

Factors influencing community participation in the implementation and monitoring of FLEGT-VPA in Ghana

FLEGT-VPA
in Ghana

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Mercy Afua Adutwumwaa Derkyi

*Department of Forest Science, University of Energy and Natural Resources,
Sunyani, Ghana*

Yaw Appau

*Plant Development Department, Centre for Plant Medicine Research,
Mampong, Ghana, and*

Kwadwo Boakye Boadu

*Department of Wood Science and Technology,
Kwame Nkrumah University of Science and Technology, Kumasi, Ghana*

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Abstract

Purpose – Voluntary Partnership Agreement (VPA) offers a framework for open and participatory forest management for forest actors, particularly communities fringing forest reserves. This paper aimed to determine the factors influencing the participation of local communities in the implementation and monitoring of Forest Law Enforcement, Governance and Trade-Voluntary Partnership Agreement (FLEGT-VPA) activities.

Design/methodology/approach – The study was conducted in three communities in Goaso Forest District in the Ahafo Region of Ghana. Based on a cross-sectional design, 105 ($n = 105$) community members were interviewed using a semi-structured questionnaire. Logistic regression analysis was performed to identify socio-demographic and cultural factors that influence people's participation in FLEGT-VPA activities. Friedman and Wilcoxon signed-rank tests were conducted to analyse the influence of the environmental role of the forest and participation in FLEGT-VPA activities.

Findings – The study found a significant association between the leadership status of respondents' local customs/taboo days and participation in both implementation and monitoring activities. At the same time, a significant association was found between respondents' participation in previous training programs and FLEGT-VPA monitoring activities. The environmental role of the forest was also found to have a significant association with respondents' participation in FLEGT-VPA activities.

Originality/value – Studies on the factors that influence the participation of forest fringe communities in Ghana in implementing and monitoring FLEGT-VPA activities are non-existent or scarce. This study identified significant socio-demographic and environmental factors contributing to participatory forest conservation modules such as FLEGT-VPA which will guide future forest conservation initiatives that are inclusive of stakeholders' interests/concerns.

Keywords Participatory forest management, Illegal logging, Voluntary partnership agreement, Forest law enforcement governance and trade, Community forestry, Ghana

Paper type Research paper

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1. Introduction

Problems of deforestation, corruption, lack of transparency, poor law enforcement and limited capacity within the forestry sector in some tropical countries shifted the focus of forest management to a bottom-up approach (Islam *et al.*, 2015). Thus, several efforts to garner the support of all stakeholders in sustainable forest management have been implemented (Maier *et al.*, 2014). One such effort is the Forest Law Enforcement Governance and Trade initiative by the European Union. Islam *et al.* (2015) noted that local communities' importance in these efforts had been highlighted.

Voluntary Partnership Agreement (VPA) as part of the Forest Law Enforcement Governance and Trade (FLEGT) mechanism targets reduction of illegal logging and long-term strengthening of structures within the forestry sector in some producer countries. The VPA revolves around a timber legality assurance system to verify timber sources into the EU market. The VPA also provides technical and financial assistance to producer countries towards reforms in the management of forest resources (Ghana-EU, 2009). The EU uses its position as the primary market destination for timber from most tropical timber producer countries to promoting equity, transparency, accountability and respect of rights in the management of forest resources within the context of the VPA implementation. Essentially, the VPA is a mutual arrangement that seeks to promote sustainable utilization of forest and its product with a significant improvement in the economic well-being of people who depend on the forest in the partner countries. In ensuring compliance to these provisions' community's fringing forest was identified as an essential stakeholder (Ghana-EU, 2009). At the local level, communities were tasked to monitor compliance to social responsibility agreements, reduce illegal chainsawing of timber, participate actively in allocating timber to loggers etc., geared towards good forest governance.

The VPA document recognizes the importance of local communities in forest management and involvement in implementing and monitoring the FLEGT-VPA activities. However, securing the active participation of communities in forest management activities has been constrained in practice by the heterogeneity of many rural settings (Arnold, 2001). Some authors have differently classified factors that facilitate or restrict the participation of communities in forest management. Araral (2009) mentioned socio-economic, demographic and micro-informal structures as factors influencing communities' participation in forest management. Agrawal and Chhatre (2006) also identified that demographic, socio-economic, biophysical and institutional factors affect community participation in forestry management activities. Other studies also found political, cultural and institutional structures in timber-producing countries as underlying factors that drive communities' participation in forest management (Asante *et al.*, 2017; Diawuo and Issiful, 2015; Dolisca *et al.*, 2006). The present study focused mainly on how incentives or benefits from forest resources, socio-demographic cultural and environmental factors promote or hinder the involvement of local communities in forest management initiatives such as FLEGT-VPA.

Forest laws and regulations, particularly in Africa, often limit community participation in co-management arrangements (Arnold, 2001). Little investment is made in structures that would develop forest communities as an active participant in forest management (Fisher, 1999). In India and Nepal, the state still retains legal titles to the forest areas allocated to joint forest management (JFM), restricting the active participation of communities (Arnold, 2001). Government agents limit community participation in co-management efforts to daily implementation and monitoring activities, such as forest boundary clearing and maintenance, while the government dominates the entire planning and policy formulation (Singleton, 2000; Akamani *et al.*, 2014). The majority of foresters doubt the capacity of local communities to contribute to planning and decision-making on forest management (Jashimuddin and Inoue, 2012). Therefore, the local communities are excluded as partners from managing the resources (Hossain, 1998). The tendency for people in authority to

influence the participation of people in forest conservation initiatives has been reported (see Akamani and Hall, 2015; Marfo *et al.*, 2012). Thus, Lomax (2008) posited that clearly defined rules supporting community participation in forest management would improve community structures for better participation of stakeholders in forest management. Similarly, it is noted that selecting and representing community members in a participatory arrangement should be transparent and based on merit (Faure *et al.*, 2019).

Opinions on the capacity of communities to participate in co-management of forest management activities vary in the literature. For example, Luza *et al.* (2011) and Hawthorne and Boissière (2014) agreed that communities have the needed capacities to contribute to forest management, especially when allowed to do so actively. Conversely, Jentoff (2000) stated that the competence of communities to perform the roles related to co-management is overrated. Communities were excluded from decision-making and benefit sharing in past forest management policies due to their limited human and economic capital (Akamani *et al.*, 2014). Lartey *et al.* (2012) and Kacho (2014) explained that governments need to provide adequate training for local communities to enhance their participation in all forest management activities. The state should show its commitment to supporting communities' efforts to become active and motivated to contribute to forest resources management (Mekbebe *et al.*, 2007; Gobeze *et al.*, 2009).

Lartey *et al.* (2012) noted that local communities lack incentives and motivation to undertake forest management activities. These communities have found ways of deriving direct benefit from the forest resources, including illegal farming in the forest reserves and illegal chainsawing (Akamani *et al.*, 2014). According to Lartey *et al.* (2012), active community participation in forest management could be achieved if the communities' benefits are likely to obtain from the participation equals the gains from illegal logging and farming in forest reserves. Thus, governments should not expect continued forest resources management participation from communities fringing forests without any form of incentives or benefits (Musyoki *et al.*, 2016). Maskey *et al.* (2006) and Kacho (2014) explained that community-based conservation programs need to consider direct and visible benefits to the local communities to encourage their full participation in such programs. It has also been observed that individual benefits obtained from forest management interventions influence the extent of personal involvement (Coulibaly-Lingani *et al.*, 2011; Agrawal and Gupta, 2005). Dolisca *et al.* (2006) found that individuals who benefited from co-management efforts were more active in protecting forest resources. The involvement in forest management of the people in the Oromia region in Ethiopia resulted from the benefits they obtained from forest products and fodder for their livestock (Lise, 2000; Degeti, 2003; Musyoki *et al.*, 2016). Dolisca *et al.* (2006) recommended that introducing more incentive packages is essential to stimulate and strengthen the greater participation of individuals in forest management activities.

Dolisca *et al.* (2006) further found that a combination of individual characteristics influenced the decision of people to participate in forest management initiatives in Haiti. Education and age were essential factors for explaining variations in the level of participation in forest management programs. Several authors (Higman *et al.*, 1999; Glendinning *et al.*, 2001; Owubah *et al.*, 2001) found that education was one of the significant variables that influenced the participation of communities in forest conservation and management activities. Education stimulates social engagement, and the probability of the involvement of illiterate individuals in forest management activities is low (Lise, 2000; Dolisca *et al.*, 2006). Agrawal and Gupta (2005) observed that people with higher educational levels might seek opportunities outside their community, thereby reducing their dependence on forest resources for survival. Therefore, they may not be willing and less available to participate in forest management actions. Beach *et al.* (2005), Atmis *et al.* (2007) and Smith (1999) have all reported that age influences the level of participation of individuals in forestry programs. They further distinguished between the interests of the old and young individuals in

participating in a co-management arrangement. Older people are more inclined to collect non-timber forest products (NTFPs), while younger individuals prefer active participation through decision-making in programs that affect their livelihoods. Other studies (Thacher *et al.*, 1997; Zhang and Flick, 2001) have also reported that age does not affect the level of participation of individuals in natural resources conservation programs.

Access to training and experience sharing programs positively influences a person's decision on participation in forest management activities (Kerse, 2016). Salam *et al.* (2005, p. 49) similarly reported that *"training participants on different aspects of participatory forestry is positively related to farmer's sustained participation"*. The authors further mentioned that continued interest in building the capacity of forest communities is critical in encouraging forest management participation. Maraga *et al.* (2010) indicated that awareness of natural resources-related issues influenced local communities' participation in forest management activities. Furthermore, Almshehay (2010) noted that understanding the aim of the natural resource conservation program could affect the level of participation.

Cultural practices or local customs have been reported to influence the participation of people in forest management activities (Diawuo and Issiful, 2015). One of such practices is the taboo day. It is common in Sub-Saharan Africa countries where traditional belief systems are rife (Diawuo and Issiful, 2015). In Ghana, the taboo day has been a key component of forest conservation at the local level before formal demarcation of forests by the state. Asante *et al.* (2017) noted that taboo day is a day set aside by the local people to prohibit all farming or forest-related activities within the catchment area of the forest reserves. It is reported that the forest serves as an abode for the ancestral spirits, deities and other supernatural beings (Aniah *et al.*, 2014); hence, a day should be dedicated for their relaxation. The day varies from community to community and is influenced by the beliefs of the people. It is one of the feared and complied rules at the community level because of the sanctions and the spiritual connotations associated with its default. It is indicated that people have been banned from entering the forest for a certain number of years for flouting the taboo day (Asante *et al.*, 2017). Diawuo and Issiful (2015) reported evidence particularly among the Ashanti ethnic group where individuals have been struck with strange ailments and sometimes death for disobeying the taboo day. Authors (Asante *et al.*, 2017; Anane, 2015) have reported on the cultural practice of taboo days towards sustainable forest management. It is indicated in Asante *et al.* (2017) that *"the gods visit the forest on these days. The absence of humans in the forest on such days allows the forest ecosystem to rest from stress from anthropological activities. That is why our forest has not been degraded compared to those managed by the government"*. For instance, Asante *et al.* (2017) noted that comparatively, forests managed by the local community through cultural practices remain protected compared to scientifically managed forests, which suffers from rampant destruction.

In the current study, participation in the implementation of FLEGT-VPA includes how and what specific activities or responsibilities communities could contribute to forest resources management. Implementation activities assessed included (1) part of enumeration team for salvage felling, (2) role of social responsibility agreement (SRA) negotiation team and (3) participation in decision-making on timber allocation. Also, under the participation in monitoring FLEGT-VPA, we focused on what aspect of forest management activities communities could observe and report. Monitoring activities assessed in the study were (1) monitoring compliance to the Social Responsibility Agreement, (2) enforcement of local laws (taboo days) and (3) reporting illegal forest chainsawing.

This paper examined the factors influencing the participation of local communities in the implementation and monitoring of FLEGT-VPA activities in Ghana. Previous studies (Lise, 2000; Degeti, 2003; Dolisca *et al.*, 2006; Akamani *et al.*, 2014) have investigated the factors that influenced community participation in general forest management activities. As yet, specific studies on the factors influencing the participation of local communities in FLEGT-VPA

activities in Ghana are scarce. The paper addresses the question—*what factors influence community participation in FLEGT-VPA implementation and monitoring activities in Ghana?*

In the next section of the paper, the methodology is presented. The results and discussion sections provide our findings on the factors influencing the participation of people in local communities in the implementation and monitoring of FLEGT-VPA activities and situates them in the context of relevant literature. The paper ends with a section on the conclusion and policy implications.

2. Design/methodology/approach

2.1 Study area

The study was conducted in Goaso Forest District (GFD) in the Ahafo Region of Ghana. The district presents an essential context for understanding the FLEGT-VPA activities in Ghana. The district is one of the key pilot forest districts selected for implementing the VPA activities coupled with their high rate of deforestation. The district has a relatively large number of logging companies in Ghana. This study was explicitly done in three communities, namely Gambia N^o1, Biaso and Kasapin Ketewa in Asutifi North (Figure 1).

The Asutifi North District lies between latitudes 6°40' and 7°15' North and Longitudes 2°45' West. It is one of the smallest districts in the Ahafo Region, with a total land surface area of 936 km². The district falls within the wet semi-equatorial zone characterized by two rainfall seasons, namely June and October, with a mean annual rainfall between 1,250 mm and 2000 mm. The district has two rainy seasons, April to June and September to October, as major and minor seasons. The district has a relatively high humidity ranging between 75 and 80% during the two rainy seasons located within the green belt (Ministry Local Government and Rural Development (MLGRD), 2013).

The district has a rich flora and fauna diversity. The district holds part of the Bia Resource Reserve, the only biosphere reserve in Ghana. The district has moist semi-deciduous vegetation composed mainly of large economic tree species such as *Melicia excelsa*, *Triplochiton scleroxylon*, *Antiaris toxicaria*, *Celtis mildbraedii*, *Terminalia superba*, *Funtumia elastica* etc. The GFD is noted for large numbers of illegal chainsaw operators, thus accounts for the high rate of deforestation. In addition to unsustainable farming practices such as shifting cultivation, uncontrolled bush fires and sand winning businesses also contribute to forest destruction (MLRD, 2013). The district is a host to three forest reserves; Biaso Shelter Belt, Bia Tano Forest and Goa Forest Reserves (see Figure 1), constituting about 20% of the entire land surface area of the district. Asutifi North District accounts for 2.7% of the total population of the Ahafo region. The district's population is slightly male-dominated, with males consisting 26,761 while females are 25,498 (Ghana Statistical Service, 2014, p. 16). The main occupation in the district is farming and employs about 58.4% of the entire members of the district. The dominant food crops grown in the districts include cocoa, cassava, plantain, cocoyam and rice.

2.2 Research design, data collection and ethical consideration

A cross-sectional research design was adopted for this study. The cross-sectional design allows for the one-time collection of data from a population (Setia, 2016). This design enables the generalization of the collected data to the larger population (Babbie, 1990) and makes it easier to examine associations only between variables (Bryman, 2012).

In total, 105 respondents ($n = 105$) were sampled for this study (Table 1); 35 respondents were selected from each of the 3 study communities based on 2 criteria. First, the respondents should have lived in the study area for at least the past five years, during which the FLEGT-VPA processes were introduced and implemented in Ghana. Second, respondents should be

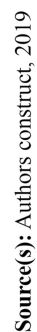


Figure 1.
Map of the study
communities in the
Asutifi North District

at least 18 years of age and have experienced or participated in any forest management activity. There was no record of official population figures for the study communities; thus, population figures for the respective communities were estimated by community leaders (Table 1). The study, therefore, did not rely on these figures for the selection of respondents for the study. Hence, the choice of 35 respondents per community (Table 1) was informed by Bailey (1994). The author argued that 30 respondents are the minimum requirement of a sample or sub-sample for a study to which statistical data analysis will be applied irrespective of the population. Thus, 35 respondents per study community were assumed to be satisfactory and representative for the data analysis. We were also guided by Bryman (2012), who explained that the choice of sample size should reflect a balance between limitations imposed by time, cost and the need for accuracy.

An open-ended structured questionnaire was employed to gather data using a face-to-face interview with respondents within the selected communities. We sought permission to collect the data for this study from community leaders before data collection. All ethical considerations were observed during data collection, including a comprehensive and careful explanation of the study objective to the respondents to enable them to make an informed decision regarding their participation in the study (Creswell, 2009; Bryman, 2012). Confidentiality of respondents was assured and that views and responses in this study can be withdrawn if they so wish.

2.3 Data analysis

Descriptive analyses of respondents' socio-demographic data were performed using the Statistical Package for Social Sciences (SPSS) version 20. The socio-demographic data and other independent variables were separately employed in a binary logistic regression analysis as independent variables for modelling their impacts on respondents' participation in the implementation and monitoring activities of the FLEGT-VPA initiative. The statistical significance of the β coefficient in the model was tested with Wald's χ^2 . The model's goodness of fit was tested using the Cox and Snell R^2 , Nagelkerke R^2 tests and the model's predictive accuracy. The predictive accuracy of the model was subsequently evaluated by comparing the predicted respondents' participation against the observed respondents' participation.

Participation of local communities in forest conservation actions are assumed to be influenced by two decisions; whether to participate or not. These decisions to participate in conservation actions are assumed to be influenced by factors related to an individual's background. Thus, dependent and independent factors were used to identify factors that would influence the participation of local communities in conservation initiatives such as the FLEGT-VPA initiative. Dependent factors are the factors that are assumed to be predicted or influenced by other factors, while independent factors predict or influence local communities' participation in conservation initiatives such as the FLEGT-VPA. The study draws on the hypothesis in Table 2 following literature on the participation of local communities in forest management.

Community	*Population (N)	Number of respondents (n)
Gambia N ^o 1	400	35
Kasapin	300	35
Biaso	500	35
Total	1,200	105

Note(s): *Represents estimated population figures given by opinion leaders in the absence of recorded data

Table 1.
Distribution of
respondents by
communities

The independent factors included direct benefits obtained from the forest resources, socio-demographic (sex, age, educational level, leadership status, perception, previous involvement in forestry training programs, duration of stay in the community) and environmental factors. Dependent factors were the participation of respondents in the implementation and monitoring of FLEGT-VPA activities.

Friedman test was conducted to determine the statistically significant difference in the overall ranking of the environmental/ecological roles of the forest. Respondents, therefore, identified and ranked the forest's five environmental/ecological roles to their livelihood in order of importance and influence on their participation in FLEGT-VPA activities. The ranking was from 1–5, with “1” being “most important” to their livelihoods and “5” being the “least important” to their livelihoods (see Table 8). Wilcoxon signed-ranked test was conducted to identify the exact location of the difference in the ranking by respondents.

3. Findings

3.1 Descriptive analysis of socio-demographic factors

The respondents' socio-demographic data are presented in Table 3. The study revealed that 79% of the respondents in the study were females and the remaining 21% males. The majority of the respondents (60%) were within the 18–40 years age group, while the least (3%) falls within the above 60 years age category. A significant number (77%) of the respondents have attained a different level of education, with 23% never schooled. The study also revealed that 82% of the respondents have stayed in the study community for more than ten years. The majority of respondents (55%) had no leadership status in the community, while 17%, 20 and 8% held traditional, religious and political positions, respectively.

3.2 Factors influencing participation in the implementation of FLEGT-VPA activities

The sex, age, duration of stay in the community and educational level did not significantly influence respondents' participation in FLEGT-VPA activities (i.e. $p = 0.05$) (Table 4). Similarly, the direct benefits respondents derived from the forest and their positive perception about the role of community-led forest management initiatives were not significant factors that influenced them to participate in the implementation of FLEGT-VPA (Table 5).

On the contrary, the leadership status of the respondents was observed to affect their participation in FLEGT-VPA (i.e. $p < 0.05$) (Table 4). Compared to the traditional leader, the odds for participating in the FLEGT-VPA activities decreases by about 0.57 for respondents who did not hold any leadership position in the communities. Likewise, participation in forestry training programs and local custom/taboo days significantly influenced respondent's participation (Table 5). It was observed that, compared to respondents who

Table 2.
Predictor factors and
expected outcomes

Factors	Expected outcome
Sex	+
Age	–
Educational level	+
Participation in forestry training programs	+
Taboo day	±
Leadership status	±
Perception on FLEGT-VPA	±
Direct benefits obtained from the forest	+
Duration of stay in the community	+

Socio-demographic variable	Frequency	Percentage (%)
<i>Sex</i>		
Male	83	79
Female	22	21
<i>Total</i>	<i>105</i>	<i>100</i>
<i>Age</i>		
18–40 years	63	60
41–60 years	39	37
More than 60 years	3	3
<i>Total</i>	<i>105</i>	<i>100</i>
<i>Educational level</i>		
Basic or secondary education	69	66
Tertiary education	12	11
Never schooled	24	23
<i>Total</i>	<i>105</i>	<i>100</i>
<i>Duration of stay in the community</i>		
Below 5 years	6	6
5–10 years	13	12
Above 10 years	86	82
<i>Total</i>	<i>105</i>	<i>100</i>
<i>Leadership status in the community</i>		
Traditional leader	18	17
Religious leader	21	20
Political leader	8	8
Not a leader	58	55
<i>Total</i>	<i>105</i>	<i>100</i>
<i>Did the benefits you derive from the forest inform your participation in FLEGT-VPA</i>		
No	29	28
Yes	76	72
<i>Total</i>	<i>105</i>	<i>100</i>

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Table 3.
Descriptive analysis of
the respondents' data

Predictor factor	<i>B</i>	SE	Wald	df	<i>p</i> -value	Exp(<i>B</i>)
Sex of respondents	–1.546	1.157	1.784	1	0.182	0.213
Age of respondents	1.043	0.565	3.410	1	0.065	2.839
Duration of stay	–0.279	0.535	0.272	1	0.602	0.757
Educational level (no education; reference category)			4.208	2	0.122	
Educational level (basic or secondary education)	1.996	0.994	4.038	1	0.44	7.363
Educational level (tertiary education)	1.162	1.216	0.913	1	0.339	3.196
Leadership status (traditional leader; reference category)			16.595	3	0.001	
Leadership status (religious leader)	–1.762	8.51	4.285	1	0.38	0.172
Leadership status (political leader)	0.209	0.997	0.44	1	0.834	1.232
Leadership status (not a leader)	–2.867	0.797	12.932	1	0.000	0.57
Constant	–1.773	2.149	0.681	1	0.409	0.170

Note(s): Cox and Snell $R^2 = 0.340$; Nagelkerke $R^2 = 0.505$; Predictive accuracy = 83.8%

Table 4.
Logistic regression
analysis of socio-
demographic factors
influencing
respondents'
participation in the
implementation
activities of
FLEGT-VPA

have attended forestry training programs, the odds for participating in FLEGT-VPA decreases by about 0.204 for respondents who have never attended any forestry training programs.

3.2.1 *Direct benefits obtained from the forest and their influence on respondents' participation in FLEGT-VPA implementation.* Our findings show that almost all the respondents depend on the forest for one product or the other (Figure 2). In total, 33% of the respondents fully benefited from the collection of firewood from the forest. These respondents exploit the forest as a commercial venture. At the same time, 62% of the respondents stated that they partially utilize firewood from the forest. This group used firewood from the forest for domestic purposes only. It was also observed that the majority of the respondents (45%) fully benefited from engaging in the modified taungya system [1]. Also, 11% of the respondents fully benefited from collecting herbal medicine from the forest (Figure 2). The study revealed that direct benefits obtained from the forest did not significantly influence the participation of local people in FLEGT-VPA implementation activities (Table 5).

3.3 *Factors influencing participation in monitoring activities of FLEGT-VPA*

The study found that the sex, educational level, duration of stay and age of respondents did not significantly influence their participation in the monitoring activities of FLEGT-VPA (i.e. $p > 0.05$; Table 6). Also, the direct benefits respondents derived from the forest, respondents'

Table 5.
Logistic regression
analysis of other
factors influencing
respondents'
participation in the
implementation
activities of
FLEGT-VPA

Predictor factor	<i>B</i>	SE	Wald	df	<i>p</i> -value	Exp(<i>B</i>)
Participation in forestry training programs (No)	−1.589	0.699	5.168	1	0.023	0.204
Local custom/Taboo days (No)	−1.469	0.524	7.846	1	0.005	0.230
Direct benefits derived from the forest (No)	−0.651	0.632	1.062	1	0.303	0.521
Positive perception about the role of community led forest management initiative (Yes)	0.707	1.226	0.333	1	0.564	2.028
Constant	0.347	0.416	0.696	1	0.404	1.415

Note(s): Cox and Snell $R^2 = 0.179$; Nagelkerke $R^2 = 0.266$; Predictive accuracy = 74.3%

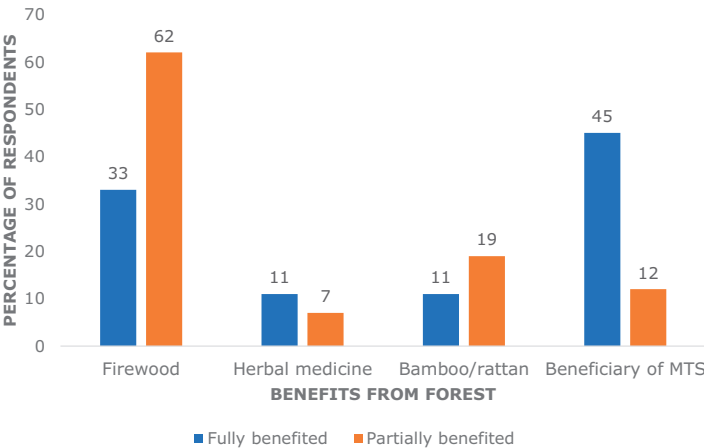


Figure 2.
Full and partial
benefits obtained by
respondents from the
forest

positive perception about the role of community-led forest management initiative and participation in forestry training programs were not significant factors that influenced them to participate in monitoring under FLEGT-VPA (Table 7).

It was revealed that the respondents' leadership status and local custom/taboo day affected their participation in the monitoring activities of FLEGT-VPA (i.e. $p < 0.05$) (Tables 6 and 7). Compared to the traditional leader, the odds for participating in the FLEGT-VPA activities decreases by about 0.163 for religious leaders.

3.3.1 Environmental factors influencing participation in FLEGT-VPA implementation and monitoring activities. The perceived role of the forest in the rainfall cycle was ranked the most critical function of the forest, followed by protection of the watershed, windbreak role, provision of shade and the soil erosion control role of the forest ranked least important (Table 8).

Predictor factor	<i>B</i>	SE	Wald	df	<i>p</i> -value	Exp(<i>B</i>)
Sex of respondents	−0.891	0.624	2.039	1	0.153	0.410
Age of respondents	0.087	0.429	0.041	1	0.840	1.091
Duration of stay	−0.291	0.401	0.527	1	0.468	0.748
Educational level (no education; reference category)			1.109	2	0.574	
Educational level (basic or secondary education)	−0.526	0.538	0.958	1	0.328	0.591
Educational level (tertiary education)	−0.644	0.805	0.640	1	0.424	0.525
Leadership status (traditional leader; reference category)			0.5795	3	0.122	
Leadership status (religious leader)	−1.811	0.782	5.795	1	0.021	0.163
Leadership status (political leader)	−0.841	0.900	0.874	1	0.350	0.431
Leadership status (not a leader)	−1.185	0.625	3.599	1	0.058	0.306
Constant	1.639	1.584	1.070	1	0.301	5.148

Note(s): Cox and Snell $R^2 = 0.108$; Nagelkerke $R^2 = 0.150$; Predictive accuracy = 69.5%

Table 6.
Logistic regression
analysis of socio-
demographic factors
influencing
respondents'
participation in the
monitoring activities of
FLEGT-VPA

Predictor factor	<i>B</i>	SE	Wald	df	<i>p</i> -value	Exp(<i>B</i>)
Participation in forestry training programs (No)	−1.030	0.700	2.168	1	0.141	0.357
Local custom/Taboo days (No)	−4.212	0.742	32.259	1	0.000	0.015
Direct benefits derived from the forest (No)	−0.342	0.725	0.223	1	0.637	1.408
Positive perception about community led forest management initiative (Yes)	1.444	1.026	1.981	1	0.159	4.238
Constant	2.328	0.652	12.728	1	0.000	10.255

Note(s): Cox and Snell $R^2 = 0.459$; Nagelkerke $R^2 = 0.635$; Predictive accuracy = 88.6%

Table 7.
Logistic regression
analysis of other
factors influencing
respondents'
participation in the
monitoring activities of
FLEGT-VPA

Environmental services of the forest	Frequency	% of the respondents	Rank
Regulation of rainfall cycle	92	88	1
Erosion control	6	6	2
Provision of shade	5	5	3
Windbreaks	1	1	4
Fire prevention	1	1	5

Table 8.
Rank of the
environmental services
of the forest by
respondents

Friedman test indicates a statistically significant difference in the overall ranking of the environmental/ecological roles of the forest, $X^2(4) = 226.73, p = 0.000$. Wilcoxon signed-ranked test reveals a significant difference between the perceived role of the forest in the rainfall cycle and the watershed protection function of the forest (ranking 1 and 2) (effect size = -0.6). There was a significant difference between the watershed protection function and windbreak's role (effect size = -0.5) (ranking 2 and 3) (Table 9). Similarly, there was a significant difference between shade provided by the forest and the soil erosion control role of the forest (effect size-0.4) (Table 9).

4. Discussion

4.1 Factors influencing participation in FLEGT-VPA implementation and monitoring activities

4.1.1 Direct benefits derived from the forest. The study found that respondents benefit directly from forest resources and land in the form of firewood, medicinal plants, bamboo/rattan and access to forestland to engage in modified taungya system. Nevertheless, there was no significant association between direct benefits obtained from the forest by respondents and their participation in FLEGT-VPA implementation and monitoring activities (see Tables 5 and 7). Ordinarily, the anticipation of benefits derived from forest resources would affect people's involvement in forest management activities, but the current findings depict otherwise. The results suggest that forest communities do not necessarily need to be compensated before engaging in forest management initiatives. The communities, instead, are intrinsically motivated to guard against forest destruction as it affects livelihoods. This finding is inconsistent with Maraga et al. (2010), who found a strong and positive association between expected benefits from the reforestation initiative and participation of communities in such programs in Kenya. It was reported in Ethiopia by Degeti (2003) that participation in forest management by the people in the Oromia region was a result of the benefits they obtained, including forest products and fodder for their livestock. Kacho (2014) asserted that community-based conservation programs need to consider direct and visible benefits to the local communities; otherwise, participation comes slowly. Dolisca et al. (2006) also recommended that introducing more incentive packages is essential to stimulate and strengthen the greater involvement of individuals in forestry programs. However, this current finding reveals that the absence of direct benefits to communities from forest co-management initiatives would not hamper the active participation of community members in forest management activities. This presents a positive outlook for the sustainability of any forestry intervention, especially when the people feel that the forest is vital to their sustenance.

4.2 Socio-demographic factors

Surprisingly, sex was not significant in influencing the participation of people in the FLEGT-VPA activities (Tables 4 and 6), as many forest-related activities are assumed to be

Table 9.
Wilcoxon signed-ranked test of pairs of the environmental role of the forest

	Rainfall-protection of watershed	Protection of watershed-Windbreaks	Provision of shade-Soil erosion control
Z	-8.89	-7.53	-7.05
p-value	0.000*	0.000*	0.000*
Mean rank	59.23	30.75	55.86
Effect size	9.21	50.56	35.32
	-0.6	-0.5	-0.4
Note(s): *Represent significance at $p \leq 0.05$			

male-dominated. This finding may indicate that no preferential consideration was given to any group of people in the forest management activities. However, several studies ([Tadesse et al., 2017](#); [Kerse, 2016](#); [Coulibaly-Lingani et al., 2011](#)) have all reported that sex is significant in influencing the participation of people in forest conservation efforts, especially in rural settings of Saharan Africa where socio-cultural norms restrict women participation in forest management initiatives. Similarly, this finding is inconsistent with the observation made by Joshi (1998) cited in [Agarwal \(2001\)](#), who explained that men take all-important forest-related decisions without reference to the views of women.

The logistic analysis revealed no significant association between age groups and local people participation in FLEGT-VPA implementation and monitoring activities. This is contrary to the popular convention in rural settings where older folks make essential decisions. [Atmis et al. \(2007\)](#) emphasized the importance of age in determining the preference of activities by local communities in participatory forest management activities. Atmis et al. further indicated that older folks are more inclined to collect NTFPs. At the same time, younger individuals prefer active participation through decision-making in forestry programs that affect their livelihoods. However, the finding of this study reports otherwise. Previous reports did not agree that age influences an individual's participation in participatory forest activities ([Zhang and Flick, 2001](#); [Thacher et al., 1997](#)).

Even though the educational level was hypothesized to significantly and positively influence participation in implementation activities, our finding reveals no significant association (See [Tables 4 and 6](#)). This finding suggests that a low level of education has no impact on the participation of local communities in participatory initiatives such as the FLEGT-VPA. In contrast, to this finding, [Kerse \(2016\)](#) noted that people with a high level of education participated actively and contributed effectively to decision-making in forest management compared to people with no formal education. Similarly, [Tadesse et al. \(2017\)](#) also found that educated people are more likely to participate in a participatory forest program in Ethiopia. Other studies ([Husseini et al., 2016](#); [Chhetri et al., 2013](#); [Higman et al., 1999](#); [Glendinning et al., 2001](#); [Owubah et al., 2001](#)) have all indicated that education is one of the significant factors that influence the participation of local communities in forest management activities.

As expected, leadership status was significantly associated with respondent's participation in FLEGT-VPA implementation and monitoring activities (see [Tables 4 and 6](#)). This implies that community members with social standing participated more in FLEGT-VPA implementation and monitoring activities than community members with low social standing. For instance, implementation activities primarily revolve around decision-making, especially on timber harvesting; traditional leaders as the customary landowners are always at the forefront. This result is in line with [Kerse's \(2016\)](#) findings which reported that decisions on forest management activities were dominated by people with positions at the local level. Similarly, [Bruce \(1999\)](#) mentioned that local elites are mostly the lead facilitators of participatory forest management initiatives, thus entrenched themselves in all aspects of the program implementation. In Southwestern Ethiopia, a study on factors influencing participatory forest management reported similar results ([Tadesse et al., 2017](#)). Thus, other studies have indicated the need to ensure open consultations during decision-making in participatory initiatives, making the process acceptable to stakeholders in the community ([Akamani et al., 2014](#); [Marfo et al., 2012](#)).

The study found no significant association between community members' perception and participation in FLEGT-VPA implementation and monitoring activities ([Tables 5 and 7](#)). This finding may imply that local people were indifferent about the outcome of the FLEGT-VPA on local livelihoods. However, authors such as [Tadesse and Teketay \(2017\)](#); [Siraj et al. \(2016\)](#) have indicated that benefits obtained from past programs could influence the decision of people to participate or not participate in conservation actions. Accordingly, [Jotte \(1997\)](#),

Tesfaye *et al.* (2012), explained that perception is critical to responding to participatory natural resource management initiatives. Also, Gurung (2003) noted that the design of any participatory program should consider the perception and knowledge of the beneficiaries, as the perception of people is vital in informing their participation in participatory efforts.

Participation in forestry training programs negatively and significantly influences community members' participation in FLEGT-VPA implementation activities ($B = -1.589$, $p = 0.023$; Table 5). This was expected as training exposes people and make them well-informed on initiatives such as the FLEGT-VPA. Similarly, Kerse (2016) found a significant and positive association between training received by local people of the Sodo community southwest of Addis Ababa and participation in the forest conservation program. In a similar study, Maraga *et al.* (2010) found that awareness of natural resources-related issues influenced the participation of local communities in forest management activities. Furthermore, Alemtsehay (2010) noted that understanding the aim of a natural resource conservation program could affect the community's level of participation. Through training programs, people become aware of the benefits of sustainable forest management, which could increase their involvement in conservation activities.

4.3 Cultural practice of taboo day

The local custom (i.e. taboo day) was hypothesized to play a role in respondents' participation in implementing and monitoring FLEGT-VPA activities in the forest reserves. Cultural practice of the taboo day was significant in influencing communities' participation in the implementation and monitoring activities of FLEGT-VPA (Tables 5 and 7). This finding may reflect the traditionalistic and conservative nature of the local people showing strong affinity with customs and traditions. Asante *et al.* (2017) noted that taboo days had been one of the socio-cultural practices adopted by the Ashanti ethnic group of Ghana in the pre-colonial era to protect forest resources. Likewise, Anane (2015) reported that many of the intact forests today were managed through cultural systems such as the taboo day, particularly in the southern part of Ghana. In other jurisdictions, the role of cultural practices in the conservation of forests has been highlighted. For instance, in India, Rim-Rukeh *et al.* (2013) noted that cultural practices to manage patched forests led to biodiversity conservation, protection of some endangered plant species and promotion of forest sustainability. However, Maraga *et al.* (2010) reported no significant association between cultural practice, particularly taboo days and participation in reforestation initiatives around River Nyandu Basin in Kenya.

4.4 Environmental factors

The study revealed regulation of rainfall cycle, erosion control, shade, windbreaks and fire prevention as environmental services influencing participation in FLEGT-VPA implementation and monitoring activities. Regulation of rainfall cycle was mentioned by 88% of the respondents, and the forest's first prioritized ecological service. The Wilcoxon signed-rank test found that the perceived role of the forest in the rainfall cycle (mean rank = 59.23) was rated more important than the protection of watershed by the forest (mean rank = 9.21). This may be linked to the fact that almost all the respondents were farmers and mainly practised rain-fed agriculture. Thus, the perceived rainfall role of the forest to livelihood would always be paramount. This tends to encourage the participation of the communities in forest management activities.

Similarly, statistical difference was observed between the watershed protection and windbreaks function of the forest, with respondents favouring the windbreaks' role of the forest (mean rank = 50.56) to the protection of watershed (mean rank = 30.75). This was so because the respondents were mainly farmers and more interested in protecting their crops and properties against the devastating effect of the wind. However, in Kenya, participation in

afforestation initiatives in the catchment of River Nyandu was due to problems related to soil erosion (Maraga *et al.*, 2010). This suggests that environmental considerations are crucial to participatory forest management initiatives, but the motivating environmental factor to participation is location-specific.

5. Conclusion

The paper examined the factors influencing the participation of communities in the implementation and monitoring activities of FLEGT-VPA in Ghana. The study found that respondents' socio-demographic characteristics, environmental and cultural factors influenced the participation of community's in FLEGT-VPA activities in Ghana. Socio-demographic factors such as age, leadership status and other factors including perception and participation in forestry training programs significantly influenced participation in FLEGT-VPA activities. Taboo day was found to be significant at influencing participation in FLEGT-VPA activities. Benefits obtained from the forest were not significant at influencing participation. This indicates that the absence of direct benefits does not always discourage the active participation of people in forest management activities. Thus, policymakers may have to emphasize the vital role of the forest in the sustenance of local livelihoods.

Moreover, the design of participatory forest conservation actions should be inclusive of all stakeholders regardless of educational background, leadership status and age. Intensive sensitization for project beneficiaries before implementation should be at the core of the program design to increase participation for a successful project rollout. Furthermore, policymakers should consider combining traditional cultural systems and modern forest management prescriptions for sustainable utilization and management of forest resources.

Note

1. The modified taugya system is a co-management arrangement between the Forestry Commission (FC) of Ghana and forest communities. The arrangement is such that degraded portion forest reserves are made available to forest fringe communities to plant and nurture trees supplied by the FC while farmers also plant food crops until the trees mature. The proceed from harvested trees are shared among the various stakeholders including the FC (40%); farmers (40%) plus 100% share of the food crops; Land owners (15%) and forest fringe communities (5%) (Agyeman *et al.*, 2010).

References

- Agarwal, B. (2001), "Participatory exclusions, community forestry, and gender: an analysis for South Asia and a conceptual framework", *World Development*, Vol. 29 No. 10, pp. 1623-1648.
- Agrawal, A. and Chhatre, A. (2006), "Explaining success on the commons: community forest governance in the Indian Himalayas", *World Development*, Vol. 34 No. 1, pp. 149-166.
- Agrawal, A. and Gupta, K. (2005), "Decentralization and participation: the governance of common-pool resources in Nepal's Terai", *World Development*, Vol. 33 No. 7, pp. 1101-1114.
- Agyeman, V.A., Asare, A.B., Danso, E., Kasanga, K.A., Marfo, K.A. and Yeboah, O.M. (2010), "Equitable forest reserve plantation revenue sharing in Ghana", Report for FAO, Forestry Research Institute of Ghana, Kumasi.
- Akamani, K. and Hall, T.E. (2015), "Determinants of the process and outcomes of household participation in collaborative forest management in Ghana: a quantitative test of a community resilience model", *Journal of Environmental Management*, Vol. 147, pp. 1-11.
- Akamani, K., Wilson, P. and Hall, T.E. (2014), "Barriers to collaborative forest management and implications for building the resilience of forest-dependent communities in the Ashanti region of Ghana", *Journal of Environmental Management*, Vol. 151C, pp. 11-21, doi: [10.1016/j.jenvman.2014.12.006](https://doi.org/10.1016/j.jenvman.2014.12.006).

- Alemtsehay, J.T. (2010), "Determinating factors for a successful establishment of participatory forest management: a comparative study of goba and Dello districts, Ethiopia", Unpublished Master's Thesis, The University of Agder.
- Anane, M. (2015), "Religion and conservation in Ghana", available at: <https://www.unngls.org/index.php/23-publications/policybooklets/236-religion-and-conservation-in-ghana-by-mikeanane>.
- Aniah, P., Thaddeus, A.A. and Bonye, S.Z. (2014), "Behind the myth: indigenous knowledge and belief systems in natural resource conservation in northeast Ghana", *International Journal of Environmental Protection and Policy*, Vol. 23, pp. 104-122, doi: [10.11648/j.ijepp.20140203.11](https://doi.org/10.11648/j.ijepp.20140203.11).
- Araral, E. Jr (2009), "What explains collective action in the commons? Theory and evidence from the Philippines", *World Development*, Vol. 37 No. 3, pp. 687-697.
- Arnold, J.E.M. (2001), *Forests and People: 25 Years of Community Forestry*, FAO, Rome, available at: <http://www.fao.org/docrep/012/y2661e/y2661e00.htm> (accessed 28 May 2018).
- Asante, E.A., Ababio, S. and Boadu, K.B. (2017), "The use of indigenous cultural practices by the Ashantis for the conservation of forests in Ghana", *SAGE Open*, Vol. 7 No. 1, 215824401668761, doi: [10.1177/2158244016687611](https://doi.org/10.1177/2158244016687611).
- Atmis, E., Dasdemir, L., Lise, W. and Yiliran, O. (2007), "Factors affecting women participation in forestry in Turkey", *Journal of Ecological Economics*, Vol. 60 No. 4, pp. 787-796.
- Babbie, E. (1990), "The essential wisdom of sociology", *Teaching Sociology*, Vol. 18 No. 4, pp. 526-530, American Sociological Association Stable, available at: <http://www.jstor.org/stable/1317643> (accessed 22 May 2018).
- Bailey, D.K. (1994), *Methods of Social Science Research*, The Free Press Collier MacMillan Publisher, London, p. 478.
- Beach, R.H., Pattanayak, S.K., Young, J.C. and Murray, A.B.T. (2005), "Econometric studies of non-industrial private forest management: a review and synthesis", *Forest Policy and Economics*, Vol. 7, pp. 261-281.
- Bruce, J.W. (1999), "Legal bases for the management of forest resources as common property", Community Forestry Note 14, FAO, Rome, available at: www.fao.org/docrep (accessed 16 April 2018).
- Bryman, A. (2012), *Social Research Methods*, 4th ed., Oxford University Press, New York.
- Chhetri, K., Johsen, H., Konoshima, M. and Yoshimota, A. (2013), "Community forestry in the hills of Nepal: determinants of user participation in forest management", *Forest Policy and Economics*, Vol. 30, pp. 6-13.
- Coulibaly-Lingani, P., Savadogo, P., Tigabu, M. and Oden, P. (2011), "Factors influencing people participation in the forest management program in Bukina Faso, West Africa", *Journal of Forest Policy and Economics*, Vol. 13, pp. 292-302.
- Creswell, J.W. (2009), *Research Design Qualitative, Quantitative and Mixed Methods Approach*, 3rd ed., Sage Publication, London.
- Degeti, T. (2003), "Factors affecting people's participation in participatory forest management: the case of IFMP Adaba-Dodola in Bale Zone of Oromia Region", Unpublished M.A. Dissertation, Addis Ababa University, Ethiopia.
- Diawuo, F. and Issifu, K.A. (2015), "Exploring the African traditional belief systems in natural resource conservation and management in Ghana", *The Journal of Pan African Studies*, Vol. 8, pp. 115-131.
- Dolisca, F., Carter, D.R., McDaniel, J.M., Shannon, D.A. and Jolly, C.M. (2006), "Factors influencing farmers participation in forestry management programs: a case study from Haiti", *Journal of Forest Ecology and Management*, Vol. 236 No. 2, pp. 324-331.
- Faure, N., Ichou, B. and Venisnik, T. (2019), "Communities at the heart of forest management: how can the law make a difference?", *Sharing Lessons from Nepal, the Philippines and Tanzania*, available at: <https://pubs.iied.org/sites/files/pdfs/migrate> (accessed 8 May 2021).

- Fisher, R.J. (1999), "Devolution and decentralization of forest management in Asia and the Pacific", *Unasylva*, Vol. 50, pp. 3-5.
- Ghana-EU (2009), "Ghana – European Community FLEGT voluntary partnership agreement", *Briefing Note*, available at: <http://bit.ly/WsW4Vc> (accessed 15 April 2018).
- Ghana Statistical Service (2014), "Housing and Population Census, 2010. District Analytical Report, Asutifi North District", (New-ndpc-static1.s3.amazonaws.com > Asutifi+North+2010PHC), (accessed 18 March 2019).
- Glendinning, A., Malapatra, J. and Mitchell, C.P. (2001), "Modes of communication and effective of agroforestry extension in Eastern India", *Human Ecology*, Vol. 29 No. 3, pp. 283-305.
- Gobeze, T., Bekele, M., Lemenih, M. and Kassah, H. (2009), "Participatory forest management and its impacts on livelihoods and forest status: the case of Bonga forest in Ethiopia", *International Forestry Review*, Vol. 11 No. 3, pp. 346-356, doi: [10.1505/ifor.11.3.346](https://doi.org/10.1505/ifor.11.3.346).
- Gurung, A.B. (2003), "Insects- A mistake in god's creation? Tharu farmers' perception and knowledge of insects: a case study of Gobardiha village development committee, Dang-Deukhuri, Nepal", *Agriculture and Human Values*, Vol. 20, pp. 337-370.
- Hawthorne, S.D. and Boissière, M. (2014), "Literature review of participatory measurement, reporting and verification (PMRV)", Working Paper 152, CIFOR, Bogor, available at: https://www.researchgate.net/publication/266387612_Literature_review_of_participatory_measurement_reporting_and_verification_PMRV (accessed 28 September 2018).
- Higman, S., Bass, S., Judd, N., Mayers, J. and Nussbaum, R. (1999), *The Sustainable Forestry Handbook*, Earthscan Publications, London.
- Hossain, S. (1998), "Participatory forest management in Bangladesh", in Isozaki, H. and Inoue, M. (Eds), *Proc. Of the 2nd IGES International Workshop on Forest Conservation Strategies for the Asia and Pacific Region*, Institute of Global Environmental Strategies (IGES), Hayama, pp. 22-32.
- Husseini, R., Kendie, B. and Agbesinyale, P. (2016), "Community participation in the management of forest reserves in the Northern Region of Ghana", *International Journal of Sustainable Development and World Ecology*, Vol. 23, pp. 245-256.
- Islam, K.K., Jose, S., Tani, M., Kimihiko, H., Krott, M. and Sato, N. (2015), "Does actor power impede outcomes in participatory agroforestry approach? Evidence from Sal forests area, Bangladesh", *Agroforestry Systems*, Vol. 89, pp. 885-899.
- Jashimuddin, M. and Inoue, M. (2012), "Community forestry for sustainable forest management: experiences from Bangladesh and policy recommendations", *FORMATH*, Vol. 11, pp. 133-166.
- Jentoff, S. (2000), "The community: a missing link in fisheries management", *Marine Policies*, Vol. 24, pp. 53-59.
- Jotte, Z. (1997), *Folklore and Conservation in Nigeria: Using PRA to Learn from Elders, Ichire Orating and the Students*, The Federal University of Agriculture, London.
- Kacho, B. (2014), "Factors influencing participation of the local community in natural resource conservation: a comparative study of Chiro and Fiche, Ethiopia", *Public Policy and Administration Research*, Vol. 4 No. 7, pp. 4-7.
- Kerse, B.L. (2016), "Factors affecting local people participation in forest managed for Carbon sequestration: the case of mount Damota, southern Ethiopia", *Developing Country Studies*, Vol. 6 No. 5, pp. 56-64.
- Lartey, E., Anderson, T.K., Boon, E.K. and Lartey, H.A. (2012), "Forest law enforcement, governance and trade processes in Ghana: strengthening the weak elements of community participation", *Compendium on Experiences from the Voluntary Partnership Agreement (VPA) Process in West and*, pp. 40-51, available at: www.fao.org/forestry (accessed 18 March 2018).
- Lise, W. (2000), "Factors influencing people's participation in forest management in India", *Journal of Ecological Economics*, Vol. 34 No. 3, pp. 379-392.

- Lomax, T. (2008), "Forest governance in Liberia: an NGO perspective", *Fern*, p. 10, available at: <https://loggingoff.info/library/forest-governance-in-liberia-an-ngo-perspective/> (accessed 18 April 2018).
- Luza, J.B., Silvius, K.M., Overman, H., Giery, S.T., Read, J.M. and Fragoso, J.M.V. (2011), "Large-scale environmental monitoring by indigenous people", *BioScience*, Vol. 61, pp. 771-781.
- Maier, C., Lindner, T. and Winkel, G. (2014), "Stakeholders' perceptions of participation in forest policy: a case study from Baden-Wurttemberg", *Land Use Policy*, Vol. 39, pp. 166-176.
- Maraga, J.N., Kibwage, K.J. and Boniface, O.O. (2010), "Factors determining community participation in afforestation projects in river Nyando basin, Kenya", *African Journal of Environmental Science and Technology*, Vol. 4 No. 12, pp. 853-859.
- Marfo, E., Acheampong, E. and Opuni-Frimpong, E. (2012), "Fractured tenure, unaccountable authority and benefit capture: constraints to improving community benefits under climate change mitigation schemes in Ghana", *Conservation and Society*, Vol. 10, pp. 161-172.
- Maskey, V., Gebremedhin, T., G. and Dalton, T.J. (2006), "Social and cultural determinants of collective management of community forest in Nepal", *Journal of Forest Economics*, Vol. 11 No. 4, pp. 261-274.
- Mekbeb, E.T., Zelealem, T.A., Robert, J.L. and Nigel, L.W. (2007), "Community attitudes towards wildlife conservation in Ethiopia", *Proceedings of the 2007 George Wright Society Conference, Protected Areas in a Changing World, Central African Countries*, pp. 40-51.
- MLGRD (2013), "Asutifi North district assembly: district medium term development plan and budget (2014-2017)", available at: https://new-ndpc-static1.s3.amazonaws.com/CACHES/PUBLICATIONS/2016/04/04/ER_Asutifi+North_2014-2017+DMTDP (accessed 20 March 2019).
- Musyoki, K.J., Mugwe, J., Mutundu, K. and Muchiri, M. (2016), "Factors influencing the level of participation of community forest associations in management of forests in Kenya", *Journal of Sustainable Forestry*, Vol. 35 No. 3, pp. 205-216, doi: [10.1080/10549811.2016.1142454](https://doi.org/10.1080/10549811.2016.1142454).
- Owubah, C., Lemaster, D.C., Bowker, J.M. and Lee, J.G. (2001), "Forest tenure systems and sustainable forest management: the case of Ghana", *Forest Ecology and Management*, Vol. 149 Nos 1-3, pp. 253-264.
- Rim-Rukeh, A., Irerhievwie, G. and Agbozu, I.E. (2013), "Traditional beliefs and conservation of natural resources: evidence from selected communities in Delta State, Nigeria", *International Journal of Biodiversity and Conservation*, Vol. 5, pp. 426-432.
- Salam, M.A., Noguchi, T. and Koike, M. (2005), "Factors influencing the sustained participation of farmers in participatory forestry: a case study in central Sal forests in Bangladesh", *Journal of Environmental Management*, Vol. 74 No. 1, pp. 43-51, doi: [10.1016/j.jenvman.2004.08.007](https://doi.org/10.1016/j.jenvman.2004.08.007).
- Setia, M.S. (2016), "Methodology series module 3: cross-sectional studies", *Indian Journal of Dermatology*, Vol. 61 No. 3, pp. 261-264, doi: [10.4103/0019-5154.182410](https://doi.org/10.4103/0019-5154.182410).
- Singleton, S. (2000), "Co-operation or Capture? The paradox of Co-management and community participation in natural resource management and environmental policy-making", *Environmental Politics*, Vol. 9 No. 2, pp. 1-21.
- Siraj, M., Zhang, K., Xiao, W., Bilal, A., Gemechu, S., Geda, K., Yonas, T. and Xiaodan, L. (2016), "Does participatory forest management save the remnant forest in Ethiopia?", *Proceedings of the National Academy of India-Section B: Biological Sciences*, p. 15.
- Smith, E.K. (1999), "Developments and Setbacks in Forest Conservation: the New political economic of forest resource use in southern Ghana", Ministry of Land and Forestry Technical Paper, p. 57.
- Tadesse, S.A. and Teketay, D. (2017), "Perceptions and attitudes of local people towards participatory forest management in Tarmaber district of North Shewa administrative zone, Ethiopia: the case of Wof-Washa forests", *Ecological Processes*, Vol. 6 No. 1, doi: [10.1186/s13717-017-0084-6](https://doi.org/10.1186/s13717-017-0084-6).
- Tadesse, S., Woldetsadik, M. and Senbeta, F. (2017), "Forest users' level of participation in a participatory forest management program in southwestern Ethiopia", *Forest Science and Technology*, Vol. 13 No. 4, pp. 164-173, doi: [10.1080/21580103.2017.1387613](https://doi.org/10.1080/21580103.2017.1387613).

-
- Tesfaye, Y., Anders, R. and Folke, B. (2012), "Attitudes of local people towards collective action for forest management: the case of PFM in Dodola area in the Bale Mountains, Southern Ethiopia", *International Journal of Biodiversity and Conservation*, Vol. 21, pp. 245-265.
- Thacher, T., Lee, D.R. and Schelhas, J.W. (1997), "Farmer participation in reforestation incentive programmes in Costa Rica", *Agroforestry Systems*, Vol. 35 No. 3, pp. 269-289.
- Zhang, D. and Flick, W. (2001), "Sticks, Carrots and reforestation investment", *Land Economics*, Vol. 77 No. 3, pp. 443-456.

Further reading

- Alhassan, A.M. (2010), "Analysis of primary Stakeholder's participation in forest resources management: the case of the Krokosua hills forest reserve, Ghana", Unpublished Master's thesis, Kwame Nkrumah University of Science and Technology, Kumasi.
- Cohen, J. and Uphoff, N. (1980), "Participation's place in rural development: seeking clarity through specificity", *World Development*, Vol. 8 No. 3, pp. 213-235.
- Oliver, P.E. (2004), "Developing effective partnerships in natural resource management", Unpublished Master's Thesis, University of Kenya, Nairobi.
- Sen, S. and Nielsen, J.R. (1996), "Fisheries Co-management: a comparative analysis", *Marine Policies*, Vol. 20 No. 5, pp. 405-418.
- Teye, J.K. (2011), "Ambiguities of forest management decentralization in Ghana", *Journal of Natural Resources and Development*, Vol. 3, pp. 355-369.

Corresponding author

Yaw Appau can be contacted at: yappau@cpmr.org.gh