

EFFECT OF INFORMATION AND COMMUNICATION TECHNOLOGIES ON YAM FARMERS OUTPUT IN IVO LOCAL GOVERNMENT AREA OF EBONYI STATE, NIGERIA

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ABSTRACT

The study examined the effect of ICTs on yam farmers output in Ivo L.G.A of Ebonyi State, Nigeria. Multistage random sampling technique was used in the selection of samples. Data were collected through a semi-structured questionnaire. The sample size was ninety (90) yam farmers. The result on socio-economic characteristics showed that 66.7% of the yam farmers were males. A fairly good proportion (38.8%) of the yam farmers were within the age range of 46–55 years with a family size between 6 and 10 persons. On educational level, 93.3% had formal education with farming experience between 11 to 20 years. All the yam farmers cultivated between 1 – 4ha of farm. The multiple regression estimates of the effects of available ICTs on the output of yam farmers indicated that the statistical test of the coefficient of newspaper was positive and significant at 10% probability level. This implies that as availability of newspapers increases as the access to innovation to farmers, there is likelihood of increase in the output of the yam farmers. The coefficient of radio had positive relationship with the output of yam farmers in the study area and significant at 1% level of probability. This could be attributed to the fact that yam farmers could listen to their radio sets and get useful information as it concerns the extension training and visits which would in return increase the production output. The coefficient of television had a positive relationship with the output of yam and statistically significant at 1% level of probability. This implies that as the yam farmers uses television sets; they can access greater information that could improve their production output. The coefficient of computers had direct relationship to the

yam output of the farmers and significant at 1% level of probability. The negative sign could be attributed to the fact that the farmers have no access to computers and this could retard their information and innovations that could have improved their production output. Based on the findings, it was recommended among other things that appropriate government agencies responsible for agricultural development in the country should carry out a thorough review of the agricultural extension communication facilities available in the rural areas with a view to increasing and updating them with more modern ICTs.

Key Words: Effect, Yam Farmers, ICTs, Ivo LGA.

INTRODUCTION

Sustainable economic development is dependent on the rate of growth of agriculture. An efficient agriculture can also necessitate the stability of food prices through progressive reduction in production cost (Nwaneri *et al.*, 2013). The sector could facilitate an orderly development of import substitution in a manner conducive to enabling the nation save the much needed foreign exchange earnings. That the agricultural sector should play this role is more relevant now than ever before in the light of the prevailing global food insecurity and crises. For agriculture to effectively perform these roles, there has to be an efficient extension service coupled with adequate and timely supply of farm inputs (Windapo, 2001). The crucial role of agricultural extension in promoting the productivity of all the agricultural sectors is felt primarily in making available to all involved in agro-business, the most current and useful information. An effective

agricultural extension also depends on extension messages (information) reaching many farmers and farmers problems reaching extension staff quickly and regularly. The Extension Agent (EA) is the only extension worker who teaches production recommendation directly to farmers. Through him, therefore it is expected that the farmers benefits from agricultural research with the ultimate target of raising their agricultural efficiency and effectiveness. Every access to information had always been a source of worry to almost all sectors of human endeavor. The conscious man approach to solving the problem of information accessibility and utilization resulted in the new technological breakthrough and boom aptly referred to as information and communication technology, and/or its variant called management Information Systems.

According to Nwaneri, (2013), Information and Communication Technology (ICT) is defined as the combination of software,

hardware and the means of production that allows the processing, exchange and management of knowledge and information, using a range of electronic technologies, which when converged on new configuration are flexible, adaptable, enabling and capable of transforming organization, and redefining social relation. The foregoing therefore includes computers, digital and non digital libraries, e-mail, mobile, cell phones, internet “websites” and software for operating them. Researchers have doggedly worked to develop these software for practically every business sector including agriculture, with the follow-up of training people on how to apply them more especially in yam production.

Yam (*Dioscorea spp*) is one of the major staple food crops grown generally in Nigeria and specifically in Ivo Local Government Area of Ebonyi State. The common species grown in Ivo L.G.A include *Dioscorea rotundata* (white yam) and *Dioscorea alata* (water yam). The crop is of great nutritional and economic importance to mankind. The tuber can be eaten boiled, roasted, fried, mashed or pounded (Osunde 2008). According to Eka (1985) dioscorine which is the major alkaloid in yam is medicinally a heart stimulant. Moreover, yam is also a source of industrial starch, the quality of which varies with the species with some of them producing starch with comparable

quality to cereal starch (Osisiogu and Uzo 1973). Throughout Nigeria, yam is used in various aspects of the people’s economic and socio-cultural activities. Proper Utilization of Information and Communication Technologies by yam farmers is, thus very relevant in order to sustain and increase the level of yam production and total output of this important staple food/emerging industrial crop. The yam farmers themselves have shown tremendous rapid response. This lead to this study on the Effect of Information and Communication Technologies on Yam farmers output in Ivo Local Government Area of Ebonyi State. The specific objectives of the study were to: describe the socio-economic characteristics of the yam farmers in the study area and determine the effect of ICTs on the yam farmers output in the area.

METHODOLOGY

The study was carried out in Ivo Local Government Area of Ebonyi State, Nigeria. The area was chosen for the study owing to the fact that farming is the predominant occupation of the people. Ivo L.G.A lies between Latitudes 5° 43¹ and 5° 5¹ North of the Equator and Longitudes 7° 29¹ and 7° 35¹ East of the Greenwich Meridian. It has an annual rainfall range of about 1,200mm to 1,600mm and temperature range from 27⁰c to 33⁰c. The LGA is made up of three

autonomous communities namely Ishiagu, Ihie and Akaeze and comprises 32 villages. Ivo L.G.A is bounded in the north by Aninri and Awgu L.G.As of Enugu State, in the West by Umunochi and Isuikwuato L.G.As of Abia State, in the East, Ivo LGA is bounded by Onicha LGA of Ebonyi State and in the south by Bende and Afikpo south LGAs in Abia and Ebonyi States respectively. Multistage random sampling technique was used in this research. First, from the three communities (Ishiagu, Ihie and Akaeze), 6 villages each were randomly selected to give a total of 18 villages. From the villages selected, 5 yam farmers each were randomly selected to give a total of ninety (90) yam farmers. Data generated in the study were analyzed using descriptive and inferential statistics. Objective i was analyzed with percentages and frequency distribution table. Objective ii was realized by means of Multiple regression model. The model functional forms were specified in explicit forms as follows:

Linear:

$$Y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + e \text{ -----(1)}$$

Cobb-Douglas (Double Log):

$$\text{Log } Y = b_0 + b_1\log x_1 + b_2\log x_2 + b_3\log x_3 + b_4\log x_4 + b_5\log x_5 + b_6\log x_6 + b_7\log x_7 + b_8\log x_8 + e \text{ -----(2)}$$

Semi – Log:

$$Y = b_0 + b_1\log x_1 + b_2\log x_2 + b_3\log x_3 + b_4\log x_4 + b_5\log x_5 + b_6\log x_6 + b_7\log x_7 + b_8\log x_8 + e \text{ -----(3)}$$

Exponential:

$$\text{Log } Y = b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5 + b_6 x_6 + b_7 x_7 + b_8 x_8 + e \text{ -----(4)}$$

Where Y = Output of yam

X₁ = Poster (number)

X₂ = Newspaper (number)

X₃ = Telephone/GSM (number)

X₄ = Calendar (number)

X₅ = Radio (number)

X₆ = Handbills (number)

X₇ = Television (number)

X₈ = Computer (number)

RESULTS AND DISCUSSION

Table 1 showed the socio-economic characteristics of the yam farmers. Result on gender revealed that 66.7% of the yam farmers were males. This implies that the males were more involved in yam production in the study area than the females. This is in line with the generally held view and a common practice in the developing countries to direct training services primarily towards men because they are more likely to adopt technologies faster than the females (Iheke and Nwaru, 2014). The survey revealed that 8.9% of the farmers were within the age range of 16-25 years, 19% within the age range of 26-35 years, 24.4% within the age range of 36-

45years and a fairly good proportion(38.8%) of the yam farmers were within the age range of 46–55 years. This implies that 82.2% of the farmers were within the economically active age as such, will respond positively to any intervention aimed at increasing their level of production. A large proportion (61.1%) of the farmers had family size between 6 and 10 persons. Farmers could draw some level of family labour from their household. Nwaneri *et al.*(2013) reported that relatively large family size is proxy to availability of labour. On educational level, 93.3% had formal

education. This implies that the yam farmers are not likely to have difficulty in understanding and adopting modern agricultural technologies and innovations. Result on farming experience showed that a large proportion (51.1%) of the farmers had farming experience between 11 to 20 years of experience. The more years of experience one has, the more he/she could be able to overcome some problems that is associated with farming and as well willing to adopt improved technologies. All the yam farmers cultivated between 1 – 4ha of farm.

Table 1: Socio-economic characteristics of yam farmers variables.

Characteristics	Frequency	Percentage
Gender		
Male	60	66.7
Female	30	33.3
Age		
16 – 25	8	8.9
26 – 35	17	19.0
36 – 45	22	24.4
46 – 55	35	38.8
56 – 65	8	8.9
Family Size		
1-5	23	25.6
6-10	55	61.1
11-15	12	13.3
Educational level		
Non-formal Education	6	6.7
Primary education	30	33.3

Secondary level	36	40.0
Tertiary education	18	20.0
Farming experience (yrs)		
1 – 10	11	12.2
11 – 20	46	51.1
21 – 30	22	24.4
31 – 40	5	5.6
41 – 50	6	6.7
Farm size(Ha)		
< – 1	22	24.4
1.1– 2	48	53.3
2.1 – 3	11	12.2
3.1 - 4	9	10.0

Source:Field survey data, 2017

The multiple regression estimates of the effects of available ICTs on the output of yam farmers is presented in table 2. Based on the statistical and econometric criteria, linear regression was chosen as the lead equation. The coefficient of the multiple determination, R^2 was 0.7663 which implies that 76.6% of the variation in the dependent variable (output of yam) was accounted by various independent variables included in the model, while the remaining 23.4% were due to error term.

The statistical test of the coefficient of newspapers was positive and significant at 10% probability level. This implies that as availability of newspapers increases as the access to innovation to farmers, there is likelihood of increase in the output of the farmers in the study area. This finding is in

line with Nwaneri (2015) who averred that agricultural development in Nigeria and other developing countries has been hampered by low level of agricultural information exchange. Furthermore as expected, the coefficient of radio had positive relationship with the output of yam farmers in the study area and significant at 1% level of probability. This could be attributed to the fact that yam farmers could listen to their radio sets and get useful information from their houses, farms, village squares, among others as it concerns the extension training and visits which would in return increase the production output of those who adopted the innovation, such as yam minisett technology. The coefficient of television had a positive relationship with the output of yam and

statistically significant at 1% level of probability. This implies that as the yam farmers uses television sets; they can access greater information that could improve their production output. Television set combines both sight and sound thereby increasing the possibility of grasping and retaining the subject presented. The coefficient of computers as an available ICT had direct relationship to the yam output of the farmers

in the study area and significant at 1% level of probability. The negative sign could be attributed to the fact that the farmers have no access to computers and this could retard their information and innovations that could have improved their production output. Finally, the overall statistical confidence of the result was confirmed by the f-ratio that has the value of 33.21 and significance at 1% level of probability.

Table 2: Effect of the Available ICTs on the Output of Yam Farmers in Ivo L G A. (Multiple Regression Analysis).

variables	+linear	semi-log	double-log	exponential
constants	1.721128 (0.98)	0.3321986 (1.12)	0.506611 (2.44)***	2.47e+09 (-1.30)
posters	-0.0518521 (-0.19)	-0.0798904 (-1.70)*	-0.3192157 (-2.14)**	0.3975508 (0.46)
newspapers	0.8928164 (1.69)*	0.3173628 (3.56)***	0.8814823 (4.44)***	2.45e+08 (1.86)*
telephone/GSM	-0.2693725 (-0.65)	-0.0125698 (-0.18)	-0.0606313 (-0.37)	2.00e+07 (0.58)
calendars	-0.3216286 (-0.98)	-0.0271575 (-0.49)	-0.1253872 (-0.79)	-0.1400955 (-0.53)
radio	1.694492 (5.10)***	0.2312456 (4.13)***	0.4377108 (2.73)***	149315.9 (0.14)
handbills	-0.6443266 (-1.27)	-0.1919457 (-2.24)**	-0.2552431 (-1.34)	1.76e+08 (1.49)

television	0.9493593 (4.06)***	0.1846592 (4.68)***	0.4211093 (2.33)**	-136926.4 (-0.29)
computers	-1.748112 (-2.83)***	-0.12566 (-1.21)	-0.0330112 (-0.15)	-1.18e+08 (-0.59)
R²	0.7663	0.7398	0.6239	0.0920
F-ratio	33.21***	28.79***	13.06***	1.03

***, ** and * shows the levels of significant at 1%, 5% and 10% respectively. The figures in bracket represent the T- values.

CONCLUSION

RECOMMENDATION

For agricultural extension to be effective, extension information must be reaching many farmers and farmers' problem in form of feedback reaching extension staff quickly and regularly. An effective way to facilitate this process is through the use of ICTs. ICT is becoming increasingly an integral part of the human society today. Its role in quality agricultural extension delivery depends on how effective its application is in the performance of the extension functions. There is need for ICT facilities to be available and usable among extension agents and farmers irrespective of gender. In so doing, the farmers will be more effective in agricultural productivity. The following recommendations were made:

Agricultural Development Project (ADP) should invest in training the extension agents and farmers on usability of ICTs for

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information dissemination and acquisition. Such training could come in the form of seminars, conferences, workshops or train the trainers course. Agricultural Development Project (ADP) should carry out a thorough review of the agricultural extension communication facilities available in all local government areas with a view to increasing and updating them with more modern information communication technologies. These facilities should not only be made available but, also accessible to farmers. For ICT to take root in quality agricultural information acquisition, processing, storage, dissemination and application in all areas of agricultural extension delivery process, all stakeholders in agricultural extension must cultivate a digital culture. Female farmers should be encouraged by extension agents to effectively participate in the use of ICTs for agricultural extension purpose. It is strongly

recommended that the Government should also establish television-viewing centers in the rural communities where agricultural programs can be broadcasted and viewed by the farmers. Agricultural policy makers should come up with policies and strategies that will facilitate the harnessing of new ICTs for agricultural projects and development.

REFERENCES

- Chadwick, B. P. (2003). *Knowledge Techniques for Sustainable Development: Future Direction in Agriculture and ICTs in USAID*. USA Winrock International.
- Eka, O. U., (1985). The Chemical Composition of yam in Gosuji (ed): *Advances in yam research*. Enugu Nigeria: Frontline Publishers, Pp. 61-83.
- FAO/World bank (2000) *Agricultural Knowledge and Information System: Strategic Vision and Principles*. Rome: FAO/World bank.
- Iheke, O.R. and Nwaru, J.C. (2014), Impact of Innovation on Smallholders' Productivity and Poverty Status: The Case of Arable Crop Farmers in South-East, Nigeria. *Asian Journal of Agricultural Extension, Economics & Sociology* 3(4): 301-318, 2014.
- Nwaneri, T.C., Ibezim, G.M.C. and Nwaneri, J.A. (2013): Farmers' Use of Information and Communication Technologies in Ivo L.G.A of Ebonyi State, Nigeria. *Journal of Agriculture, Socio-economics and Sustainable Environment (JASSE)* 1(2):34-41.
- Nwaneri, T. C and Nwaneri, J. A (2013): *Essentials of Information and Communication Technologies on Rural Farmers Activities in Nigeria*. Proceedings of the 47th Annual Conference of Agricultural Society of Nigeria. "Ibadan 2013" Pp 823-827
- Nwaneri, T.C. (2015). *Adoption of Pond Fishery Technologies by Farmers in Imo State, Nigeria*. M.Sc. Dissertation; Dept of Agricultural Economics and Extension, Abia State University, Uturu.
- Osunde, Z. D., (2008). *Minimizing Post-Harvest Losses in Yam (Dioscorea spp) Treatment and Techniques*. In GL Robertson, JR Lupien (Eds): *Using Food Science and Technology to Improve Nutrition and Promote National Development: Canada; International Journal of Food Science and Technology*, 2(12):55-61.

Windapo, O. (2001).role of Agricultural Extension in Sustainability of Agricultural Development Programmes in Nigeria Proceedings of 7th Annual National Conference of Agricultural Extension Society of Nigeria, held at Zamfara hotels, Bauchi, August 19- 22.