

Sweet potato Production Technologies and Flow of Information Among Farmers in Southeast, Nigeria

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Abstract

The study assessed sweet potato production technologies and flow of information among farmers in southeast, Nigeria. The specific objectives were to: examine different sources of information on improved sweet potato production technologies used by the farmers and ascertain the types of information sourced from the various sources on sweet potato production activities by the farmers. A multistage sampling procedure was used to select 240 respondents for the study. Data were collected from primary source through the use of structured questionnaires. Data collected were analyzed using frequency, percentage and mean score. Findings showed that age of the farmers (43.3 years), farming experience (16 years), household size (8 persons) and farm size (1.7 hectares) respectively. The farmers used fellow farmers, National Root Crops Research Institute (NRCRI), and Agricultural Development Programme (ADP) as their major source of information on sweet potato production technologies. Similarly, the majority (55.3%) of the farmers sourced information on land preparations for sweet potato production practice from research institute (RI), while 60.2% and 60.1% of the sweet potato farmers sourced information on plant spacing from research institute and friends/neighbor. The study recommended that there should be efficient and effective information dissemination to sweet potato farmers at the grass root using various communication channels. Government should broaden extension services by engaging more extension agents and providing them with working facilities. Village information center should be built in all the villages in south east zone to enable farmers have easy access to information flow.

Keywords: Sweet Potato; Farmers; perception; Production Technologies; Information Flow

Abbreviation: NRCRI: National Root Crops Research Institute; ADP: Agricultural Development Programme; RI: Research Institute

Introduction

An important approach to boost agricultural productivity is through the introduction of improved agricultural technologies and information management system. Agricultural researchers face the challenge of understanding the needs of farmers to know how and when new technologies are used to achieve better results Garba [1]. In the dynamic world within which agriculture is practiced today, the need for the application of the best technology to boost agricultural production to meet the world food demand becomes imperative Kolawale [2]. Farmers need a wide variety of information on appropriate seeds, crop and animal diseases, input and output prices, weather related information, market information, pre and post-harvest management technologies, among others. If properly utilized, agricultural information can significantly contribute towards overall economic development through improved productivity and incomes. However, achieving the desired objective for agricultural information can only be realized if farmers have adequate access and know how to apply

these innovations to their potential. Research has shown that although researchers have developed many technologies, their adoption remains low, due to lack of or inadequate awareness exacerbated by a wide communication gap between farmers and researchers among other factors Wanyama [3]. Therefore, information must be seen as an essential path to modern agriculture to achieve farmers' needs. The advent of computers and improvements in telecommunications offer farmers and extension workers ample new opportunities to obtain technical and profitability information quickly and use them effectively for their decision-making. Modern farmers are the entrepreneurs who strive to grow right crops and animals in the most profitable way. The amount of information a farmer can and should use for his management decision is increasingly growing. Previously, the mass media gave generalized advice to farmers, but with modern information technology, extension agent can provide for each farm and farmer without visiting farm personally Wanyama [3]; Adio et al, 2016.

Through agricultural information farmers are able to acquire knowledge on new technologies or farming systems, when to plant and when to harvest, which crops or animal to raise and where to sell them. It is also through agricultural information that farmers know where to acquire bank loans and other farming inputs as well as how to control pest and diseases and such information will consequently increase agricultural production and improved the standard of living of farmers (Adio et al, 2016). Information sources are various means by which information is recorded for use by an individual and organization. Sources of information are: radio, television, extension workers, cooperative societies, friends and colleagues, newspapers and magazines, books/leaflets, phones, libraries and institutions. However, observation of people organization, speeches, documents, picture and art work can also be described as information sources (Adio et al, 2016). Therefore, Agriculture extension is an important tool for disseminating information to farmers, and has been highlighted as critical agent for transforming subsistence farming to modern and commercial agriculture, thereby improving household food security, incomes, and reducing poverty. Agricultural information is an important factor that interacts with other production factors. Productivity of these other factors, such as land, labor, capital and managerial ability, can arguably be improved by relevant, reliable and useful information. Information supplied by extension, research, education and agricultural organizations helps farmers make better decisions. Therefore, there is a need to understand the functioning of a particular agricultural information system in order to manage and improve it Vidanaphirana [4].

An agricultural information system is a system, in which agricultural information is generated, transformed, transferred, consolidated, received and fed back in such a manner that these processes function synergistically to underpin knowledge utilization by agricultural producers. Accordingly, an agricultural information system consists of components (subsystems), information related processes (generation, transformation, storage, retrieval, integration, diffusion and utilization), system mechanisms (interfaces and networks) and system operations (control and management) Vidanaphirana [4]. Therefore, agricultural information is defined as the various sets of information and messages that are relevant to agricultural production activities to farmers such as crop production and protection, animal production and management of natural resources and conservation. For the purpose of this study, agricultural information therefore refers to agricultural related data which are transformed into meaningful and useful contexts or forms for effective decision making in agriculture or farming related activities. Studies by scholars have revealed that the major source of agricultural information used by the farmers was friends/neighbors, radio, television, personal experience, co-workers among others, while the knowledge and skills they possessed for accessing agricultural information were generally low. Lack of accessibility to extension and credit services have been reported in many parts of sub-Saharan Africa as well as

other developing countries as the limiting factors for increased agricultural productivity Garba [1]; Ugonna [5]. In the light of this, this paper assessed sweet potato production technologies and flow of information among farmers in southeast, Nigeria. The specific objectives were to: examine different sources of information on improved sweet potato production technologies used by the farmers and ascertain the types of information sourced from the various sources on sweet potato production activities by the farmers.

Methodology

The study area was South-East, Nigeria. It is made up of Abia, Anambra, Enugu, Imo and Ebonyi States. The area under study stretches from latitude $04^{\circ} 15' N$ to longitude $09^{\circ} 24' E$. It has a land area of 29,526 square kilometers and a population of 10,712,675 people comprising population 75,569,241 females and a male population of 5,142,434 males. There are two main seasons in the zones; the raining season (April- November) and the dry season that takes the rest of the year. The average annual rainfall is about 1730mm in about 110 rainy days and its maximum monthly atmospheric temperature is about 32.5c Okeke [6]. The target population for this study was all the sweet potato farmers in the selected States. Multistage sampling procedure was used for the study. In the first stage, three States out of the five states that make up South Eastern zones were purposively selected because of their perceived active engagement in sweet potato production. Anambra, Abia and Ebonyi were selected for the research. In the second stage, four local governments were purposively selected from each selected state. Ogbaru, Anambra East, Ayame Lum and Anambra West Local Government in Anambra State, in Abia State the selected local governments were Umuahia South, Ikwuano, Bende and Isialangwa North while Afikpo North, Ezza North, Ikwo, and Ohaukwulocal governments in Ebonyi State were also selected.

This gave a total of twelve local governments used for the research. In the third stage, two communities each from the selected local governments were randomly selected in the areas. The communities were as follows; Akili Ogidiand Ossamain Ogbaru LG, Igbariam and Aguleri Otu in Anambra East L.G.; Nmiata Anam and Umuoba Anam in Anambra West L.G.; Omor and Umumbo in Ayamelum L.G.; Umudike and Ibeku in Ikwuano L.G.; Ubalaka and Nserimo in Umuahia South L.G.; Amaputigha and Okpuala-Ngwain Isialangwa North; Nkpa and Bende in bende L.G. of Abia State; Izzia Ngbo and Effium in Ohaukwu L.G.; Ezzia and Umuezoka in Ezzia North L.G.; Amagu and Alike-Ndufu Ikwo in Ikwo L.G ; Amaizu and Ohaisu in Afikpo North L.G. of Ebonyi State. This gave a total of twenty-four (24) town-communities that were used for the study. In the fourth stage, ten (10) sweet potato farmers were selected from the list of information in each community using simple random sampling techniques and this gave a total sample size of 240 farmers. Data for the study were collected from primary source through the use of structured questionnaires. The interview schedule contained relevant questions which were divided according to the objectives of

the study. Data collected on socio-economic characteristics, Objective1 and 2 were analyzed using frequency; percentage and mean scores, respectively.

Results and Discussions

The findings of the study were presented and discussed under the following sub-headings:

- a) Socio-economic characteristics of the sweet potato farmers
- b) Different sources of information on improved sweet potato production technologies used by the farmers
- c) The types of information sourced from the various sources on sweet potato production activities by the farmers.

Socio-economic characteristics of the sweet potato farmers

Age: Data in Table 1 show that a greater proportion (38.1%) of the farmers were between 31-40 years of age, while 27.1% were within the age range of 21-30 years. Those that fell within the age range of 41-50, 51 and above accounted for 23.3% years and 11.3% respectively. The mean age of the farmers was 43.3%. This implies that young people of active age were involved in sweet potato production. This could also influence farm decision making process as a result the active young people involved in the production. This could be also an indication of the fact that the levels of youth movement in agriculture have been increased due to lack of white-collar job among youths in the study area. This finding confirmed the result of Garba [1] which reported that most farmers in their study were still in their productive years

Table 1: Socio-economic Characteristics of the Farmers.

Variables	Frequency	Percentage	Mean
Age			
21-30	65	27.1	43.3
31-40	92	38.3	
41-50	56	23.3	
51 and above	27	11.3	
Sex			
Male	110	45.8	
Female	130	54.2	
Marital status			
Single			8
Married	97	40.4	
Divorced	45	18.8	
Separated	33	13.8	
Widowed	30	12.5	
Household size			
5-Jan	99	41.3	8
10-Jun	70	33.3	
11 and above	61	25.4	
Farm size			
<0.5 - 1ha	89	37.1	1.7ha
1.1 - 2ha	78	32.5	
2.1 - 3ha	43	17.9	
3.1 and above	30	12.5	
Farming experience			
9-Jan	75	31.3	16.1yrs
19-Oct	85	35.4	
20-29	50	20.8	
30-39	30	12.5	
Occupation			

Full time farmers	120	50	
Trading	28	11.7	
Pension	22	9.2	
Civil Servant	55	22.9	
Artisan	15	6.3	
Types of improved sweet-potato varieties grown			
Ex-Igbariam	60	25	
Buttermilk	90	37.5	
Ex-Oyunga	35	14.6	
OFSP	55	22.9	
Other crops grown			
Yam	32	13.3	
Maize	45	18.8	
Cassava	55	22.9	
Rice	94	39.2	
Okra	14	5.8	

Marital Status: The entries in Table 1 show that greater proportions (40.4%) of the farmers were married, while 18.8% of the farmers were divorced. However, 14.6% of the farmers were single and 13.8% of them were separated. On the other hand, 12.5% of the farmers were widowed, respectively. This finding is in line with farmer's culture as many rural farmers do marry as early as possible in order to avoid unnecessary embarrassment from their age grade, parents, relatives and more importantly to get additional helping hands both at home and on the farm. This result also confirmed the finding of Okeke [7] that the largest proportion of the sweet potato farmers was married in the study. The findings indicate that marriage is a relevant union/institution that brings about the synergy among farm families that can be used to accomplish certain farm activities thereby promoting the spread of innovations on sweet potato production as the members of the family are possible source of information. This finding is also in consonant with that of Ume, Onunka and Okoro (2016) that the majority of sweet potato farmers were married. According to Kanu, Nwachukwu and Olojede [8], marriage is an institution that brings about division of labour among farm families, therefore reducing the cost of labour resulting to increase in income.

Household size: Result in Table 1 reveals that a greater proportion (41.3%) of the farmers had a household size of 1-5 persons while 33.3% of them had a household size of 6-10 persons. On the other hand, 24.4% of the farmers had a household size of 11 and above. The average household size for sweet potato farmers was 8 people. This finding is in consistence with the finding of Garba [1] and Okeke [6] whose average household size of Irish potato and sweet potato farmers were 8 persons and 7 persons in their separate studies. This implies that farmers had relatively large-sized household that could sustain their family labour. Household size could influence the level and rate of adoption of improved sweet potato technologies. The

larger the household size, the more likely the farm labour will be available to enhance the practice of various improved sweet potato production technologies. Household size has a greater role to play in family labour provision because it can serve as an insurance against short falls in application of farm labour such as land preparations, ridging, planting and weeding, among others.

Farm size: Results in Table 1 indicate that 37.1% and 32.5% of the sweet potato farmers cultivated <0.5 – 1ha and 1.1 – 2ha respectively. On the other hand, 17.9% of sweet potato farmers cultivated 2.1 – 3ha, while 12.5% of the farmers cultivated 3.1ha and above. The average farm size of sweet potato farmers in the study area was 1.7ha. This implies that farmers cultivated small hectares of land and this could bring about low investment and returns to scale up agriculture for food security. According to Mbanaso (2010) in Udemezue [9] farm holdings in Nigeria is grouped into three broad categories; small-scale (less than 6 hectares in farm size), medium-scale (6-9 hectares) and large-scale (10 hectares and above). The result from this research implies that sweet potato farmers were small-scale farmers. This finding collaborates with Okeke [6] who found small-scale farmers predominantly in the South East zone.

Farming experience: Entries in Table 1 also show that 35.4% of the sweet potato farmers had 10-19 years of farming experience, while 30.0% and 20.8% of them had 1-9 and 20-29 years of sweet potato farming experience respectively. Those that had 30-39 years farming experience accounted for 12.5%. The average mean for the sweet potato farming experience was 16years. This finding implies that the farmers had fairly long period of sweet potato farming experience which could serve as an alternative for increased participation in sweet potato production, since long farming experience promotes specialization, improved knowledge, skill and aspiration. On the other hand, long farming experience could also influence

farmer's willingness to learn and adopt technology packages associated with improved sweet potato production. Therefore, the more experience the farmer is, the more his ability to make farm decision. This result is in line with the finding of Okeke [7] which said that the average farming experience in their study was 13.34 years.

Types of improved sweet potato varieties grown by the farmers: Entries in Table 1 reveal that a greater proportion (37.5%) of the sweet potato farmer grown butter milk sweet potato variety while 25% of them grown orange fleshed sweet potato improved variety. Similarly, 22.9% and 14.6% of the remaining farmers grown ex-igbariam and ex-oyunga improved sweet potato variety respectively. The fact that a majority of the farmer's cultivated butter milk improved variety may be attributed to its unique quality such as early maturity, higher yield, taste, tolerant to some stress and resistant to pests/diseases when compared to other improved sweet potato varieties.

Yield remains the most important deciding factor and determining choice of sweet potato genotypes for cultivation. This is mainly for the economic portion of the crop that can be sold for financial benefits of the farm enterprise. According to Effa, Uko and Nwagwu [10] varieties with good biomass, leaf area index and vine length were most prolific in tuber production, and this could be the reason this variety is selected among other disseminated varieties to farmers. The finding, therefore, shows that buttermilk sweet potato was incorporated into farmers' farming system maybe because of the above reasons. On the other hand, growing OFSP could be attributed to its health benefits, time of maturity, higher dry matter when compared to sweet potato, much higher beta carotene content, it's tolerant to sweet potato weevil and resistant to sweet potato viral disease. These characteristics make OFSP a good candidate for farmers' preference in the study area. This result contradicted Babatunde, Omoniwa and Adeniyi [11], who said that age of the smallholder farmers, household size, years of schooling, cost of production were the factors that significantly influence the cultivation OFSP in Kwara State, Nigeria. Sex of the sweet potato farmers: Table 1 indicates that 54.2% of the sweet potato farmers were female while 45.8% were male.

This shows that the sex distribution of the sweet potato farmers skewed towards female farmers and this could be that female farmers are more efficient than male farmers when it comes to minor root crops like sweet potato production in the study area. The implication of this is that sweet potato production activities will be more or less masculine activities that will be dominated by younger females than the male counterparts. This can also bring about relegation on sweet potato production activities in South Eastern zone. This finding disagrees with Okeke [7] who observed that sweet potato is grown mainly by men in their study. A majority of the farmers in the study area are females, this may be as a result of the fact that the study area

is an agrarian society where the interest of sweet potato may not be covered by men, and this may be as a result of a stigma attached to it as a minor crop that should be cultivated by lazy men. However, in a society where women are mostly not allowed to own other crops like yam and rice, men possess the much access to own these crops, which therefore give them (men) a relative advantage over their counterparts (women).

Occupation: Results in Table 1 show that a greater proportion (50%) of the farmers were full time farmers, while 22.9% of them were civil servants. On the other hand, 11.7% of the sweet potato farmers were traders and 9.2% of them were pension earners. The remaining 6.3% of them were artisans as indicated in Table 1 below. The implication could be that farmers in the study area see sweet potato production as an enterprise and also a source of income to support their livelihood. This finding is in line with Ezeano [12] who saw sweet potato enterprise as a source of income to augment other incomes in the South East Agro-ecological zone.

Other crops grown: Table 1 shows that 39.2% of the farmers grow rice as an alternative crop while 22.9% of the sweet potato farmers grow cassava. However, 18.8% of the sweet potato farmers grown maize while 13.3% of them grown yam. The remaining 5.8% of the sweet potato farmers grown okra as a supplement to sweet potato production. High percentage values attached to rice and cassava may be due to their frequent consumption, high economic values as cash crops and industrial use associated with them when compared to other crops the study area.

Sources of information on sweet potato production technologies

Table 2 shows that the majority (85%) of the sweet potato farmers sourced information on sweet potato production technologies from fellow farmers, while 72% of them also sourced information on sweet potato production technologies from National Root Crops Research Institute, Umudike (NRCRI). Similarly, 70% and 46% of sweet potato farmers sourced information on sweet potato production technologies from Agricultural Development Program (ADP) and extension agent, while 31% and 30% of the sweet potato farmers sourced information on sweet potato production technologies from radio program and input dealers. However, 25% and 16% of the sweet potato farmers sourced information on sweet potato production technologies from internet and television. On the other hand, 15% of the sweet potato farmers sourced information on sweet potato production from cooperative while the remaining sweet potato farmers sourced information on sweet potato production technologies from University lecturers. Television and University lecturers were the least source of information. This could be attributed to the fact that most of the sweet potato farmers do not have easy access to television and university lecturers. The farmers used fellow farmers, NRCRI and AADP more than

other information sources. However, proximity of the farmers to NRCRI, ADP and frequent access to fellow farmers could also facilitate the adoption of the improved sweet potato varieties and various sources of information related to the technologies.

Since fellow farmers, NRCRI and ADP dominated the information sources used by the sweet potato farmers in the region, it therefore would be appropriate to deliver new technologies to farmers through fellow farmers, NRCRI and ADP respectively.

Table 2: Percentage distribution of farmers based on sources of information on sweet potato production technologies.

Information sources	Percentage	Rank
Fellow farmers	85	1 st
NRCRI	72	2 nd
ADP	70	3 rd
Extension agent	46	4 th
Radio	31	5 th
Input deniers	30	6 th
Internet	25	7 th
Television	16	8 th
Cooperative	15	9 th
University	10	10 th

In terms of ranking, fellow farmers, NRCRI, ADP and extension agents were ranked as the first four major sources of information used by the farmers in the region. Other channels of information dissemination like radio and input dealers were ranked as the 5th and 6th. Internet and television were ranked 7th and 8th, while cooperative and universities were ranked 9th and 10th sources of information used by sweet potato farmers respectively. The reasons of sourcing information from fellow farmers, NRCRI and ADP could also be either frequent contact with fellow farmers, NRCRI and ADP at their convenient time. Such sources of information require that the farmers relax and utilize the messages that are relevant to their day to day improved sweet potato production technologies. This finding agrees with Garba [1] who asserted that the greater percentage of the Irish potato farmers in Kaduna State Nigeria sourced their information from fellow farmers and research institute. More so, research conducted by Yaseen, Xu, Yu and Hassan [13] in Pakistan, affirmed that a greater proportion of farmers ranked neighbor-friends-relatives as first source of information. Therefore, farmers' preference for any information source could be a stepping stone for agricultural production in a developing country like Nigeria and it could be also significantly influence adoption of improved technologies in a social system provided that the social norms are not tampered with.

Types of information sourced from the various sources on sweet potato production practices by the farmers

Table 5 shows that a majority (55.3%) of the farmers sourced information on land preparations of sweet potato production practice from research institute (RI), while 52.3% and 50.1% of the farmers sourced information on preparation from friends/neighbor and cooperative. Similarly, 40.1% and 30.2% of the sweet potato farmers sourced information from extension agent and university while 15.2% of them sourced information

on the same land preparation from television respectively. The implication of this may be that since improved sweet potato technologies were bred and disseminated by research institute across the states, they will be in a better position to recommend the best agronomic practice such as land preparation for sweet potato production. This could be also attributed that everybody wants to get information from a reliable source. It could be that farmers saw the institute as an expert that has mandate for improve sweet potato breeding and production and also wanted to use the expertise to improve their farming system. In view of these, the finding contradicts Okeke [6] who reported that sweet potato farmers in Anambra and Abia did not have any source of information on land preparation, harvesting and storage. Furthermore, 60.2% and 60.1% of the sweet potato farmers sourced information on plant spacing from research institute and friends/neighbor, while 50.1% and 42.1% of the farmers sourced information on plant spacing from extension agents and cooperatives. The remaining 40.1% of the farmers sourced information on plant spacing from university. Plant spacing is one of the major factors that determines the productivity of every crop and this could be the major points farmers sourced their information on plant spacing from research institute or their friends/neighbors who might have attend training in research institute on sweet potato production in order to have optimal yield. This result agrees with Okeke [6] who reported that sweet potato farmers sourced their information on time of planting, plant spacing and weeding from research institute.

On the other hand, majority (70.1% and 65.2%) of the sweet potato farmers sourced information on fertilizer application from research institute and extension agent, while 62.1% and 55.3% of the farmers sourced information on fertilizer application from friends/neighbor and cooperatives. In terms of weed management, a greater proportions (72.5% and 70.3%)

of the farmers sourced information from friends/neighbors and extension agents and 52.3% of the farmers sourced information from research institute. More so, 30.3% and 20.3% of the farmers also sourced information from cooperatives and television respectively. A greater proportion of the farmers sourced information on fertilizer application from research institute with the utmost confidence that research institute is the offshoot of knowledge behind improved sweet potato technology, and this can also be of help to them to know when and how to apply fertilizer in their various farm with a specific measurement in order to minimize cost. This is an indication that some of the farmers are educated and could be the major reasons they decided to source information on fertilizer application from the reliable like research institute to boost their standard of living. This finding goes contrary to that of Okeke [6] which said that farmers in Anambra and Abia sourced information on fertilizer application from their fellow farmers. As regards to pest control, a greater proportions (65.3% and 65.1%) of the farmers sourced for information from research institutes and cooperatives, 60.5% of the farmers sourced for information from friends/neighbours, while 50.2% and 30.4% of the farmers sourced for information from extension agent, and internet. In the same vein, 58.3% and 52.3% of the farmers sourced information on disease management from friends/neighbours and research institute, while 50.3% of the farmers received information on disease management from cooperative. More so, 45.1% and 30.5% of the farmers sourced information on disease management from extension agent and radio station. Since disease is a pathogen that reduces the life and economic values of crops, farmers pay much attention to get information that will be of help and relevant to their farm.

Access to agricultural information influences the farming practices adopted by farmers while inefficient access and dissemination of agricultural information can negatively affect agricultural development Thuo and Njoroge [14]. This implies that if farmers are constantly reached with agricultural information and more specific information on the top most important, they will utilize it to improve their productivity as well as their incomes and livelihoods. This finding is in line with that of Kaske [15], which indicated that the top three most important types of agricultural information that farmers wished to source from various sources were: information on crop production technologies; information about diseases, pests, and weather forecasts as well as market information particularly current output prices. On the other hand, 70.3% of the farmers sourced information on crop harvest from friends/neighbours, while 65.2% and 60.2% of the farmers sourced information on crop harvest from research institute and cooperatives. The remaining 40.5% of the farmers sourced information on crop harvest from extension agents. Further more, 65.3% and 60.3% of the farmers sourced information on agricultural support service from research institutes and extension agents, while

60.2% and 55.6% of them sourced information on agricultural support services from television and radio stations. As regard to government policy/regulation on food, majority (60.5%) of the farmers sourced for information from radio station while 50.3% of them sourced information from extension agent. In terms of credit sourcing and management, 60.3% and 50.3% of the farmers sourced information from friends/neighbours and cooperatives while 40% of the farmers sourced information from extension agent. Access to credit is one of the ways of improving farmers' access to new production technology; farmers who have access to credit can reduce their financial constraints and buy inputs more readily. Since majority of the farmers sourced information on credit from friends/neighbours and cooperative, this may imply that farmers engaged themselves seriously to form 'issue' club through friends and cooperative and this can easily help them to access credit to sort out their financial needs.

According to findings, they belong to cooperative may be due to small nature of the less risk associated with it as well as the convenience in terms of payment. Therefore, it is expected that access to institutional credit can increase the probability of adopting improved technologies therein. On the other hand, 53.5% and 50.2% of the farmers sourced information on farm business planning from extension agents and friends/neighbours, while 40.5 and 36.7% of them sourced information on farm business planning from research institutes and cooperative. With respect to new agro-technologies practices, a greater proportion (60.2%) of the farmers sourced information from research institutes, while 59.3% and 56.3% of them sourced information from extension agents and cooperative. However, 56.1% of the farmers sourced information from friends/neighbours, while in terms of food prices, 70.1% and 60.5% of the farmers sourced information from friends/neighbor and cooperative. Agricultural information creates awareness among farmers about agricultural technologies for adoption. Efficiency of technologies generated and disseminated depends on effective communication which is the key process of information dissemination. Agricultural technology is the application of knowledge for practical purpose and is generally used to improve the condition of farmers and their natural environment as well as carrying out some other socio-economic activities. Agricultural technology is always associated with technical know-how. This could be the reason a majority of the farmers relied on research institute's information to have a firsthand knowledge about the application of the technology in order to improve their farming system. Therefore, agricultural technologies are more likely to be adopted if they are less complex, easy trials and results are being observable to the end-users (farmers). This finding agrees with Uwandu, Adesina and Okoro [16] who found in their study that adoption of agricultural technologies depends on the perceived relative advantage and technical know-how of using the technology Table 3.

Table 3: Type of information sourced from the various sources on sweet-potato production practices by the farmers.

Types of Information sourced on sweet potato production technologies	RD	Tel	COP	Inter	US	F/N	Ext	PM	UN	RI
Land preparation	7.5	15.2	50.1	8.9	-	52.3	40.1	8.2	30.22	55.3
Planting	8.9	3.5	42.1	8.2	-	60.1	50.1	10.2	40.1	60.2
Fertilizer Application	15.2	16.2	55.3	18.1	5.5	62.1	65.2	11.3	-	70.1
Weed Management	-	20.3	30.3	19.2	5.3	72.5	70.3	16.3	18.1	52.3
Insect/pest control	20.5	15.3	65.1	30.4	17.3	60.5	50.2	13.2	25.3	65.3
Disease Management	30.5	11.5	50.3	14.3	-	58.3	45.1	16.3	15.3	52.3
Harvest information	10.6	18.1	60.2	11.3	9.6	70.3	40.5	16.1	13.4	65.2
Agricultural support services	55.6	60.2	40.2	14.5	8.8	48.2	60.3	-	17.2	65.3
Productive resources such as land, inputs and capital	2.7	-	60.1	-	-	60.5	15.1	-	17.1	25.2
Sweet potato processing	1.5	2.1	40.3	1.6	-	60.1	17.2	-	1.3	70.3
Sweet potato storage	2.3	1.6	30.2	1.8	-	45.2	18.1	1.8	5.2	50.1
Sweet potato marketing	5.3	-	40.5	8.7	-	65.3	-	-	1.3	-
Government policies/regulation on food	60.5	45.3	30.5	40.3	3.5	25.7	50.3	1.6	5.6	40.2
Credit sourcing and management	-	-	50.3	-	-	60.3	40.1	3.6	1.3	-
Planning the farm business	20.5	15.1	36.7	1.4	-	50.2	53.5	-	6.7	40.5
New agro-technologies	-	-	56.3	40.5	-	56.1	59.3	-	40.2	60.2
Food prices	30.2	25.6	60.5	1.4	-	70.1	1.5	2.3	-	30.2

Note: The following acronyms mean; RD = Radio, Tel = Television, COP = Cooperative, Inter = Internet, US = USAID, F/N = Friends/neighbours, FF = Fellow farmers, Ext = Extension agent, PM = Print media, UN = Universities, RI = Research Institutes.

Conclusion

Based on the results of this study, the following conclusions were drawn: majority of the respondents were in the middle age and also literate, showing that many of them were in a better position to be aware and understand the adoption of improved sweet potato production technologies. Findings also indicated that majority of the farmers were female with long period of farming experience. More so, most of the farmers were married with average household size of 8 persons and this could be used as a factor to increase the adoption of the improved technologies since supply of labour is possible. Similarly, 70% of the sweet potato farmers sourced agro-inputs from ADPs while majority (85%) of the farmers sourced information on sweet potato production technologies from fellow farmers. Also, 55.3%, 60.1%, 70.1%, 72.5%, 68.5%, 58.3%, 65.2%, 65.3%, 60.5%, 70.3%, 50.1%, 65.3%, 60.5%, 60.3%, 53.5%, 60.2% and 70.1% of the respondents sourced information on land preparation, plant spacing, fertilizer application, weed management, insect/pest control, disease management, harvest information, agricultural support service, productive resources, sweet potato processing, sweet potato storage, marketing, government policies/regulations on food, credit sourcing and management, planning the farm business, new agro-technologies and food prices from research institutes, friends/neighbours, extension agents, friends/neighbours, RI, F/N, research institutes, television,

cooperative, friends/neighbours, research institutes, friends/neighbor, radio station, friends/neighbours, cooperatives and friends/neighbours.

Recommendations

- There should be efficient and effective information dissemination to sweet potato farmers at the grass root using various communication channels.
- The government should broaden extension services by engaging more extension agents and providing them with working facilities. This will boost the availability of improved technologies and a higher rate of adoption.
- Village information centers should be built in all the villages in south east zone to enable farmers to have easy access to information flow.
- Farming information database and agricultural library should be available to enable farmers access farming information more often.
- Since cooperatives give access to information through exchange of ideas among members, each and every farmer is encouraged to be a member.
- Government should organize training and workshops for effective information dissemination among farmers. This

implies that information on crop production should also be decentralized to reach farmers in various communities.

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