

Socio-Economics Factors Influencing Utilization of Information and Communication Technologies among Soya Beans Farmers in Ningi LGA, Bauchi State, Nigeria

Musa, S. L., Mahmood, S. M., Hussaini, I., Garba M., Usamatu, Y., Abdullahi M.
*Department of Agricultural Education,
Adamu Tafawa Balewa College of Education, Kangere,
Bauchi State*

ABSTRACT

The study assessed the use of information and communication technology (ICT) in accessing information among soya beans farmers in Ningi Local Government Area of Bauchi State, Nigeria. The specific objectives were to; describe the socio-economic characteristics of the respondents, ascertain the ICT tools used by soya beans farmers in the study area, identify the information which respondents use ICT to obtain, determine the socio-economic characteristics influencing the use of ICT and examine the problems faced by the respondents in using ICT. Primary data were collected for the study using questionnaire and a total number of 180 respondents were used. Data were analyzed using descriptive (frequency, percentages and mean), the result of the multiple regression revealed that 71.43% of the use of ICT is explained by the variables included in the model. The result of the analysis further showed that age, farm size, educational level and access to credit were found to be statistically significant at various probability level.

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INTRODUCTION

Information and Communication Technology (ICT) usage can be defined as the utilization of a diverse set of technological tools and resources that can be used to communicate, create, disseminate, store and manage information (Khan, 2011). According to Teo and Beng, (2010), ICT usage can be referred to as the utilization of the internet along with computer networks, World Wide Web, e-mail and search engines used in the production and sharing of information. Promoting effective use of ICTs in agriculture provides a viable solution to entire youth into agriculture by connecting them to new opportunities in inclusive agricultural value chain (Alliance for Green Revolution in Africa, AGRA, 2015). Okello et al. (2012), note that ICTs have the potential for improving production techniques, provision of updated agricultural information, extension services, money transfer, increasing sales and improving efficiency which is beneficial

to young farmers. In addition, ICT tools especially mobile phones, internet and social media can be used by youth to source for new information and marketing of high value commodities such as horticultural crops, which have more beneficial prospects for income generation and food supply both at the household and community level (Okello et al., 2012). The increased focus on the use of modern ICTs by youth comes from the comprehension that youth can play a major role in dissemination of information and the comprehension that youth can play a major role in dissemination of information and knowledge to rural farmers (Issa et al., 2012). The emergence of ICTs in general has been positively accepted by youth for communication, networking, entertainment and job searching.

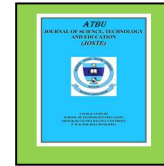
Despite its importance, there is slackness in the use of ICTs for agriculture compared to its development in other sectors such as health, education, media and financial institutions. Regardless of the increased levels of

Corresponding author: Musa, S. L

✉ musasaaduliman@gmail.com

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internet and mobile subscriptions, its use for agricultural purposes remains low among youths. Adoption of ICTs in agriculture is an advantage for the youth since they have the interest and excitement to try new things, technical knowhow to operate ICTs and are always alert on any ICT updates. Use of ICTs is in agriculture likely to stimulate development of the entire value chain including production, marketing, and provision of extension services, input supply and transportation (Issa et al., 2014). The objectives were to describe the socio-economic characteristics of soybean farmers in the study area ii. determine the relationship between socio-economic characteristics and use of ICT among soybean farmers,

METHODOLOGY

The Study Area

The study was conducted in Ningi Local Government Area of Bauchi State. Ningi Local Government Area covered a land of 4,625km². The area is bounded to the north by Jigawa state, to the west by Kano state and Toro LGA Bauchi state, to the south by Ganjuwa LGA Bauchi state, and to the east by Warji LGA Bauchi state. The study area is located by longitude 11° 23E to 11° 41E and latitude 9° 33N to 10° .12N. The annual rainfall varies from 283.28mm to 492mm per annum with mean temperature of 90° F.

It is inhabited by several ethnic groups. A number of socio-cultural factors, such as inter-marriages, religion tolerance, have all succeeded

in promoting harmony in the Local Government Area. The tribe in the Local Government Area including: Butawa, Sirawa, Afawa, Warjawa, Hausa and Fulani respectively. The area has a population of 585,420 (NPC, 2006). The study area is blessed with abundant arable land for agricultural purposes, capacity to produce wide range of agricultural goods. The major crops produce in the area are Maize, Soybeans, Sorghum and millet, while animals such as Goat, Sheep, Cattle and poultry.

Sampling Technique and Sample Size

There are two districts in Ningi L.G.A. Four political wards from each districts in the Local Government Areas was purposefully selected due to their predominance in soy beans production (BSADP, 2018). The districts are: Burra Districts; Burra Ward, Sama Ward, Bashe Ward and Kurmi Ward and Ningi district; Jangu ward, kudu yamma, Balma and jimi ward. Random sampling technique was employed to select the sample for this study. This is to ensure that the sample was the true representation of the soybean farmers in the study area. Random sampling technique involved selection of individual from a given population such that each individual has an equal chance and probability of being selected (Olowu, 2004). Twenty respondents were selected at random from each of the eight wards. A total of 180 respondents were selected for this study.

Table 1: Shows Sample frame, Local Government Area, Districts and their Respective Wards

S/N	LGA	Districts	Wards	Sample size
1	Ningi	Ningi West	Burra, Sama, Bashe and Kurmi	90
		Ningi Central	Jangu, Kudu Yamma, Balma and Jimi	90
	Total	2	8	180

Data Collection

Data were collected through the use of questionnaire. A total of 180 questionnaires was administered which was supplemented with verbal / oral interview. Information on socio-economic characteristics of the respondents were collected. Relevant Information on famers level of awareness to ICTs, level of use of ICTs as well as

problems associated with the use of ICTs for accessing agricultural information were also collected.

Data Analysis

Both descriptive and inferential statistics were used to analyse the data collected.

Corresponding author: Musa, S. L

✉ musasaaduliman@gmail.com

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Descriptive Statistics

Descriptive statistics such as frequency distribution, percentage and mean were used to analyse the socio-economic characteristics of soybeans farmers in the study area, the ICT tools used by the respondents, information accessed using ICT tools and the problems associated with the use of ICT by soybeans farmers in the study area (objective i, ii, iii and v)

Multiple Regression Model

Multiple regression model was employed to determine the relationship between the dependent and independent variables. The dependent variable was the number of ICT used in the study area, while the socio-economic characteristics were the independent variables. The multiple regression model was expressed implicitly as follows;

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7)$$

The model was expressed as;

$Y =$ Number of ICT tools Used.

$X_1 =$ Age of the respondent (years)

$X_2 =$ Household Size (Number)

$X_3 =$ Farm Size (Hectares)

$X_4 =$ Farming Experience (Years)

$X_5 =$ Educational Level (Number of years spent in School)

$X_6 =$ Extension Contact (Number)

$X_7 =$ Access to Credit (Dummy: Yes=1, No=2)

$B_0 =$ Constant

Table 2: Distribution of respondents' Sex

Sex	Frequency	Percentage
Male	126	70.00
Female	54	30.00
Total	180	100.00

Age of the respondents

Age indicates the number of years an individual has spent from birth. The result from Table 3. indicates that majority (38.30%) of the respondents were between the ages of 41-50 years, 31.70% were between 31-40 years, 24.40% were between the ages of 51-60 years, and 3.30% are above 61 years while few (2.2%) were between 21-30 years. The result further indicates that the mean age of soya beans farmers

RESULTS

Socio-Economic Characteristics of the Respondents

Socio-economic characteristics refers to an individual's position within a social structure. It is expressed in term of economic and sociological variables combined which is presented in this section. The variables considered are; sex, age, marital status, educational level, membership of association, source of information, primary occupation, land ownership, access to credit, source of labour and access to ICT.

Sex of the respondents

Sex refers to the biological classification of an individual in terms of gender, that is, either feminine or masculine. It influences the types of economic activities an individual performs. Table 2 below indicates that majority (70.00%) of the respondents were male while 30.00% were female. This indicates that soya beans production in the study area is dominated by male farmers. This is in line with the findings of Mustapha (2012) who reported that majority soya beans farmers are male. This shows that there is gender disparity among soya beans farmers and this could lead to less participation of the female folks in soya beans production activities.

in the study area is 35 years which shows that they are relatively young and energetic. Therefore, they could easily learn the use of ICT in obtaining relevant information to improve their yield and productivity. This lends credence to the findings of Jakamal (2017) who reported that most soya beans farmers are between the ages of 41-50years.

Corresponding author: Musa, S. L

✉ musasaaduliman@gmail.com

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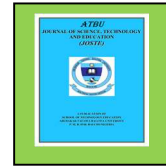


Table 3: Distribution of Respondents' Age in Years

Age	Frequency	Percentage
21-30	4	2.20
31-40	57	31.70
41-50	69	38.30
51-60	44	24.40
Above 61	6	3.30
Total	180	100.00
Minimum	20	
Maximum	61	
Mean	35	

Marital Status of the Respondents

Marital status refers to the categories of the soya beans farmers in the study area who are married, single, widowed or divorced. The distribution of the respondents based on marital status is presented in Table 5. The result revealed that Most (76.11%) of the respondents

were married with 14.44% single, 1.12% widowed and 8.33% divorced. This is in line with the findings of Tanko (2021) who reported that majority of the soya beans farmers in Borno State are married.

Table 4: Distribution of Respondents' Marital Status

Marital Status	Frequency	Percentage
Single	26	14.44
Married	137	76.11
Divorced	15	8.33
Widowed	2	1.12
Total	180	100.00

Educational Level of the respondents

Educational level describes the level of formal education attained by individual farmers. According to Ndaghu (2011) education is a variable that broadens the mental horizon, influences the totality of the mind and predisposes farmers to new ideas, adequate education could enhance farmers understanding and sources of information on improved farm innovations and practices. The educational distribution of the respondents is presented in Table 6. The findings revealed that 7.22% of the respondents had no formal education, 15.56% had primary education, majority (44.45%) of the respondents had secondary education, 18.89% had tertiary

education, and 3.89% had Adult Literacy Education while 10.00% had Quaranic education. This implies that majority of the respondents have attained at least a primary education. This result indicates that literacy level is high among the respondents and the implication of this result is that the highly educated soya beans farmers are expected to achieve optimum production as higher education improves farmers' ability to make decisions that will maximized their benefit. This corroborates with the study of Tanko (2021) which reported that majority of soya beans farmers are secondary school certificate holders.

Table 5: Distribution of Respondents' Educational Level

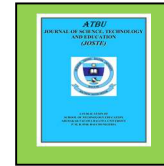
Educational Level	Frequency	Percentage
Primary	28	15.56
Secondary	80	44.45

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✉ musasaaduliman@gmail.com

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Tertiary	34	18.89
Adult Literacy	7	3.89
No Education	13	7.22
Quranic	17	10.00
Total	180	100.00

Membership of Association

According to Essay (2019) cooperative society is an association of persons, voluntarily united to meet their socio-economic needs and aspirations through a jointly owned and controlled business enterprises. The result as indicated in Table 6 shows that majority of the respondents (69.44%) were members of cooperative societies while 30.56% of the respondents were not members of any cooperative society. In an ideal

situation belonging to an association is very important. This enable the fellow to benefit from support of either governmental or non-governmental organisations (NGOs), financial institutions or politicians. Farmers who belong to cooperatives are better informed on resource use and farm planning which enables them to utilize resources more efficiently (Mamman et al., 2016).

Table 6: Distribution of Respondents' Membership of Association

Membership	Frequency	Percentage
Yes	125	69.44
No	55	30.45
Total	180	100.00

The sources of information on soya beans production available to farmers were shown in Table 7 below. A higher percentage (40.00%) of the respondents became aware of the soya beans production technologies through the extension services, followed by 33.33% of the respondents through Mass Media, 18.33% through Open Market, 2.78% through Research Officers, 5.00% through other farmers and 0.56% through Non-Governmental Organizations (NGOs). This shows

that a larger percentage of the respondents has access to information on improved technologies and hence they were expected to have better production practices. When farmers are aware of new practices and are convinced that the new method is better than the existing one they will adopt the new innovation to better their productivity

Table 7: Distribution of Respondents' Source of Information

Source of Information	Frequency	Percentage
Mass Media	60	33.33
Agricultural Extension Officer	72	40.00
Open Market	33	18.33
Research Officers	5	2.78
Other Farmers	9	5.00
NGO	1	0.56
Total	180	100.00

Primary Occupation of the Respondents

Primary occupation refers to as the major source of livelihood of the respondents. The

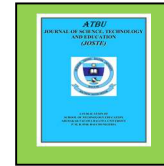
result from Table 8 depicts that majority (43.33%) of the respondents were into crop farming, 34.44% were livestock farmers, and 9.44% are into Agro-

Corresponding author: Musa, S. L

✉ musasaaduliman@gmail.com

Department of Agricultural Education, Adamu Tafawa Balewa College of Education, Kangere,

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processing, 2.22% are into Agro-marketing, 5.00% are Artisans while 3.33% and 2.22% were Traders and Civil Servants respectively. This shows that most of the respondents are crop farmers and are most likely to majorly produce soya beans. They are also likely to seek good agronomic practices for soya beans production using ICT tools to increase their productivity because it is their main source of livelihood.

Land Ownership of the Respondents

Indicates the state of ownership of the land used for cultivation of soya beans. Table 9 shows that most (58.89%) of the ownership of land used for cultivation of soya beans in the study area is ownership by inheritance, 28.33% is purchased ownership, 5.00% is communal, 3.89% is rented, 2.22% is leased while 1.11% and 0.56% are gifted and Government owned respectively.

Table 8: Distribution of Respondents' Primary Occupation

Primary Occupation	Frequency	Percentage
Crop Farming	78	43.33
Livestock	63	34.44
Agro-processing	17	9.44
Agro-marketing	4	2.22
Artisan	9	5.00
Trading	6	3.33
Civil Servant	4	2.22
Total	180	100.00

Table 9: Distribution of respondents' Ownership of Land

Ownership	Frequency	Percentage
Inheritance	106	58.89
Purchased	51	28.33
Communal	9	5.00
Rent	7	3.89
Leased	4	2.22
Gift	2	1.11
Government	1	0.56
Total	180	100.00

Access to Credit of the Respondent

Financial working capital is crucial in any business enterprise. Credit is an amount or sum at a person's disposal. It can be obtained through loans from credit institutions, personal or family savings and other financial institutions. The distribution of the respondents according to access to credit is shown in Table 10 indicates that

majority (91.67%) have access to credit while 8.34% do not have access to credit facilities. This has a good outlay for soya beans production because access to credit improved the farmers' purchasing power through providing capital for production.

Table 10: Distribution of Respondents' Access to Credit

Access to Credit	Frequency	Percentage
Yes	165	91.67
No	15	8.34
Total	180	100.00

Corresponding author: Musa, S. L

✉ musasaaduliman@gmail.com

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Source of Labour of the Respondents

This refers to the channels which an individual use as labour for his/her farm operations. Table 11 below indicates that majority (40.00%) of the soya beans farmers in the study area use hired labour, 21.11% use family labour while 38.89% use both family and hired labour.

Table 11: Distribution of Respondents' Source of labour

Source of labour	Frequency	Percentage
Hired	72	40.00
Family	38	21.11
Both	70	38.89
Total	180	100.00

Access to Information and Communication Tools

Table 12 shows that most (91.12%) have access to ICT tools while 8.89% do not have access to ICT tools. This shows that accessibility to ICT is very high in the study area therefore, soya beans farmers can easily and readily access production information using ICT to improve their yield.

Table 12: Distribution of respondents' Access to ICT

Access to ICT	Frequency	Percentage
Yes	164	90.56
No	16	8.89
Total	180	100.00

Farm Size of the Respondents

Table 13 indicates that majority (76.66%) have a farm size of 1-5 hectares, 18.89% had 6-10 hectares, 2.78% had 11-15 hectares while few (1.67%) had more than 15 hectares. This shows that majority of the soya beans farmers in the study area are small and medium scale farmers. This corroborates with the findings of Babuga (2020) which stated that most soya beans farmers have a farm size of between 1-5 hectares.

Table 13: Distribution of the Respondents' Farm Size

Farm Size	Frequency	Percentage
1-5	138	76.66
6-10	34	18.89
11-15	5	2.78
Above 15	3	1.67
Total	180	100.00

Farming Experience of the Respondents

This refers to the number of years which the respondents have been involved in cultivating soya beans. The result in Table 14 shows that most (33.89%) of the respondents had 6-10 years of experience, 32.22% has 1-5 years, 23.33% had 11-15 years, 8.89% had 16-20 years while few (1.67%) had above 20 years.

Table 14: Distribution of Respondents' Farming Experience

Farming Experience	Frequency	Percentage
1-5	58	32.22
6-10	61	33.89
11-15	42	23.33
16-20	16	8.89
Above 20	3	1.67
Total	180	100.00

Household Size of the respondents

Household size is the number of people in the household for each respondent. That is the number of people who live together in a single home. The distribution of respondents according to household size is given in Table 15. The result showed that majority (45.55%) of respondents have household size of 1-5 people, 27.78% have household size of 6-10 people, and 21.67% have household size of 11-15 persons while 5.00% had household size of above 15 people. The mean household size is 7 persons. This is in line with the reported of Babuga (2020) who reported that most soya beans farmers have household size of 6-10 persons. The implication is that large household size constitutes family labour, the larger the household size the more labour force is available for family farm activities.

Corresponding author: Musa, S. L

✉ musasaaduliman@gmail.com

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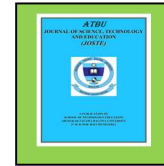


Table 15: Distribution of Respondents' Household Size

Household Size	Frequency	Percentage
1-5	82	45.55
6-10	50	27.78
11-15	39	21.67
Above 15	9	5.00
Total	180	100.00

Access to Extension Service

This refers to whether the farmers had access to extension services or not. Enhanced access to extension services avails farmers the opportunity to learn about innovations and global best practices in agricultural production. This will help them increase their yield which will in turn improve their income and livelihood. Table 16 below indicates that Most (92.22%) of the respondents have access to extension services while 7.78% do not have access to extension service. This has a positive outlook on soya beans production in the study area because it means that soya beans farmers have access to enhanced knowledge on good agronomic practices in cultivation of soya beans.

Table 16: Distribution of the Respondents' Access to Extension Service

Access to Extension	Frequency	Percentage
Yes	166	92.22
No	14	7.78
Total	180	100.00

Information and Communication Technology Used by Respondents

Table 17 shows that the respondents use different types of information and communication technology (ICT) tools frequently to help them build capacity, improve their knowledge, reach more information to keep in touch with innovations in the soya beans cultivation. The study revealed that majority of the respondents with a means score 3.41 used mobile phone, social media (2.52), internet (2.18), radio (2.72), Computer (1.63), Television (1.69) and Video (1.77). This means that mobile phone is the most used ICT tool in obtaining information on soya beans production. This could be because of its affordability and user-friendly nature of mobile phones

Table 17: Distribution of the respondents based on the use of ICT tools

ICT Tools	Always	Often	Rarely	Never	Mean	Rank
Mobile Phone	95(52.8)	63(35.0)	22(12.2)	0(0)	3.41	1
Social Media	46(25.6)	47(26.1)	65(36.1)	22(12.2)	2.52	3
Internet	24(13.3)	42(23.3)	55(30.6)	59(32.8)	2.18	4
Radio	70(38.9)	30(16.7)	40(22.2)	40(22.2)	2.72	2
Computer	7(3.9)	17(9.4)	59(32.8)	97(53.9)	1.63	7
Television	6(3.3)	23(12.8)	60(33.3)	91(50.6)	1.69	6
Video	11(6.1)	20(11.1)	65(36.1)	84(46.7)	1.77	5

Information Accessed Using ICTs

This refers to the type of information which respondents use ICT to obtain from the various sources of information which they use. Table 18 revealed that Majority (62.80%) of the respondents use ICT to access information on input supply, 37.20% obtain information on Market price using ICT, 49.40% obtain information on new variety available, pest and disease control (37.2%), Market Availability (50.6%), advisory

service (37.20%), workshop and Training (54.40%), Credit availability (36.10%), Post-harvest practices (51.10%) while 41.10% and 45.00% use ICT to access information on agronomic practices and weather reports respectively.

Corresponding author: Musa, S. L

✉ musasaaduliman@gmail.com

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Relationship between Socio-economic Characteristics and Use of ICT

The socio-economic characteristics which influences the use of ICT by respondents in Table 19 in which the double-log model gave the best fit on the basis of economic, statistical and econometrics criterion revealed that; the

coefficient of multiple determinations (R^2) indicated that 71.43% variation in the use of information and communication technologies in the study area is explained by the variables included in the model. Four variables namely; age, farm size, educational level and access to credit were significant

Table 18 Distribution of Respondent Based on Information Accessed Using ICT

Information	Frequency	Percentage	Rank
Input Supply	113	63.80	1
Market Price	67	37.20	8
New Varieties	89	49.40	5
Pest and Disease Control	67	37.20	8
Market Availability	91	50.60	4
Advisory Services	67	37.20	8
Workshop/Training	98	54.40	2
Credit Availability	65	36.10	11
Post-harvest Practices	92	51.10	3
Agronomic Practices	74	41.10	
Weather report	81	45.00	

Table 19 Socio-economic Factors Influencing Utilization of ICT

Variable	Coefficient	Std Error	t	Prob.
C	1.716283	0.3581176	4.79	0.000
Age X_1	-1.029636	0.2599742	-3.96	0.000**
Household Size X_2	0.0141249	0.0796173	0.18	0.859
Farm size X_3	0.5052224	0.2398375	2.11	0.039*
Years of Experiences X_4	0.055104	0.0767511	0.72	0.474
Educational Level X_5	0.198971	0.0747072	2.66	0.008**
Extension Contacts X_6	0.1123709	0.0738665	1.52	0.130
Access to Credit X_7	0.2228449	0.1223739	1.82	0.070*
R-Square	0.7143			
Adjusted R-square	0.6950			

**= 1% Significance, *= 5% Significance.

CONCLUSION AND RECOMMENDATIONS

The findings of this study revealed that the respondents in the study area were mostly male and in their active and productive ages with moderate formal education. Most of the respondents were married with and average household size and they were experienced soya beans farmers. Majority of the respondents have access to ICT belong to cooperative associations. The respondent use ICT frequently. Based on the findings, age, educational level, farm size and credit access significantly affects the use of ICT.

The major problem associated to use of ICT were high cost, inadequate training and complexity in operations of ICT. It is therefore recommended that Input support services in the form of credit facilities, fertilizer and chemicals should be provided with a view to enhancing adoption of soya bean production technologies, encouragement should be made to form soya bean cooperative societies by respondents in order to take advantage of government policies and programmes, Government should make ICT tools easily and readily accessible for farmers and

Corresponding author: Musa, S. L

✉ musasaaduliman@gmail.com

Department of Agricultural Education, Adamu Tafawa Balewa College of Education, Kangere,

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Governmental and Non-Governmental Organization should provide avenues for farmers to receive training on the use of ICT to obtain production information which will increase their yield

REFERENCES

- Teo T. and Beng L. C. (2010) Explaining the intention to Use Technology among students Teachers: An application of the theory of planned behaviour (TTPB), Retrieved from Campus Wide Information System:
<http://doi.org/1065074111033035>
- Okello, J. J., Kirui, O. K., Njiraini, G. W. and Gitonga, Z. M., 2012. Drivers of Use of Information and Communication Technologies by Farm Households: The Case of Smallholder Farmers in Kenya. *Journal of Agricultural Science*, 4(2). 111-124
- NPC, (2006). National Population Commission, Federal Office of Statistics. Census 2006.
- Ngalamu, T., Meseka, S. and Ashraf, M. (2012). Performance of soybean (*Glycine max* L. Merrill) genotypes under different planting dates in Sennav State of the Sudan. *J. Appl. Biosci.* 49(1): 3363-3370.
- Mansour, Tamer., Abd El-Ghani, Salah., Abdelazez, Mahmoud., (2019), The Role of Egypt Agricultural Channel in the Enhancement of Farmers' Agricultural Knowledge in Kafr El-Sheikh Governorate, Egypt, *Bioscience Research*, (16): 26-35.
- Issa, F. O., Obioma, O. D. and Sallau, R., 2014. Assessment of Youth Involvement in Agricultural Production: The case of Sabon-Gari Local Government Area of Kaduna State, Nigeria. *International Journal of Agricultural Science, Research and Technology in Extension and Education Systems (IJASRT in EESs)*, 4(3) 163-171
- Idrisa, Y.L., Ogunbameru, B.O. and Madukwe, M.C. (2012). Logit and Tobit analyses of the determinants of likelihood of adoption and extent of adoption of improved soybean zseed in Borno State, Nigeria. *Greener J. Agric. Sci.* 2:37- 45.
- Bauchi State Agricultural Development Programme (2018). Crop Area Yields Surveys. Bauchi State Agricultural Report. 12.
- Babuga, U. S., 2Ali, A. M., and 3Garba, A. (2020), the Effect of Information and Communication Technology (ICT) utilization among Small Scale Farmers in Bauchi Local Government Area, Bauchi State, Nigeria.

Corresponding author: Musa, S. L

✉ musasaaduliman@gmail.com

Department of Agricultural Education, Adamu Tafawa Balewa College of Education, Kangere,

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