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Information Sources and Needs among Mango (*Mangifera Indica* L.) Farmers in the Shai Osudoku District, Greater Accra Region, Ghana

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Abstract
This paper seeks to examine and understand the information-seeking behaviour of farmers in terms of their information needs, sources and challenges. Structured questionnaires were administered randomly to 125 mango farmers selected from the Shai Osudoku District of the Greater Accra Region. Besides, one focus group discussion section with the executives of the District mango farmer-based organisation and one-on-one in-depth interview session with the Head of Department of Agriculture in the District were held, coupled with farm visits for personal observations to make for triangulation with the quantitative data. The study showed that radio, leaflets and family/friends remained the first option of choice as sources of information to the mango famers. On the other hand, the Internet, books, newspapers and extension agents emerged as the least sources of preference to the farmers. Selection of varieties/hybrids, pests and disease management and pruning of tree crops were perceived by the farmers as the most pressing information needs, which, to them, were critical to the success of their mango farming business. The study also showed a strong positive relationship ($p<0.05$) between age of the mango farmers and the use of information. Furthermore, the results revealed that number of years spent on formal education positively correlated ($p<0.05$) with the use of information from family/friends, books, agricultural input dealers, leaflets and radio. These findings will inform agricultural extension programme planning of the District and the Greater Accra Region, as a whole.

Keywords: Information sources, Information needs, Mango farmers, Agricultural Extension Services, Ghana

Sources d'information et besoins des agriculteurs de mangue (*Mangifera Indica L.*) dans le quartier de Shai Osudoku, région d' Accra, Ghana.

Résumé
Cet article vise à examiner et à comprendre le comportement des agriculteurs en matière de recherche d'informations, en termes de besoins, de sources et de défis. Des questionnaires structurés ont été administrés au hasard à 125 agriculteurs de mangues sélectionnés dans le quartier de Shai Osudoku de la région d'Accra. En outre, un groupe de discussion avec les dirigeants de l'organisation de producteurs de mangues du quartier et un entretien approfondi avec le chef du département de l'agriculture du quartier ont été organisés, ainsi que des visites de fermes pour des observations personnelles afin de trianguler les données quantitatives. L'étude a montré que la radio, les prospectus et la famille/les amis restent les sources d'information privilégiées des agriculteurs de mangues. En revanche, l'Internet, les livres, les journaux et les

agents de vulgarisation sont les sources les moins appréciées par les agriculteurs. La sélection des variétés/hybrides, la gestion des ravageurs et des maladies et la taille des cultures arboricoles ont été perçues par les agriculteurs comme les besoins d'information les plus pressants, qui, selon eux, sont essentiels à la réussite de leur activité de culture de mangues. L'étude a également montré une forte relation positive ($p<0,05$) entre l'âge des cultivateurs de mangues et l'utilisation de l'information. En outre, les résultats ont révélé une corrélation positive ($p<0,05$) entre le nombre d'années passées dans l'enseignement formel et l'utilisation d'informations provenant de la famille/des amis, de livres, de revendeurs d'intrants agricoles, de prospectus et de la radio. Ces résultats contribueront à la planification des programmes de vulgarisation agricole du quartier et de la région d' Accra dans son ensemble.

Mots clés: Sources d'information, besoins en information, agriculteurs de mangues, services de vulgarisation agricole, Le Ghana.

Introduction

Today, mango (*Mangifera indica L)* is one of the economically important crops in Ghana, possibly on account of its strong aroma, delicious taste, and high nutritive value. Mangoes are now growing in more than 100 countries of which more than 65 countries produce each more than 1000 MT a year. Total world production of mangoes is about 40 MT, which played an integral part in the lives of many people (Mitra, 2016)**.** In Ghana, the crop is gaining popularity as one of the major non-traditional fruits for export (Adams *et al.*, 2019). Thus, it is being promoted to become a major potential foreign exchange earner. For mango production to be effective and efficient, farmers may need to be equipped with the necessary information about mango production as well as information on mango marketing. Since agriculture may be deemed to be an information-driven industry, farmers seek and rely on information for optimum performance.

Information therefore may be a key driver of agricultural development. In support of this fact, Bachhav (2012) is of the view that the use of information in the agriculture sector has enhanced farm productivity in such ways as providing information on weather trends, best farming practices, and timely access to market information. These have informed effective decision-making about what crops to plant, where to sell their produce and buy inputs. Information needs of farmers may be dynamic. Delecourt *et al.* (2019) support this thinking with the view that information needs of farmers change from time to time due to changing agricultural technologies, environmental changes, agricultural policies, and the emergence of agricultural innovations. Information may be critical to the sustenance of the mango business of farmers in the Shai Osudoku District of the Greater Accra Region of Ghana. Babu *et al.* (2011) reinforce this opinion with the theoretical assumption that a better understanding of farmers' agricultural information sources and information needs could help guide extension and other agricultural programmes to better target farmers. The dynamics of the information seeking behaviour of mango farmers in the Shai Osudoku District may be yet to be fully understood. The present paper therefore attempts to fill this seeming gap and bring more clarity to the dynamics of the information seeking habits of the mango farmers. The objective of the study was thus to examine and understand the information seeking behaviour of the farmers in terms of their information needs, sources and

challenges. Besides, the study sought to assess the demographic characteristics of the mango farmers and how these characteristics correlated with the farmers' information seeking behaviours.

Theoretical Framework

This study is theoretically underpinned by Wilson's theory of information behaviour, which is widely cited in information behaviour literature. Introducing the term 'information need,' Thomas Wilson explained that understanding the information need of an individual involved three elements, namely why the individual decides to look for information; what purpose the information they find will serve; and how the information is used once it is retrieved (Wilson, 1981). He later modified his theory by introducing the term 'information behaviour' on the grounds that the previous term was unhelpful since 'need' could not be directly observed, while how people behaved in seeking information could be observed and investigated. Thus, his theory posited that information seeking behaviour could be observed and investigated. Wilson described information behaviour as the totality of human behaviour in relation to sources and channels of information, including both active and passive information seeking and information use (Wilson, 2000). He described information seeking behaviour as purposive seeking of information as a consequence of a need to satisfy some goal. It is instructive to note that increasingly, work in the information seeking field that followed afterwards introduced a nexus between information behaviour and underlying needs (Jansen *et al.,* 2009). The theory has been the subject of some revisions, incorporating psychological components into the original model and a more recent review is found in the publication of Wilson (2016) in which the universality of the theory is reiterated. It is evidently clear that information remains the 'blood' that runs through all levels of the agricultural commodity value chain from input supplying, production, marketing, processing and other forms of value addition (Bjournlund *et al.*, 2020). For the mango farmers in the Shai Osudoku District, Greater Accra Region of Ghana, this view is more pronounced and more valid than ever on the assumption that decision making may be a function of the quality of the information needs, information source and information use by the farmers. It is against this background that it is important to study the dynamics of the information seeking behaviour of the mango farmers; the subject matter of this paper.

Materials and Methods

Study Area and Sample Communities

The study was conducted in the Shai Osudoku District in the Greater Accra Region of Ghana. The District was purposively selected on account of its status as a major mango growing area in Ghana (GBC, 2017). The Shai Osudoku District is situated in the south-eastern part of Ghana in the Greater-Accra Region. The District can be located between latitudes 5045 and 6005 degrees north and longitude 0005 E and 0020 W. The District was carved out of the former Dangme West District as a result of a re-demarcation exercise undertaken in the context of decentralisation reforms in the country. The District shares boundaries with North Tongu District to the north-east, Yilo Krobo Municipality and Upper Manya District to the north-west, Akwapim North Municipality to the west, Kpone Katamanso Municipality to the south-west, Ningo-Prampram District to the south and Ada West District to the east. Agriculture is the mainstay of the District economy employing 58.6% of the working population. Five major mango growing communities were initially selected from the District. From these communities, 125

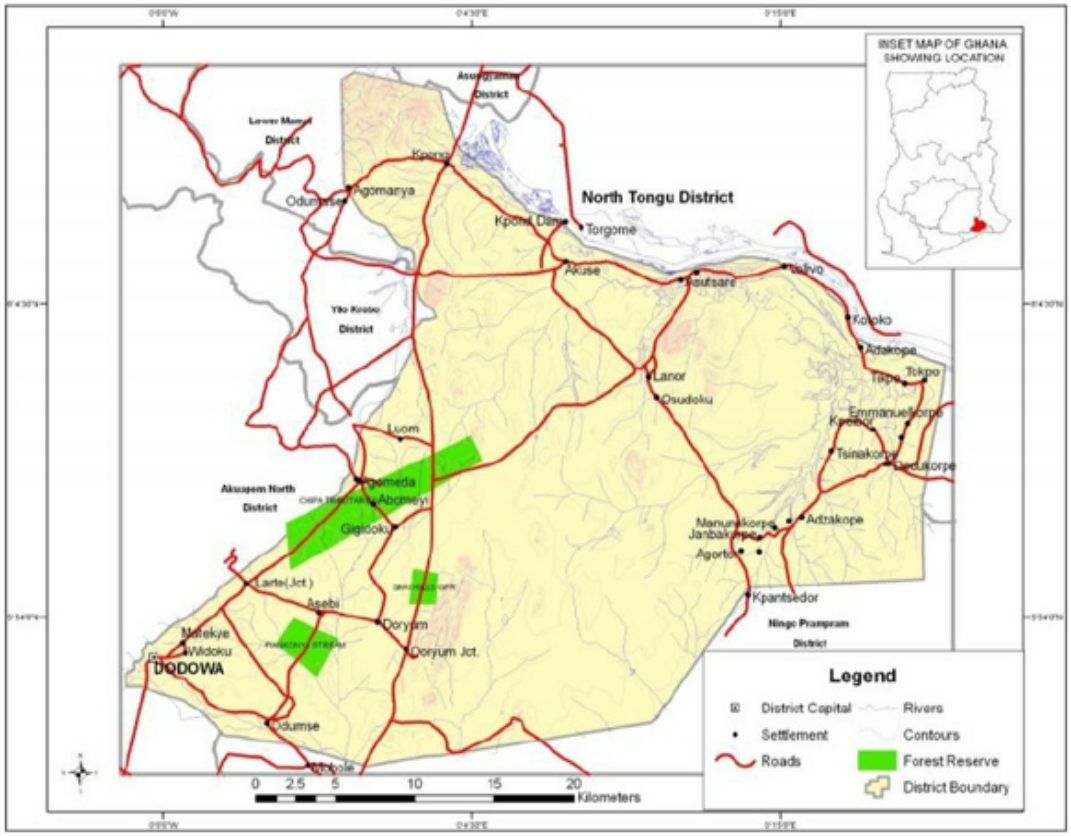

Fig 1 Map of the Greater Accra Region Showing the Shai Osudoku District
Source: Thematic Mapping Section, CSIR-INSTI

mango farmers out of a population of 375, who were members of Shai Osudoku District Mango Farmers Association, were randomly selected for the study based on proportionate sampling procedure (Table 1). That is one-third of the population of mango farmers in each community were selected for the study.

Data Collection

Data used for this study were mainly primary and were obtained from the mango farmers using a structured questionnaire. The questionnaire was pre-tested on ten farmers in Doryumu and Asebi communities in the District. This allowed for the modification of the questions to ensure reliability and validity. The researchers personally visited the farmers to conduct the interviews in the study site. The data collection lasted for four weeks.

Furthermore, some qualitative methods were introduced to enhance the validity of the study and also to make for triangulation of both the quantitative and qualitative data. One focus group discussion session was held with five executive members of the Mango Farmer-based Organisation, coupled with one-on-one

Table 1. Mango Farmers Sampled for the Study

Community	Number of farmers	Sampled farmers
Dodowa	66	22
Ayikuma	120	40
Agomeda	141	47
Afienya	24	8
Asutsuare	24	8
Total	**375**	**125**

Source: By Authors, Field Data, 2019

in-depth interview session with the Head of the Department of Agriculture in the District. Besides, visits were made to four selected mango farms for first-hand observations of field activities on the farms to enrich the quality of the data-collection process.

Data Analysis

The data were collected and analysed with descriptive statistics including frequencies and percentages using The Statistical Package for the Social Sciences (SPSS) software version 21.0. Descriptive statistics such as means, frequencies and percentages were used to analyse the results. Inferential statistics used was Bivalent correlation to analyse socio-economic characteristics of mango farmers and use of various information sources**.** The qualitative aspects were organised into key themes and outcomes identified under each theme were summarised from a response sheet. Respondents' quotes were used to enhance the quality of the narrative.

Results and Discussion

Socio-economic characteristics of the mango farmers

Table 2 showed that mango farming in the study area was done mainly by men. Out of 125 mango farmers who partook in the study, about 78.4% were men, while 21.6% were women. This is not surprising because plantation crop production in Ghana has been observed to be dominated by men (Osei *et al.*, 2017). This may be explained by the fact that a plantation crop such as mango requires a large span of farmland, high initial capital, and labour; conditions that the average Ghanaian woman generally will struggle to meet (Nchanji, 2017; SEND-Ghana, 2014; Friedman & Boyd, 2018). This shows a low level of female labour participation in cash crop production compared with food crop production. Again, since cash crop is a major source of income for agricultural households, the findings raise the concern of gender gap in earnings, confirming the findings of Elborgh-Woytek *et al.* (2013), which indicated that women spent much of their time in unpaid household activities such as childbearing, cooking among others, and the little time left is spent in food production for the sustenance of their households.

The results also indicated that a greater proportion of farmers (60.8%) in the mango production business in the study area were adults in their middle ages (31 - 50 years); there is however a growing interest by the youth in the business. Despite the major problem of the youth in Ghana in acquiring the necessary initial capital and land to enter into cash crop production, the results showed quite a substantial proportion (31.2%) of young farmers (20 -30 years) engaged in the mango production business. Furthermore, unlike in the other cash crops, the farmers in mango production business have higher levels of education. Table 2 showed that 58.4% of the mango farmers had a minimum of primary and secondary school education with some 29.6% with tertiary education. Additionally, 71.2% of the mango farmers were farming on full-time basis, having been

Table 2. Socio-economic Characteristics of the Mango Farmers in the Study

Characteristics	Frequency	%	Mean
Gender			
Male	98	78.4	
Female	27	21.6	
Age (years)			
20 – 30	39	31.2	
31 – 40	49	39.2	36.0
41-50	27	21.6	
> 50	10	8.0	
Educational Level			
Non-formal	15	12.0	
Primary	35	28.0	
Secondary	`38	30.4	
Tertiary	37	29.6	
Level of Occupation			
Full-time	89	71.2	
Part-time	36	28.8	
Years of Experience			
1 – 5	25	20.0	
6 – 10	52	41.6	9.6
11- 15	30	24.0	
16-20	18	14.4	

Source: by authors, field data, 2019

in the business for over six years (Table 2). The four most important reasons the farmers gave for engaging in mango farming were that the business was i) low risk and thus offer a better security, ii) profitable in terms of net returns, iii) marketable and iv) easy to maintain, reasons, which were also confirmed by Okorley *et al.* (2014) in an earlier related study.

Sources of information used by mango farmers

Farmers were asked to rank the sources of information in order of relevance namely first, second and third. They were given the freedom to do multiple choices on the basis of which the computation was done. According to results indicated in Table 3, mango farmers in the study area ranked various information sources listed into three levels of relevance. Thus, with respect to sources from family/friends, 44.8% of the farmers ranked them as relevant source of information, 36.0% ranked them as second source and 19.2% ranked them as third source of information on mango farming. These results are consistent with those of Daudu *et al*., (2009), who noted that 37.5% of farmers in Benue State, Nigeria sourced their information from friends. The implication is that family members and friends ought to be equipped with good quality information to make the sharing process more effective. On the other hand, Internet sources were ranked third by 60.8% of the farmers, 20.8% ranked them as second source and 18.4% as first source. This may not be surprising as 40% of the farmers in the study area had either non-formal or primary education. According to Agwu & Chah (2007), the Internet is a formidable source of information; and information on recent developments in the field of agricultural extension can be readily obtained from the Internet. What it means is that with the right information technology and telecommunication infrastructure, optimum benefit can be derived from farmers' use of the Internet. Similarly, 56.0% of the farmers ranked books as third source with 24.0% and 20.0% ranking them as second and first source respectively. The Internet and books therefore may be said to be unpopular sources of information.

Equally, extension agents were regarded by

12.8%, 53.6% and 33.6% of farmers as first, second and third sources of information respectively. According to Osei *et al.*, (2017) there are too few agricultural extension agents providing information for farmers in the Accra Metropolitan Assembly (AMA) and this may not be too different in the Shai Osudoku District, also in the Greater Accra Region of Ghana. Likewise, agricultural input dealers were ranked as first, second and third sources of information by 53.6%, 33.6% and 12.8% of farmers. The implication here was that interpersonal methods were perceived as the most frequent method used by the farmers in sourcing agricultural information from input dealers, probably because of the frequent meetings and their multiplier effects (Agwu & Adeniran, 2009).These results confirm the findings of Yaseen *et al.* (2014) that an overwhelming majority (98.3%) of the respondents got information through pesticide dealers. In a similar manner, mango farmers in the Shai Osudoku District ranked leaflets as first by 52.8% of the farmers, second by 36.0% of the farmers and third by 11.2% of the farmers as a source of agricultural information. This may be attributed to the availability of these extension materials and their publication by the Agricultural Extension Directorate with funding by some Development Partners supporting agricultural development in the country. On the other hand, television was ranked at first position by 35.2% of mango farmers, second position by 62.4% and third position by 2.4% of farmers as source of agricultural information.

Other print media sources such as newspapers were ranked first by 35.2% of mango farmers, 28.0% as second and 36.8% as third sources of information. Posters were also ranked by 14.4%, 36.0% and 49.9% as first, second and third sources of information respectively. A popular electronic media source radio was ranked by 68.0% of farmers as first sources of

Table 3: Sources of information used by mango farmers

Sources of information	Ranked first		Ranked second		Ranked third	
	Freq	%	Freq	%	Freq	%
Family/friends	56	44.8	45	36.0	24	19.2
Internet	23	18.4	26	20.8	76	60.8
Books	25	20.0	30	24.0	70	56.0
Extension agents	16	12.8	67	53.6	42	33.6
Agric. Input Dealers	67	53.6	42	33.6	16	12.8
Leaflets	66	52.8	45	36.0	14	11.2
Television	44	35.2	78	62.4	3	2.4
Newspapers	44	35.2	35	28.0	46	36.8
Posters	18	14.4	45	36.0	62	49.6
Radio	85	68.0	25	20.0	15	12.0
NGOs/CBOs	58	46.4	53	42.4	14	11.2

Source: By Authors, Field survey, 2019. *Multiple choice

information, while 20.0% and 12.0% ranked it as second and third sources. Radio is a key information source for the most time-sensitive local news and information topics, especially in view of its ability to break linguistic barriers; hence farmers' preference for it over other sources. Besides 46.4% of the farmers ranked non-governmental organisations/community-based organisations (NGOs/CBOs) as first source of agricultural information, 42.4% also ranked NGOs/CBOs as second source of information, while 11.2% ranked them as third sources of agricultural information.

Information needs of Mango farmers

The study sought to establish the information needs of the mango farmers in the Shai Osudoku District. It is revealed from Table 4 that crop improvement technology through 'selection of varieties and hybrids' ($\bar{x}$ =3.75), 'pest and disease management' ($\bar{x}$ =3.71) and 'pruning in crops' ($\bar{x}$ =3.64), were perceived as areas where mango farmers wanted more information. Manures and fertiliser management' ($\bar{x}$=3.21), 'post-harvest technology' ($\bar{x}$ =3.18), 'preparation of main field' ($\bar{x}$ =3.15), 'planting techniques' ($\bar{x}$ =3.13), 'pre-treatment of seedlings' ($\bar{x}$=2.74), 'weed management' ($\bar{x}$=2.44), 'method of propagation' ($\bar{x}$=2.39), 'irrigation management' ($\bar{x}$=2.34), 'inter-cropping' ($\bar{x}$ =2.24), 'recommended growth regulators' ($\bar{x}$ =2.18), 'harvesting' ($\bar{x}$ =2.14) and 'value addition' ($\bar{x}$ =2.06) were perceived in the descending order of importance as regards famers' information needs. Mango farmers wanted information on 'selection of varieties' because an ideal variety could fetch them more yield and ultimately more profit. Farmers can also select varieties suited for pulp marking. The need for more information on various mango varieties and hybrids was therefore obvious.

The study showed that pest and disease management emerged as the critical information need for the mango farmers. This finding is consistent with the results of Akotsen-Mensah *et al.* (2017) and Sujaivelu & Kanaga (2013) on a study of mango farmers in Ghana and India respectively. The mango crop was affected by various pests and diseases as found by the researchers at the time of the field work. The farmers had to control the pests and diseases; however, they had limited knowledge on pest and disease management. It is a well-known fact that the properly-pruned crop will yield better. This fact is known to mango farmers, hence, their preference to have more information about the pruning of their mango tree. Similarly, a well-manured and properly-fertilised mango tree may yield better. Hence, there was increasing need for information on quantity and type of manures and fertilisers to be applied to the mango tree.

Mango farmers expressed the desire to have information, on the techniques of 'preparing main field', planting techniques, and 'pre-treatment of seedlings' as these activities contribute significantly to the increased yield of mango. The farmers wanted least information on weed management, method of propagation, 'irrigation management', 'inter-cropping', 'use of growth regulators', and 'harvesting techniques' because they were fairly familiar with all these techniques. Value addition/processing in mango was one area the farmers wanted least information. Mango farmers are exclusively confined to the production level of the mango value chain; hence going into value addition/processing will be an extra task for which they may not

Table 4: Information needs of Mango farmers

Information needs of mango farmers	Mean score	Rank
Selection of varieties and hybrids	3.75	1
Pests and diseases management	3.71	2
Pruning in crop	3.64	3
Fertilizer management	3.21	4
Post-harvest technology	3.18	5
Preparation of main field	3.15	6
Planting techniques	3.13	7
Pre-treatment of seedlings	2.74	8
Weed management	2.44	9
Methods of propagation	2.39	10
Irrigation management	2.34	11
Inter-cropping	2.24	12
Recommended growth regulators to prevent flower and fruit drop	2.18	13
Harvesting techniques	2.14	14
Value addition in mango	2.06	15

Source: by authors, field survey, 2019

have the expertise, time and finances. The task therefore had to be taken over by other sector actors.

Relationship between socio-economic characteristics and mango farmers and use of various information sources

The result of the bivalent correlation analysis in Table 4 showed that there was a positive, strong relationship ($p < 0.05$) between the age of the respondents and the use of information sources (Family/friends, Internet, Books, Extension agents, Agric. Input Dealers, Newspapers, Posters and Radio). This shows that as the farmers grow older, they may have a propensity to seek more information from various sources. Results in Table 4 also revealed that number of years spent on formal education by the respondents correlated positively and significantly ($P< 0.05$) with the use of Family/friends, books, Agric. Input Dealers, leaflets and Radio. In a much earlier study, Anyanwu *et al.* (2002) observed that educational attainment predisposed one to using different sources of information, with emphasis being more on professional rather than interpersonal sources of information. In other words, the more educated an individual, the more likely exposed the person becomes to sources of information. Furthermore, the analysis showed that there was a positive and significant relationship between household size and the use of professional mass methods of information dissemination (television and newspapers). The positive and significant correlation existing between the household and use of mass methods in disseminating information tended to suggest that the more

Table 5: Bivalent correlation analysis of socio-economic characteristics of mango farmers and use of various Information Sources

Information source	Age	Number of years on formal education	Household size	Years of experience
Family/friends	0.460	0.446	0.283	0.389
Internet	0.309	-0.047	0.075	0.232
Books	0.448	0.376	0.185	0.406
Extension agents	0.344	0.113	-0.175	0.232
Agric. Input Dealers	0.460	0.446	0.283	0.389
Leaflets	0.198	0.256	0.154	0.102
Television	0.204	-0.120	0.224	0.209
Newspapers	0.309	-0.047	0.292	0.293
Posters	0.253	-0.114	0.132	0.253
Radio	0.460	0.369	0.136	0.396
NGOs/CBOs	-0.115	0.097	-0.217	-0.074

Source: by authors, field survey, 2019

the households, the more they were inclined to seek information from professional mass media methods. Again, there was a positive and significant relationship ($P < 0.05$) between years of experience and the use of various professional information sources (family/friends, Internet, books, extension agents, agric. input dealers, newspapers, posters and radio.), suggesting that the more the farming experience, the more farmers would be desirous to seek information from professional sources.

Challenges faced in accessing information by mango farmers

Mango farmers in the study area were asked to indicate challenges/constraints they faced in accessing information and to choose their answers from the checklist. According to Table 6, 92.2% of mango farmers indicated lack of information Centres/Libraries in accessing agricultural information. Similarly, inadequate number of extension agents (96.0%) in the study area was cited as a challenge as well as the lack of awareness about information sources (93.75%). Information was not easily accessible according to 91.2% of the mango farmers and time limitation (80.0%) was another challenge according to the farmers. Further-more, poor knowledge-sharing culture (78.4%), and language barrier (60.8%) were mentioned as some of the challenges constraining farmers' access to agricultural information. The language barrier was largely attributed to information in the English language. While farmers cited family and friends as the first port of call in seeking information, the challenge related to poor knowledge-sharing culture probably implied the need for them to build more effective relationships. This is because the quality of knowledge-sharing may be enhanced when people build relationships and work together (Yi-Ming, T. & Chin-Fu, H., 2010)

Results from the focus group discussions, key informants and personal observations showed that there were no information centres/ libraries available in the area of the study. This is a common problem in most largely rural communities in Ghana. Therefore, this is an opportunity information providers can take advantage of to support the information delivery drive of district and municipal assemblies. The findings further revealed the inadequate numbers of extension agents as a major challenge constraining farmers' ability to access information. The logistical constraints of extension agents may have impaired their ability to visit all the communities and reach out to all the mango farmers. This emerging picture is consistent with the much earlier findings by Aina (2006), which revealed that, the ratio of agricultural extension workers to farmers' population in Africa is generally low.

Also, the study revealed low awareness about the various information sources among majority of the farmers. For instance, the focus group discussion session captured one of the sentiments of an Executive Member of the FBO in the following words:

"We have limited information on where to get help in terms of information for our mango farming business. Our only option is to fall on friends, family members and sometimes on our personal experience gained from the many years of farming."

This sentiment obviously calls for the need for sustained awareness creation about agricultural information sources and services for the benefit of the farmers.

This study has demonstrated the crucial importance of agricultural information to farmers in general and the availability of the various sources of information to mango farmers in the study area. It showed that radio, leaflets and family/friends remained the first option of choice as sources of information to the mango famers of the Shai Osudoku District of the Greater Accra Region, Ghana. On the other hand, the Internet, books, newspapers and extension agents emerged as the unpopular and least sources of preference to the farmers. Selection of varieties and hybrids, pests and disease management and pruning of tree crops were perceived by the farmers as the most pressing information

Table 6: Challenges and Constraints of Farmers

Challenges	Frequency	Percentage
Lack of Information Centres/Libraries	124	99.2
Inadequate number of extension agents	120	96.0
Lack of awareness of information sources	115	92.0
Information not easily accessible	114	91.2
Time	100	80.0
Poor knowledge-sharing culture	98	78.4
Language barrier	76	60.8

Source: by authors, field survey, 2019 Multiple response

needs, which, to the farmers, were critical to the success of their mango farming business. The study showed a positive relationship ($p<0.05$) between age of the mango farmers and the use of information sources. Furthermore, the results revealed that number of years spent on formal education positively correlated ($p<0.05$) with the use of information from family/friends, books, agricultural input dealers, leaflets and radio. These findings have valuable policy implications for the delivery of agricultural extension services to farmers in the Shai Osudoku District, in particular and farmers in the Greater Accra Region as a whole. The findings ought to inform extension policy and feed into the agricultural extension progra-mme planning of the District. They will also serve as important materials for the teaching of agricultural extension in secondary and tertiary educational institutions. On the basis of the policy implications, the paper recommends:

1. The establishment of an Agricultural Information Centre in the District to complement the available sources of information and address the information needs of the farmers.
2. The up scaling of activities of agricultural non-governmental organisations and community-based organisations to make for the limited number of public agricultural extension agents and increase the scope of agricultural extension activities in the District. 3. The strong and effective collaborations between the District Department of Agriculture and the local community radio stations to increase the content of agriculture in their radio programming and promote mass media agricultural extension activities.

Authors' contributions

BYF was the lead investigator and the initiator of the study also responsible for literature search. BYF, SAM, NAM and SM were responsible for the study design, data collection and preparing the manuscript. SAM was responsible for the overall study design and write-up and provided critical feedback on the manuscript. NAM did the data entry, while BYF, SAM and SM did analysis and discussion. All authors read and approved the final manuscript.

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