Assessment of the Usage of Extension Communication Channels for Disseminating Crop Production Information to Oil Palm Farmers in the Birim South District, Ghana

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Abstract

The study assessed the usage of extension communication channels for disseminating crop production information to oil palm farmers in Birim South District. A sample size of 181 farmers was selected through purposive and simple random sampling techniques. The data collected were analyzed using frequency, percentage, mean, standard deviation, ordinal logistic regression, and Kendall's coefficient of concordance. The results showed that radio, extension agents and colleague farmers were generally the most available communication channels for oil palm farmers. Radio, colleague farmers and extension agents were the communication channels that the farmers frequently used. Nursing and planting, pest and disease control, use of fertiliser, and harvest and post-harvest handling were the crop production information mostly sought by the farmers. It was also discovered that the majority of farmers do not get any agricultural information from farmer magazines, newspapers, or mobile text messages. Sex, level of education and household size were the most significant factors influencing oil palm farmers' frequency of use of the available/accessible communication channels for crop production information (p values =0.037, 0.010 & 0.034, respectively). The major challenges affecting the use of communication channels were low farmer-extension ratio, poor signals and the high cost of using such channels. The study recommends that the Ministry of Food and Agriculture and Non-Governmental Organisations facilitate the establishment and maintenance of farm radio programmes and encourage more peer-to-peer extension among rural farmers.

Keywords: use, extension communication channels, dissemination, crop production information, oil palm farmers.

1. Introduction

Agricultural development is one of the most powerful tools to end extreme poverty, boost shared prosperity and feed a projected 9.7 billion people by 2050 (World Bank, 2007). Agriculture is crucial for economic growth. In 2018, it accounted for 4 % of global gross domestic product (GDP); in some developing countries, it accounted for more than 25 % (Osabohien et al., 2019). The agricultural sector forms the backbone of the global economy and serves as the means of revenue for about 50 % of the world's population (Chemutai et al., 2012). In this regard, agriculture has been prioritised in Ghana's national development blueprint, which aims to transform the nation into a middle-income and rapidly industrializing country. The sector is identified as one of

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the critical drivers of the economy. It contributes to about 19.7 % of Ghana's current GDP, accounts for over 30 % of export earnings and serves as a major source of inputs to our manufacturing industry, as stated by the Government of Ghana (2021). Therefore, this shows that agriculture is a significant sector of Ghana's economic growth (Government of Ghana, 2021).

Ghana's agriculture is predominantly smallholder, traditional and rain-fed (Ministry of Food and Agriculture, MoFA, 2011). However, the World Bank (2007) suggested that subsistence farming can and should be enhanced to help the rural poor meet their basic needs while acquiring new skills for the labour market. This implies that while working out strategies towards poverty eradication, there is a need to focus more on rural agricultural development, particularly how these farmers acquire information about their production. Such strategies must accelerate agriculture productivity, causing overall output growth and creating necessary agricultural research and education interventions, especially extension and its communication channels and development (Food and Agriculture Organization, 2008).

The concept of the use of communication channels is of great importance because the knowledge of it will provide keys for understanding and predicting outcomes of the communication process. Exposure to or use of various communication channels is a precondition for any effect of media content on people to occur (Shahzad et al., 2011). It seems right to state that the influence of any medium in a communication situation or on the message depends not merely on the type of media but also on how it is used or the use to which it is put. Agricultural information is a key component in improving agricultural production. The importance of knowledge and information sharing in research for development settings has been firmly established through various research (Masuki et al., 2010; Ndimbwa et al., 2021; Rodriguez et al., 2015).

There are complaints among oil palm farmers in the Birim South District about their oil palm production outputs. They complain that there is low output from the production and that most of them were quitting for other crops because of inadequate access to or lack of agricultural information as far as their production is concerned. Access to appropriate information and knowledge is known to be one of the biggest determinants of agricultural production (Masuki et al., 2010).

This study used various theoretical perspectives to assess the extension communication channels used to disseminate crop production information to oil palm farmers. The theories were the use and gratification theory, the social exchange theory, and the two-step flow communication theory (Lazarsfeld et al., 1944; Lin, 1999; Szekely, Strebel, 2013). The Use and Gratification theory perceives message recipients as those who selectively choose, attend to, perceive and retain the media messages because of their needs. The focus of this study was on channel consumption by the farmers. The theory acknowledges that users are goal-driven decision-makers who select information communication channels that meet their needs (Lin, 1999). The social exchange theory suggests that extension clients (farmers) are likely to use a particular source-channel combination when the social benefits are greater than the social costs. This theory also suggests that benefits are more likely to be realized when information is relevant to the client's needs and when channels provide detailed individualized information (Strebel, Szekely, 2013). Lazarsfeld et al. (1994) figured out how media messages directly affected the choice of users. According to their theory (the two-step flow communication theory), information from the media moves in two specific stages. The information gets to the key informants who first receive and envision it. The leaders then pass their interpretation with the exact media content to the rest of the members. In a sense, the key informants or leaders are very influential in directing and changing the behaviour and attitudes of lesser active members of the population. The audience's reaction to media messages relies on their interpersonal exchanges within social surroundings.

A number of studies have been conducted on extension communication channels. A study by Shahzad et al. (2011) showed that various public and private organisations use communication channels such as mass media and print media to catalyse agricultural innovation and diffusion. Another study by Age et al. (2012) concluded that if there is a continued imbalance in the distribution and wrongful targeting of information, the possibility of harnessing the full potential of the rural populace towards attaining high production will remain problematic and in limbo. According to Rodriguez et al. (2015), the usage of interpersonal communication channels has frequently overshadowed the use of non-interpersonal channels. They discovered that extension agents were the most favoured resource in the specific field of agriculture. Also, the results of

Ndimbwa et al. (2021) revealed that the scheduling of the programmes influenced farmers' use of radio and television.

Farmers maintain daily activity routines and only watch or listen to radio or television programmes when those schedules are agreeable. Agricultural extension agents are thought to have greater authority when providing agricultural extension services; they are more knowledgeable and skilled at meeting farmers' information needs (Melesse et al., 2018; Msoffe, Ngulube, 2017). Masuki et al.'s (2010) findings showed that rural communities, apart from agricultural officers, appreciated using non-interpersonal channels such as the telephone as an easy, fast, and convenient way to communicate and get prompt answers to respective problems. New technologies and extension workers are still trying to bridge the gap between the research stations and the local farmers. Developing an understanding of extension channels used by clientele to obtain agricultural information is a pre-requisite for efficient educational programming because messages that go unheard or unseen cannot lead to change (Israel, Wilson, 2006). Kapia-Mendano (2012) also found low extension contact between extension officers and smallholder oil palm farmers. Swanzy et al. (2020) conducted a study on the availability and use of information and communication technology among oil palm farmers in Ghana. They indicated a need to improve technical and infrastructural organisational structures regarding ICT availability to allow oil palm farmers more access to and use these facilities.

For oil palm farmers in Birim South District, information is key to their production's success. This information must be relevant, timely, accurate and easy to understand to ensure they reach their target. For that, this study was set to discover the crop information needs and the communication channels used for disseminating agricultural information among the oil palm producers to ensure the efficient use of the available extension communication channels in remote areas, particularly the Birim South District. The specific objectives of the study are to identify the extension communication channels available to oil palm farmers for agricultural information in the study area, identify the types of agricultural information farmers get from using the extension communication channels, assess the frequency of use of extension communication channels by oil palm farmers for agricultural information, determine the factors that influence the frequency of use of communication channels and examine the challenges affecting the use of communication channels by farmers for agricultural information on oil palm production.

2. Materials and Methods

The study area, Birim South District, is one of the thirty-three districts in the Eastern Region of Ghana. It was formerly part of the then-larger and original Birim South District until 2008 when it was split off to become a new Birim South District. The district lies within longitude 10 51 and 20 581 West and Latitude 80 321 and 100 21 North, has a total land mass of about 4,845.5 sq km, and has Akim Swedru as its capital town. The district's total population is 119,767, and it is 47.6 % male and 51.4 % female. Within it are a lot of hills, streams and rivers. The Birim River flows through the Birim South District. As high as 78.2 % of households in the district are engaged in agriculture. Major activities in the agricultural sector are crop farming and livestock production, which employ about 70 % of the active labour force. The main crops cultivated are cocoa, oil palm, rice, citrus, cereals, cassava, cocoyam and plantain. Other sectors that employ a minority of the population are trade, commerce and services (hotels, banking). The district has two peak rain seasons: May to June and September to October. The relative humidity ranges from 56 % during the dry season to 70 % during the rainy season (GSS, 2010).

The population for the study was made up of all the registered oil palm farmers under Birim South District MoFA. The purposive sampling technique was used to select the District. This is because it is one of the highest oil palms producing Districts in the Eastern Region. The communities in the district were grouped into three (3) operational areas: Swedru, Apoli and Akortekurom. A sample of 226 was used for the study using Yamane's formula ($n = [(N)/ (1+ N (e)^2)]$) since the total population was known. They were selected using the simple random sampling technique, where the names were written on slips of paper, folded and placed in a basket. The papers were picked without replacement to obtain the total sample. Out of the 226 questionnaires, only data from 181 respondents were used for analysis. The others were discarded because some respondents could not complete the interview session, making some information incomplete.

Cross-sectional field survey was carried out to obtain primary data for the study. A well-structured questionnaire was developed and subjected to the scrutiny of relevant experts to ensure the instrument's validity. The developed questionnaire was used to collect data from oil palm farmers in the study area. The researchers personally administered the questionnaire to the respondents in the three operational areas. The agricultural extension agents (AEAs) in the study area assisted the researchers in locating the farmers during the field data collection. They were not involved in the actual data collection. The questionnaires were administered mostly in the Twi language because that was the main language in the district. Responses were written in English. Descriptive statistics was used to analyse the data.

Statistical Package for the Social Sciences version 20.0 software was used in the analysis of the data. Descriptive (mean, standard deviation, frequency, percentage) and inferential statistics were used to analyse the data (ordered logistic regression model and Kendall's coefficient of concordance). Kendall's coefficient of concordance (W) was used to examine the degree of agreement among the farmers regarding the challenges. The ranks were conducted on a scale of 1-9.

As adapted from Somanje et al. (2021), ordinal logistic regression was used to analyze the factors that influenced the frequency of the respondents' use of extension communication channels. The ordered logistic regression is ideal because the dependent indicator has multiple outcomes that use the Likert scale to measure farmer's responses (1 = low, 2 = moderate, 3 = high). A three-point Likert-type scale was used to assess farmers' frequency of use of extension communication channels. The mean of 0-1.49 meant low (rare/never), 1.5–2.49 was moderate (sometimes), and 2.5-3.00 was high (always). Some explanatory indicators were also ordinal (age, household size, educational level, farm size and years of farming experience), while others were categorical (sex, marital status and religion). The regression model used in the study is depicted as follows: $Y = (\beta_o + \beta_i X_i + e_i)$: where Y (dependent variable) represents the frequency of use of extension communication channels by the oil palm farmers, X_i describes the independent socio-economic factors that influence farmers' frequency of use of communication channels, and βi are the coefficients of the explanatory variables, and ei are the error of terms.

Table 1. Definition of Variables

Variables	Definition	a-prior expectation
Dependent Variable (Channels frequency of use)		
High (3)	Regular use of communication channels	
Moderate (2)	Use of communication channels sometimes	
Low (1)	Rare/never use of communication channels	
Independent Variables		
Sex	Dummy: 1 = Male 0 = Female	+/-
Age	Measured in years	-
Marital status	Dummy: 1= Married 0 = Not Married	+/-
Household size	Measured in number of persons in farmers' household	+/-
Religion	Dummy: 1 = Christian 0 = Others	+/-
Educational levels	Measured in the years of school attended by the farmer	
Farm size	Measured in Acres	+/-
Years of farming experience	Measured in years that the oil palm farmer has practised	+/-

3. Results and Discussion

The frequency distribution of the respondents' socio-economic characteristics is presented in Table 2. The sex distribution of the respondents showed that most were males, as they constituted 67.4 % of the total number of respondents, whilst 32.6 % were females. This is to be expected given that most of the activities involved in plantation crop production in Ghana tend to be more vigorous and physical and entail a lot of lifting heavyweights such as bunches and ladders during harvesting (Mensah et al., 2009).

Majority of the respondents (71.8 %) were married. Only 9.4% were single, while only 18.8 % were separated or widowed. A substantial percentage of the farmers (22.7 %) had no formal education. Those with primary or middle school and secondary school constituted the highest percentage (75.7 %) of the respondents. Only a small fraction of the respondents (1.6 %) had tertiary background education. Overall, the level of education of the farmers is relatively high and encouraging, and it indicates that most of them have a foundation in formal education, which will help the farmers appreciate technological sources for information. The results supported Kabeer's (2003) and Rehman et al.'s (2011) findings on the human right to education and information dissemination.

Table 2. Frequency distribution of the respondents' personal and social characteristics

Demographics	Frequency	Percentage (%)	Max	Min	Mean
Sex					
Males	122	67.4	-	-	-
Females	59	32.6	-	-	-
Age			79.0	23.0	47.0
20 – 30	6	3.3	-	-	-
31 – 40	41	22.7	-	-	-
41 – 50	65	35.9	-	-	-
Above 50	69	38.1	-	-	-
Marital status					
Single	17	9.4	-	-	-
Married	130	71.8	-	-	-
Others	34	18.8	-	-	-
Educational level					
No formal education	41	22.7	-	-	-
Primary education	38	21.0	-	-	-
Middle school/ Junior High School	58	32.0	-	-	-
Secondary School	41	22.7	-	-	-
Tertiary	3	1.6	-	-	-
Household size			17.0	2.0	7.3
1-5	94	51.9	-	-	-
6-10	69	38.1	-	-	-
11-15	14	7.8	-	-	-
16 – 20	4	2.2	-	-	-

Source: Field Data, 2021

The age distribution of farmers showed that the age group of 50 and above had the highest frequency of 69 respondents, constituting 38.1 % of the total number of respondents. In other words, most of them were above 50 years and had an average age of 47. The results showed that most of the farmers were quite strong enough to undertake most of the difficult farming activities. The young age group (farmers of 40 years and below) constituted only 26.0 %, indicating youth involvement in sectors other than agriculture. This finding agrees with that of Guo et al. (2015), who, after their studies, concluded that the number of younger people in plantation farming or agricultural labour population on farmland is not encouraging.

The household size distribution among the farmers showed that the majority (51.9 %) had between 1 and 5 people per household. The household size between 6–10 people was 38.1 %. Those with 11-20 people constituted 10.0 % of the total respondents, and the mean household size was seven (7) people among the farmers, which is higher than the national average of four (4) members per household (Ghana Statistical Service, 2008). The implication is that increases in household size put pressure on the demand for household needs, resulting in the need to produce more for the family and earn more to support the home. This could lead to the search and use of communication channels for agricultural information to improve productivity.

An average farm size of 10.64 acres was recorded for the farmers. Most farmers (41.4 %) had farm size between 6 and 10 acres while 35.9 % had 1 to 5 acres. A small number of the farmers (11.6 %) had 16 acres or more. The average farming experience of the farmers was estimated at 13 years. The majority of the farmers (60.2 %) had been in oil palm farming for 11-20 years. 26.5 % had 1-10 years of farming experience, 8.8% had been in production for 21-30 years, and the remaining few percentage (4.4%) had experience from 31 to 40 years.

Table 3. Distribution of communication channels available to farmers for agricultural information (Multiple responses)

Communication Channels	Frequency	Percentage (%)
Extension Agent (farm/home visit)	181	100.0
Colleague farmer	170	93.9
Radio	181	100.0
Television	176	97.2
Telephone call	168	93.4
Value chain actors (agro-input dealers, palm oil processors, buyers and sellers of palm oil, etc.)	12	6.7
Newspaper	5	2.8
Farmer Magazine	7	3.9
Mobile text message	3	1.7

Source: Field Data, 2021

The farmers indicated radio and extension agents (farm/home visit) as the highest available communication channels (100 %) for agricultural information. Television was ranked second (97.2 %) by the farmers, colleague farmers (93.9 %) had third position and telephone calls (93.4 %) placed fourth. Value chain actors (6.7 %), farmer magazines (3.9 %), newspapers (2.8 %) and mobile text messages (1.7 %) were the lowest available communication channels indicated by the farmers for acquiring agricultural information. Extension agents (farm/home visit) and radio were the two most available communication channels for the farmers because, since the establishment of extension services, extension agents have been very crucial in the development of agriculture, particularly in Ghana. Also, radio is one of the traditional mass media channels (Antwi et al., 2021). These findings agree with Isaya et al. (2018), who stated traditional media were successful in developing countries and rural radio, in particular, has played a significant part in distributing agricultural messages.

Table 4. Distribution of frequency of use of communication channels by farmers (Multiple responses)

Communication Channels	Never/ Rarely Use	Sometimes Use	Regular Use	Mean	Std Dev.
Extension Agent (farm/home visit)	15 (8.35 %)	22 (12.2 %)	144 (79.6 %)	2.90	0.02
Colleague farmer	4 (2.2 %)	30 (16.6 %)	147 (81.2 %)	2.85	0.04
Radio	4 (2.2 %)	3 (1.7 %)	173 (96.1 %)	3.00	0.01
Television	28 (15.7 %)	128 (71.9 %)	25 (14.0 %)	2.01	0.18

Telephone call	0 (0.0 %)	139 (6.8 %)	42 (23.2 %)	2.34	0.15
Value chain actors	173 (96.1 %)	0 (0.0 %)	8 (9.9 %)	1.85	0.07
Newspaper	181 (100.0 %)	0 (0.0 %)	0 (0.0 %)	1.82	0.20
Farmer Magazine	181 (100.0 %)	0 (0.0 %)	0 (0.0 %)	1.50	0.26
Mobile text message	174 (97.2 %)	7 (2.8 %)	0 (0.0 %)	1.01	0.30

Source: Field Data, 2021

The needs and gratification theory and the social exchange theory are reflected in this table. The frequency of use of the communication channels shows which types are most needed and used by the oil palm farmers (Lin, 1999; Strebel and Szekely, 2013). Oil palm farmers are likely to use a particular channel or a combination when the social benefits exceed the social costs. In the table, radio (96.1 %) constituted the most regularly used communication channel, followed by colleague farmers (81.2%) and then extension agents (farm/home visit) (79.6 %). This shows that most respondents regularly use the radio to acquire crop production information. This result agrees with Mangstl (2008) and Mittal and Mehar (2012), whose research discovered that radio has many advantages, including low cost, flexibility, and timely message delivery. Value chain actors, farmer magazines, newspapers, mobile text messages, telephone calls and television have very low usage as 96.1 %, 100.0 %, 100.0 %, 97.2 %, 76.8 %, and 71.9 % of the respondents had respectively indicated their rarely/non-use at all for agricultural information. The non-use of these communication channels could be due to inadequate educational level. These findings agree with the findings of Okwu and Daudu (2011) and Tologbonse et al. (2006), whose work discovered that the non-use of communication channels such as newspapers and farm magazines is due to the low educational level of farmers.

Table 5. Types of crop production information sought by farmers through extension communication channels (Multiple responses)

Type of Agricultural Information	Frequency	Percentage (%)
Market Information	8	4.4
Seed Sowing	31	16.1
Weather Information	20	11.0
Nursing and Planting	181	100.0
Use of Fertiliser	176	97.2
Pest and Disease Control	180	99.4
Record Keeping	23	12.7
Harvest and Post-harvest handling	160	88.4
Processing information	7	3.9

Source: Field Data, 2021

The needs and gratification theory, which explains that oil palm farmers selectively choose, attend to, perceive, and retain the media messages because of their needs, shows that they consume information because they need it (Lin, 1999). The types of crop production information sought by farmers are shown in Table 5. Nursing and Planting (100 %), pest and disease control (99.4 %), use of fertiliser (97.2 %), and harvest and post-harvest handling (88.4 %) were the agricultural information sought mainly by the farmers in the study area. Most of the farmers indicated that they get little market information (4.4 %), record keeping (12.7 %), processing information (3.9 %), seed sowing (16.1 %) and weather information (11.0 %). The results imply that nursing and planting information is the most sought and needed information by oil palm farmers. The results agree with Armstrong et al. (2010), who indicated that farmers will use communication

channels to access the information needed most. When the plants grow, different types of information are required to improve the amount and the quality of produce.

Table 6. Levels of frequency of usage of available extension communication channels

Levels	Frequency	Percentage (%)
Rarely/never	50	27.6
Sometimes	82	45.3
Regularly	49	27.1
Total	181	100.0%

Source: Field Data, 2021

Data summarized in Table 6 tells the proportion of cases falling at each level of frequency of usage of extension communication channels. From the table, the available extension communication channels in the study area were sometimes used by the majority (45.3 %, n = 82) of the oil palm farmers for crop production information. Very few (27.1 %, n = 49) regularly used the extension communication channels for getting agricultural information, and 27.6 % (n = 50) indicated they rarely used the communication channels available in the study area.

Table 7. Factors that influence the frequency of usage of extension communication channels by farmers

Variables	Estimate	Std. Error	T	df	Sig.	95 % Confidence Interval	
						Lower Bound	Upper Bound
Low	-0.23	0.77	-0.30	1	0.76	-1.73	1.27
Moderate	1.85	0.78	2.37	1	0.02	0.32	3.37
Sex	0.62	0.29	2.14	1	0.04**	0.04	1.21
Age	-0.01	0.01	-1.00	1	0.33	-0.03	0.01
Marital status	-0.11	0.17	-0.65	1	0.52	-0.44	0.22
Household size	0.13	0.05	2.60	1	0.01***	0.03	0.22
Years of farming experience	0.01	0.02	0.50	1	0.05*	-0.04	0.05
Farm size	-0.02	0.03	-0.67	1	0.55	-0.07	0.04
Educational level	0.12	0.13	0.92	1	0.03**	0.38	0.37

Source: Field Data, 2021

Factors that influence the frequency of use of extension communication channels by oil palm farmers are summarised in Table 7 above. From the table, sex, household size, years of farming experience and educational level of the respondents were found to be significant positive predictors of the frequency of usage of extension communication channels amongst oil palm farmers in the study area (p values =0.04, 0.01, 0.05, and 0.03 respectively).

The log odds of being able to use the extension communication channels frequently for crop production information is 0.62 points higher on average for a male oil palm farmer than a female farmer. This means that male farmers are more likely to be active seekers of information through extension channels than their female counterparts. Okwu and Daudu (2011) and Howell and Hebron (2004) support the findings on males being active seekers of agricultural information.

For every unit increase in household size, there is a predicted increase of 0.13 in the log odds of an oil palm farmer being able to regularly use the extension communication channels available for crop production information. This means that farmers with larger household sizes are more likely to be active seekers of information through extension channels than those with smaller farm sizes. Similarly, Howell and Hebron (2004) found household size influences both patterns of information use and methods of delivery.

For every unit increase in years of farming experience, there is a predicted increase of 0.01 in the log odds of an oil palm farmer being able to regularly use the extension communication channels available for crop production information. This means that farmers with more years of farming experience are more likely to be active seekers of information through extension channels than those with less farming experience. Similarly, Okwu and Daudu (2011) found farming experience influences patterns of information use and delivery methods.

For every unit decrease in farm sizes, there is a predicted decrease of 0.02 in the log odds of an oil palm farmer being able to regularly use the extension communication channels available for crop production information. This means that farmers with smaller farm sizes are more likely to be active seekers of information through extension channels than those with large farm sizes. Okwu and Daudu (2011) disagree and assert that farmers with large farm sizes are active seekers of agricultural information.

For every unit increase in years of education, there is a predicted decrease of 0.12 in the log odds of an oil palm farmer being able to regularly use the extension communication channels available for crop production information. This means that farmers with higher education are more likely to be active seekers of information through extension channels than those with less education. People with high educational levels and farming experience are expected to frequently use communication channels since they are better inclined to understand their usage (Okwu, Daudu, 2011; Yahaya, 2002).

Table 8. Challenges affecting farmers' usage of communication channels

Challenges	Mean Rank	Ranking
Low ratio of extension agents to farmers	2.00	1st
High cost of Using such channels	2.40	2nd
Inadequate or erratic power supply	3.30	3rd
Programmes on the Radio are not interesting	3.80	4th
Poor radio signal	4.80	5th
Lack of time to listen to agricultural information	6.00	6th
Poor television signal	6.60	7th
Misinterpretations of information by colleague farmer	7.20	8th
Attitudes of the extension agents	8.90	9th

Source: Field Data, 2021

Note: N = 9; Kendall's Wa = 0.76; Chi-Square = 30.22; df = 8; Asymp. Sig. = 0.00

A low ratio of extension agents to farmers has the highest mean rank (2.00) and therefore becomes the most serious challenge facing the use of communication channels by the farmers, followed by the high cost of using such channels (2.40), inadequate or erratic power supply (3.30), programmes of radio are not attractive (3.80) and poor radio signal (4.80). The rest are lack of time to listen to agricultural information, poor television signal, misinterpretations of information by colleague farmers, attitudes of the extension agents, and their mean ranked values are 6.00, 6.60, 7.20, and 8.90, respectively. The findings agree with (Anang et al., 2020) and Sennuga et al. (2020) that challenges contributing to the poor use of communication channels can be due to the low extension agent-to-farmer ratio of 1:1300 in Ghana.

4. Conclusion
The following conclusions can be drawn. First of all, radio, extension agents, colleague farmers, television and telephone calls were generally found to be the more available communication channels for the farmers to obtain agricultural information. Radio was the most frequently used communication channel, followed by colleague farmers and extension agents for agricultural information. Most of the farmers received information on nursing and planting, pest and disease control, and fertiliser use from the communication channels. Sex, household size and educational level of the respondents were found to be significant positive predictors of the frequency of usage of extension communication channels amongst oil palm farmers in the study

area. The low ratio of extension agents to farmers and the high cost of using such channels were the major challenges militating against using communication channels in the study area. These findings of the study have important theoretical implications as the study largely corroborates the social exchange and the needs and gratification theories which underpinned the study, that the oil palm farmers are the ones who selectively choose and attend to particular communication channels that meet their needs. Aside from radio, extension agents and colleague farmers were frequently used because they passed the explanation with the exact research context to the farmers and friends. This supports the two-step flow communication theory.

It is recommended that the Ministry of Food and Agriculture, Oil Palm Research Institute, Non- Governmental Organisations and the District Assembly ensure that rural radio stations and community information centres are established and managed to feature special agricultural programmes targeted at rural farmers, and they should ensure that information disseminated to farmers is timely and relevant. Moreover, to solve the low ratio of extension agents to farmers, the government should employ more extension agents to disseminate information to oil palm farmers. This is because they are the most available source of information to oil palm farmers. For further research in this area, we recommend an expansion of the socio-economic variables in the logistic regression model to include other variables captured in theory. A national study of oil palm farmers will be very interesting in understanding their information-seeking behaviour.

4. Declarations

Ethics approval and consent to participate
The study was conducted after all permissions and committee approvals had been obtained. The authors also strictly adhered to the ethical principles outlined in the Declaration of Helsinki.

Consent for publication
Not applicable.

Availability of data and materials
Not applicable.

Conflict of interest statement
The authors report no conflicts of interest.

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