



## Impact of ICT Usage on Success/Failure of Youth-Led Agribusiness Activities in Different Agricultural Value Chains in Southeast Nigeria

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### Abstract

The emergence of computer and internet based ICT platforms offers an agricultural commodity exchange platform. The use of ICTs has consistently advanced over the last ten years and the number of people connected to the Internet via fixed or mobile devices is increasing rapidly with African farmers, especially the youth, not been left out of this ICT explosion. This study examined the impact of ICT usage on success/failure of youth-led (young men and women) agribusiness activities in different agricultural value chains. The respondent involved all youth-led (young men and women) agribusiness entrepreneur in the south east that are involved in agricultural value chains. Three hundred and sixty (360) youth-led agribusiness entrepreneurs were studied with the use of multi-stage and simple random techniques. Primary data were collected with the use of a well-structured questionnaire through the aid of enumerators while descriptive statistics (mean, standard deviation and graphs) and inferential statistics (OLS regression) were used for data analysis. The result show that mobile phone (88.89%), internet (58.33%), radio (52.22%), computer (55.56%), social media (66.67%), facebook (58.33%) and Youtube/online videos (58.33%) were the most commonly used ICT tools in agriculture. Youth participation in agricultural value-chain activities is a high yielding venture as the average revenue, cost and return for youth in different value chain activities were N486,203.61, N166,433.33 and N319,770.3. OLS estimate on effect of ICT usage on success/failure shows that mobile Phones (1%), Blogs and website used (1%) and used of camera (1%) were significant and positively related to performance of youth in the area while the coefficient of cost of data was statistically significant at 1% level but negatively related to performance of youth in the area participation in agricultural value-chain. The study recommends that Government should provide adequate fund for youth-led (young men and women) agribusiness activities to enable it procure necessary relevant ICT facilities. Also Youth should engage themselves in continuous training in ICT facilities.

**Keywords:** Impact, ICT usage, success/failure, young men, young women, agricultural value-chain, South East Nigeria

### Introduction

ICT play an important role in the development process as ICTs enable organizations to be more productive, thereby spurring economic growth and helping firms be more competitive (Okello *et al.*, 2010). The acquisition and usage of ICT applications by actors in the agribusiness sector including producers is increasing very rapidly every day. The most common ICTs used by agrienterprises include computers, radio, television, internet and telecommunication networks (Sife *et al.*, 2010). Radio is mostly used ICT platform due to its wide coverage of frequencies, availability of many vernacular radio stations, and the portability nature of

most radio (Okello *et al.*, 2010). This has triggered emergence of TV programmes which broadcast information on agribusiness and how youth-led (young men and women) agribusiness activities can commercialize their agribusiness. Another dominantly used ICT tool is the mobile phone. An increasing number of people are currently using mobile phones to run their agrienterprises. Several studies have shown that mobile phones can cause significant benefits for agrienterprises through improved access to information through information communication devices such as mobile phones, radio and TV Stations enable producers to focus and extract useful and up-to-date information

from social and business networks. Lower marketing costs though business negotiation via online which reduced transaction cost and thus higher profits and incomes. Through the use of mobile phones market accessibility has improved, investment promoted, risk from disasters are reduced, and are known to contribute to empowerment of societies through enhancing access to information (Okello *et al.*, 2010).

In addition to such direct effects, mobile phones are an enabling technology for other innovations. One important example are mobile phone based money transfers, which could be very relevant for rural youth-led agribusiness activities that are often underserved by the formal banking system. The use of mobile money services provides a unique opportunity for the development of agrienterprises. This is because these services can enable cheap and reliable money transfers between people that have access to a mobile phone. Also mobile money services provide relatively secure opportunities for saving even in remote rural areas. Lastly, there has been emergence of computer and internet based ICT platforms such as web-based system which offers an agricultural commodity exchange platform. So far, little is known about the impact of ICT usage on success/failure of youth-led (young men and women) agribusiness activities in different agricultural value chains (Aker and Mbiti, 2010).

In Value chain activities, the use of ICT can be influenced by a number of different factors, such as type of agrienterprise, farmer's permanent characteristics, agrienterprise characteristics, goals and community culture. These factors have direct and indirect relationships and influence the use of ICT either positively or negatively and in an agrienterprise, the use of ICT also depends on the perceived value of ICT (Alvarez *et al.*, 2006). According to Taragola *et al.* (2005) the significant factors influencing the use of ICT in dairy industry to include cost of technology, lack of training, lack of technological infrastructures, lack of ICT proficiency, lack of ICT benefit awareness, too hard to use, trust level in the ICT system, system integration and software availability limit the use of ICT by dairy industry stakeholders. ICTs' adoption and assimilation in different agricultural value chains offer enormous opportunities to youth-led (young men and women) agribusiness activities, that notwithstanding, previous research has indicated that dissemination and assimilation of ICTs in Africa is lacking and numerous ideas, theories and perspectives pertaining to the understanding of ICTs' use in SMEs reflect the views of the West.

Thus, information technology contributes to economic activities through increase in aggregate productivity which will cause improvement on economic growth and development. ICT is the bedrock for organization and national survival and development on a rapidly changing global environment. Increase in usage of ICT per worker hour, increased output per hour tremendously. The ability of ICTs to bring refreshed

momentum to agriculture appears even more compelling in light of rising investments in agricultural research, such as creating agricultural value chain which identifies the set of actors and activities that bring basic agricultural product from production in the field to final consumption where at each stage value is added to the product (Okello *et al.*, 2010; Afande *et al.*, 2015; Sife *et al.*, 2010 and Sekabira *et al.* (2012). ICT innovations and contributions can advance value chains, providing new opportunities and attract more young people to the sector. Facilitating cheaper and more reliable access to ICT devices and connectivity is needed to accelerate ICT adoption among youth in agriculture (Sambira, 2013). Therefore, the researchers examine the impact of ICT on success/failure of youth-led agribusiness activities in different agricultural value chains.

### **Methodology**

This study was carried out in Southeast Nigeria, its coastal boundary is delimited by the Gulf of Guinea in the south and the land boundary is shared by Cameroon and Chad in the east, Niger in the north and Benin in the west. Abuja is Nigeria's capital city and Lagos is its largest city. Nigeria covers a total area of 923,768 sq. km. making it the thirty second largest country of the world. It has a small coastline of 853 km in comparison to its total land boundary of 4047 km. The latitudinal and longitudinal extent of the country is 4° to 14°N and 2° to 15°E respectively. The climate of the country varies from equatorial in the south to arid in the north and tropical in the center. The topography of the country has valley, plateaus and hilly areas. South-east Nigeria was one of the initial created during the Nigerian Civil War, which later broke into the present Akwa Ibom State and Cross River State. South-East became the name of one of the six geo-political zones in the country in the 1990s consisting of Abia State, Anambra State, Ebonyi State, Enugu State and Imo State. The local language in this region is Igbo.

### **Population of the Study**

This involved all youth-led agribusiness entrepreneurs in the south east that are involved in agricultural value chains.

### **Data collection and sampling techniques**

Data were collected through primary sources which involved the administration of a well-structured and pretested questionnaire, field observations and personal assessments. The study adopted a three-stage sampling strategy to select youth-led agribusiness entrepreneurs for the study: Stage 1 is purposive sampling to select three States (Abia, Enugu and Imo) from the five States in South East Nigeria. (Abia, Enugu, Imo, Anambra and Ebonyi); Stage 2 is random sampling of four Local Government Areas (L.G.A) from each State, making a total of 12 L.G.As. Stage 3 is random sampling of 2 autonomous communities from each L.G.A to give 24 communities. Finally, 15 youth-led agribusiness entrepreneurs were selected for the 24 communities. This bring the total sample to 360 youth-led agribusiness entrepreneurs.

### Model specification

#### Performance Analysis

This was used to estimate farm net revenue for value addition. Theoretically, net revenue (NR) is the total revenue (TR) less the total cost (TC);

$$NR = TR - TC \quad \dots (1)$$

Total cost is the addition of the entire variable cost (VC) and fixed cost (FC) items;

$$TC = TVC + TFC \quad \dots (2)$$

Total revenue is the total amount of money received from the sale of value added product;

$$TR = \sum P_x Q_x \quad \dots (3)$$

$$\text{Gross margin (GM)} = TR - TVC \quad \dots (4)$$

$$\text{Net income (NFI)} = GM - TFC \quad \dots (5)$$

The rate of return is a performance measure used to measure the amount of return on an investment relative to the investment cost. It is given by:

$$\text{Rate of Returns (ROR)} = NR/TC \quad \dots (6)$$

$$\text{Gross Ratio (GR)} = TC/TR \quad \dots (7)$$

$$\text{Benefit cost ratio (BCR)} = TR/TC \quad \dots (8)$$

P = price per value added product

Q = quantity of value added product sold

Value added product production is profitable if its BCR  $\geq 1$ . The higher the BCR, the more profitable the value added product is. Depreciation will be calculated using the straight line method.

#### Ordinary Least Square Regression

Effect of ICT usage on performance is explicitly specified as:

$$II = \delta + \delta_1 X_1 + \delta_2 X_2 + \delta_3 X_3 + \delta_4 X_4 + \delta_5 X_5 + \delta_6 X_6 + \delta_7 X_7 + \delta_8 X_8 + \mu \quad \dots (9)$$

Where;

II = Performance (proxy as profit define in equation 1; positive sign for success and negative sign for failure)

X<sub>1</sub> = Mobile Phones used in a given agricultural season (Naira)

X<sub>2</sub> = Radio used in a given agricultural season (Naira)

X<sub>3</sub> = Television used in a given agricultural season (1=yes, 0=no)

X<sub>4</sub> = Computer used in a given agricultural season (Naira)

X<sub>5</sub> = Office software used X<sub>6</sub> = Blogs and website used in a given agricultural season (Number)

X<sub>7</sub> = Camera used in a given agricultural season (Naira)

X<sub>8</sub> = Cost of data used in a given agricultural season (Naira)

$\delta_1$  to  $\delta_8$  = Regression parameters that were estimated

$\mu$  = Error term associated with data collection which was assumed to be normally distributed with zero mean and constant variance

### Results and Discussion

Table 1 present the socio-economic characteristics of youth farmers in south east Nigeria who participated in value-chain activities and self-employment through ICT. The average age of the respondent was 29 years. This implies that the youth in South East Nigeria are in economically active age and can be productive in carrying out agricultural value-chain activities and self-employment through ICT, this is expected to impact positively on their performance, given that energy required for production increases at very active age (Aigbokie *et al.*, 2021). Out of 360 respondents interviewed, 233 representing 64.72% were male. About 56.94% of the respondent were married. This implies stability, because according to Obike *et al.* (2019) married implies stability and married people are more settled as it relates to giving appropriate attention to farming operation. The average number of years of formal schooling was 16 years, this indicate that most youth are educated and receptive to adopting new value chain technologies and ICT usage. Higher literacy level would make them more favorably disposed to accessing information that would increase their value chain activities. Improved education level brings about positive changes in the knowledge, attitude and skills through research and extension (Okezie *et al.*, 2021). The average farming experience was 6, this implies that the respondents have not spent many years in farming. The number of years a farmer has spent in business may give an indication of the practical knowledge he has acquired on how he can overcome certain inherent farm problems (Nwaru, 2004). About 96.44% of the respondents were members of social organization, implying that the social capital formation among youth was high in South East Nigeria. This is because youth increase their services and bargaining power through involvement in groups, therefore gives them easier access to credit. Majority (70%) of the respondent had access to extension services; this implies that youth will gain useful information on value chain activities though their contact with extension agent. This will thus spur participation in agriculture. About 86% of the youth owned ICT tools such as radio and phone. This is because youth are major user of ICT tools (International telecommunication Union, 2017). Also the average land size acquired by the farmers was 1.86. This show that lack of land is major obstacle in youth participation in agricultural value chain activities. Although about 55.33% still prefer as major occupation. On average the youth received N38,460.16 monthly for social services, purchase of food and investment in production. The consequences are more serious when the income is 'low' and majority of them area married as portrayed by this study. Also, majority of the respondent had access to credit (83.33%), and by virtue of access to credit have better access to new innovation which will boost value chain activities and its related activities (Obike *et al.*, 2019).

A value chain is a business model that describes the full range of activities needed to create a product or service. Table 2 show the agricultural value chain activities

participated in the last 12 months. The result revealed that across all enterprises, the youth participated more in production process (88.89%), input supply in production (86.11%) and marketing and trade (66.67%). This implication is that youth major participation in agricultural value chain in South East Nigeria was majorly labour supply. This confirms with the findings of Afande *et al.* (2015) that youth are involved in agriculture by supply of labour.

The result in Table 3 show the ICT facilities used in Agricultural Value chain. Basically the result revealed that mobile phone (88.89%), internet (58.33%), radio (52.22%), computer (55.56%), social media (66.67%), facebook (58.33%) and Youtube/online videos (58.33%) are the most commonly used ICT tools in agriculture. The most used among all across was mobile phone. This is mainly because young people are the target group using phones, probably because of the ease and convenience in getting information on agricultural production techniques, money transfer and communication (GSM Association, 2017). This finding is inline with Sekabira *et al.* (2012) who reported that mobile phones are most frequent ICT tools used by young farmers to facilitate agricultural production.

The result in Table 4 showed performance of youth participation in agricultural value-chain activities in South East Nigeria per annum. From the result presented, the average revenue realized was N486,203.61. This was realized from input supply in production (N45,780.28), production process (N152,708.33), marketing and trade (N62,566.67), processing, packaging and storage (N55,555.56), finance access (N41,644.17), transportation (N102,804.17) and extension services (N25,144.44). The second phase of the table showed that the total cost of production was N166,433.33 for an average enterprise, with average variable cost accounting for 70.97% of total cost of production, while the fixed cost accounted for 29.03%. The table further reviewed the component of variable cost to include transportation cost (N17,727.22), feeding cost (N7,039.17), utility (water and electricity) (N26,483.33), tax (N27,905.56), maintenance (N15,947.22), storage cost (N5,783.33) and loading and offloading (N17,228.06). While the net return for an average youth was N319,770.3. This shows that youth participation in agricultural value-chain activities is a high yielding venture as indicated by the positive net returns recorded. Results also showed the rate of returns and gross ratio were 1.92 and 0.34, while the benefit cost ratio was 2.92. Aiyelaja and Ogunjimi (2013) revealed a cost-benefit ratio of 3.64. These are indications that business in the study area is economically viable since the benefit cost ratio shows that they can pay-off their debt and still remain in business. The implication is that the enterprise will be able to meet its long-term debts and financial obligations. This is essential to staying in business as it demonstrates an enterprise's ability to continue operations into the foreseeable future. A company that is insolvent will often enter bankruptcy. This has shown

youth participation in agricultural value-chain activities is profitable in the study area. Profitability analysis enables the individuals to examine the performance of the business noting areas where cost should be minimized and how profit could be maximized with optimum utilization of available resource. It serves as a guide to the entrepreneur in making wise decisions and also serves as an integral part of the overall performance of a business enterprise (Adirika *et al.*, 2012).

The Linear functional form was chosen as the lead equation (Table 5). The choice of the lead equation was based on the number of significant variables, magnitude of the coefficient of multiple determination ( $R^2$ ), and conformity of signs borne by the variable to with *a priori* expectation as well as the significance F-ratio. The coefficient of multiple determination was 0.969 which implies that 96.9% of the variation in the youth performance was explained by the explanatory variables included in the model. Mobile Phones (1%), Blogs and website used (1%) and used of camera (1%) were significant and positively related to performance of youth in the area. The implication of this is that increase in used of mobile phones, blogs and website used and used of camera will lead to increase in performance in agricultural value-chain. This in tandem with findings of Sekabira *et al.* (2012) who reported that use mobile phones, blogs and website used and camera facilitate agricultural production. The coefficient of cost of data was significant at 1% level but negatively related to performance of youth in the area participation in agricultural value-chain. This implies that the more expenses on data, the failure the performance of youth in participation in agricultural value-chain. Youth face difficulties high transaction cost in data along the value chain and high cost of data prevent them from accessing vital information online timely which lead to failure of business. The result is in consistent with FAO, (2012) who noted that reduced cost of data lead to success of participation in agricultural value chain.

## Conclusion

Findings of this study served as a premise for making the following conclusions: firstly production process, input supply in production and marketing and trade were the value chain youth participated more in secondly mobile phone, internet, radio, computer, social media, facebook and Youtube/online videos are the most commonly used ICT tools in agriculture. Thirdly the net return for an average youth was N319,770.3 and finally mobile Phones, Blogs, cost of data and website used and used of camera were significant factors affecting performance of youth in the area. There is therefore need for adequate use and management of facilities should be ensured by the youth-led (young men and women) agribusiness activities in different agricultural value chains in Southeast Nigeria. Government should provide adequate fund for youth-led (young men and women) agribusiness activities to enable it procure necessary relevant ICT facilities. Also Youth should engage themselves in continuous training in ICT facilities. Both private and public information providers



through ICT tools should keenly consider the different attributes of ICT tools (complementarity, accessibility, relevance, feedback timeliness and portability) which influence their usage in agriculture.

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**Table 1: Socio-economic characteristics of youth farmers in South east Nigeria**

Variables	Statistics (360)
Average Age (Years)	29 (5)
Gender (% of male)	64.72
Marital status (% of married)	56.94
Average education (number of years of formal schooling completed)	16.2 (6)
Experience	6 (3)
Group membership (% of farmers)	69.44
Access to extension (% of farmers)	70.00
Access to credit (% of farmers)	83.33
Average monthly income (Naira)	38,460.16 (10024.03)
Average land size (hectare)	1.86(1.03)
Main occupation (% of farmers)	55.33
Ownership of ICT tools (% of farmers)	86.11

**Source: Field Survey, (2022). NB: Standard deviation for mean values are in parentheses**

**Table 2: Distribution of respondent based on value chain activities**

Value Chain	*Frequency	Percentages
Input supply in production	310	86.11
Production process	320	88.89
Marketing and trade	240	66.67
Processing, packaging and storage	77	21.39
Finance access	200	55.56
Transportation	91	25.28
Extension services	188	52.22

*Source: Field survey; 2022. \*Multiple responses recorded*

**Table 3: ICT facilities used in Agricultural Value chain**

ICT facilities	Frequency	Percentage
Internet	210	58.33
Mobile phone	321	89.17
Radio	188	52.22
TV	77	21.39
Computer	200	55.56
Office software	91	25.28
Social media	240	66.67
Blogs and website	92	25.56
Facebook	210	58.33
Camera	64	17.78
YouTube/online videos	210	58.33

*Source: Field survey; 2022. \*Multiple responses recorded*

**Table 4: Performance of youth participation in agricultural value-chain activities in south east Nigeria**

	Mean	Std. Deviation	Skewness	Kurtosis	% of Revenue
<b>A. Revenue</b>					
Input supply in production	45,780.28	474817.82	18.79	355.21	9.42
Production process	152,708.33	398046.53	6.02	61.37	31.41
Marketing and trade	62,566.67	524577.75	9.34	85.89	12.87
Processing, packaging and storage	55,555.56	524839.51	9.37	86.22	11.43
Finance access	41,644.17	190264.38	8.06	68.56	8.57
Transportation	102,804.17	382782.54	16.43	295.61	21.14
Extension services	25,144.44	371042.90	18.63	350.71	5.17
<b>Total return/revenue</b>	<b>486,203.61</b>	<b>1101171.22</b>	<b>4.88</b>	<b>27.15</b>	<b>100.00</b>
<b>B. Cost</b>					
					<b>% of cost</b>
Transportation cost	17,727.22	157615.14	9.32	85.60	10.65
Feeding cost	7,039.17	43129.50	9.30	91.95	4.23
Utility (water and electricity)	26,483.33	88274.32	5.14	29.29	15.91
Tax	27,905.56	99901.50	4.93	27.45	16.77
Maintenance	15,947.22	54670.04	4.53	21.47	9.58
Storage cost	5,783.33	42494.41	8.98	80.95	3.47
Loading and offloading	17,228.06	71153.16	6.56	49.92	10.35
<b>Total Variable cost</b>	<b>118,113.89</b>	<b>224257.50</b>	<b>3.36</b>	<b>15.20</b>	<b>70.97</b>
Gross profit					
<b>Fixed cost</b>	<b>48,319.44</b>	<b>202171.76</b>	<b>4.19</b>	<b>16.22</b>	<b>29.03</b>
<b>Total cost</b>	<b>166,433.33</b>	<b>301576.63</b>	<b>2.52</b>	<b>6.53</b>	<b>100.00</b>
<b>C. Profit</b>					
Net Return	319,770.3	799594.6	2.36	20.62	
Rate of Returns (ROR) = NR/TC	1.92				
Gross Ratio (GR) = TC/TR	0.34				
Benefit cost ratio (BCR) = TR/TC	2.92				

*Source: Field Survey Data, 2022*

**Table 5: Effect of ICT usage on performance (Success/Failure) of youth participation in agricultural value-chain**

<b>Variables</b>	<b>Linear(+)</b>	<b>Exponential</b>	<b>Semi log</b>	<b>Double log</b>
Constant	21679.734 (15.937)***	0.117 (4.287)***	126934.569 (5.656)***	1.2519 (7.446)***
Mobile Phones	21679.734 (15.937)***	0.117 (4.287)***	126934.569 (5.656)***	1.2519 (7.446)***
Radio used	1936.684 (0.208)	-0.184 (-0.982)	16280.051 (0.301)	-0.131 (-0.381)
Television used	665.871 (0.262)	-0.017 (-0.315)	7276.774 (0.209)	-0.174 (-0.744)
Computer used	40.251 (0.045)	0.017 (0.953)	-10855.798 (-0.497)	-0.028 (-0.203)
Office software used	-1243.175 (-0.191)	0.014 (0.110)	-32.904 (-0.001)	-0.158 (-0.914)
Blogs and website used	3.603 (4.240)***	0.000 (6.920)***	29800.329 (0.239)	4.818 (4.524)***
Camera used	4.601 (3.779)***	9.045E-5 (3.671)***	232855.291 (2.795)***	3.614 (5.664)***
Cost of data	-12.754 (-3.240)***	8.394E-5 (1.065)	-18781.348 (-1.840)*	-0.112 (-1.725)*
R <sup>2</sup>	0.969	0.911	0.880	0.965
R <sup>-2</sup>	0.961	0.887	0.847	0.954
F-ratio	128.129***	38.152***	26.645***	89.137***

*Source: Field survey (2022).* + lead equation, \*\*\* Significant at 1%, \*\* Significant at 5%, \*significant at 10%.