

**E-BUSINESS IN AGRICULTURE: RELEVANCE, IMPORTANCE AND
CONSTRAINTS OF INFORMATION AND COMMUNICATION TECHNOLOGY
(ICT) TO COMMODITY TRADE IN NIGERIA**

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Abstract

This study investigates the E-business in agriculture, its relevance, importance and constraints of information and communication technology to community trade in Nigeria. In agriculture, there was great enthusiasm for on-line trading of inputs as well as outputs, for instance in the UK, several multi-national projects were established to exploit this perceived opportunity. The south-western states of Nigeria were considered for this work and a well structured questionnaire was used to interview the respondents. Their socio-economic characteristics, business data, type of business practice, ICT appreciation/ their awareness were sourced for with questionnaire. From the analysis, it was discovered that a higher proportion (56%) of the marketers deal in cocoa beans marketing only and practice sole proprietorship while 44% added oil palm produce to cocoa bean marketing as well as trade with partners. These factors may have effect on the decision of respondents to trade on-line. Majority had no knowledge of computing, had neither computer nor attended computer use training (78%, 89% and 89%) respectively. 50% of respondents viewed ICT as being risky to their business, equal proportioning (50%) wanted training to improve awareness/ knowledge on ICT use and to encourage ICT in produce marketing. However, the regression model of selected factors on the level of use of ICT in agribusiness showed that the use of ICT in record keeping, agribusiness record kept using ICT and the perceived effects of ICT on profitability were significant (< 0.05 , < 0.05 , $p < 0.001$ respectively). Furthermore, the elasticity estimate for the types of records kept was -0.49, while the elasticity estimate for effect of ICT on (firm's) profitability was 1.41. This calls for education on the relevance and importance of ICT on agribusiness profitability.

Keywords: *Business, computer trading community economic*

Introduction

In recent times, technology sophistication such as ICTs (Information and Communication Technologies) of which Internet technology is a key component, is becoming very important in everyday activities including agriculture (Pickernell *et al*, 2004; Michailidis, 2007; Roldan and Wong, 2008; Mishra *et al*, 2009; Sudaryanto and Soekartawi, 2009). ICT through the internet constitutes an effective business resource as it provides a persistent communication infrastructure as well as huge business opportunities (Mishra and Park, 2005; Andreopoulou *et al*, 2008).

Fong (2009) opined that there is a consensus that ICT (internet technology inclusive) have a propensity to contribute to economic growth and to improve quality of life. For example, these technologies can be deployed to facilitate integration of value chains within and among firms, industries and economic sectors (Fong, 2009). For farm businesses operating in remote rural areas, internet-based technologies offer the prospect of overcoming disadvantages relative to urban areas, particularly those related to spatial and social isolation (Warren, 2002). If ever there was an example of expectation in IT (Information Technology) being ahead of reality, then it must be e-Commerce. In agriculture there was great enthusiasm for on-line trading of inputs as well as outputs; for instance in the UK, several multi-national projects were established to exploit this perceived opportunity.

According to Sudaryanto and Soekartawi (2009), internet technology has now made it possible to search for and find on-demand and necessary information very easily. Furthermore, the convenience of advertising or selling products worldwide using e-commerce facilities of the Internet technology has led to the rapid expansion of business activities including agribusiness. This becomes pertinent because market information with advances in ICT is necessary to penetrate a global market. Be this as it may, the Internet technology is fraught with some set-backs or disadvantages and this was why Palmer (2002) argued that there is nothing like “e-business” since what is mostly referred to as e-business is a relatively poorly developed bundle of technologies that are yet to achieve full application in order to deliver optimum benefit. However, according to Warren (2002), notwithstanding the initial failures and apparent set-backs of this (Internet) technology, there are a large number of smaller Internet based output trading sites particularly in agriculture and horticulture which are trading very successfully. Much of this activity is focused on niche products often in the organic or ‘green’ sector where the demographics of internet users tend to favour this type of trading. Typically these businesses already

operate mail order delivery which means that fulfillment, a major obstacle to successful e-trading, is already in place.

There is undoubtedly a place for e-trading in agriculture. Agriculture's fragmented structure, relatively dispersed trading community and consequently inefficient supply chains mean that the Internet provides ample scope to reduce costs and improve service levels (Warren, 2002).

Uzoka *et al* (2007) examined the development of ICT-based businesses (or e-commerce) in a developing country i.e. Botswana, however they asserted that most of the studies conducted on e-commerce and other technology adoption has been in developed countries because developing countries have been slow in fitting into the global digital market. Therefore, this study evaluates the utilization of e-commerce in commodity business in South-western Nigeria with particular reference to commodity trade especially cocoa.

Methodology

The study area was selected from South-west geo-political zone of Nigeria. The zone is situated within the tropics and has fifteen ethnic groups with *Yoruba* as the general language of communication by the people. The major food crops grown in the study area include cereals like maize and rice; root and tubers such as cassava and yam while the main cash crops are cocoa, kola nut, rubber and palm produce. Many educational institutions, industries as well as health facilities and public utilities such as police station, commercial Banks, judiciary, etc can be found in the zone.

Using a multi-stage sampling technique; three States (Oyo, Osun and Ogun) were randomly selected in the zone (i.e. 50%) as the study area in the first stage. The second stage involved a random selection of five Local Government Areas (LGAs) each from the selected States. The third stage was typified by a simple random sampling of two towns/villages in each selected LGA. In the last stage, four (4) cocoa traders were randomly sampled from each selected town/village and interviewed with the use of a well-structured questionnaire. This makes a total of 120 respondents out of which 90 were found useful while the remaining (30) were rejected because of inadequate information and inconsistencies in information volunteered (a response rate of 75%).

The information sought from the questionnaire pertains to the factors affecting the utilization of ICT in agricultural commodity in South Western Nigeria. Some of the information sourced with

the questionnaire include: socio-economic characteristics e.g. age, educational and marital status; business data such as commodity of trade and type of business practice; as well as the ICT appreciation of the traders such as computer and internet awareness. Information obtained were analyzed using simple descriptive statistics such as averages and percentages, Chi-square statistics as well as Ordinary Least Square (OLS) regression technique.

Chi-square is calculated using the formula below:

$$\chi^2 = \sum \{ (O - E) O^{-1} \}^2 \text{-----} (1)$$

where:

O = observed values of variable,

E = expected values of variable.

The Chi-square statistic is compared to the tabulated at observed degree of freedom.

The OLS model estimates the combined effect of independent variables on a dependent factor.

The model is implicitly expressed as :

$$L_i = \alpha_i X_i + \epsilon_i \text{-----} (2)$$

where:

L_i = level of ICT use;

α_i = vector of estimated parameters;

X_i = individual variables considered in the study;

ϵ_i = the error term.

$X_{i,\dots,n}$ = ith to nth variable used in measuring the responsiveness of ICT use level to influencing factors.

The variables considered in this study on the use of ICT are indicated as follows:

X_1 = Socio-economic factors,

X_2 = Agri-business features,

X_3 = Knowledge of computer,

X_4 = ¹Skill in computer,

X_5 = ¹Knowledge of ICT,

X_6 = ¹Perception of ICT,

X_7 = ¹Perception of ICT on Agri-business trading.

¹ The weighted values of the variable were used in running the regression analysis.

The significant variables from the Chi-square analysis were included in the regression model. Furthermore, the elasticity of respective variables was computed with the statistic enumerated below:

$$\{\delta L_i(\delta X_i)^{-1}\} \bullet \{X(L)^{-1}\} \text{-----} (3)$$

where:

$$\{\delta L_i(\delta X_i)^{-1}\} = \alpha_i$$

X = mean value of $X_{i,\dots,n}$ ($X_{i,\dots,n}$ as defined previously),

²L = mean value of L_i (L_i as previously defined).

Results and Discussion

From Table 1, it is apparent could be seen that more males (89%) than females (11%) were involved in commodity trade in the study area. This contradicts erstwhile reports that marketing of agricultural produce is mainly an exclusive preserve of the female gender. However, this finding could be as a result of the special skills and particularly enormous time required in successfully trading in commodity produce that accounts for few of the female gender participation since they have some other duties especially domestic ones on their schedule. Gender could there be a significant factor in the prospect of produce marketers adopting e-business in their vocational activities.

A higher proportion (56%) of the marketers deal in cocoa beans marketing only and practice sole proprietorship while the rest (44%) added oil palm produce to cocoa beans marketing as well as trade with partner(s) (Table 1). These factors may have effect on the decision of respondents to trade on-line. Many (56%) marketers utilize hired labour in conducting their business with an average of 6 mandays (with a positively skewed distribution) and an overwhelming majority (89%) believed their business is labour intensive. Therefore, marketers may not readily embrace e-business as a result of possible limited time for business which they may not be ready to invest in on-line trading.

Majority (78%, 89% and 89% respectively) had no knowledge of computing; had no computer nor attended computer use training (Table 2). These factors could be significant in the prospective adoption of e-business by respondent marketers in the study area. From those who had knowledge about computing, only a few (25%) rated their skill in use of spread sheet (such as Excel) and power point as fairly good. However, 50% of the respondents rated their use of

² The weighted values of the variable were used in running the regression analysis.

Table 1: Socio-economic characteristics and agri-business features of respondents**Respondents' Socio-economic Characteristics**

<i>Variable</i>	<i>Description</i>	<i>Frequency</i>	<i>Percent</i>
<i>Socio-economic characteristics</i>			
<i>Gender</i>	Male	80	88.89
	Female	10	11.11
	Total	90	100.00
<i>Marital Status</i>	Single	5	5.56
	Married	85	94.44
	Total	90	100.00
<i>Educational Status</i>	Primary Education	20	22.22
	Post Primary Education	65	72.22
	Tertiary Education	5	5.56
	Total	90	100.00
<i>Religion</i>	Christianity	30	33.33
	Islam	60	66.67
	Total	90	100.00
<i>Secondary Occupation</i>	Yes	35	38.89
	No	55	61.11
	Total	90	100.00
<i>Age</i>	Statistics	40*	2.11**
<i>Years of business</i>	Statistics	18*	0.90**
<i>Income</i>	Statistics	1,004,966.67*	1.34**
Respondents' Agri-business features			
<i>Mix produce</i>	Cocoa only	50	55.56
	Cocoa + Oil palm	40	44.44
	Total	90	100.00
<i>Type of business</i>	Sole proprietorship	50	55.56
	Partnership	40	44.44
	Total	90	100.00
<i>Type of Labour</i>	Family Labour	40	44.44
	Hired Labour	50	55.56
	Total	90	100.00
<i>Business Practice Labour Intensive</i>	Yes	80	88.89
	No	10	11.11
	Total	90	100.00
<i>Number of worker</i>	Statistics	6*	0.92**

NB:- *Mean Value, **Skewness.

Source: Field Survey, 2009.

Table 2: Respondent Knowledge and Skill in computer

<i>Variable</i>	<i>Description</i>	<i>Frequency</i>	<i>Percent</i>
<i>Computer compliance level</i>			
<i>Computer Know How (Operating)</i>	Yes	20	22.22
	No	70	77.78
	<i>Total</i>	90	100.00
<i>Have PC</i>	Yes	10	11.11
	No	80	88.89
	<i>Total</i>	90	100.00
<i>Computer Type</i>	Lap top	10	11.11
	Don't Know	80	88.89
	<i>Total</i>	90	100.00
<i>Attend Computer Training</i>	Yes	10	11.11
	No	80	88.89
	<i>Total</i>	90	100.00
<i>Computer skills</i>			
<i>Skill in Word Processing</i>	fairly good	15	75.00
	poor	5	25.00
	<i>Total</i>	20	100.00
<i>Skill in Spread Sheet</i>	fairly good	5	25.00
	Not at all	15	75.00
	<i>Total</i>	20	100.00
<i>Skill in Power Point</i>	fairly good	5	25.00
	Not at all	15	75.00
	<i>Total</i>	20	100.00
<i>Skill in Programming</i>	fairly good	5	25.00
	Not at all	15	75.00
	<i>Total</i>	20	100.00
<i>Skill in Doors Prompt</i>	Not at all	20	100.00
	<i>Total</i>	20	100.00
<i>Skill in Windows Application</i>	Not at all	20	100.00
	<i>Total</i>	20	100.00
<i>Name Computer Software</i>	fairly good	10	50.00
	poor	10	50.00
	<i>Total</i>	20	100.00
	Microsoft Office	20	100.00
	<i>Total</i>	20	100.00

Source: Field Survey, 2009.

windows application as fairly good and poor respectively (Table 2). While 75% of the marketers rated their understanding/use of words (processing) as fairly good, all (100%) had no idea of programming and doors (application). Equally, all (100%) of the respondent marketers knew only Microsoft office as a software (Table 2). The above implies a bleak prospect for extensive use of e-bus by the respondents in the study area. An appreciable proportion (61%) of respondents were aware of ICT while quite a low proportion (17%) use ICT and none (100%) attended ICT use training before (Table 3). All of those (100%) who use ICT have particular facility they use which was identified by all (100%) of them to be commercial cybercafé (Table 3). Out of those who use ICT an appreciable proportion (67%) know how to operate ICT facilities and they use ICT for business related information respectively (Table 3). Majority (67%) of ICT users amongst the respondents use ICT in marketing operation while 33% use it in sourcing information on produce collection. Most of the respondents (61%) expressed support to encourage other businessmen in using ICT. A larger proportion (56%) of respondents among those who were aware of ICT identified cost as the major constraint to their use of ICT while lack of awareness hinders its use for 39% and 6% did not like the technology (Table 3). However, all (100%) indicated interest in participating in subsidy scheme and training on ICT (Table 3)). This implies that these factors could be significant in the prospect of ICT use by respondents in the study area.

Majority of the respondents (67%) who use ICT, source information generally on their business with the technology while a few (33%) did using the website (Table 4). As revealed in Table 3, Table 4 equally showed that ICT users used the technology in sourcing information on marketing aspect of their business particularly domestic price and standardization. Information on other aspects of produce business i.e. agro-chemicals (preservatives) equipment, implement and produce quality parameters were obtained through other sources such as friends and associates by majority of the respondents (72%, 61%, 50% and 67% respectively). These factors may be very important in the level of use of ICT by the respondents in the study area.

Table 3: Respondents' Level of ICT Compliance

<i>Variable</i>	<i>Description</i>	<i>Frequency</i>	<i>Percent</i>
<i>ICT Awareness</i>	Yes	55	61.11
	No	35	38.89
	Total	90	100.00
<i>ICT Use</i>	Yes	15	16.67
	No	75	83.33
	Total	90	100.00
<i>Attend ICT Training</i>	No	90	100.00
	Total	90	100.00
<i>Use of ICT Facility</i>	Yes	15	100.00
	Total	15	100.00
<i>Type of ICT Facility</i>	Cybercafe	15	100.00
	Total	15	100.00
<i>Know how to Operate ICT Facility</i>	Yes	10	66.67
	No	5	33.33
	Total	15	100.00
<i>Keep/Search business Related Records with ICT</i>	Yes	10	66.67
	No	5	33.33
	Total	15	100.00
<i>Business Operation in which you utilise ICT</i>	Produce collection	5	33.33
	marketing of farm produces	10	66.67
	Total	15	100.00
<i>Encourage other business men on ICT use</i>	Yes	55	61.11
	No	10	11.11
	Don't use	25	27.78
	Total	90	100.00
<i>Constraint to ICT use</i>	Lack of awareness	35	38.89
	Just don't like it	5	5.56
	Costly	50	55.56
	Total	90	100.00
<i>Interested in Subsidized ICT scheme</i>	Yes	90	100.00
	Total	90	100.00
<i>Participation in ICT Use seminar</i>	Yes	90	100.00
	Total	90	100.00

Source: Field Survey, 2009.

Table 4: Respondent Information Sources on Business Activities

<i>Variable</i>	<i>Description</i>	<i>Frequency</i>	<i>Percent</i>
<i>Use ICT to search info relating to firm</i>	Yes	5	33.33
	No	10	66.67
	Total	15	100.00
<i>Source of Info</i>	None	85	94.44
	Web	5	5.56
	Total	90	100.00
<i>Input_Agroxclas</i>	Books	5	5.56
	Print media	15	16.67
	Electronic media	5	5.56
	Others (e.g. fellow farmers)	65	72.22
	Total	90	100.00
<i>Input_equipment</i>	Print media	20	22.22
	Electronic media	15	16.67
	Others	55	61.11
	Total	90	100.00
<i>Input_Implement</i>	Books	10	11.11
	Print media	5	5.56
	Electronic media	30	33.33
	Others	45	50.00
	Total	90	100.00
<i>Marketing_Quality parameters</i>	Print media	25	27.78
	Electronic media	5	5.56
	Others	60	66.67
	Total	90	100.00
<i>Marketing_Domestic Price</i>	ICT	5	5.56
	Electronic media	35	38.89
	Others	50	55.56
	Total	90	100.00
<i>Marketing_Standardisation</i>	ICT	5	5.56
	Books	5	5.56
	Electronic media	10	11.11
	Others	70	77.78
	Total	90	100.00

Source: Field Survey, 2009.

All (100%) users of ICT perceived their level on knowledge of ICT as fairly good while many (67%) of them believed their level of ICT was low and 67% perceived their skill in internet use as fairly good (Table 7). Generally, about 50% of (all) respondents believed the use of ICT for their business operation was difficult or very difficult (Table 7). Also about 50% viewed ICT has having a low to very low degree in importance to their business while majority (83%) can

not evaluate the effect ICT may have on produce marketing (Table 7). This shows a low estimation of ICT relevance and importance to produce marketing in the perspective of the practitioners.

Table 5: Respondents' Perception of Use of ICT

<i>Variable</i>	<i>Description</i>	<i>Frequency</i>	<i>Percent</i>
<i>Level of ICT Knowledge</i>	fairly good	15	100.00
	Total	15	100.00
<i>Level of ICT Use</i>	Moderate	5	33.33
	Low	10	66.67
	Total	15	100.00
<i>Skill in Internet</i>	fairly good	10	66.67
	Poor	5	33.33
	Total	15	100.00
<i>ICT use for firm operations</i>	Very easy	10	11.11
	Easy	30	33.33
	Slightly easy	5	5.56
	Difficult	15	16.67
	Very difficult	30	33.33
	Total	90	100.00
<i>Effect of ICT on Business profitability</i>	Cant evaluate	75	83.33
	Low	5	5.56
	Loss	10	11.11
	Total	90	100.00
<i>Degree of ICT importance</i>	High	10	11.11
	Moderate	35	38.89
	Low	10	11.11
	Very low	35	38.89
	Total	90	100.00

Source: Field Survey, 2009.

Majority (about 61%) of the respondent marketers believed that the use of ICT for gathering produce, impute and processing records was either difficult or very difficult (Table 6). However, about 61% and 66% respectively believe that the use of ICT for warehousing and marketing records was very easy or slightly easy (Table 6). Furthermore, although most (50%) of the respondents viewed ICT (particularly internet) as been risky to their business, equal proportions (50% wanted training to improve awareness/knowledge on ICT use and to encourage ICT use in produce marketing respectively (Table 6). This shows further that the estimation of the relevance and importance of ICT in produce marketing by respondents is low and need improvement.

Table 6: Respondents' Perception of ICT in Business Activities.

<i>Variable</i>	<i>Description</i>	<i>Frequency</i>	<i>Percent</i>
<i>Rating for use of ICT produce (gathering) record</i>	Easy	15	16.67
	Slightly easy	20	22.22
	Difficult	15	16.67
	Very difficult	40	44.44
	Total	90	100.00
<i>Rating for use of ICT firm input record</i>	Easy	25	27.78
	Slightly easy	10	11.11
	Difficult	30	33.33
	Very difficult	25	27.78
	Total	90	100.00
<i>Rating for use of ICT firm primary processing record</i>	Easy	20	22.22
	Slightly easy	15	16.67
	Difficult	30	33.33
	Very difficult	25	27.78
	Total	90	100.00
<i>Rating for use of ICT firm warehousing record</i>	Very easy	5	5.56
	Easy	30	33.33
	Slightly easy	20	22.22
	Difficult	10	11.11
	Very difficult	25	27.78
	Total	90	100.00
<i>Rating for use of ICT firm marketing record</i>	Very easy	20	22.22
	Easy	35	38.89
	Slightly easy	5	5.56
	Difficult	5	5.56
	Very difficult	25	27.78
	Total	90	100.00
<i>Comparison of ICT use & other firm records methods</i>	quite appropriate	40	44.44
	Appropriate	45	50.00
	very appropriate	5	5.56
	Total	90	100.00
<i>Perception on Firm Business</i>	Yes	50	55.56
	No	40	44.44
	Total	90	100.00
<i>Suggestion for encouraging/improving ICT use</i>	need for training to improve our knowledge on ICT use	45	50.00
	encouraging produce buyers to adopt ICT use	45	50.00
	Total	90	100.00

Source: Field Survey, 2009.

Table 7: Factors affecting ICT use in agricultural trading

<i>Variable</i>	<i>X²-Statistic</i>	<i>Prob.</i>
<i>Socio-Economic r Characteristics</i>		
<i>Gender</i>	1.80	0.18
<i>Age</i>	13.20	0.36
<i>Marital Status</i>	0.21	0.65
<i>Educational Status</i>	1.39	0.50
<i>Years of business</i>	9.60	0.48
<i>Mix produce</i>	0.18	0.67
<i>Income</i>	14.40	0.35
<i>Type of biz</i>	0.18	0.67
<i>Computer Know How (Operating)</i>	4.11**	0.04
<i>Have PC</i>	1.80	0.18
<i>Attend Computer Training</i>	1.80	0.18
<i>Effect of ICT Variables</i>		
<i>ICT Awareness</i>	2.29	0.13
<i>Use of ICT Facility</i>	18.55***	0.00
<i>Know how to Operate ICT Facility</i>	18.15***	0.00
<i>Keep/Search biz Related Records with ICT</i>	11.25***	0.00
<i>Business Operation in which you utilise ICT</i>	18.10***	0.00
<i>Perception of Respondent on ICT</i>		
<i>Effect of ICT on Biz profitability</i>	18.11**	0.01
<i>Level of ICT Use</i>	18.40***	0.00
<i>Degree of ICT importance</i>	4.15	0.25
<i>Skill in Internet</i>	11.31***	0.00
<i>Rating for use of ICT produce (gathering) record</i>	1.50	0.68
<i>Rating for use of ICT firm input record</i>	4.80	0.19
<i>Rating for use of ICT firm primary processing record</i>	7.20*	0.07
<i>Rating for use of ICT firm warehousing record</i>	3.00	0.56
<i>Rating for use of ICT firm marketing record</i>	2.31	0.68
<i>Comparison of ICT use & other firm records methods</i>	0.50	0.78

NB:- *Sig. at 1%, **Sig. at 5%, *Sig. at 10%**

No socio-economic characteristic of respondent had any significant effect on respondents' ICT use (Table 7). This implies that respondent use or non use of ICT does not have anything to do with respondent's socio-economic features. Table 7 also shows that computing knowledge, ICT facility used by respondent, knowledge of how to operate ICT facility, search of business related information and aspect of business operation information being searched all had significant influence of ICT use by respondents ($p < 0.05$, $p < 0.001$, $p < 0.001$, $p < 0.001$ and $p < 0.001$ respectively). These factors become important in the use of ICT for produce marketing.

From the perception variables the factors that have significant effect on the use of ICT by respondent ICT users were perceptions on effect of ICT on profitability, level of ICT use, skill on the internet and use of ICT for search (primary) processing record ($p < 0.05$, $p < 0.001$, $p < 0.001$ and $p < 0.01$). Hence, these factors are crucial in the use of ICT by produce marketers.

Table 8: Regression Result for Level of Use of ICT in Agribusiness

<i>Variables</i>	<i>Coefficients</i>	<i>Std. Error</i>	<i>Prob.</i>	<i>Elasticity</i>
<i>Constant</i>	-0.42	0.12	0.01**	-
<i>Knowledge of Operating Computer</i>	0.04	0.02	0.11	0.04
<i>Use ICT in Record Keeping</i>	0.12	0.04	0.02**	0.12
<i>Agribusiness Record Kept using ICT</i>	-0.49	0.02	0.04**	-0.49
<i>Effect of ICT on Profitability</i>	0.79	0.11	0.00***	1.41
<i>Degree of ICT Importance to Firm</i>	0.01	0.04	0.75	0.03
<i>Use of ICT for Primary Prod. Records</i>	0.03	0.04	0.38	0.08
<i>F-Statistic</i>	22.81	-	0.00***	-
<i>R-Square</i>	0.93	0.03	-	-
<i>Adj. R-Square</i>	0.89	-	-	-
<i>Durbin-Watson Statistic</i>	1.55	-	-	-

***, **, ***Sig. at 10%, 5%, 1% respectively**

The significant variables from the Chi-square analysis were pooled together in the regression model. From nine significant factors only seven were allowed in the regression run, the use of ICT Facility and ICT Operation Know-how were removed probably due to interaction effect of

similar variables in the model. From the selected 7 factors, the level of use of ICT was taken as the independent variable. The result showed that only 3 were significant, the use of ICT in record keeping, agribusiness record kept using ICT and the perceived effect of ICT on profitability (< 0.05 , < 0.05 , $p < 0.001$ respectively).

The elasticity estimate for the use of ICT in keeping agribusiness records was computed to be 0.12. This implies that the more an entrepreneur keeps records with ICT, the more the level of ICT use. Furthermore, the elasticity estimate for the types of records kept by agribusiness entrepreneur was -0.49. This implies that the more the types of records kept by entrepreneur the lower the level of ICT use, i.e. keeping too many records indicates low intensity of ICT use. Also, the elasticity estimate for effect of ICT on (firm's) profitability was 1.41, meaning that the more an entrepreneur perceived ICT as enhancing profit, the more the intensity of ICT use in agribusiness activities. Hence, from the elasticity estimates, the greatest positive impact is on firm's profitability while keeping records that is not ICT compliant will have negative impact on the level of ICT use in agri-business.

Conclusion

We can see that no socio-economic characteristic of respondent had any significant effect on respondents' ICT use. This implies that the use or non use of ICT have no relevance with respondent's socio-economic features in the area of study. The factors that have significant effect on the use of ICT by respondent / ICT users were perceptions of the respondents on effect of ICT on profitability, level of ICT use, skill on the internet and use of ICT for search (primary) processing record . Hence, these factors are crucial in the use of ICT by produce marketers. This become pertinent in view of Boadi *et al* (2007) findings on the role of m-commerce in Ghana farmers' decision-making on business transactions However, further study need be carried out to ascertain influence of location (in terms of residence i.e. rural or urban) and the six geopolitical zones in Nigeria.

However, it is also necessary to examine the digital divide existing within the production and marketing enterprises of the cocoa sub-sector in the study area in terms of the various digital media being employed in agri-business in Africa with particular reference to Nigeria such as m-commerce (i.e. the use of mobile phone in agri-business e.g. Sanusi *et al*, 2007 and Boadi *et al*,

2007) and e-commerce (i.e. the use of internet in agri-business e.g. Pickernel *et al*, 2004 and Mishra and Park, 2005).

Finally it could be seen from the regression model result and the elasticity estimates that the greatest positive impact that will increase the level of use of ICT in agribusiness is traders' perception of the benefits of ICT on their firm's profitability while keeping records that is not ICT compliant will have negative impact on the level of ICT use in agri-business. It is therefore important to evolve ways of educating the traders in agribusiness on the benefits of using ICT especially in their record keeping towards increasing their profitability through better information on prices and markets for their commodities. This becomes pertinent because market information with advances in ICT is necessary to penetrate a global market.

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