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RESEARCH ARTICLE

FACTORS INFLUENCING OIL PALM SMALL-SCALE FARMERS' ACCESS TO AGRICULTURAL INFORMATION IN KIGOMA-UJIJI MUNICIPAL COUNCIL, TANZANIA

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ABSTRACT

Agricultural information is very important as it helps small-scale farmers with necessary information to make right decisions and improve agricultural productivity. Small-scale farmers in many countries including Tanzania are surrounded by many factors which influence access to agricultural information. Several studies have been done to examine these factors, however most of them were conducted in a number of years ago. This study which was conducted in year 2024, aimed to examine the factors influencing oil palm small-scale farmers' access to agricultural information in Kigoma-Ujiji Municipal Council, Tanzania. It specifically examined the following factors: personal (farmer) factors, cultural factors (language barriers), and situational factors. These factors involved gender, age, educational level, sources of income, farm size, language barriers, limited information infrastructures, cost of accessing information, relevancy of information, and outdated information. The study was both descriptive and explanatory following a cross-sectional approach. Data were collected using a structured questionnaire by interviewing 120 purposively selected oil palm small-scale farmers from three wards: Kagera, Kibirizi, and Businde. Checklists of questions were used to conduct the key informant interviews. The collected data were analyzed using the Statistical Package for Social Sciences (SPSS) Version 20 software. A binary logistic regression model was used to determine factors influencing oil palm small-scale farmers' access to agricultural information. The study found that factors had different degrees of influence on respondents' access to agricultural information. Key findings indicated that about 64.2% of the respondents had no access to agricultural information, and the variables that significantly influenced the oil palm small-scale farmers' access to agricultural information were age (β= -0.152; p=0.013), gender (β= -1.942; p=0.027), educational level (β= 4.264; p=0.004), and cultural factors (β=2.671; p=0.002). This study recommends strong efforts by local government, central government, and stakeholders **(**NGOs) to improve access to agricultural information.

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1. INTRODUCTION

Information is very important resource to everyone for carrying out different activities. It is needed in all spheres of life and is regarded as one of the main requirements for development (Masele, 2019). Agricultural information is very important and highly desired by farmers to achieve optimal yield from their farmlands (Obidike, 2011). Small-scale farmers in many countries including Tanzania, need to access accurate, timely, and relevant agricultural information in order to bring development in the agricultural sector (Mkenda *et al.*, 2017; Salau *et al*., 2013). Accuracy means that information is free from bias, timeliness implies that recipients can get information when they need it, while relevance is whether information specifically answers the user's questions of what, when, where, who, and how (Salau *et al*., 2013). In Tanzania, both governmental and non-governmental organizations are involved in the provision of agricultural information (Rutatora and Mattee, 2001). In order to ensure the availability of agricultural information needed by small-scale farmers, access to accurate, timely, and relevant information is very critical so as to enhance agricultural productivity, economic development, and there-by alleviate poverty. However, a limited access to agricultural information especially in rural areas has been mentioned as one of the factors limiting agricultural productivity (Lwoga *et al*., 2011). Small-scale farmers in developing countries including Tanzania, are at the forefront of those who face challenges in accessing agricultural information. According to Hart *et al*. (2012) and Matasane and Zaaiman (2016), rural areas are surrounded by many factors including, availability of electricity, extension officers, penetration of mobile phones, policy and government support, which in one way or another influence accessibility of information. Babu *et al*. (2012) discovered that the major factors influencing information access by smallholder farmers include shortage of information sources, lack of awareness, and untimely provision of information. In Tanzania particularly in Kigoma-Ujiji Municipal Council, various factors including, personal (farmer), cultural (language challenges), and situational, seemed to influence oil palm small-scale farmers' access to agricultural information. Small-scale farmers need to access relevant agricultural information in order to improve the agricultural performance and livelihood (Lwoga *et al*., 2011). Examples of relevant agricultural information desired by small-scale farmers

include information related to, weather condition, agricultural credits/loans, improved seeds, contemporary agricultural technologies, storage methods, planting methods, pests and diseases control, and pesticide availability and its application (Bernard *et al*., 2014). In order to ensure effective access of relevant agricultural information, mass media like radio, television, and telephones are very important resources as they have ability to disseminate information efficiently. According to Munyua (2000) and Bonephace *et al.* (2022) relevant agricultural information can be made available to small-scale farmers via extension agents, print materials, video, radio, television, films, slides, pictures, drama, dance, folklore, group discussions, meetings, exhibitions, mobile phones and demonstrations. The oil palm crop (*Elaeis guineensis*) is a member of the family Palmae which is mainly grown for production of edible oil (Verheye, 2010). It produces two types of edible oil which are, palm oil extracted from fresh fruit pulp and palm kernel oil/palm nut oil extracted from oil palm nuts (Murphy, 2019). Palm oil is very versatile in a range of products across the world. For example, 68% of palm oil is used in foods ranging from margarine to chocolate, pizzas, bread, cooking oils, and food for farmed animals, while 27% in industrial applications and consumer products such as soaps, detergents, cosmetics and cleaning agents, and 5% as biofuels for transport, electricity, or heat (Ritchie, 2021). According to Verheye (2010) there are three types of oil palm varieties which are, Dura (local variety), Pisifera, and Tenera /Improved Oil Palm Variety (IOPV). Tenera is obtained by crossing Pisifera (male flowers/pollen) and Dura (female flower). Dura produces about 1.5 tons of palm oil per hectare per year, while Tenera produces about 4.5. Pisifera (male flowers/pollen) is mostly used for breeding purposes (URT, 2018).

Kigoma-Ujiji Municipal Council is one of the eight councils forming the Kigoma region. The municipal is a town council with several information factors influencing small-scale farmers' access to agricultural information. Unfortunately, it is not known how these factors facilitate oil palm small-scale farmers' access to agricultural information. According to Aina (2007) farmers would benefit from global information, once information centers are sited to areas complete with all information and communication gadgets. Studies on oil palm crop conducted in Kigoma Rural District, Tanzania, did not point out factors influencing oil palm small-scale farmers' access to agricultural information. Examples include, Mwaikambo (2018) who examined the contribution of oil palm farming to poverty reduction for small-scale farmers, Mwatawala *et al*. (2022) who assessed factors influencing the adoption of improved oil palm variety, and Andrea and Mishili (2023) who determined the profitability of oil palm farming. Along these points of view, this study aimed to examine the factors influencing oil palm small-scale farmers' access to agricultural information in Kigoma-Ujiji Municipal Council, Tanzania.

2. THEORETICAL AND CONCEPTUAL FRAMEWORKS

2.1 Theoretical framework: This study is guided by the "Theory of Access" as proposed by Ribot and Peluso 2003, and reviewed in 2020. The authors define the term "access" as the ability to derive benefits from things. This definition was extended from the classical one which defined the term "access" as the right to benefit from things (Ribot and Peluso, 2003). The term "things" in question, has explored the range of powers embodied in through various mechanisms, processes, and social relations that affect peoples' ability to benefit from resources. These powers constitute the material, cultural and political-economic strands within bundles and webs of powers that configure resource use. The theory of access is relevant to this study in that, the ability to derive benefits from things is parallel to oil palm small-scale farmers' access to agricultural information as a result of the influencing factors, in Kigoma-Ujiji Municipal Council, Tanzania. The term "access" has already been used in literature to include means of benefiting from resources. (Peluso, 1992b; Bruce, 1988; Berry, 1989, 1993; Newell, 2000; Blaikie, 1985; de Janvry *et al*., 2001; Mamdani, 1996; Mearns, 1995; Lund, 1994; Agarwal, 1994; and Shipton and Goheen, 1992). In the theory of access, a "bundle of power" is a set of relationships through which people and their institutions realize benefits from things (Ribot and Peluso, 2003). These relationships have been viewed as mechanisms that influence who is able to benefit from resources, environment, or other things. The bundles of powers become nodes in larger webs, and at the same time, can be disaggregated into their constituent strands (Ribot and Peluso, 2003). The strands in webs and bundles of power, are means, processes, and relations by which actors are able to gain, control, and maintain access to resources (Ribot and Peluso, 2003).

2.2 Conceptual Framework: Based on the "Theory of Access" (Ribot and Peluso, 2003) possible factors that can influence access to information are presented in figure 1. The factors (personal farmer), cultural, and situational) influencing oil palm small-scale farmers' access to agricultural information are independent variables, while oil palm small-scale farmers' access to agricultural information is a dependent variable. Personal (farmer) factors include, gender, age, educational level, source of income, and farm size. Cultural factors include, language barriers such as the use of Swahili, English, both Swahili and English, and Local language, while situational factors involve challenges including limited infrastructures, information accessing cost, relevancy of information, and outdated information.

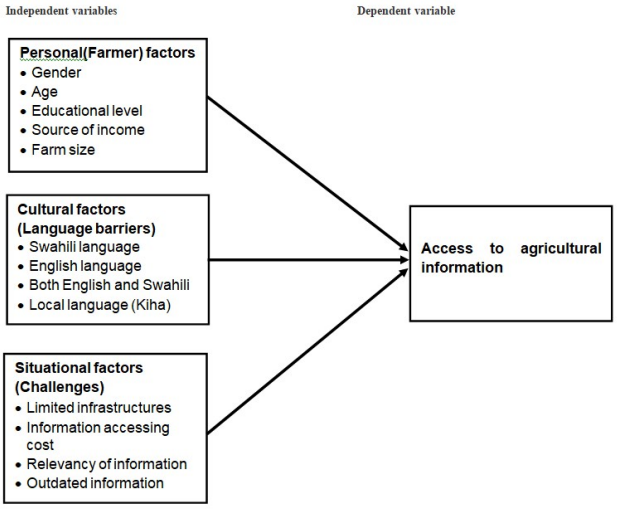

Fig. 1. A conceptual framework of the study

3. METHODOLOGY

3.1 The Study area: This study was conducted in Kigoma-Ujiji Municipal Council in Kigoma region, Tanzania. The municipal council is one of the eight councils in Kigoma region. Other councils include, Kigoma District, Uvinza, Buhigwe, Kasulu Urban, Kasulu Rural, Kibondo, and Kakonko (URT, 2018). The municipal lies between the latitude of 4.52^0 South and longitude 29.35^0 East. It has a total area of 128 km^2 of which 0.15 km^2 is covered with water and 127.85 km^2 is land (URT, 2018). The Tanzania National Bureau of Statistics Reports (NBS, 2022) reported that, Kigoma-Ujiji Municipal Council had a population of 232 388 people (109,188 males, 123 200 women). It has two divisions, which are Kigoma North and Kigoma South, 68 Streets/Hamlets, and 19 wards (URT, 2018). In the western part, the municipal borders the Democratic Republic of Congo (DRC), to the South, East and North, it borders Kigoma District Council (URT, 2018). The temperature ranges at an average of 20˚C and average rainfall is 980 – 1200mm per annum (Magigi, 2013). The study was conducted in three wards namely, Kagera, Businde and Kibirizi. These wards were selected because, have majority of the oil palm small-scale farmers in the municipality (URT, 2018). The major crops which were grown in the study area, included the oil palm, maize, paddy, beans, cow peas, cassava, plantains, potatoes and yams. Similarly, horticultural crops were also grown including, tomatoes, onions, eggplants, peppers, amaranths, and cabbages.

Three varieties of oil palm crop exist in the study area. These include, Dura, Tenera and Pisifera. Dura is a local variety, while Tenera is an improved oil palm variety as a result of breeding Dura and Pisifera (URT, 2018).

Important oil palm stakeholders in the study area were, agricultural extension officers, Tanzania Agricultural Research Institute (TARI-Kihinga), Farming for Energy for better Livelihoods in Southern Africa (FELISA), Kwitanga Prison, Jeshi la Kujenga Taifa (JKT)-Bulombola, Small Industries Development Organisation (SIDO), agro-input dealers, Luiche Basin Agricultural Marketing Co-operative (LUBAMACO), Kikundi cha Wakulima wa Michikichi Kigoma (KICHAWAMIKI), Wakulima wa Michikichi (WAMI), Yangumacho group, and financial institutions including, Tanzania Agricultural Development Bank (TADB), National Microfinance Bank (NMB), National Bank of Commerce (NBC), and Cooperative Rural Development Bank (CRDB). All these stakeholders aimed to increase palm oil production through the use of improved oil palm variety (Tenera).

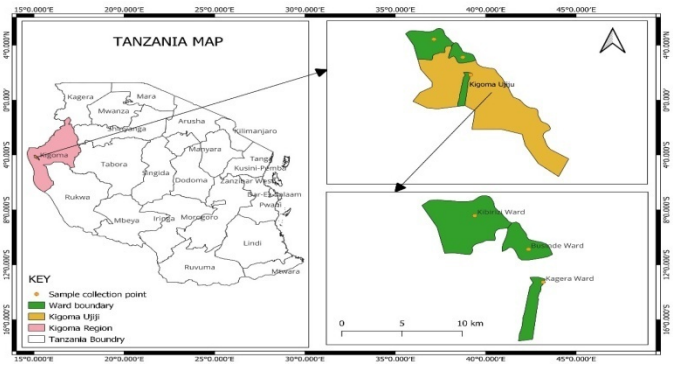

Figure 2. A map showing the study area

3.2 Research Design: The study applied a cross-sectional research design which helped to collect data from respondents at a single point in time. Sedgwick (2014) emphasizes that a cross-sectional research design is generally quick, easy, cheap to perform, and provide information at an instant of time. Babbie and Babbie (2010) reveal that a cross-sectional research design involves both descriptive and explanatory research designs. A descriptive research design involves the accurate portrayal of the characteristics of persons, situations or groups and the frequency with which certain phenomena occur (Delost and Nadder, 2014). Explanatory research design provides a better understanding of "how" and "why" something occurs when only small amounts of information is available and allows a researcher to understand the cause-and-effect relationship between independent and dependent variables (Akhtar, 2016). This study considers factors influencing oil palm small-scale farmers as independent variables, while access to agricultural information as a dependent variable.

3.3 Target Population, Sampling Procedures, and Sample Size: The target population for this study was all oil palm small-scale farmers in Kigoma-Ujiji Municipal Council. A purposive sampling technique was used to select the Kigoma-Ujiji Municipal Council because it has favourable environmental condition for production of oil palm crop (URT, 2018). Thereafter, three wards out of nineteen were randomly selected to minimize over representative of homogeneity population. Purposive sampling was also used to select key informants (ward agricultural extension officers) in the three wards. The sampling frame in the study area consisted of all oil palm small-scale farmers in the three wards, while the sampling unit was an individual oil palm small-scale farmer. According to the information provided by key informants in year 2024, the study wards had a total number of 897 oil palm small-scale farmers as indicated in Table 1. Since the population size of the study wards is finite or known, the formula proposed by Kothari (2004) was used to find the sample size as follows:

$$n = \frac{Z^2.p.q.N}{e^2(N-1) + Z^2.p.q}$$

Where n=sample size, Z = confidence level 95% score which is 1.96, p=sample proportion (0.1), q = 1-p where q= 0.9, e= tolerable sampling error (0.05), and N=size of the sampling population. For this study, the sampling population (897), once computed using Kothari formula, gives the sample size (n) = 119.9413, rounded to 120.

$$n = \frac{1.96 \text{ X } 1.96 \text{ X } 0.1 \text{ X } 0.9 \text{ X } 897}{0.05 \text{ X } 0.05(897-1) + 1.96 \text{ X } 1.96 \text{ X } 0.1 \text{ X } 0.9} \quad \text{..... (1)}$$

$$n = \frac{310.1323}{2.5857} \quad \text{..... (2)}$$

n= 120

Thereafter, a sampling proportionate to size method was used to get the sample size distribution (both male and female) among the wards.

Table 1. Sampling distribution per ward

	Oil palm small-scale farmers				
Ward	Male	Female	Total	Sampling Proportionate to Size Method	Sample Size
Kagera	336	113	449	449/897 X 120	60
Kibirizi	154	33	187	187/897 X 120	25
Businde	205	57	262	262/897 X 120	35
Grand Total	695	203	898		120

Source: Computed from survey data (2024)

3.4. Data Collection: A structured questionnaire with both open and close-ended questions was used to collect primary data from respondents, while a check-list of questions was used for key informant interviews (KII). Before the actual data collection, the respondents were informed about the objectives of the survey. A questionnaire contained key questions related to socio-economic characteristics of the respondents (personal (farmer) factors, cultural factors, situational factors, level of access, and information media used by the respondents in accessing agricultural information.

3.5 Data Analysis: The collected data were analyzed using the Statistical Package for Social Sciences (SPSS) Version 20 software. The analytical techniques used to analyse the data were descriptive statistics, including frequencies and percentages which helped to examine the proportion of oil palm small-scale farmers who had access to agricultural information. A content analysis method also was also used to analyse the data from key informants. A binary logistic regression model was used to examine factors influencing oil palm small-scale farmers' access to agricultural information. Ahmed *et al*. (2022) emphasized that a binary logistic regression model is easier to use and provides a more meaningful interpretation of the results than the other models. A binary logistic regression model is indicated in equation (3).

$$\log p/1\text{-}p = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \beta 5X5 + \ldots\ldots + \beta nXn + \varepsilon \ldots\ldots \quad (3)$$

4. RESULTS AND DISCUSSIONS

4.1 Socio-economic characteristics of respondents

The results in Table 3 regarding age revealed that about 45.0% of the respondents falls within the age group of 41-50 years. This shows that a large proportion of the respondents who accessed agricultural information were adult, and more likely to engage in farming activities. These results corroborate with those by Bernard and Dulle

(2014) and Mwaikambo (2018) in Tanzania, who found that the age group of 41-50 years was a productive one with more access to agricultural information for increasing crop productivity. Also these results agree with Ebewore and Emuh (2015) in Nigeria who discovered that the age group of the respondents between 41-60 years indicated a positive effect on accessing agricultural information, which helped them in increasing palm oil production. Fadoyin *et al*. (2015) in Oyo State, Nigeria, discovered that the age group of the respondents ranging between 40-49 years was more likely to access agricultural information and indicated a positive significant role in farming activities to increase crop production.

education, making a total of 68.3% of the respondents who had attained formal education. This shows that a large proportion of the respondents had attained formal education which could help them to access agricultural information in order to increase agricultural production. These findings concur with Udoh et *al*. (2008), Bernard *et al*. (2014), Eneke and Igbokwe (2009), Tambo and Abdoulaye (2011), Ebewore and Emuh (2015), and Quisumbing and Meinzen – Dick (2001) who revealed that education is very important as it promotes access to information so as to increase agricultural productivity. The findings also indicate that 31.7% of the respondents were those with no formal education.

Table 2. Description of the study variables

Variable	Descriptions	Measurement
Dependent variable		
Access to agricultural information	Small-scale farmers' access to agricultural information	1 if a small-scale farmer has access to agricultural information, 0=otherwise
Independent variable		
Age	Age of a small-scale farmer	Number of years (continuous)
Gender	Gender of a small-scale farmers	1=male, 0=otherwise
Source of income	The basis for small-scale farmers' revenue per month	Tanzanian shillings (TSHS.) (continuous)
Educational level	Level of education of a small-scale farmers	1 if a farmers attended school, 0=otherwise
Farm size	Total amount of land cultivated oil palm	Acres
Use of Swahili	Small-scale farmers use of Swahili language	0=No, 1= Yes
Use of English	Small-scale farmers' use of English language	0=No, 1= Yes
Use of both English and Swahili	Small-scale farmers' use of English and Swahili	0=No, 1= Yes
Use of local language, "*Kiha*"	Small-scale farmers' use of *"Kiha"*	0=No, 1= Yes
Limited information infrastructure	Inadequate information infrastructure	0=Low, 1= High, and 2=Very high
Cost in accessing information	Small-scale farmers' charges in accessing information	0=Low, 1= High, and 2=Very high
Relevance of information	Significance of information to small-scale farmers	0=Low, 1= High, and 2=Very high
Outdated information	Invalid information to small-scale farmers	0=Low, 1= High, and 2=Very high
Radio ownership	Small-scale farmers who owned radio	0=No, 1= Yes
Television ownership	Small-scale farmers who owned television	0=No, 1= Yes
Mobile phone ownership	Small-scale farmers who owned mobile phones	0=No, 1= Yes

Source: Computed from survey data (2024)

Table 3. Socio-economic characteristics (n=120)

Socioeconomic characteristics	Category	Frequency (f)	Percent (%)
Age	≤ 30 years	1	0.8
	31-40 years	8	6.7
	41-50 years	54	45.0
	51-60 years	35	29.2
	>60 years	22	18.3
Gender	Male	103	85.8
	Female	17	14.2
Sources of income	Farming	98	81.7
	Livestock	6	5.0
	Salary	6	5.0
	Business	10	8.3
Educational level	No formal education	38	31.7
	Primary	78	65.0
	Secondary	4	3.3
Farm size	< 1 acre	41	34.2
	1 to 3 acres	74	61.7
	> 3 acres	5	4.2

The findings in Table 3 also reveal that majority (85.8%) of the respondents were males. The reason for this could be that men are dominant to oil palm crop. These results link with other studies by Modirwa (2019), Daemane and Muroyiwa (2022), and Ebewore and Emuh (2015) who found that majority of the respondents were males and this made them to have more access to agricultural information than women. The study findings (Table 3) show that majority (81.7%) of the respondents depended on agriculture as their main source of income. This shows that agriculture sector is a backbone of economy. Bernard and Dulle (2014) emphasized that agriculture is the main source of income for 90% of rural populations in Africa. These findings agree with Andrea and Mishili (2023) in Kigoma Rural District, Tanzania, who discovered that majority (93%) of the respondents depended on agriculture as a major source of income. The findings in Table 3 reveal that about 65.0% of the respondents had attained primary education, while 3.3% had attained secondary

This means that respondents with no formal education were not able to access agricultural information especially in print, electronic, and others (Aina, 2004). The findings in Table 3 regarding farm size show that majority (95.9%) of the respondents were small-scale farmers with small farms below 3 acres. Qiao *et al*. (2018) described small-scale farmers as marginalised people who have difficulties to access resources, capital, information and technology. These findings agree with Bernard and Dulle (2014) in Kilombero District, Tanzania, who discovered that majority of the respondents were smallholder farmers with 1-2 acres of farm. Rahman *et al.* (2022) in Bangladesh discovered that majority of the respondents with 0.50-2.49 acres were small-scale farmers.

4.2 Level of access and media used by respondents: The results in Table 4 indicate the level of access to agricultural information and types of major media used by respondents. The results show that out

of 120 respondents, only 35.8% had access to agricultural information. The problem of low levels of access to agricultural information have also been reported by other researchers in different parts of the world. To point out a few examples, Sahu *et al*. (2024) in Indo-Gangetic Plains, India, found that only 32.88% of the respondents had access to agricultural information which helped in improving agricultural activities. Similarly, Bakunda *et al.* (2023) in Lushoto and Korogwe Districts, Tanzania, revealed that only 18.5% of the respondents had access to agricultural information on improved seeds, market, best farming methods, pest management, agricultural incentives, manure and agricultural tools. However, Mauki *et al*. (2023) in Mbarali and Mvomero Districts, Tanzania, discovered that a high percent (77.2%) of the respondents had access to agricultural information which helped in increasing agricultural productivity. Wahome *et al*. (2024) in Kenya found that about 85.0% of the respondents had access to agricultural information which increased crop productivity. Fadoyin *et al*. (2015) in Oyo State, Nigeria, found that 96.0% of the farmers had access to agricultural information which helped in improving agricultural production. The study results (Table 4) also indicate that, radio, television, and mobile phones, were the major information media which helped the respondents to access the agricultural information. About 66.7% of the respondents used mobile phones as major media in accessing agricultural information. This implies that there was a high penetration of mobile phones in the study area, but the respondents did not access enough agricultural information which could be attributed by other factors like language barriers. Studies by Ndimbwa *et al*. (2019), Abebe *et al*. (2019), Ng'atigwa *et al*. (2020), and Hoang *et al.* (2022) revealed that, mobile phones, radio, and television, are important milestones for enhancing agricultural information access by farmers. These results agree with Krell *et al*. (2021) in Kenya, who divulged that majority (98%) of the respondents possessed mobile phones, which helped to access agricultural information and this helped to manage and reduced vulnerabilities to climate change. In regard to radio, the results in Table 4 show that the minimal percent (22.5%) of the respondents depended on radio as one of the major media for accessing agricultural information. This could be due to poor information infrastructures like electricity, which influenced some of the respondents to buy and use batteries for their radios. The results corroborate with Adeogun *et al*. (2010) in Nigeria, who found that radio was a second information source after personal experience, which helped farmers to access agricultural information. Bernard *et al*. (2015) in Unguja, Tanzania, found that the main sources of information to the respondents were, neighbours and friends, followed by radio, family/parents, personal experience, village leaders, agricultural inputs suppliers, television, internet, and leaflets, which helped farmers to access the agricultural information. The results further revealed that about 10.8% of the respondents accessed agricultural information via television. The reason for this could be due to poor electricity supply and high cost of some televisions. These findings corroborate with Atsiaya *et al*. (2022) in Busia county, Kenya, who found that few (40%) of the farmers owned television due to lack of access to electricity which led to poor agricultural production. Moreover, Ndimbwa *et al*. (2019) pointed out that, lack of electricity and money limited access to and usage of radio and television in rural Tanzania, which led to poor information availability among the respondents.

Table 4. Level of access and media used by small-scale farmers (n=120)

	Frequency (f)	Percentage (%)
Access to agricultural information	43 (Yes)	35.8
	77 (No)	64.2
Information media used		
Radio	27	22.5
Television	13	10.8
Mobile phone	80	66.7

Source: Computed from survey data (2024)

4.3 Factors influencing oil palm small-scale farmers' access to agricultural information: Binary logistic regression model was used to analyse factors influencing respondents' access to agricultural information. Findings in Table 5 show that the model was fit for a set of observation (Nagelkerke R^2=0.933) of factors that influence access to agricultural information. Among the factors; age, gender, educational level, and cultural factors had significant ($p<0.05$) influence to access agricultural information.

4.3.1 Personal (Farmer) Factors: The study results in Table 5 show that gender had a negative regression coefficient (β) of -1.942, the odds ratio (Exp β) of 0.143, and statistically significant (p=0.027) at 5% significant level. The negative sign on coefficient indicates that statistically, male oil palm small-scale farmers have lower likelihood of accessing agricultural information compared to females by -1.942 units. According to Aldosari *et al*. (2017) one's gender can influence access to agricultural information and resources. These results agree with Masanja *et al*. (2023) in Kibondo District, Tanzania, who revealed that gender had a negative regression coefficient (β) of -1.807, the odds ratio of 0.164, and statistically significant (p=0.016) at 5% significant level, which could influence rural farmers' access to agricultural information provided by private organizations. The study results (Table 5) also reveal that age of the respondents had a negative regression coefficient (β) of -0.152, the odds ratio (Exp β) of 0.859, and statistically significant (p=0.013). The results revealed that an increase in age decreases the likelihood of accessing agricultural information by a factor of 0.859 given other variables in the model held constant. This means that there is a negative relationship between the age of a small-scale farmer and access to agricultural information. This implies that an increase in age would decrease the likelihood in accessing agricultural information. These results are consistent with Atsiaya *et al*. (2022) in Busia County, Kenya, who found that increase in age decreased the likelihood of a small-scale farmer to access agricultural information. From these points of view, it implies that younger farmers are more likely to access agricultural information than older. According to Muema *et al*. (2018) and Antwi-Agyei *et al*. (2021) older farmers are less likely to access agricultural information because of the vast knowledge they have gathered for many years. In regard to educational level, the results in Table 5 show that educational level had a positive and statistically significant (β=4.264, p=0.004) influence on access to agricultural information. The odds ratio 71.094 implies that a one-unit increase in education level of respondents is expected to change the level of accessing agricultural information by 71.094 given other variables held constant. This denotes that access to agricultural information increases as the level of small-scale farmers' education increases. These results agree with Daemane and Muroyiwa (2022) in Lesotho who concluded that higher level of education is associated with the ability of small-scale farmers' access to agricultural information. Jamshidi *et al*. (2019) and Omerkhil *et al*. (2020) revealed that the education level of a farmer increases his ability to access agricultural information.

4.3.2 Cultural factors: The study results (Table 6) show the cultural factors influencing the respondents' access to agricultural information. The regression results (Table 7) revealed that cultural factors had a regression coefficient (β) of 2.671, odds ratio (Exp β) of 14.454, and statistically significant (p=0.02). This implies that for oil palm small-scale farmers to access agricultural information, languages must support them. According to Joseph and Shaibu (2020) language is very important in agricultural development and that, language provides an effective means for accessing various agricultural information. URT (2019) pointed out that Kigoma region comprises of more than five tribes including Waha, Wahaya, Wafipa, Wasukuma, Wachagga, and Warundi. Along this point of view, it implies that each tribe has its own local language, which in turn influences access to agricultural information. The results in Table 6 show that majority (90.8%) of the respondents used Swahili language in accessing agricultural information, followed by local language-*Kiha* (5.1%), both English and Swahili (3.3%), and English (0.8%). This means that Swahili language is a common/national language used by majority of the people in Tanzania. These results concur with Ramadhani *et al*. (2017) in Tanzania, who discovered that majority (86.6%) of the farmers were able to communicate by using Swahili language only, which helped in accessing more agricultural information. Similarly, Bonephace *et al*. (2022) in Mbeya, Tanzania,

found that 300 (100%) farmers could read and understand simple instructions as translated in Swahili language, which enabled them to understand the agricultural information of their desire. The results in Table 6 regarding the use of local language reveal that only a small proportion (5.1%) of the respondents used *Kiha* language in accessing agricultural information. This could be due to the reason that *Kiha* was one of the languages used by few respondents (indigenous) in accessing agricultural information. According to Elugbe and Omamor (2007) local language is the one that is native to a region and spoken by indigenous people. According URT (2019) *Kiha* is a local/indigenous language which is spoken by the biggest tribe called *"Waha"* in the Kigoma region. Regarding the use of local/indigenous language, the results agree with Joseph and Shaibu (2020) in Nigeria who discovered that a minimal percent (32.9%) of the farmers accessed agricultural information through indigenous language *(Igala)*, which helped them to understand important agricultural information.

The findings in Table 6 reveal that a small percent (3.3%) of the respondents used both English and Swahili languages in accessing agricultural information. The reason for this could be that not all respondents use a single language for accessing agricultural information, since others use local, national, and foreign languages for valuable information. These findings are consistent with Ramadhani *et al*. (2017) in Tanzania, who discovered that 3.9% of the farmers in rural communities used both Swahili and English languages in accessing agricultural information and this helped them to obtain diverse information. The findings in Table 6 further show that a smaller percent (0.8%) of the respondents used English only in accessing agricultural information. This is due to the reason that majority of the respondents had low level of education, which influenced them negatively in accessing agricultural information, especially the information written in English language. The findings agree with Ramadhani *et al*. (2017) in rural communities of Tanzania, who found the smaller proportion of the farmers able to communicate by English language only, which led to poor access to agricultural information.

4.3.3 Situational factors influencing access to agricultural information: The results in Table 7 indicate the situational factors influencing access of agricultural information by respondents. The respondents agreed that relevance of information (Mean =0.72) mostly influenced them in accessing agricultural information, followed by limited information infrastructures (Mean=0.51), outdated information (Mean=050), and cost (Mean=0.49). Along with relevance of information, it means that majority of the respondents did not access appropriate agricultural information. According to Salau *et al*. (2013) the quality of any agricultural information rests solidly on three pillars, including the accuracy, timeliness and relevance. Moreover, Lwoga *et al*. (2011) divulged that access to relevant agricultural information is vital for improving the agricultural productivity. It also means that irrelevance of agricultural information impedes small-scale farmers in agricultural activities. These results agree with Bonephace (2022) in Mara, Tanzania, who revealed that lack of access to relevant agricultural information by farmers was a major factor constraining efforts to improve agricultural production. The results in Table 7 regarding limited infrastructures (Mean=0.51) reveal that respondents were influenced to slightly minimal by poor information infrastructures. This could be due to the reason that information infrastructures including, roads, electricity, and telecommunications were sited to town while majority of the respondents lived in remote areas and this led to poor access to agricultural information. These results link with Atsiaya *et al*. (2022), Masele (2023), and Magesa *et al*. (2014) who discovered the information infrastructures impeding farmers in farming activities include, electricity, roads, telecommunications, and internet networks. They emphasized that extending information infrastructures to rural areas enables easy access to agricultural information by farmers. The study findings (Table 7) about outdated agricultural information with a mean of 0.50 show that the respondents were influenced to the minimal. This means that the respondents were not accessing agricultural information on time, which could be due to poor confidence among the respondents in using Information Communication Technology (ICT), poor electrical infrastructures, and poor information networks. These results are consistent with Amelia *et al.* (2022), Mdoda and Mdiya (2022), who observed that farmers' ability to access ICT was still low, due to electricity problems, poor connections, and lack of confidence among farmers in using ICT. Moreover, Babu *et al*. (2012) observed that, the major constraints to information access for farmers was unavailability, unreliability, lack of awareness, and untimely provision of information, which reduced agricultural production. The findings in Table 7 further reveal that the respondents were least influenced by costs of accessing agricultural information. The reason for this could be due to high costs of accessing information infrastructures like, internet, and computer to some of the respondents. These findings corroborate with Swanzy *et al*. (2020) in Akyemansa District of Ghana, who found a low population of oil palm farmers with access to computer (17%) and internet (7%) due to high cost of the computer, lack of internet cafes in the communities and poor telephone network which led to poor palm oil production. Similarly, Dutta (2009) discovered that costs of batteries, lack of electrification, and unfavourable timing of radio and television programmers, impeded smallholder farmers' access to agricultural information and knowledge delivered through electronic media, which reduced agricultural productivity.

Table 5. Binary logistic regression results for factors influencing access to agricultural information

Variables	Coefficients (β)	Odds ratio (Exp. β)	Standard Error	Sig.
Gender	-1.942	0.143	429.338	0.027*
Age	-0.152	0.859	37.503	0.013*
Educational level	4.264	71.094	1307.795	0.004*
Source of income	-0.093	0.911	110.495	0.153
Farm size	-0.713	0.490	565.553	0.095
Cultural factors	2.671	14.454	961.467	0.002*
Level of access	0.220	1.246	225.776	0.135
Limited infrastr.	0.706	2.026	939.716	0.109
Cost of access	0.097	1.102	184.844	0.207
Relevance of info.	1.991	7.323	119.554	0.430
Outdated info.	-0.834	0.434	809.196	0.074
Radio	2.699	14.865	801.562	0.529
Television	-1.268	0.281	915.291	0.063
Mobile phone	2.498	12.158	167.892	0.555
CONSTANTS	-7.823	1.176	56.711	0.485

Summary of the model fit: Number of observations= 120, Pseudo – R^2 = 0.933, Chi-square=2.220. Notes: * is significant at 5%. Source: Computed from survey data (2024).

Table 6. Cultural factors influencing access to agricultural information (n=120)

Cultural factors	The extent of influence	
Language used by farmers	Frequency	Percentage (%)
Swahili	109	90.8
English	1	0.8
Both English and Swahili	4	3.3
Local language (Kiha)	6	5.1

Source: Computed from survey data (2024)

Table 7. Situational factors influencing access to information (n=120)

Situational factors (Challenges)	Degree of influence			Mean
	Very high (n)	High (n)	Low (n)	
Limited information infrastructures	49	52	19	0.51
Cost involved in accessing information	34	75	11	0.49
Relevance of information	31	29	60	0.72
Outdated information	53	61	6	0.50

Source: Computed from survey data (2024)

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion: This study examined the factors influencing oil palm small-sale farmers' access to agricultural information in Kigoma-Ujiji Municipal Council, Tanzania. Key findings indicated that a large proportion of the oil palm small-scale farmers had no access to agricultural information and the most important variables that influenced them were age, gender, educational level, and cultural factors. Moreover, limited information infrastructures, costs in accessing agricultural information, relevance of information, and outdated information, influenced the oil palm small-scale farmers' access to agricultural information. The comparison of the findings in this study with those conducted in previous studies indicated that factors influencing oil palm small-scale farmers' access to agricultural information is a subject of various factors hence not uniform from one place to another.

5.2 Recommndations

- This study recommends strong efforts by local government, central government, and stakeholders **(**NGOs) is required to improve oil palm small-scale farmers' access to agricultural information. Stakeholders like TARI-Kihinga, JKT, Kwitanga Prison, FELISA, agricultural extension officers, agro-input dealers, and financial institution including, TADB, NMB, NBC, and CRDB, should cooperate together to ensure that oil palm small-scale farmers are able to access accurate, timely, and relevant agricultural information.
- Moreover, further studies in other regions (Mbeya, Tanga, and Pwani) potential for oil palm production in Tanzania are highly recommended to examine the factors influencing oil palm small-scale farmers' access to agricultural information. This is very important as the findings from these studies if will be used, will help to establish strong efforts towards oil palm production and later, will increase the income of oil palm small-scale farmers as well as the government of Tanzania as a whole.

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