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CONTRIBUTIONS OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) ON INCREASED GINGER PRODUCTION BY FARMERS IN SOUTH EAST AGRICULTURAL ZONES OF NIGERIA

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Abstract: *The study was aimed at determining the contributions of information and communication technology (ICT) on increased ginger production by farmers in South East Agricultural zones of Nigeria. Survey research design was adopted for the study. Four research questions guided the study. The population for the study was 150 farmers randomly selected from South East States of Nigeria. The number was manageable hence, there was no sampling. Structured questionnaire containing a total of 52 items was the instrument for data collection. The reliability of the instrument was determined using Cronbach Alpha Reliability Coefficient Method. A correlation of 0.81 was obtained. Out of 150 copies of the questionnaire distributed, only 148 were returned giving 98.67% return rate. The data collected were analysed using mean and standard deviation to answer the research questions. The study fund out that farmers can access information on increased ginger production through radio, television, website, etc. The study also revealed that information on land preparation, field management of ginger plant, harvesting and processing of ginger for increased production could be accessed through ICT. Based on these findings, it was recommended that agriclutral extension workers should always give an updated information to farmers through ICT facilities and government should help in ensuring that electricity is made available in rural areas where most of these farmers live.*

Keywords: Ginger plant, ICT, Contribution, Farmers.

Introduction

Ginger (*zingiber officinale*) is a spice grown across many climates in the world. It is an annual crop and originated in India and Malaysia (Adegboye, 2011). It is a hardy herbaceous plant that thrives in tropical and subtropical climate particularly in humid and shady conditions. The varieties are distinguished largely by vegetative characteristics as well as the size, colour and fibre content of the rhizomes (Anikwe, Onyia, Ngwu and Mba, 2005). The plant produces erect, tall and dark green shoot (Pseudo Stems) which measures about 30 – 100cm above the ground with long narrow ribbed green leaves which are 5 – 25cm long and 1 – 3cm wide (www.indiamart.com.2019).

Ginger plant is mainly grown for its roots which are known as rhizomes popularly called ginger (www.agriclutrenigeria.com2020). Ginger root has a striated texture with brownish skin which could be either thin or thick depending on when it is harvested. The fleash is most times yellow in colour, in some cases white or red. Ginger can be utilized as fresh or green ginger for culinary purposes, brined ginger, confectionary or preserved ginger, dried ginger, seed ginger, medicine and in preparation of candy and pickle (Anikwe et al, 2005).

Ginger can equally be used as a spice or herbal medicine because of its aromatic pungent and hot taste. It is also used as ginger crystals and ginger paste

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(www.indiamart.com2019). Ezeagu (2006) in Adegboye (2011) added that about 10% of the produce is consumed locally as fresh ginger while the remaining 90% is dried for both local consumption and export due to its powder, oil and oleoresin. In Nigeria, ginger was traditionally grown in the guinea savannah region, however, in recent times, ginger cultivation has been introduced into the South Eastern and South western agricultural zones of Nigeria (Onwueme 1988 in Adegboye, 2011). This implies that location and nature of the soil do not necessarily affect ginger production. This was why Anikwe et al (2006) posited that ginger plant can be grown under varying agro climatic conditions that requires a warm and humid conditions. The authors further opined that ginger can successfully be grown in areas with low temperature and rainfall of about 28 – 35^{0}C and 150 – 3000cm respectively over 8–10 months during the growing period. The authors maintained that ginger is grown on a wide variety of soil types such as loamy, clayey loam, lateritic soils etc having good drainage and humus content.

Under rain Fed conditions, ginger rhizomes are planted on beds but if under irrigation system, rhizomes are planted on ridges (www.indiamart.com2019). In another vein, ginger can equally be planted between April and May. The planting material is first treated with fungicide and insecticide to avoid seed borne diseases and scales (Matelja 2019). The author advised that after planting, the beds should be mulched with green leaves thrice at intervals of one month.

Ginger plant requires large quantity and good quality manure in order to produce the desirable yield. As a result Anikwe et al (2005) posited that manure should be added in two split doses. The first dose is at about 40 – 60 days after planting and the second dose three months after planting. The authors added that the beds should be earthed up twice at 2 – 3 months after each manuring or fertilizer application. Among all the nutrients, nitrogen is the major limiting nutrient militating against massive production of ginger and application of inorganic NPK 15:15:15 fertilizer at the rate of 300kg/ha applied 6 – 8 weeks after planting in split applications has been recommended as being adequate (Adegboye, 2011). The author further recommended 400kg/ha of nitrogen, phosphorus and potassium. After application of fertilizer, Jayashree, kandiannan, Prasath, Rashid and Thankamai (2014) advice that two or more weeding may be needed depending on the intensity of weed growth. This may be done with the use of a hoe. The first weeding should be done just before the second mourning (6 – 8 weeks) after planting. Anikwe et al (2005) added using herbicides such as chlorthal, 6 – 12kg/ha, oxandizaole, 1 – 2kg ai/ha, fluometuron 3, 4-5kg ai/ha to control weeds.

The ginger plant crop becomes ready for harvesting 8 months after planting. This is done when the leaves turn yellow and start drying up (www.agri.farmers, 2020). When green ginger is in demand, the harvesting is done by lifting the clumps carefully with a spade or digging fork and then gathering the rhizomes. After harvesting, the ginger is cured by drying (Anikwe et al, 2005). Ginger can equally be harvested if required for making dry ginger when it is 8 – 9 months for maximum oil and Oleoresin content.

In processing of ginger, dry ginger is prepared by peeling of the outer skin of the rhizomes and the drying in the sun. The ginger processed in this manner is known as “rough” or unbleached dry ginger (Anikwe et al, 2005). The authors further noted that there is another type of dry ginger known as “bleached” ginger. In this case, the rhizome after peeling are soaked in a 2% clear lime solution for about 6 hours and then dried in the sun, as in the case of unbleached ginger. Ginger may be stored as fully mature rhizomes in pits, smoke houses. Over sand bed in the corner of room or allowed to remain in the field unharvested. More information on ginger production can easily be gotten by the farmers through the use of Information and Communication Technology (ICT) such as radio, television, film shows, telephone, video, telex, voice information system and fax as well as those requiring the use of personal computer fitted with a modern (Warren 2001).

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Information and communication technology (ICT) is an extensional term for information Technology (IT) that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals) and computers, as well necessary enterprise software, middle ware, storage, and audio visual system that enables users to access, store, transmit and manipulate information (Wikipedia 2019). It can be deduced that ICT is an umbrella term that includes any communication device encompassing radio, television, cell phones, video tapes, CDs, DVDs, email, computer, network hardware, world wide web, satellite system and so on as well as the various services and appliances with them such as video conferencing and distant learning. In the view of ADB (2003) ICT is seen as set of activities that are facilitated by electronic means, the processing, transmission, and display of information. With reference to this study, ICT contributes in communicating information to farmer who are engaged in ginger production contribution of ICT here implies lead that ICT takes part often with the idea that will led to progress scientifically who are engaged in ginger production.

In Ebonyi State which is the study area, information are disseminated to the farmers through the use of radio, television, telephone, personal computers, internet which are part of ICT. It has also been observed that farmers in the study area can easily source for information through these sources (means) for increased ginger production. According to Shivkumadas (2011), the benefits of ICTs for increased productivity include timely and updated information on agriculture (ginger production) related issues threats such as diseases weather forecast, pricing control, warning alerts, up-to-date market and consumer trends etc. This implies that instead of the ginger farmers waiting for the extension workers to visit them they can access the needed information through ICT.

An extension worker is a person who identifies farmer's problems; takes the problems to the research institute for solution and then takes the solution back to the farmers (Nwosu, 2015). An extension worker acts as an intermediary between research institutes and the farmers. In the context of this study, an extension worker is one who educates ginger farmers to adopt new farming practices to improve their output. These extension workers assist farmers through educational procedures in improving farming methods and techniques. They also help to educate farmers (ginger farmers) on the skill that if adopted will help to increase production (ginger product). In the study area, these agriclutral extension workers would be of great help in identifying the areas ICT will contribute in adoption of information by ginger farmers for increased production.

A farmer is a person who owns or manages an area of land and the buildings on it for growing crops or keeping animals. Nwosu (2017) sees a farmer as a person who grows, plant or rear animals for the benefit of mankind. A farmer takes all the necessary steps to ensure proper nourishment of the items that he raises for his family and then sells the items to consumers. With reference to this study, a ginger farmer is one who is trained through extension education to adopt useful information for increased ginger production. Increased ginger production means that ginger farmers will cultivate more ginger quickly and complete its operations at a more rapid rate than before.

For farmers in Ebonyi State to adopt agricultural information for increased ginger production, what they need to know about ginger production must be identified and communicated to them through the right channel (ICT) which makes information faster and easier. In the study area, it has been observed that farmers rarely get information on ginger production techniques by the extension workers through visits. This limits the farmers having the knowledge about ginger production techniques for increased production. It is worthwhile to make these farmers increase ginger production in line with the state's motto as the food basket of the nation and the enormous advantages associated with ginger production especially in the area of being an export crop. Upon this background, it becomes necessary to identify the contributions of ICT

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on adoption of agricultural information by farmers for increased ginger production in Ebonyi State. Specifically, the study sought to determine the:

1. various ways farmers access information through ICT for increased ginger production in South East Agricultural zone of Nigeria.
2. various ways ICT has contributed in land of preparation by farmers for increased ginger production in South East Agricultural zone of Nigeria.
3. various ways ICT has contributed in field management of ginger plant by farmers for increased ginger production in South East Agricultural zone of Nigeria.
4. various ways ICT has contributed in harvesting and processing of ginger for increased ginger production in South East Agricultural zone of Nigeria.

Research Questions

The following research questions guided the study:

1. What are the various sources farmers' access information through ICT for increased ginger production in South East Agricultural zone of Nigeria?
2. What are the various ways ICT has contributed in land preparation by farmers for increased ginger production in South East Agricultural zone of Nigeria?
3. What are the various ways ICT has contributed in field management of ginger plant by farmers for increased ginger production in South East Agricultural zone of Nigeria?
4. What are the various ways ICT has contributed in harvesting and processing of ginger for increased ginger production in South East Agricultural zone of Nigeria?

Research Method

The study adopted a survey research design. According to Alio (2008) and Nworgu (2015), survey research design is one in which a group of people or items are studied by collecting and analysing data from only a few people or items considered to be representative of the entire group. The design was considered necessary because of the wide distribution of the respondents and the polychotomously structured instrument used for data collection. The area of the study was Ebonyi State of Nigeria. Ebonyi State is one of the five States in South East agriclutral zone of Nigeria. The state was chosen because of her rich agriclutral activities and food production to the nation. There are different agricultural activities existing in the state and it has large area of fertile soil for plant growth. The population for this study was 150 farmers who were randomly selected for the purpose of the study. The entire population size was manageable, therefore no sampling was made.

The instrument used for data collection was a structured questionnaire developed by the researcher through literature review. The questionnaire contained a total of 52 structured items grouped into four sections according to the research questions that guided the study. The items in the instrument were structured with four point rating scale of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD) with numerical values of 4, 3, 2 and 1 respectively.

The instrument was subjected to face validation by three experts, two experts in agricultural education and one in Measurement and Evaluation, all in Faculty of Education, Ebonyi State University, Abakiliki. They validated the instrument to ensure the appropriateness of the measuring instrument and that the instrument was structured to address the purpose of the study (Uzoagulu, 2011). The reliability of the instrument was determined using Cronbach Alpha which yielded a reliability index of 0.81 showing that the instrument was reliable. The questionnaire was distributed by the researcher and four guided research assistant. Out of 150 copies of the questionnaire distributed 148 were properly filled and used for data analysis representing 98.6% return rate. The data were analysed using weighted mean and standard deviation to answer the research questions.

Decisions were made using real limits of the mean thus:

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Strongly Agree (SA)	-	3.50	- 4.00
Agree (A)	-	2.50	- 3.49
Disagree (D)	-	1.50	- 2.49
Strongly Disagree (SD)	-	1.00	- 1.49

The standard deviation was used to determine the homogeneity or otherwise of the opinions of the respondents.

Result

The result of the study were presented based on the research questions that guided the study.

Research Question 1

What are the various sources farmers access information through ICT for increased ginger production in South East Agriclutral zone of Nigeria?

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Table 1

Mean rating and standard deviation of farmers on the various sources farmers access information through ICT for increased ginger production in South East Agriclutral zone of Nigeria.

S/N	Various sources farmers access information through ICT for increased ginger production	SA 4	A 3	D 2	SD 1	N	Σfx	$\bar{X}$	SD	Decision
1.	Radio	67	56	17	10	150	480	3.2	0.57	Agree
2.	Television	70	75	2	3	150	512	3.41	0.79	Agree
3.	Film shows	73	62	14	1	150	507	3.38	0.48	Agree
4.	Telephones	77	54	15	4	150	540	3.36	0.50	Agree
5.	Video	79	58	8	5	150	511	3.41	0.87	Agree
6.	World Wide Web (www)	60	70	9	11	150	497	3.19	0.74	Agree
7.	Telex	70	75	2	3	150	512	3.46	0.91	Agree
8.	Voice Information System	77	54	15	4	150	504	3.36	0.57	Agree
9.	Satellite System	57	79	7	7	150	486	3.24	0.87	Agree
10.	Far	60	70	9	11	150	497	3.19	0.50	Agree
11.	Wi-Fi	59	68	17	6	150	480	3.20	0.71	Agree
12.	Computers	70	57	19	4	150	493	3.29	0.50	Agree
13.	Website	63	71	12	4	150	493	3.29	0.86	Agree
14.	e-mail	72	64	9	5	150	503	3.35	0.48	Agree
15.	Internet	72	67	10	1	150	510	3.40	0.51	Agree
16.	Facebook	78	66	3	3	150	519	3.46	0.50	Agree
	Grand mean							**3.32**	**0.65**	**Agree**

In table 1 above, all the items had their mean above the cut-off point of 2.50 and grand mean of 3.32 showing that the farmers agreed that all these are sources through which information could be accessed for increased ginger production.

Research Question 2

What are the various ways ICT has contributed in land preparation by farmers for increased ginger production in South East Agriclutral zone of Nigeria?

Table 2

Mean rating and standard deviation of ginger farmers on the various ways ICT has contributed on the preparation for increased ginger production in South East Agriclutral zone of Nigeria.

S/N	Information on land preparation for increased ginger production	SA 4	A 3	D 2	SD 1	N	Σfx	$\bar{X}$	SD	Decision
1.	Select loose, rich, moist loam soil	68	66	13	3	150	499	3.33	0.56	Agree
2.	Remove all grasses, trees and slump on the land before ridge making	75	60	10	5	150	505	3.36	0.52	Agree
3.	Use minimum tillage	80	50	15	5	150	505	3.36	0.51	Agree
4.	Make beds/ridges 15cm high and 1m in width raised beds	70	64	9	7	150	497	3.31	0.57	Agree
5.	Use mild acidic soils with pH of 5.5 to 6.5	74	42	20	14	150	476	3.17	0.72	Agree

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6.	Plant ginger in the month of April or May	65	62	13	10	150	482	3.21	0.79	Agree
7.	Plant on flat	62	56	24	8	150	472	3.15	0.67	Agree
8.	Properly plough the land to make a fine-tilt	72	64	8	6	150	502	3.34	0.93	Agree
9.	Plant with irrigated water	83	57	8	2	150	521	3.47	0.67	Agree
	Grand Mean							**3.30**	**0.66**	**Agree**

The table 2 above shows that all the items were agreed to by the farmers as information's in land preparation through ICT. All the items had a mean ranging from 3.17 to 3.47 and a grand mean of 3.30.

Research Question 3

What are the various ways ICT has contributed in field management of ginger plant by farmers for increased ginger production in South East Agriclutral zone of Nigeria?

Table 3

Mean rating and standard deviation of ginger farmers on the various ways ICT has contributed in field management of ginger plant by farmer for increased production in South East Agriclutral zone of Nigeria.

S/N	Information on field management of ginger for increased production	SA 4	A 3	D 2	SD 1	N	Σfx	$\bar{X}$	SD	Decision
1.	Mulch the beds/ridges with green leaves after planting to prevent weed growth	79	59	7	5	150	512	3.41	0.57	Agree
2.	Mulch the beds with dry grasses after planting to impact of rainfall	63	58	18	11	150	473	3.15	0.73	Agree
3.	Apply of farmland or compost manure to prevent the beds form drying out	84	45	12	9	150	504	3.36	0.78	Agree
4.	Use green leaves mulch up to 10 tons/ha.	66	52	24	8	150	476	3.17	0.59	Agree
5.	Repeat mulching with green leaves during the second and third month after planting using about 5 tons/ha of green leaves.	62	59	18	11	150	472	3.15	0.50	Agree
	Fertilization									
6.	Apply well decomposed cattle/poultry manure or compost manure at the rate of 25 – 30 metric tonnes/ha at the time of planting.	71	57	16	6	150	493	3.29	0.44	Agree
7.	Apply the manure in each hole over the planting material (seed) and then covering with soil	75	46	20	9	150	487	3.25	0.50	Agree
8.	Broadcast the manure over the area mixed with soil during ploughing and harrowing operations.	80	50	15	5	150	505	3.36	0.84	Agree
9.	Apply 60 – 100kg each of P_2O_5 and K_2O as basal dressing at the time of planting.	68	66	13	3	150	499	3.33	0.73	Agree
10	Apply 60-100kg of N in 2 split doses of 40-60 days after planting and second dose 3 months after planting	78	66	3	3	150	519	3.46	0.50	Agree
11	Apply a second potassium fertilizer at 60-100kg per/ha along with the first application of nitrogenous fertilizer.	72	67	10	1	150	510	3.40	0.51	Agree

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12	Generally apply mixed N.P.K 15:15:15 at rate of 400-600kg/ha or 8:8:16 fertilizer at the rate of 60-100kg/ha either in a single or split doses at planting time and 2 months after planting.	72	64	9	5	150	503	3.35	0.48	Agree
	Weeding									Agree
13	Weed 2 or three times using hand, the first done at 1 month after planting at repeated at monthly intervals depending on the intensity of weed growth.	63	71	12	4	150	493	3.29	0.86	Agree
14	Use herbicides such as chlorthat 6-12kg ai/ha, or oxandiazole 1-2kg ai/ha or fluometuron 3-4.5kg ai/ha	59	68	17	6	150	480	3.2	0.71	Agree
15	Earth up the beds twice at 2 and 2 months after each fertilization or manuring	70	57	19	4	150	493	3.29	0.50	Agree
	Pest Control									
16	Periodically spray with 0.02T endrin at an interval of 1 month starting from the second month of planting to control shoot borers	60	70	9	11	150	497	3.19	0.56	Agree
17	Make one or two prophylactic spraying as precautionary measure against incidence of shoot borers	57	79	7	7	150	486	3.2	0.87	Agree
18	Adopt disease control of crop rotation to control soft not or rehizome not since it is soil borne	77	54	15	4	150	504	3.36	0.57	Agree
19	Treat seeds with ceresan to prevent infection	70	75	2	3	150	512	3.46	0.91	Agree
20	Select of well drained site for planting	65	62	13	10	150	482	3.21	0.75	Agree
21	Use disease free seed material	68	66	13	3	150	499	3.33	0.59	Agree
	Grand Mean							**3.29**	**0.61**	**Agree**

In table 3 above, all the items numbered 1 – 21 have their cut off means above 2.50 and their grand mean of 3.29. This reveals that the farmers agreed that all these are information on field management of ginger plant through ICT for increased production.

Research Question 4

What are the various ways ICT has contributed in harvesting and processing of ginger plant by farmers for increased ginger production in South East Agriclutral zone of Nigeria?

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Table 4

Mean rating and standard deviation of farmers on the various ways ICT has contributed in harvesting and processing of ginger plant by farmer for increased production in South East Agriclutral zone of Nigeria.

S/N	Information on harvesting and processing of ginger for increased production	SA 4	A 3	D 2	SD 1	N	Σfx	$\bar{X}$	SD	Decision
1.	Harvesting ginger when the leaves turn yellow and start drying up	73	62	14	1	150	507	3.38	0.48	Agree
2.	Lift the clumps carefully with a spade or digging fork and then gathering the rhizomes	70	75	2	3	150	512	3.41	0.79	Agree
3	Remove the soil and other plant parts adhering to the rhizomes	67	56	17	10	150	480	3.20	0.57	Agree
4	Cure the ginger by drying processing	77	54	15	4	150	504	3.36	0.50	Agree
5	Peel the outer skin and then drying in the sun to prepare dry ginger (rough or unbleached ginger)	60	70	9	11	150	497	3.19	0.74	Agree
6	Peel, soaking in 2% lime solution for about 6 hrs. and then drying in the sun to prepare bleached ginger	79	58	8	5	150	511	3.41	0.87	Agree
	Grand Means							**3.33**	**0.66**	**Agree**

All the items in Table 4 had their mean above the cut-off point of 2.50 and grand mean of 3.33, showing that farmers agreed that all these are information on harvesting and processing of ginger through ICT for increased production.

Findings

The following findings were made based on the result of the data analyzed.

1. Ginger farmers access informations through radio, television, telephone, internet, computers etc for improved ginger production in South East Agriclutral zone of Nigeria.
2. Ginger farmers get informations through ICT on land preparation for increased ginger production in South East Agriclutral zone of Nigeria.
3. Ginger farmers act informations through ICT on field management of ginger for increased ginger production in South East Agriclutral zone of Nigeria.
4. Ginger farmers have information through ICT on harvesting and processing of ginger production in South East Agriclutral zone of Nigeria.

Discussion

A grand mean of 3.32 and standard deviation of 0.65 obtained for all the items in research question 1 showed that the farmers agreed that these are sources information could be accessed for increased ginger production in South East Agriclutral zone of Nigeria. These items are radio, television, film shows, telephones, video, World Wide Web (www), telex, voice information system, satellite systems, fax, Wi-Fi, computers, website, e-mail, internet and face book. This agreed with the findings of Warren (2001) that farmers can get information through the use of ICT such as radio, television, film shows, personal computers, websites, internet etc.

All their means ranged from 3.15 – 3.47 with a grand mean of 3.30. This is in line with Anikwe et al (2005) that stated that ginger plant can be grown on a wide variety of soils such as loamy, clayey loamy, lateritic soils etc having good drainage and humus content. The authors further opined planting ginger on a

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properly ploughed land to make a fine tilt. This is also in line with Mateljan (2019) that stated that planting of ginger should be done between mid-Aprils to May.

The result of the study according to research question two showed that all the items listed for land reparation for ginger production were all agreed to by the ginger farmer as information from ICT. The information include selecting loose, rich, and moist loamy soil, removal of all grasses before ridge making, use of minimum tillage, making of raised beds, using mild acidic soil with pH of 5.5 to 6.5, planting ginger in the month of April or May, planting on flat, properly plugging the land to make a fine-tilt and planting with imitated water.

Furthermore, the result of the study with respect to research question three indicated that 21 items were in identified as information on field management of ginger plant by ginger farmers for increased production in Ebonyi State. These management skills include: mulching the beds/ridges with free leave after planting to prevent weed growth, application of farm yard or compost manure to prevent the beds form drying out at the rate of 25-30 metric tunnels/ha, application of 60-100kg of N in two split doses of 40-60 days after planting, weeding 2 or three times using hand, using herbicides such as chlorthat 6-12kg ai/ha, earthing up the beds twice at 2 and 3 months after each fertilization, periodical spraying with 0.02% endrin at an interval of 1 month to control pests, adoption of crop rotation to control soft rot or rhizome rot etc. The implication of the findings was that the ginger farmers have information of these field management skills through ICT. The findings of the study is supported by Shivkumardas (2017) that ICT provides timely and updated information on agriculture related issues such as disease control and weather forecasting.

Moreso, research question four revealed that ICT has helped ginger farmers in providing information on harvesting and processing of ginger for increased production. All the items listed had a mean ranging from 3.19 to 3.33 with a grand mean of 3.33. The items are harvesting ginger when the leaves turn yellow, and start drying up, lifting the clumps carefully with a spade or digging fork and then gathering the rhizomes, removing the soil and other plant parts, adhering to the rhizomes and curing the ginger by drying. Others include peeling the outer skin and then drying in the sun, peeling, soaking in 2% lime solution for about 6 hours and then drying in the sun. This study is in line with Ibenegbu (2017) that stated the benefits of ICT to include enriching learning through a combination of avoid, video, images, text and animation and equally promoting learning by doing approach.

The study is also in line with Wikipedia (2019) that define ICT as necessary enterprise software, middle ware, storage and audio visual systems that enable users to access, store, transmit and manipulate information. These implies that ginger farmers instead of waiting for extension workers can access information through ICT.

Conclusion

Information and Communication Technology (ICT) is an extensional term for Information Technology (IT) that stresses the role of unified communications and the integration of telecommunications and computers, as well as necessary enterprise software, middle ware, storage and audio visual systems, that enable users to access store, transmit and manipulate information. Ginger farmers can access information for increased ginger production through ICT since it is an umbrella term that includes any communication device encompassing radio, television, cell phones, video tapes, CDs, DVDs, email, computer, network hardware world wide web, satellite systems etc. Therefore extension workers can easily communicate farmers through ICT for any relevant information in ginger production.

Recommendations

Based on the findings of the study the following recommendations were made:

1. Agricultural extension workers should always give an update information to farmers through ICT (radio, television), website, internet etc.

2. Farmers should be encouraged to always access ICT for an updated information relating to ginger production.
3. The government should help in ensuring that electricity is made available in the rural areas where most of these farmer live.
4. Farmers should be guided by extension workers on how to operate ICT facilities for easy access.

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