

EFFECTIVENESS OF ELECTRONIC WALLET SYSTEM OF GROWTH ENHANCEMENT SUPPORT SCHEME DISTRIBUTION AMONG ARABLE CROP FARMERS IN IMO STATE, SOUTH EASTERN NIGERIA

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Abstract

The study analyzed effectiveness of e – wallet system of Growth Enhancement Scheme (GESS) distribution among arable crop farmers' in Imo State, South East Nigeria. Simple random sampling technique was used to select one hundred and twenty (120) registered Growth Enhancement Support Scheme (GESS) farmers. Data for the study were collected through a structured questionnaire and analyzed with descriptive statistics and inferential statistics (Probit regression and Z–test analysis). The result revealed that a high proportion (60%) of the respondents were males, with mean ages of 49.8 years, 35.50% acquired secondary education, mean farming experience of 16.50 years, mean farm size and household size of 1.1 hectares and 9.5 persons respectively. Result showed that farmers perceived the scheme was effective ($\bar{x} = 2.0$) by enhancing timeliness of notification ($\bar{x} = 2.8$), increases responsiveness of staff to disburse inputs ($\bar{x} = 2.5$), effective in notifying clients through SMS and ensures quality to cost effectiveness of inputs, increases responsiveness of GESS staff to certify farmer's notification of inputs and helps in the management of clients and inputs at the redemption centre with mean ratings of 2.1. The result of Probit regression showed that coefficients for availability, quality and cooperation were significant and influenced effectiveness of e – wallet system at 1% and 5% levels of probability respectively in the study area. Location of the redemption centres, bureaucratic bottlenecks, network problems and inadequate farm inputs were challenges encountered by farmers in the scheme. The study therefore recommends formation of cooperatives, easy access to redemption centres and improved telecommunication network to enhance input delivery and effectiveness of the system

Key words: distribution, effectiveness, e-wallet, farmers

INTRODUCTION

The services of agro-input dealers are critical to farmers' access to affordable quantities of appropriate farm inputs in their local environments. Between 2003 and 2005, the increase in number of agro-input dealers ranged from 2% (for seed treatment chemicals) to 22% (mineral fertilizers) with a mean of 16% across agro-inputs. The difference in the magnitude of percent increase between 2003 and 2005 in the number of agro-input dealers selling different inputs reflects the demand for different agro input in the farming systems of Nigeria. Compared to other developing regions of the world, the low use of farm inputs by smallholder farmers in Nigeria is responsible for the gap between potential farmers' yields and actual crop yields at farm level [9].

However, Nigeria's aggregate agricultural output remains extremely low relative to other developing regions of the world. This has been blamed on low crop yields and much lower use of external inputs than the rest of the world. Distribution of agro inputs such as fertilizer, seeds and agro chemicals are faced with fraudulent practices ranging from adulteration to diversion of products. Much money has been expended by relevant agencies at the state and federal levels on procurement of inputs to targeted farmers but has not yielded positive result [4]. The Federal Government took it as a responsibility to procure these inputs neglecting active participation of beneficiary farmers and private sectors such as agro inputs dealers and this has led to inconsistent subsidy regimes and thus grossly affecting distribution of these inputs. It is quit unfortunate that small scale

farmers that are responsible for the food production in the country has to compete with non farmers before they could have access to fertilizers and other farm inputs. In spite of the continued application of subsidy, total farm inputs such as fertilizer use are far below the potential and economic demand, [14, 24].

The need for a holistic transformation of the Nigerian State has necessitated a strategy that gives cognizance to Growth Enhancement Support Scheme (GESS). The criteria for farmer's participation include: farmers being above 18 years old; have participated in a survey authorized by the government to capture farmers personal detailed information; must own a cell phone with a registered SIM card and have at least sixty naira credit in the cell phone [11]. The fulfillment of these conditions guarantees the issuance of an e-wallet voucher to the farmer whereby an accredited farmer will receive agro inputs allocation through an e - wallet that hosts unique voucher members sent to his or her phone and goes to an accredited agro dealer to redeem his input. An e-wallet has thus been defined as an efficient and transparent electronic device system that makes use of vouchers for the purchase and distribution of agricultural inputs [1]. The e - wallet system is designed for smallholder farmers, who appear the most hit and vulnerable by the impropriety in the fertilizer and other input sector of the Agriculture Ministry. Prior to the introduction of e- wallet, the agricultural sector was shrouded with a lot of irregularities delay in supply of inputs getting to farmers and late or no supply of fertilizers and at exorbitant prices [7]. The voucher is used to redeem fertilizers, seeds and other agricultural inputs from agro-dealers at half the cost. The introduction of e-wallet scheme in the distribution of agricultural inputs had eliminated diversion by 95 per cent in the states covered and had improved farmers' access to agricultural inputs such as fertiliser, seeds and herbicides [6]. At the same time, the projects focused on building the professionalism of rural agro-dealers and strengthening a country's private sector fertilizer supply and distribution channels [17]. [19] noted that agricultural input

vouchers are increasingly being employed across developing countries to address problems of low agricultural productivity and food security by increasing the timely access to inputs[21]. However, the technicality of an innovation affects its effectiveness. A well intended programme such as GESS will not meet its goals if the beneficiaries cannot cope with its operations to make it very efficient and effective. It is very unfortunate that despite the intervention by the government on effective farm input delivery, the effectiveness of the system is far below the economic and potential demand for the farmers which is dependent on timely distribution, affordability, availability, quality, cooperation and value addition of farm inputs. In view of this alternative system, it is not certain whether there has been any improvement in agro input distribution and delivery through voucher-based approach in the study area. Based on the stated facts, this study was undertaken to analyze effectiveness of e-wallet system of Growth Enhancement Scheme on arable crop farmers' production in Imo state, south eastern Nigeria.

The specific objectives of the study were to:

- (i) describe socio-economic characteristics of the beneficiary crop farmers;
- (ii) ascertain farmers perception on the effectiveness of e – wallet practices of the scheme;
- (iii) identify the challenges faced by farmers on the scheme.

Hypothesis

H₀₁: Factors such as timely distribution, availability, affordability, quality, cooperation and value addition do not determine effectiveness of the e-wallet system among arable crop farmers in the study area.

MATERIALS AND METHODS

The study was conducted in Imo State which is located in the south-east Geo-political zone of Nigeria with its capital at Owerri. It is bounded south River State, to the east Anambra State, to the south-west Akwa Ibom State, to the west by Abia and Ebonyi State and to the north Benue State. It lies between the co-ordinates of latitudes 5°29'06" and

5°48'05"N and longitudes 7°02'06" and 7°03'05"E of the equator.. It has equatorial climate which experiences rain and dry seasons yearly. The mean annual rainfall is between 2,000 mm and 3,500 mm. The Relative Humidity ranges from 80-90% with daily annual maximum and minimum temperature of between 31°C and 21°C. Simple random sampling technique was adopted the selection of arable crop farmers. A list of farmers under the Growth Enhancement Support Scheme (GESS) in the state were obtained from Imo State Ministry of Agriculture, which is the ministry mandated to oversee and supervise the implementation of the scheme. From the list, simple random sampling technique was used to select one hundred and twenty (120) arable crop farmers randomly across the state that registered in the programme. Data from the study were analyzed using descriptive statistics such as frequency counts, percentages and mean score and Probit regression analysis. Specifically, objectives i, ii and iii, were achieved using descriptive statistics while the hypothesis was tested using Probit regression analysis. Objective ii: that ascertained farmers perception on the effectiveness of e – wallet system was captured using a 3 – point Likert type scale of very effective = 3, effective = 2 and not effective = 1. In realizing the midpoint decision rule, the Likert rating were summed up thus; 3+2+1 and was divided by 3 to give a mean score of 2.0. Any mean equal to or above 2.0 implied effective and otherwise not effective.

Model Specification

Probit regression model is explicitly stated thus;

$$Y_i^* = B^1 x_i + E$$

$$Y_i^* = 0 \text{ if } Y_i^* = 0$$

$$Y_i = 1 \text{ if } Y_i^* = 0$$

Where:

Y_i^* = an underlying latent variable that indexes effectiveness of the scheme

Y_i = dummy variable indexing effectiveness of the scheme (effective =1, not effective= 0)

B^1 = a vector of estimated parameter

E = the error term

X_i = individual farmers variables considered

in the study include;

X_1 = timely distribution (yes = 1, no = 0)

X_2 = availability (yes = 1, no = 0)

X_3 = affordability (yes = 1, no = 0)

X_4 = quality (unadulterated) (yes = 1, no = 0)

X_5 = cooperation (yes = 1, no = 0)

X_6 = value addition (yes = 1, no = 0)

E_i = error term

RESULTS AND DISCUSSIONS

The distribution of respondents according to socio-economic characteristics is shown in Table 1. The result shows that the mean age of the farmers was 49.8 years, 60.0% of the arable crop farmers were males while 64.17% were married. This implies that males were in their productive ages. This result is in line with the study of [8] which states that the population within the age group of 16 – 55 years constitutes the active workforce in Nigeria. The result indicates that 37.50% of the respondents attended secondary school and mean farming experience of 16.5 years. Level of literacy could have significant influence on their sourcing and access of agro inputs from the scheme. These findings agreed with [13] as they opined that education increases level of skill and foster access to information on improved agricultural practices. Number of years of scheme has shown to encourage farmers to make decisions on sourcing of farm inputs and appropriate technologies to employ in their farms [20]. The result also indicates that the respondents had mean household size of 9.5 persons with mean farm size of 1.1 hectares. This indicates that the household size of respondents was relatively large implying that they would provide farm labour [23]. This establishes the fact that, Nigeria farmers are small scaled and such intervention as the e-wallet is necessary, as it can help improve the status of the farmers, guaranteeing timely access to fertilizer, seeds and other essential agricultural inputs. [2, 4] reported that small scale farmers cultivate between 0.8 and 1.3 hectares of land.

Table 1. Socio- economic Characteristics of Famers in Imo State, Nigeria (n = 120)

Variables	Indices
Females	60(%)
Age	49.8(years)
Married	64.17 (%)
Secondary Education	37.50 (%)
Farming Experience	16.5 (years)
Household Size	10 persons
Farm size	1.1(hectares)

Source: Field Survey, 2015

Farmers’ Perception on Effectiveness of E-Wallet System Growth Enhancement Scheme

The results in Table 2 show the effectiveness of the farmer’s perception on the e-wallet practices of Growth Enhancement Support Scheme (GESS) in the study area.

Table 2. Distribution of Respondents according Perception on Effectiveness E–Wallet System of the Scheme

Perception Statements	Very effective	Effective	Not effective	Total	Mean	Remarks
Notification through SMS	16(13.33)	104(86.67)	0(0.0)	256	2.1	Effective
Timeliness of Notification	92(76.67)	27(22.50)	1(0.83)	331	2.8	Effective
Responsiveness to GESS Staff to certify farmers notification	18(15.0)	92(76.67)	10(8.33)	248	2.1	Effective
Responsiveness to GESS Staff to disburse the inputs	80(66.67)	18(15.0)	22(18.33)	298	2.5	Effective
Adequacy of inputs in relation to farmers demand	7(5.83)	56(46.67)	57(47.50)	190	1.6	Not effective
Insurance of quality to cost effectiveness of the inputs	20(16.67)	97(80.83)	3(2.5)	257	2.1	Effective
Facilitating use of improved seeds	14(11.67)	27(22.50)	79(65.83)	175	1.5	Not effective
Facilitating use of inorganic fertilizer	8(6.67)	40(33.33)	72(60.0)	176	1.5	Not effective
Management of clients and inputs at redemption centres	19(15.83)	92(76.67)	9(7.5)	250	2.1	Effective
Grand Mean					18.9	Effective
Pooled Mean					2.0	

Source: Field Survey, 2015

2.0 and above is Effective, less than 2.0 = Not Effective

The result revealed that majority (76.67%) of the farmers claimed that the e – wallet system enhances timeliness of notification (\bar{x} =2.8), while 66.67% assert that the scheme increases responsiveness of it staff to disburse inputs (\bar{x} =2.5). Furthermore, majority 86.67% and 80.83% assert that the scheme is effective in notifying clients through SMS and ensures quality to cost effectiveness of inputs while 76.67% affirmed that the scheme increases responsiveness of GESS staff to certify farmer’s notification of inputs and helps in the management of clients and inputs at the redemption centre with mean ratings of 2.1. The pooled mean perception score (\bar{x} =2.0) indicate that the farmers had perceived effectiveness of e – wallet system, since the mean score was equal to 2.0. This result is in line with the findings of [12] which assert that the use of mobile phones (e-wallet) enables farmers to access information from various sources such as research institutes, inputs dealers, government agencies, agricultural extension officers, veterinary doctors’ traders and even consumers of their products. This finding also supports the studies conducted by [15] who indicated that mobile phone (e-wallet system) is not only adopted for social reasons, but is viewed by the farmer as a tool that will allow for more efficient and

informed action to enhance greater productivity.

Determinants of E- Wallet System among Farmers in Imo State, Nigeria

The result in Table 3 shows the determinants of the effectiveness of e- wallet system in the study area. The chi-square value of 8.73 was highly significant at 1% level probability indicating the goodness of fit of the Probit regression line. The coefficient for availability was positively signed and highly significant at 1% level. This implies that any increase in availability of inputs will lead to a corresponding increase in probability of effectiveness of e–wallet system in the study area. The Agricultural Transformation Agenda (ATA) introduced in 2011 seeks to tackle the ineffectiveness in the distribution of key inputs making them more available and affordable [22]. The coefficient for quality was also positively signed and significant at 5% level, implying that any increase in quality will lead to a corresponding increase in probability of effectiveness of e – wallet system in the study area. This result corroborates with findings of [16], as they found farmers in rural areas of Northern Nigeria affirmed that inputs received from Growth Enhancement Support Scheme through e-wallet system were of high quality. The coefficient for cooperation was positively

signed and significant at 5% level of probability, indicating that any increase in membership of cooperative will lead to increase in the probability of effectiveness of e – wallet system. This implies that e-wallet system encourages and facilitates farmers to form groups and engage in training activities of the scheme. Membership of cooperatives in enhancing the distribution of inputs is very crucial because of the credibility among members within the group. This result is in consonance with findings of [10], which reported that cooperative participation plays important role in the utilization of agricultural technologies.

Table 3. Probit Regression Estimates of Determinants of the Effectiveness of E – Wallet System in the Study Area

Variables	Coefficient	Standard Error	T – Value
Constant (b ₀)	1.3023	0.3996	2.83**
Timely distribution (X ₁)	0.2888	0.3187	0.91
Availability (X ₂)	0.4030	0.1631	3.02***
Affordability (X ₃)	0.2586	0.2806	0.92
Quality (X ₄)	0.6997	0.2507	2.79**
Cooperation (X ₅)	0.5258	0.2864	2.84**
Value Addition (X ₆)	0.0091	0.2562	0.04
Chi ²	8.73***		
Pseudo R ²	0.0763		
Log Likelihood	-52.805623		

Source: STATA 4A Result

Challenges Encountered by Farmers on E – Wallet System under Growth Enhancement Support Scheme

The result in Table 4 indicates that majority (74.17%) and 68.33% of the farmers claimed that location of the redemption centres hampered and bureaucratic bottlenecks respectively were major challenges encountered in the scheme. [5] found that distance to input redemption centres affect farmers’ access to these inputs, especially fertilizer. Bureaucratic bottle necks (68.33%), limited access and inadequate supply were stated among the constraints to effective distribution and procurement of farm inputs especially fertilizer in Nigeria [18]. Also, most (66.67%) and 62.50% assert network problems and late arrival of farm inputs respectively posed a problem. The network problems encountered by the farmers might result from the restricted source of information being utilized by them – the interpersonal communication. Poor telephony

network is a major challenge of most of the telephone subscribers in Nigeria. The coverage of some of the networks are restricted to particular areas hence most farms might have limited network coverage. Insufficient fertilizer challenges actually occur as a result of failure on the part of agro dealers to order and supply fertilizer from the manufacturing company. This is contrary to the view of [18] that the promotion of a dual fertilizer market (subsidized and free-market) has prevented the required response from the private sector in taking over the role played by the public sector.

Table 4. Distribution of respondents’ responses based on the Challenges of E-wallet System under Growth Enhancement Support Scheme

Challenges	Frequency	Percentage*
Bureaucratic bottlenecks attached in receiving farm inputs	82	68.33
Inadequacy of farm inputs	14	11.67
Selective availability of farm inputs	21	17.50
Distance to redemption centre	89	74.17
Network problems	80	66.67
Untimely supply of inputs	10	8.33
Late delivery of inputs	75	62.50
Insufficient fertilizer	12	10.00
Insufficient seed supply	6	5.00
Quality of farm input supplied	4	3.33

Source: Field Survey, 2015

*Multiple Responses Recorded

CONCLUSIONS

The study has shown that the respondents had positive perception on the effectiveness of electronic wallet system of Growth Enhancement Scheme (GESS) in the study area. The study also revealed that effectiveness of e – wallet system is influenced by practices such as availability, quality and cooperation. Location of the redemption centres, bureaucratic bottlenecks, network problems and inadequate farm inputs were major challenges facing the scheme. The study recommends;

- Cooperative formation among farmers to enhance access to farm inputs.
- Redemption centres of this scheme should be closer to farmers for easy access to inputs and procurement.
- Good telecommunication network coverage should be improved upon in order to ensure effective communication between the scheme and its beneficiaries. This will help the

farmers get information at the right time, since farming is time bound.

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