

Digital Communication Tools Usage and Buyer-Seller Relationship: Cocoa Smallholder Farmers' Perspectives

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Abstract

Cocoa farming, production and exports in Nigeria remain a study focus because of the agricultural sector revenue in the pre-crude oil era of Nigerian history. Cocoa being one of the chief sources of revenue and exporting income for the country, exposes the subsector to contention and continuous review for analysts and policymakers to improve both the farming practices and commercial viability of the sphere. This study uses a smallholder population of 87 respondents in Ondo state to describe and analyze the buyer-seller relationship of cocoa farmers in the region. This article examined the level of usage of digital communication tools among cocoa farmers and evaluated the impact of digital communication tools used on the buyer-seller relationship in the study area. ANOVA, regression analysis, Pearson correlation analysis were employed for empirical investigations. The study findings revealed that the propensity to the adoption of digital communication tools is low and widespread adoption can eliminate challenges of trust, satisfaction, and imperfect market with regards to the information in the relationship context as extended by previous studies. It is recommended that beyond Messengers and SMS, a further advancement to using other means of communication including social media and video-conferencing can aid in solving some of the issues meandering the buyer-seller relationship. Congruently, global market rivalry and international standards in cocoa farming and processing can be achieved if digital communication tools are widely adopted by farmers in the region.

Keywords: Digital Communication Tools, Buyer-Seller Relationship

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1. Introduction

Overview of Cocoa Smallholder Farmers in Nigeria

In Africa and the sub-region of West Africa, the country is regarded as the fourth-largest producer, covering a 6.5% share of global production (Lawal et al., 2016). Even though the crop is cultivated on a large scale, however, the sector has always been dominated by smallholder farmers and remains a critical source of livelihood for rural populations in states where the crop is produced. This is because of subsistence operations that are carried out through inherited farmland, and mode of sharecropping system in which two-thirds of the harvest accrues to the capitalist landowners, who also subsidized the mechanization process through acquisition of farming implements that facilitate mass cocoa production and in turn yield enormous amount of profit (Anthony Eghe et al., 2014)

Nonetheless, the country's cocoa plantation sector still reflected the dominating impact of smallholder farmers that are numbered close to 350,000 and cultivated around 1.4 million hectares of farmland in the cocoa production process. And as a result, the country is seen as a major player in international cocoa production (NEPC, 2018).

Furthermore, the concept of smallholder farmers has always served as the nucleus and contributed immensely to the expansion and sustenance of socio-economic growth and development of any nation. It has been posited that smallholder farmers are those that own small-based arable land that is utilized for subsistence farming which means they operate on a small-scale level of food and cash crops production (Jelili, 2020).

More importantly, it has been observed that almost 80% of farmers are smallholder farmers in the country and 98% of food and cash crops consumed in the country are produced by these smallholder farmers. This showcases that the smallholder farming system is integral in sustaining food security which remains crucial to the socio-economic growth and development of the country. Hence, the smallholder farming system serves as the base or superstructure upon which other food security value chain processes heavily rely, which creates both physical and economic access leading to sufficient and sustainable food for the populace of the country (Jelili, 2020).

From the foregoing, the relationship between cocoa smallholder farmers and the Nigerian government has been encouraging recently. Even though, there are some evident changes due to the impact of the pandemic on the socio-economic growth and development of the country. Before the discovery of crude oil, cocoa production serves as one of the major sources of the country's foreign exchange revenue and as of the year 2020, the country's foreign export trading stood at N135 Billion despite encountering supply and demand shortfalls because of the pandemic (Lawal et al., 2016; Amuge, 2021).

Moreover, the cocoa smallholder farmers and other stakeholders are set for more profit sharing as a tonne of cocoa has now risen to \$2,500 and the government is now moved in their economic diversification agenda by ensuring that they partner smallholder farmers in a crucial area of development of the sector such as; handling out of cocoa seedling to these farmers at a subsidized rate, providing credit facilities through the Cocoa Association of Nigeria that will facilitate quick cash in the procurement of farming utilities for the smallholder farmers, making available the necessary insecticides and pesticides while increasing the extension services as well as ensuring that there is transparency in price-setting policies (Amuge, 2021).

Furthermore, the government is also currently looking at providing constant training in the application of modern techniques and agricultural practices including the operation of collapsible solar dryers which will be useful in terms of mini processing of cocoa after harvesting (Lawal et al., 2016; Amuge, 2021).

Nevertheless, the most critical challenge been faced by these cocoa smallholder farmers could be said to be the moribund nature of farmland that has led to low productivity level and which the government has assured them that those that fall under that category will be trained on how to carry out structural rehabilitation that will bring back the waning farmland into full productivity (Amuge, 2021).

In a nutshell, the impact of cocoa smallholder farmers cannot be overemphasized as they serve as the lynchpin in the overall growth and development of the cocoa sector as well as government support, initiatives and policies are essential in sustaining the growth and development of the sector which in turn brings about effective and efficient revenue increase to the sector and the country at large.

2. Conceptual Analysis

Concept of Digital Communication Tools Usage and Buyer-Seller Relationship

Communication has been the most interactive activity carried out by humans within the social context using a varying form of tools in the discharge of communicative actions. The traditional communication tool such as television, radio, newspaper, etc. have served society well and it is still relevant, however, the advent of digital communication technology has brought about diverse communication tools such as; cell phones, social media, networking etc. that has increased the level of communication in contemporary society. It refers to any form of communication taking place through technology and electronic medium that provides users with instant access to interaction on an unprecedented level (Nguyen, 2017).

From the foregoing, it is imperative to evaluate the theoretical dispositions that surround the DCT concerning the buyer-seller relationship, and how it concerns the cocoa smallholder farmers in terms of marketing and creating product awareness that leads to increased profit through a sustainable value chain in the buyer-seller relationship.

Invariably, one of the strong points of DCT is the proper utilization of marketing goods and services and which cocoa smallholder farmers can channel in creating a well-established buyer-seller relationship that leads to augmented profit realization in the cocoa industry.

Cizmeci (2015) argued that creating effective and efficient product awareness through digital marketing communication tools must start with the deconstruction of traditional marketing tools that will transform the interaction between the buyer and seller into one of active and constant dialogue rather than passive interaction that will facilitate smooth marketing process. The study further emphasized that initiating product awareness is the first basic step that must take place between the buyer and seller before other steps in the process follow (Cizmeci, 2015).

On the other hand, Ekhlassi et al. (2012) posited that the cost-effectiveness of digital marketing communication tool has made it more relevant in the buyer-seller relationship because it could be used to replace the traditional customer relationship channels by focusing on the major goal of customer relationship which is the acquisition of best customers, maintaining and encouraging them to consume the product and services through marketing communication functions such as; advertising, sales promotion, direct marketing, etc. (Ekhlassi et al., 2012).

Sokolova & Titova (2019) corroborated the fact that the concept of digital marketing communication encapsulates a set of activities and practices of utilizing all aspects of traditional marketing to manage relationships with target customers through digital information and communication technologies and electronic devices such as; e-commerce, social media marketing and mobile marketing. And as a matter of fact, digital marketing communication aims to supplement and enrich marketing judgments through the practice of digital marketing communication (Sokolova & Titova, 2019).

In a nutshell, it can be deduced that marketing of goods and services is germane to the development and sustenance of buyer-seller relationship, and which could be carried out by the deconstruction of the traditional marketing techniques through the application of digital marketing communication tools, that will further strengthen the bi-dimensional relationship between the buyer and seller while focusing on the transition from passive marketing interaction to active marketing interaction that brings about satisfaction in products and services from the buyer's end, and acquisition and retention of consumer from the seller's end that will

ultimately lead to increase revenue and profit.

Salo et al. (2020) further argued that digitalization of the buyer-seller relationship builds on the interaction approach within the context of digital infrastructure, digital communication and degree of digitalization. The digital infrastructure is a structural element added to the deconstruction of the traditional buyer-seller relationship characteristics to reflect changes that have taken place after the megatrend of digitalization (Salo et al., 2020). On the other hand, digital communication is an element that is added also to the traditional buyer-seller relationship characteristics to enrich the description of current buyer-seller relationships that are influenced by digital technologies. It also intensifies and enhances other interactive elements (specifically, face-to-face social interaction) of the relationship (Salo et al., 2020). They believed that social interaction remains the nucleus of buyer-seller relationships as it is more focused and intense when mundane work like sending documents via faxes is now conducted over digital infrastructure such as; the internet. However, the degree of digitalization showcases how the cycle of digitalization create and alter the digital infrastructure and digital communication processes between buyer and the seller resulting in diverse outcome in their relationship (Salo et al., 2020).

Nonetheless, it is imperative to cast light on the buyer-seller relationship in relation to how effective and efficient the cocoa smallholder farmers utilize the DCT as leverage in the actualization of customer acquisition and retention as well as augmenting their revenue and profit.

Theoretically, Kranton & Minehart (2001) developed a hypothesis that emphasized a new model of exchange known as 'networks' of buyers and sellers rather than 'markets' of buyers and sellers. The theory analytically surmises that a buyer and seller must have a relationship, a link to exchange goods. The networks develop a high-value chain action that connects the buyers, sellers, and process of relational transaction of goods and services within a common exchange environment. It explained that network structures are germane in the determination of transaction processes between the buyer and the seller and also showcase that buyer and seller must act strategically in their self-interests that ultimately lead to the formation of network structures that maximize the overall welfare of both the buyer and the seller (Kranton & Minehart, 2001).

From the foregoing, it can be deduced that the goal of this theory is to create a platform that connects both the buyer and the seller within the common ideology and environment of relational transaction in which their self-interest is satisfied. Moreover, about cocoa smallholder farmers and prospective buyers of cocoa products, these farmers must ensure that their self-interest is secured that leads to improved livelihood while utilizing dynamic provision of DCT as the veritable network that connects them and the buyers together.

Lu et al. (2010) contended that buyer-seller relationships will be significantly influenced by the networks created through social interaction built on trust between the buyer and the seller that will impact the bi-dimensional marketing and investment behaviour. This network helps to improve smallholder farmers' participation in modern high-value markets as well as encourage relational transactions. They further reiterated that buyer-seller market participation will be further enhanced by trusting buyer-seller relationships through absolute compliance with buyers' quality requirements while the application of formal contracts reinforces the trusting relationships established between the buyer and the seller (Lu et al., 2010).

It can, therefore, be deduced that having a strong buyer-seller relationship between the cocoa smallholder farmers and their prospective buyers must centre around the trust built in terms of social interaction, that should be leveraged upon by the smallholder farmers which will lead to improved relational transaction, acquisition and retention of prospective buyers.

Dlamini-Mazibuko et al. (2019) differed in their opinion as they beam their searchlight on how the buyer-seller relationship could further improve the livelihood of smallholder farmers because the production and marketing problems been faced by these farmers hinders them from profiting through formal and informal channels that leads to calls for relational transactions to enhance exchange efficiency. In which the result of research carried out showcase several indicators that build a buyer-seller relationship on derived satisfaction enjoyed by the seller (smallholder farmers) from the price offered by both formal and informal channels because trust and communication was the basis of both the buyer and the seller's interaction during the course of a transaction (Dlamini-Mazibuko et al., 2019).

Zhang & Hu (2009) established and supported the fact that to build a sustainable buyer-seller relationship it must be based on the three principles of transaction cost economics that include; contract, trust, and environment. The concept of contract is viewed as a mechanism that attempts to reduce risk and uncertainty in an exchange relationship. Nevertheless, trust as a mechanism is classified under the relational governance that is regarded to enhance transaction-specific investment associated with less monitoring and bargaining. Environmental factors play a significant role in decision-making uncertainty that leads to buyers and sellers seeking to establish a scope of transaction through relational governance structure, to manage any uncertainty that might want to frustrate the interest of both the buyer and the seller (Zhang & Hu, 2009).

Furthermore, contract and trust function as a complement of each other within the discourse of the buyer-seller relationship that strengthens and promotes long-term cooperation between the buyer and the seller (Zhang & Hu, 2009).

Conclusively, the dynamic DCT can help to strengthen the buyer and seller relationship if properly utilized as a means that influence the social interaction and promote both the buyer and seller self-interests that leads to active interaction, derived satisfaction, increased revenue and profit through formal and informal channels, absolute compliance of quality requirements and other variables within the scope of a transaction.

The aim of this study is to determine the influence of DCT and its impact on the buyer-seller relationship among cocoa farmers in Ondo State, Nigeria. The main objectives are to:

- ascertain the level of usage of digital communication tools among cocoa farmers in Ondo State;
- Examine the impact of digital communication tools used on the buyer-seller relationship in the study area
- To proffer solutions on the sustainability of buyer-seller relationship in the study region given the potentials for the adoption of DCT.

3. Methodology

In establishing the impact of DCT on the buyer-seller relationship from smallholder cocoa farmer perspectives, a quantitative method of research was followed using a survey approach for data collection. The survey involved questionnaires disseminated to 87 respondents among resident farmers in Ondo State, Nigeria. Digital communication covers all forms of telecommunications technology used for exchanging data and information from one person/people to the other. Hence, DCT cover videos, social media, short message service, etc. to capture all means of information exchange between cocoa small-hold farmers. The questionnaire is segmented into three sections covering demographics, DCT and BSR variables. Likert scales were used as response guides after using close-ended questions. This gives room for the researcher to gather data from the respondents with degrees of accuracy (Munshi, 2014). Statistical Package for Social Sciences (SPSS) was used in data analysis and inferences. Altogether, test of reliability, normality distribution test, Pearson test of correlation, Analysis of variance, simple linear regression were run to further describe the nexus and draw empirical assertions from the population

Analysis of Variance is usually used to test degrees of statistical significance in terms of mean differences between multiple independent variables or groups of variables (Glantz, Slinker and Neilands, 2016). The buyer-seller relationship variable comprises sunsets that describe the interaction and connection between the buyers and sellers which form an independent group. Likewise, DCT stands independently away as a group comprising of multiple sunsets that are capable of representation of DCT. Variables like video conferencing, social media channels, SMS, internet, email, audiovisuals, voice calls, Television and radio. ANOVA tests between the two independent groups of DCT and BSR will prove if there is a statistical difference between the means of the unrelated groups (Rutherford, 2011). The first criterion under the application of ANOVA is that the dependent group, the Buyer-seller relationship has to be measured at ratio and interval level (Tarlow, 2015). The second assumption is that DCT, the independent group of variables should consist of two or more subsets and the tool of communication specified in the model has 9 subsets satisfying this criterion. Thirdly, the model will satisfy another criterion for ANOVA tests which assumes the exclusivity of the observations in each group i.e no subset in the BSR group must have a presence in the DCT group of variables and all observations for the subsets must not have dual-presence in both independent and dependent groups of variables (Rutherford, 2011). Outliers pose statistical problems and reduce the validity of results for ANOVA tests, because of data points that deviate from the usual pattern (Glantz, Slinker and Neilands, 2016).

After correlation, linear regression will be run to know whether the variables of DCT can predict the values of BSR in the model. The expectation is to statistically discern if the BSR and DCT are at intervals or ratio-dependent. However, Tarlow (2015) emphasizes that both variables are to give values at a continuous level.

The linear regression will aid in estimating whether a linear relationship exists between buyer-seller relation and DCT. The SPSS statistics uses a scatter plot to examine the presence of linearity between variables. Harridon and Rizal (2020) hold that if the variables give a diagonal line using the coordinates on both axes using data values, then linearity is established. Within the statistical standards, there should be no outliers at a significant level between the expected linear variables in the regression. A significant outlier will be found if a point in the value readings of the dependent variable exhibits disparity from the values forecasted by the regression model (Su, Yan and Tsai, 2012). Outliers from the buyer-seller relationship values and the DCT will exhibit points and coordinates that are distant from the regression line, usually informing that there is a large residual (Sikaroudi and Park, 2019).

4. Results

Table 4.1: Tests of Normality of BSR distribution

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Buyer Seller Relationship	.144	87	.000	.922	87	.000

a. Lilliefors Significance Correction

The p-value for Shapiro-Wilk and the Kolmogorov-Smirnov tests show that it is significant. Hence, the outcome of the normality test for the distribution of buyer seller in the study population shows that it is normally distributed.

Table 4.2 Reliability Analysis Statistics Test

Reliability Statistics

Cronbach's Alpha	No. of Items
.749	18

Cronbach's alpha coefficient is 74.9% from the reading result of .749. This is a figure tending towards 1. Thus, the study is valid and reliable as approximately 75% is found to be a good measure of fit for buyer seller relationship with the influence of DCT.

Table 4.2: Degrees of adoption of digital communication tools

	Mean	Std. Deviation	Degree
Voice calls	4.47	.502	Very High
Short Messaging Services	4.28	.677	Very High
Messengers (WhatsApp, Telegram, WeChat, etc.)	3.46	.775	High
Social media (Facebook, Instagram, etc.)	2.60	.637	Very Low
Email	2.57	.676	Very Low
Radio	2.55	.678	Very Low
Audio-visual media (Electronic billboards)	2.02	.792	Very Low
Television	1.51	.626	Never used
Video conferencing (Zoom, Teams, etc.)	1.40	.559	Never used

1.00 – 1.80 – Never Used; 1.81 – 2.60 – Very Low; 2.61 – 3.40 – Low; 3.41 – 4.20 – High; 4.21 – 5.0 – Very High

Short messaging service (SMS) was found to be very highly used by cocoa farmers in the study area. The results depict that SMS was very highly used by farmers in communicating with their produce sellers as shown by a mean score of 4.28. The results found that most extensionists communicate their activities to the farmers using SMS, which made it the second most widely used digital tool adopted as a communication means across the farmers.

DCT such as e-mails, radio, and audio-visual media (electronic billboards) were rarely used by cocoa farmers in the study area. The levels of usage were rated low as shown by mean scores of 2.60, 2.57, 2.55, and 2.02 respectively. The very low usage of social media may relate to the high cost of smartphone devices and internet data. Only a few of the farmers use social media to communicate with their potential buyers and some use it for purposes other than selling their agricultural produce. The results further show that television and video conferences were not used as shown by mean scores of 1.51 and 1.40 respectively.

Table 4.3 Correlation Table I

		Buyer Seller Relationship	Digital Communication Tools Usage
Buyer_Seller_Relationship	Pearson Correlation	1	.296**
	Sig. (2-tailed)		.005
	N	15.410	2.894
Digital Communication Tools Usage	Pearson Correlation	.296**	1
	Sig. (2-tailed)	.005	
	N	2.894	6.202

** . Correlation is significant at the 0.01 level (2-tailed).

b. Listwise N=87

Table 4.3: The table above shows the outcome of a Pearson's product Moment Correlation Coefficient conducted with SPSS to ascertain the relationship between DCT usage and buyer-seller relationship. The

outcome proves that there is 99% statistical significance between the two variables at 0.01 level of confidence. The sign (**) denotes that the correlation is not occurring by chance and that it is stronger than the 5% and the 10% confidence intervals. The above result further exhibits that **r at 0.296****, which is the correlation coefficient implies that if DCT usage decrease by 29.6%, the buyer-seller relationship will also follow suit in the same magnitude and vice-versa. Hence, the stated null hypothesis (Ho) is rejected while the alternative hypothesis that says “There is a positive relationship between DCT and buyer-seller relationship” is therefore accepted.

Table 4.4 Regression Analysis IV
 Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.296 ^a	.088	.077	.40671	1.485

a. Predictors: (Constant), Digital Communication Tools Usage

b. Dependent Variable: Buyer_Seller_Relationship

ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.350	1	1.350	8.164	.005 ^b
	Residual	14.060	85	.165		
	Total	15.410	86			

a. Dependent Variable: Buyer_Seller_Relationship

b. Predictors: (Constant), Digital Communication Tools Usage

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error			
1	(Constant)	2.900	.453		6.398	.000
	Buyer_Seller_Relationship	.467	.163	.296	2.857	.005

a. Dependent Variable: Buyer_Seller_Relationship

Model Specification

In conducting an empirical investigation on DCT usage and buyer-seller relationship using cocoa smallholder farmers’ perspectives, the model below is applied to the regression line between the dependent and independent variables

$$BS = C + \beta_1 DC_1 + \beta_2 DC_2 + \dots + \beta_i DC_i + \mu_i$$

Where, BS = Buyer-Seller relationship; dependent Variable

C = Intercept

β_1 = Slope of the independent variables

DC₁ = Digital communication tools; Independent variable

μ = Error term

The outcome of the model after regression gives the equation.

$$BS = 2.9 + 0.467DC_1 + \mu_i$$

The regression results indicate that the model estimation is in good fit. The shows the model summary of the effect of DCT used on the buyer-seller relationship, and the significance of the model as predicted by the independent variable. The model is found to be significant at $p = 0.005$, which is less than the significance level of 0.05. The R-square is calculated at 0.088 as shown in the Table. The regression analysis showed that the independent variable could only explain 8.8% (R Square = 0.088) of the variation in the buyer-seller relationship in the study area. It also reveals that there is a direct positive relationship between the BSR and the use of DCT. From the estimation, for there to be a 100% perfect BSR experience for the cocoa farmers, there has to be an average use of DCT at 46.7% level. The Durbin-Watson record of 1.485 signifies that there is no serial autocorrelation between the variables, implying the presence of positive autocorrelation. The F-value yielded 8.164 with a p-value of 0.005, which connotes a 99% confidence level at a statistical significance of 0.01. It further shows that the independent variable of DCT dependably predicts the values of the dependent variables of BSR.

Table 4.5 ANOVA Analysis

ANOVA Table	Sum of Squares	df	Mean Square	F	Sig.
Buyer_Seller_Relationship * Audio-visual media (Electronic billboards)	.216	3	.072	.393	.758
Buyer_Seller_Relationship * Video conferences (Zoom, Teams, etc.)	.348	2	.174	.971	.383
Buyer_Seller_Relationship * Audio-visual media (Electronic billboards)	.216	3	.072	.393	.758
Buyer_Seller_Relationship * Social media (Facebook, Instagram, etc.)	.684	3	.228	1.286	.285
Buyer_Seller_Relationship * Radio	.145	3	.048	.263	.852
Buyer_Seller_Relationship * Email	.343	3	.114	.629	.598
Buyer_Seller_Relationship * Messengers (WhatsApp, Telegram, WeChat, etc.)	2.072	4	.518	3.185	.017
Buyer_Seller_Relationship * Voice calls	.010	1	.010	.057	.812
Buyer_Seller_Relationship * Short Messaging Services	2.188	3	.729	4.579	.005

A one-way ANOVA is conducted between the BSR and subscales of DCT to establish the correlation levels (Glantz, Slinker and Neilands, 2016). The above table shows the ANOVA results for BSR and their tests of significance. The result indicates that not all DCT are statistically significant. Only Messengers and short message service (SMS) were found to be statistically significant at 5% and 1% confidence interval with the P values of 0.017 and 0.005 respectively. This means that other tools of communication are not relevant in the scope of buyer-seller relationship but however, messengers and SMS were relevant in the communication of small holder cocoa farmers in the region.

4. Discussion

The study has explored in great depth the significance of DCT to small cocoa smallholder farmers. In recourse to the aims and objectives of this study, the findings demonstrate that DCT has a direct functional positive relationship with BSR. Cross-cultural marketing communications has a very high impact on buyer-seller relationship (Bamidele-Sadiq & Sadiq-Bamgbopa, 2022). The findings provide the insight that BSR is bound to be fruitful and mutually beneficial if there is an increase in propensity to DCT. The empirical findings reveal that some challenges and contingencies affecting the BSR can be resolved through DCT. Primarily, there is a gap of communication between the agricultural extension workers and the farmers which also brings about market imperfections. The buyers of cocoa produce anticipate some degree of trust and satisfaction to help augment the existing relationship with the sellers; the smallholder farmers (Batt and Rexha, 2000). However, these problems can be solved using DCT. Messengers such as WhatsApp and Telegram have been highly adopted and used by cocoa farmers in communicating their messages. Farmers of different smaller groups pass information to their group members using messaging platforms. Some of these groups also hold their routine meetings on these messaging platforms.

The study has proved that small cocoa holder farmers can leverage DCT and some of these digital tools are predominantly efficient than others within the context of the market. Voice calls and Messengers platforms such as WeChat, WhatsApp, and Telegram are frequently used by the buyers and sellers in this population. However, video-conferencing which is never used can be attributed to the prevalence of low adoption of technology-based communication methods by farmers in the region. However, in more developed countries, it is one of the most frequent means of communication for farmer sensitization on new initiatives (Jang, Kim and Ko, 2016; Fawzy and Shedeed, 2020).

Furthermore, the empirical analysis buttresses the fact that DCT has a significant role to play in improving BSR. It can be advanced and recommended to eliminate issues pertaining to trust and satisfaction as cited by (Mangus et al., 2018; Dadzie, Dadzie and Williams, 2018) Seamless Communication can improve feedback mechanisms between buyers and sellers, assessment protocol for recent improvements and developments in the cocoa industry.

The cocoa industry is plagued with a downfall in revenue in Nigeria due to numerous challenges in the industry and even from the economic position of the country. However, a remedial approach can be achieved to improve the production levels and quotas of the smallholder farmers surging them to competitive positions with their foreign counterparts. Locally, DCT has proved from the regression findings that it can trigger as much as 100% turnover in cocoa productivity given a 46.7% increase in the adoption of DCTs, ceteris paribus. Nigeria currently satisfies 6.5% of global cocoa production with 50,000 metric tons according to 2020 statistics

(Olusegun Sansi, 2021). DCT can provide extensive reach to the foreign global market feeding the demands for cocoa products and other cocoa derivatives. Consequently, it can provide access to the latest technologies and methods of cocoa processing which will enhance the productive capacities of smallholder farmers.

5. Conclusion

Conclusively, BSR is a functional relationship that needs to be improved with DCT in the study region. DCT is a stimulating factor capable of catalyzing the synergy between buyers and sellers to a more competitive market devoid of trust and satisfaction issues. In the study population, the propensity to the adoption of DCT is low and enhanced usage of DCT can eliminate challenges of imperfect information in the relationship context. It is recommended that beyond Messengers and SMS which are conventional means of extension communication in farming, a further advancement to using other means of communication including social media and video-conferencing can aid in solving some of the issues meandering the buyer-seller relationship. Congruently, global market rivalry and international standards in cocoa farming and processing can be achieved if digital communication tools are widely adopted by farmers in the region.

References

- Amuge, O. (2021). *Nigeria's cocoa earnings put at N135bn in 2020 by Cocoa Research Institute – Businessamlive*. www.businessamlive.com. <https://www.businessamlive.com/nigerias-cocoa-earnings-put-at-n135bn-in-2020-by-cocoa-research-institute/#:~:text=Nigeria>
- Anthony Eghe, A., Taiwo, O., Solomon, F.B. and Joseph Olumide, O. (2014). Perception of cocoa farmers to voluntary standard certification: An implication on Cocoa Transformation in Nigeria. *IOSR Journal of Agriculture and Veterinary Science*, 7(6), pp.17–20.
- Batt, P.J. and Rexha, N. (2000). Building Trust in Agribusiness Supply Chains. *Journal of International Food & Agribusiness Marketing*, 11(1), pp.1–17.
- Bamidele-Sadiq, M., & Sadiq-Bamgbopa, Y. (2022). Cross-Cultural Marketing Communication in the United State Fashion Industry. An Empirical Evidence of the Hispanic and Latino Americans and Asians. *Journal of Economics & Sustainable Development*. 13(7), 43-51. <https://10.7176/JESD/13-7-06>
- Cizmecci, F. (2015). The effect of dijital marketing communication tools to create brand awareness by housing companies. *MEGARON / Yıldız Technical University, Faculty of Architecture E-Journal*, 10(2). <https://doi.org/10.5505/megaron.2015.73745>
- Dadzie, K.Q., Dadzie, C.A. and Williams, A.J. (2018). Trust and duration of buyer-seller relationship in emerging markets. *Journal of Business & Industrial Marketing*, 33(1), pp.134–144.
- Dlamini-Mazibuko, B. P., Ferrer, S., & Ortmann, G. (2019). Examining the farmer-buyer relationships in vegetable marketing channels in Eswatini. *Agrekon*, 58(3), 369–386. <https://doi.org/10.1080/03031853.2019.1596824>
- Ekhlassi, A., Maghsoodi, V., & Mehrmanesh, S. (2012). *Determining the Integrated Marketing Communication Tools for Different Stages of Customer Relationship in Digital Era*. www.cloudfront.net. https://d1wqtxtslxzle7.cloudfront.net/35598522/Paper3-Vahid_Maghsoodi-with-cover-page-v2.pdf?Expires=1639241272&Signature=c5hZ5mfAF5wwAqp5jDwwEEu7UjJG0dARIEw82b9aLx26GZi1ZnhD2CPc~gOBLO0hIOWFJiIzhFIUjzZlMxLwEp0xunVmfmBfWhKqwnE9BpEdIvW-FN-inqH4~2Xlbt7iNoty4s13~Z7weLvQyLtagKK6797AKsdbD43nUEYpW0X3EA9681iqdYML06X8dnZ9Gt2NP3ZK16MTqOSgqfo5Bp0hYlmU2IOaHgTY-naHiqOAh2BbMzNUAcCJ3R14~29WgAavXbm6tUhSa8FtwDdFEedVeoS2L5rIO3qlX7skywBsv3hFjwkoUPyPlgGhxpA-Pf9N4-A6kXIIxipVtT1ag_&Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA
- Fawzy, Z. and Shedeed, S.I. (2020). Subsistence Farming Towards Sustainable Economic Agriculture of Small Farmers in the Developing Countries. *NASS Journal of Agricultural Sciences*, 2(1).
- Glantz, S.A., Slinker, B.K. and Neilands, T.B. (2016). *Primer of applied regression & analysis of variance*. New York: Mcgraw-Hill Education.
- Harridon, M. and Rizal, M. (2020). Flight Profile Analysis: Finding Correlations using Scatter Plot Method and Evaluation of Scatter Plot. *AVIA*, 1(1).
- Jang, S.B., Kim, Y.G. and Ko, Y.-W. (2016). Mobile video communication based on augmented reality. *Multimedia Tools and Applications*, 76(16), pp.16893–16909.
- Jelili A., Y. (2020). *Cocoa Plantation among Smallholder Farmers: Towards Mitigating Socio-economic Effect of Covid -19 in Nigeria*. www.researchgate.net. https://www.researchgate.net/publication/350149047_Cocoa_Plantation_among_Smallholder_Farmers_Towards_Mitigating_Socio-Economic_Effects_of_COVID-19_in_Nigeria
- Kranton, R. E., & Minehart, D. F. (2001). A Theory of Buyer-Seller Networks. *American Economic Review*, 91(3), 485–508. <https://doi.org/10.1257/aer.91.3.485>
- Lawal, J.O., Omonona, B.T., Oluwatayo, I.B. and Salman, K.K. (2016). Welfare transitions and its correlates

among cocoa farming households in Nigeria. *Agrosearch*, 16(1), p.65.

Lu, H., Trienekens, J. H., Omta, S. W. F., & Feng, S. (2010). Guanxi Networks, Buyer-Seller Relationships, and Farmers' Participation in Modern Vegetable Markets in China. *Journal of International Food & Agribusiness Marketing*, 22(1-2), 70–93. <https://doi.org/10.1080/08974430903372815>

Mangus, S., Jones, E., Folse, J.A.G. and Sridhar, S. (2018). Leveraging Trust in Buyer-Seller Relationships to Battle Market Turbulence. *SSRN Electronic Journal*.

Munshi, J. (2014). A Method for Constructing Likert Scales. *SSRN Electronic Journal*.

NEPC. (2018). *Cocoa*. NEPC Importer. <https://nepc.gov.ng/importer/nigeria-product/cocoa/>

Nguyen, N. (2017). *A tool for digital communication implementation in the marketing funnel*. www.theseus.fi. <https://www.theseus.fi/handle/10024/130178>

Olusegun Sansi (2021). A Comparative Analysis of the Effect of Aflatoxin Standards of Sub-Saharan African Countries Cocoa Export Trading Partners' on Sub-Saharan African Countries Primary and Processed Cocoa Export Trade. *Chinese Business Review*, 20(6).

Rutherford, A. (2011). *Introducing Anova and Ancova a GLM approach*. Hoboken Wiley.

Salo, J., Teck, M. T., & Makkonen, H. (2020). *Digitalization of the buyer-seller relationship in the steel industry*. www.emerald.com. <https://www.emerald.com/insight/content/doi/10.1108/JBIM-03-2020-0141/full/html>

Sikaroudi, A.E. and Park, C. (2019). A mixture of linear-linear regression models for a linear-circular regression. *Statistical Modelling*, p.1471082X1988184.

Sokolova, N. G., & Titova, O. V. (2019). *Digital marketing as a type: concept, tools and effects*. <https://www.atlantis-pess.com/article/125908881.pdf>

Su, X., Yan, X. and Tsai, C.-L. (2012). Linear regression. *Wiley Interdisciplinary Reviews: Computational Statistics*, 4(3), pp.275–294.

Tarlow, K.R. (2015). Teaching principles of inference with ANOVA. *Teaching Statistics*, 38(1), pp.16–21.

Zhang, X., & Hu, D. (2009). Contracts, trust and market environment in farmer-buyer relationships. In X. Zhang & D. Hu (Eds.), *AgEcon Search*. <https://ageconsearch.umn.edu/record/49925/>

QUESTIONNAIRE

DIGITAL COMMUNICATION TOOLS USAGE AND BUYER-SELLER RELATIONSHIP: COCOA SMALLHOLDER FARMERS PERSPECTIVES

Instruction: Please tick (✓) the options applicable to you.

Section A: Background Information

1. Gender: (a) Male (b) Female
2. Age: (a) Less than 30 years (b) 30-40 years (c) 41-50 years (d) Above 50 years
3. Highest Educational Qualification: (a) Primary (b) Secondary (c) Diploma (d) Degree

Section B: Digital communication tools usage

1 = Never Used; 2 = Very Low; 3 = Low; 4 = High; 5 = Very High

S/N	Tools	1	2	3	4	5
1	Audio-visual media (Electronic billboards)					
2	Emails					
3	Messengers (WhatsApp, Telegram, WeChat, etc.)					
4	Radio					
5	Short Messaging Services					
6	Social media (Facebook, Instagram, etc.)					
7	Television					
8	Video conferences (Zoom, Teams, etc.)					
9	Voice calls					

Section C: Buyer-Seller Relationship

1 = Strongly Disagree; 2 = Disagree; 3 = Uncertain; 4 = Agree; 5 = Strongly Agree

S/N	Statements	1	2	3	4	5
1	I get feedback and comments from my buyers					
2	I maintain long-term relationships with my buyers					
3	There exist mutual goals between me and my buyers					
4	There exists clear understanding of each other's roles and responsibilities between me and my buyers					
5	There is a high level of commitment between me and my buyers					
6	There is a high level of trust between me and my buyers					
7	There is good communication between me and my buyers					
8	There is mutual information sharing between me and my buyers					
9	There is responsiveness towards each other's and needs between me and my buyers					

Respondents Responses

Highest Educational Qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Primary	19	21.8	21.8	21.8
	Secondary	32	36.8	36.8	58.6
	Diploma	27	31.0	31.0	89.7
	First Degree	9	10.3	10.3	100.0
	Total	87	100.0	100.0	

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 30 years	2	2.3	2.3	2.3
	30 – 35 years	8	9.2	9.2	11.5
	36 – 40 years	6	6.9	6.9	18.4
	41 – 45 years	20	23.0	23.0	41.4
	46 – 50 years	21	24.1	24.1	65.5
	Above 50 years	30	34.5	34.5	100.0
Total	87	100.0	100.0		

BSR1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	3	3.4	3.4	3.4
	Uncertain	6	6.9	6.9	10.3
	Agree	51	58.6	58.6	69.0
	Strongly Agree	27	31.0	31.0	100.0
	Total	87	100.0	100.0	

BSR2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	3	3.4	3.4	3.4
	Uncertain	8	9.2	9.2	12.6
	Agree	47	54.0	54.0	66.7
	Strongly Agree	29	33.3	33.3	100.0
	Total	87	100.0	100.0	

BSR3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Uncertain	9	10.3	10.3	10.3
	Agree	58	66.7	66.7	77.0
	Strongly Agree	20	23.0	23.0	100.0
	Total	87	100.0	100.0	

BSR4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Uncertain	7	8.0	8.0	8.0
	Agree	51	58.6	58.6	66.7
	Strongly Agree	29	33.3	33.3	100.0
	Total	87	100.0	100.0	

BSR5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Uncertain	9	10.3	10.3	10.3
	Agree	50	57.5	57.5	67.8
	Strongly Agree	28	32.2	32.2	100.0
	Total	87	100.0	100.0	

BSR6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Uncertain	12	13.8	13.8	13.8
	Agree	48	55.2	55.2	69.0
	Strongly Agree	27	31.0	31.0	100.0
	Total	87	100.0	100.0	

BSR7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Uncertain	7	8.0	8.0	8.0
	Agree	54	62.1	62.1	70.1
	Strongly Agree	26	29.9	29.9	100.0
	Total	87	100.0	100.0	

BSR8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Uncertain	12	13.8	13.8	13.8
	Agree	54	62.1	62.1	75.9
	Strongly Agree	21	24.1	24.1	100.0
	Total	87	100.0	100.0	

BSR9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Uncertain	7	8.0	8.0	8.0
	Agree	50	57.5	57.5	65.5
	Strongly Agree	30	34.5	34.5	100.0
	Total	87	100.0	100.0	

Television

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never Used	49	56.3	56.3	56.3
	Very Low	32	36.8	36.8	93.1
	Low	6	6.9	6.9	100.0
	Total	87	100.0	100.0	

Video Conferences (Zoom, Teams, etc.)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never Used	55	63.2	63.2	63.2
	Very Low	29	33.3	33.3	96.6
	Low	3	3.4	3.4	100.0
	Total	87	100.0	100.0	

Audio-visual media (Electronic billboards)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never Used	24	27.6	27.6	27.6
	Very Low	39	44.8	44.8	72.4
	Low	22	25.3	25.3	97.7
	High	2	2.3	2.3	100.0
	Total	87	100.0	100.0	

Social media (Facebook, Instagram, etc.)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never Used	4	4.6	4.6	4.6
	Very Low	30	34.5	34.5	39.1
	Low	50	57.5	57.5	96.6
	High	3	3.4	3.4	100.0
	Total	87	100.0	100.0	

Radio

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never Used	5	5.7	5.7	5.7
	Very Low	33	37.9	37.9	43.7
	Low	45	51.7	51.7	95.4
	High	4	4.6	4.6	100.0
	Total	87	100.0	100.0	

Email

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never Used	5	5.7	5.7	5.7
	Very Low	31	35.6	35.6	41.4
	Low	47	54.0	54.0	95.4
	High	4	4.6	4.6	100.0
	Total	87	100.0	100.0	

Messengers (WhatsApp, Telegram, WeChat, etc.)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never Used	2	2.3	2.3	2.3
	Very Low	4	4.6	4.6	6.9
	Low	38	43.7	43.7	50.6
	High	38	43.7	43.7	94.3
	Very High	5	5.7	5.7	100.0
	Total	87	100.0	100.0	

Voice calls

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High	46	52.9	52.9	52.9
	Very High	41	47.1	47.1	100.0
	Total	87	100.0	100.0	

Short Messaging Services

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Low	3	3.4	3.4	3.4
	Low	2	2.3	2.3	5.7
	High	50	57.5	57.5	63.2
	Very High	32	36.8	36.8	100.0
	Total	87	100.0	100.0	