging indicated that despite the practice of selective logging, the damage caused to residual trees and seedlings ranged from 5% to 70% at Owo Forest Reserve, Ondo State, Nigeria. The high frequency of logging recorded in the current study reflects the motivation to log because "logging is a very lucrative business in Nigeria today and provides employment for many Nigerians" (Adekunle and Olagoke, 2010). Din *et al*. (2008) examined logging among 120 loggers in Douala, Cameroon and reported that 61% of respondents have chosen to become permanent loggers without any intention of quitting. Current findings underscore the need for government and non-governmental organizations to step-up efforts directed at enhancing livelihood diversification especially among people living in forest communities. The high frequency of logging represents a huge threat to the biodiversity of forests in the study area.

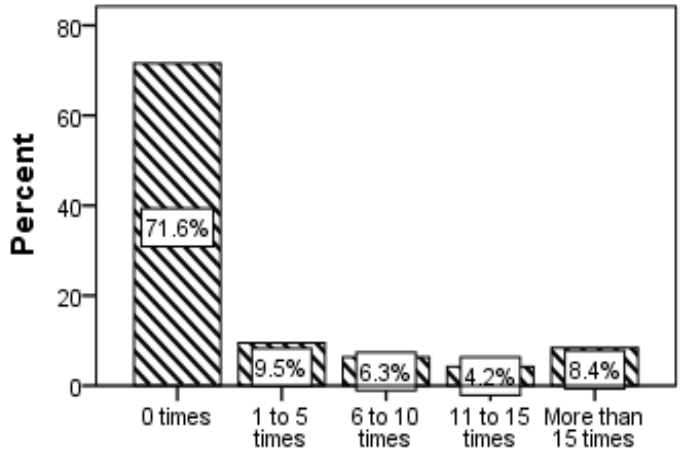

Figure 3: Distribution of the extent of logging among respondents within one month before the survey.

Socio-demographic characteristics and logging among respondents

The cross-tabulation of socio-demographic variables and logging is shown in table. The table shows that the proportion of male (70.7%) and female (73.1%) respondents that did not exploit log of wood from the forest are close. Similarly, the proportion of male (7.3%) and female (10.4%) respondents that most frequently exploited log of wood from the forest are quite close. The Pearson chi-square was 2.465 (p> 0.05). Hence, sex is not associated with logging among respondents. Although information regarding the influence of socio-demographic characteristics on logging is scarce in the literature, this finding is contrary to expectation. This is because women's role in the natural resource industry has been said to be poor when compared to men's (Colfer *et al*., 2015; Elias *et al*., 2017; Kristjanson, 2020). In this study logging is not significantly different between men and women probably because of the lucrativeness of logging (Din *et al*., 2008; Adekunle and Olagoke, 2010); and because it is perpetrated unabated in Nigeria communities (Adekunle and Olagoke, 2010, Fasona *et al*., 2019), which makes people strongly motivated to log.

Results further indicate that 75% of Christians and 71.6% of Muslim respondents did not cut or carry log of wood from the forest. However, just a third (33.3%) of practitioners of traditional religion did not. Further, 3.0%, 8.6% and 66.7% of Christians, Muslims and practitioners of traditional religion most frequently exploited log of wood from the forest. Though they constitute a small proportion of the study sample (4.7%), the cross-tabulation of religion and logging has shown that practitioners of traditional religion are dominant exploiters of log of wood. The Pearson chi-square was 48.649 (p< 0.05). Hence, religion is significantly associated with logging. The extent of this association as assessed with contingency co-efficient is 0.451 (p< 0.05). Hence, the strength of this significant association is 45.1%. Considering that stronger spiritual orientation is significantly associated with lesser logging (see analysis of spiritual orientation and logging on table 4), it is counter-intuitive to find that practitioners of traditional religion exhibit a significantly higher level of logging. This is because they are expected to possess a greater measure of spirituality considering their traditional African religion. However, perhaps their level of spirituality is not necessarily stronger. Perhaps, this group of persons has special skills and endowments such as charms

that protect them/is perceived to protect them from real and perceived danger in the forest.

The cross-tabulation of education and logging shows that the highest proportion of respondents who did not exploit log of wood was those with tertiary education (91.3%). Respondents having primary education (70.3%), secondary education (69.7%) and no formal education (59.3%) did not logwood at all. None of the respondents having tertiary education belonged to the category of those who logged most frequently. Holders of secondary education (7.1%), primary education (8.1%) were also sparingly represented among those who logged most frequently. Only those having no formal education (22.2%) were noticeably represented among the most frequent loggers. These descriptive findings show that increasing education reduces the frequency of logging, probably because increased education expands people's livelihood options. These findings further suggest the valuable role of education in checking the frequency of logging. The Pearson chi-square was 18.434 (p> 0.05), indicating that education is not significantly associated with logging.

The cross-tabulation of age and logging shows that all age categories except the 16-25 (58.1%) were similarly and highly represented among those who did not log at all. The 16-25 age sub-group (16.1%) was also the largest proportion of respondents categorized as most frequent loggers. The youngest age category tended to log more. The Pearson chi-square was 15.880 (p> 0.05). Hence, age is not significantly associated with logging. The insignificance of the influence of age in the extent to which people log is probably borne out of the lucrativeness of logging, which makes it difficult for people of all age categories to resist logging especially considering prevailing poverty among the people.

Table 3: Socio-demographic characteristics and logging

Socio-demographic characteristics	Sub-groups	Wood logging					
		0 times	1 to 5 times	6 to 10 times	11 to 15 times	More than 15 times	Total
		Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	
Sex	Male	87 (70.7)	14 (11.4)	7 (5.7)	6 (4.9)	9 (7.3)	123 (100.0)
	Female	49 (73.1)	4 (6.0)	5 (7.5)	2 (3.0)	7 (10.4)	67 (100.0)
	Total	136 (71.6)	18 (9.5)	12 (6.3)	8 (4.2)	16 (8.4)	190 (100.0)
Religion*	Christianity	75 (75.0)	8 (8.0)	10 (10.0)	4 (4.0)	3 (3.0)	100 (100)
	Islam	58 (71.6)	10 (12.3)	2 (2.5)	4 (4.9)	7 (8.6)	81 (100)
	Traditional religion	3 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)	6 (66.7)	9 (100)
	Total	136 (71.6)	18 (9.5)	12 (6.3)	8 (4.2)	16 (8.4)	190 (100.0)
Education	No formal education	16 (59.3)	1 (3.7)	1 (3.7)	3 (11.1)	6 (22.2)	27 (100.0)
	Primary education	26 (70.3)	3 (8.1)	3 (8.1)	2 (5.4)	3 (8.1)	37 (100.0)
	Secondary education	69 (69.7)	12 (12.1)	8 (8.1)	3 (3.0)	7 (7.1)	99 (100.0)
	Tertiary education	21 (91.3)	2 (8.7)	0 (0.0)	0 (0.0)	0 (0.0)	23 (100.0)
	Total	132 (71.0)	18 (9.7)	12 (6.5)	8 (4.3)	16 (8.6)	186 (100.0)

Age	16-25	18 (58.1)	6 (19.4)	1 (3.2)	1 (3.2)	5 (16.1)	31 (100.0)
	26-35	43 (75.4)	5 (8.8)	4 (7.0)	0 (0.0)	5 (8.8)	57 (100.0)
	36-45	45 (73.8)	3 (4.9)	6 (9.8)	4 (6.6)	3 (4.9)	61 (100.0)
	46-55	20 (71.4)	3 (10.7)	1 (3.6)	2 (7.1)	2 (7.1)	28 (100.0)
	56-65	10 (76.9)	1 (7.7)	0 (0.0)	1 (7.7)	1 (7.7)	13 (100.0)
	Total	136 (71.6)	18 (9.5)	12 (6.3)	8 (4.2)	16 (8.4)	190 (100.0)

*Significant association.

Sex: Chi-square = 2.465, df = 4, p =0.651. *Religion: Chi-square = 48.649, df = 8, p =0.000; Contingency co-efficient = 0.451, (p =0.000). Education: Chi-square = 18.434, df = 12, p =0.103. Age: Chi-square = 15.880, df = 16, p =0.461.

Spiritual orientation and logging among respondents in the study area

The cross-tabulation of the dimensions of spiritual orientation and logging is presented in table 4. Among respondents whose spiritual orientation is weak, 53.6% did not log at all; whereas 79.1% of those exhibiting strong spiritual orientation did not log at all. Those exhibiting weak as opposed to strong spiritual orientation were more represented across all the gradients of the frequency of logging: 10.7% as opposed to 9.0% among those who logged 1 to 5 times; 14.3% as opposed to 3.0% among those who logged 6 to 10 times; 8.9% as opposed to 2.2% among those who logged 11 to 15 times; and 12.5% as opposed to 6.7% among those who logged more than 15 times in the one month before the survey. These ordinarily showcase the greater propensity to log among those exhibiting weak spiritual orientation as opposed to those exhibiting strong spiritual orientation. The Pearson chi-square was 17.479 (p< 0.05). Hence, spiritual orientation is significantly associated with logging. The significantly higher frequency of logging among people exhibiting weak spiritual orientation has positive implication for the relevance of cosmological belief in the sustainable use of environmental resources. In a similar instance to this study, the anthropological study by Adom (2018) was designed to examine the role of traditional cosmology in the conservation of nature at the Bomfobiri wildlife sanctuary in Ghana. Adom (2018) reported vast evidence showcasing "the quintessential roles that cosmological belief systems play in nature conservation". In a partly similar instance, Li *et al*. (2021) reported the significant relevance of religion in the rate at which people collect of Non-Timber Forest Products (NTFPs) in China. According to them, people who held religious belief collected NTFPs to a lesser extent. Hence, Li *et al*. (2021) concluded that religion contributes to nature conservation. The current finding affirming positive implication of spiritual orientation for natural resource consumption is an addition to the scare evidence proclaiming this positive implication: Smith (2016) asserted that "whilst the decline in biological diversity associated with environmental change is one of the critical challenges for the 21st century, … evidence suggests that spiritual worldviews, linked to traditional management, can conserve forests and other environments". Indeed, spiritual orientation stands to benefit resource conservation, as exemplified in the study area. It is therefore incumbent on academic, political and private-sector actors and otherwise; to jettison disciplinary boundaries cum other divisions (Kattumuri, 2018). This will enable the acknowledgement of useful solutions such as the incorporation of spiritual matters in resources-use interventions, to achieve sustainable use of resources.

Table 4: Spiritual orientation and wood logging

	Sub-groups	Wood logging					
		0 time	1 to 5 times	6 to 10 times	11 to 15 times	More than 15 times	Total
		Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
Spiritual orientation	Weak	30 (53.6)	6 (10.7)	8 (14.3)	5 (8.9)	7 (12.5)	56 (100.0)
	Strong	106 (79.1)	12 (9.0)	4 (3.0)	3 (2.2)	9 (6.7)	134 (100.0)
	Total	136 (71.6)	18 (9.5)	12 (6.3)	8 (4.2)	16 (8.4)	190 (100.0)

Chi-square = 17.479, df = 4, p =0.002; Contingency co-efficient = 0.290 (p =0.002)

Conclusions

Spiritual orientation is a phenomenon that manifests strongly among the people of the study area while logging is also noticeably high. Being male or female; having no formal, primary, secondary or tertiary education; and being younger or older are insignificant in matters of logging. However, being a practitioner of traditional religion is significantly associated with a greater extent of logging. The stronger the spiritual orientation, the lower the frequency of logging. Spirituality fosters the frugal use of natural resources.

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