

EFFECT OF E-WALLET PROGRAMME ON RICE PRODUCTION AMONG SMALL-SCALE FARMERS IN NIGER STATE, NIGERIA

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ABSTRACT

The study examined the effect of e-wallet programme on rice production in Niger State, Nigeria. Multistage sampling technique was used in the selection of rice farmers. A total of two hundred and seven (207) rice farmers form the sample size through purposive sampling. Results reveal that most (91.8%) of the respondents were male with mean age of 38 years, 93.2% were married and 87.4% had formal education. Results revealed that most (80.7%) of the respondent's sources of information on e-wallet programme were from radio station. Results also reveal that respondents had a positive perception of the e-wallet programme. Major constraints faced were difficult or no access to extension agents (\bar{x} = 4.70) and element of corrupt tendencies at redemption centres (\bar{x} = 4.68). The study concluded that the rice farmers have great judgement towards e-wallet programme toward ensure maximum production of rice in order to eradicate poverty in the study area. It was recommended that extension services should be improved upon in order to disseminate e-wallet programme properly at local level or brought closer to the many farmers.

Keywords: Assessment, effect, perception, information, rice production

INTRODUCTION

E-wallet programme is aimed at subsidizing the cost of major agricultural inputs like fertiliser and seeds. The programme started in May 2012, and has so far registered about 14 million farmers throughout Nigeria for direct redemption of farm inputs through the e-wallet system (communicating with rural farmers via e-wallet, precisely SMS). This shows that e-wallet system/new media has a significant role to play in evolving such a paradigm (Meera, Jhamtani and Rao, 2004). The National Food Security Programme, according to the Federal Ministry of Agriculture and Rural Development, is to ensure sustainable access, availability and affordability of quality food for all Nigerians and for the country to become a significant provider of food to the global community (Amobi 2010). As a result, the Federal Government initiated e-wallet programme to actualize the Agricultural Transformation Agenda (ATA), 2009-2015. Okafor and Malizu (2013) observed that in virtually every sphere of life in Nigeria, there are noticeable changes and transformations brought about by the emergence of Information and Communication Technology (ICT) and the agricultural sector is not left out. In Nigeria, ICT infrastructure is springing up fast and Nigerians are increasingly getting used to computing devices, digital imaging, the Internet and Wide Area Networking (WAN), and mixed media.

The Federal Government of Nigeria is implementing an Agricultural Transformation Agenda (ATA) through a set of complementary programme intervention which aim to solve, in a holistic and integrated manner, the constraints and

weaknesses that have held down agricultural development in the country for a long time. Among the ATA components, the e-wallet programme provides a unique connecting link as it targets the farmers directly with critically needed modern farm inputs on real-time basis (Okafor and Malizu, 2013). This guarantees registered farmers e-wallet voucher with which they can redeem fertiliser, seeds and other agricultural inputs from agro-dealers at half the cost, the other half being borne by the Federal Government and State Government in equal proportions (Okafor and Malizu, 2013). However, most development agents use mobile phone's SMS capability (text messaging) as one of the new media features that is easily accessible and affordable in Nigeria. This feature tends to cut across literacy and poverty barriers to disseminate needed agricultural information to rural farmers, extension officers and farm produce sellers. Specifically, mobile phones (i.e. through e-wallet system) have the following advantages over other new media, as well as the traditional mass media:

- (i) Accessibility and affordability of e-wallet systems by majority of farmers.
- (ii) Produce exact duplicates of such information at significantly lower cost.
- (iii) Instant delivery of information and knowledge rapidly over large distances through communication networks.
- (iv) Develop standardized algorithms to large quantities of information relatively rapidly.
- (v) Achieve greater interactivity in communicating, evaluating, producing and sharing useful information and knowledge.



- (vi) Deliver personalized information to individual owners.
- (vii) Provide other functions such as voice communication (Okafor and Malizu, 2013).

The application of ICT in the agricultural production is becoming increasingly important. Electronic wallet programme introduced in 2011 seeks to tackle the inefficiencies in the distribution of key inputs, making them readily available and affordable. In this regard, agro-dealers are assigned a critical role, especially in implementing the e-wallet project, which took off in 2012. The country has adopted a range of instruments designed to protect local production. The Nigerian National Rice Development Strategy (NRDS) set up in 2009 aims to make the country self-sufficient in rice by raising production of paddy rice from 3.4 million tonnes in 2007 to 12.8 million tonnes in 2018. The NRDS outlines three priority areas of focus to achieve this level of production:

- (i) improving post-harvest processing and treatment;
 - (ii) developing irrigation and extending cultivated lands ; and
 - (iii) making seed, fertiliser and farming equipment more readily available.
- The specific objectives of this study are to: Under this programme, farmers are to benefit directly from an innovative electronic wallet programme of delivering subsidized inputs.

The specific objectives of the study are to: (i) identify the sources of information available to farmers about the e-wallet programme. (ii) determine the perception of rice farmers on the usefulness of e-wallet in the study area. (iii) identify the constraints associated with using e-wallet in rice production.

Hypothesis of the study is stated as follows; There is no significant relationship between socioeconomic characteristics of rice farmers and the constraints associated with using e-wallet in rice production.

METHODOLOGY

The study was conducted in Niger State. The State is located in the north-central geopolitical zone of Nigeria and lies within latitudes 8° 21' N to 11° 30' N and longitudes 3° 30' E to 7° 20' E with about 86,000sq.km, or about 8.6million hectares, representing 9.3% of the total land area of the country. Niger State is predominantly agricultural, with an estimated 80% of its population living in rural areas and earning their livelihood directly or indirectly from agriculture. According to Aregheore 2009, Niger State has an estimated population of about 3,950,249 which is likely to increase at an annual population growth rate of 2.38% with a projected number of 5,454,503 at the

end of 2015. Generally, the fertile soil and hydrology of the state permit the cultivation of most of Nigeria's staple crops and still allows sufficient opportunities for grazing, fresh water fishing and forestry development. The target population of the study was rice farmers who got inputs through e-wallet programme in Niger State. A multi-stage sampling technique was used in selecting the sample. The first stage was the purposive selection of one extension block known for rice production in each of the three (3) agricultural zones in Niger State. The second stage involved a random sampling of five cells from each selected extension blocks making a total of fifteen cells. The third stage involves purposive sampling to select three local Government Areas which are Gbako, Gurara and Wushishi LGAs of Niger State, due to the large involvement of rice farmers in the area. Yamane's simplified formula as cited in Singh and Masuku (2013) was used to calculate sample size (n) 207 from N population (sample frame) of 430 rice farmers in the study area.

The formula is given as:

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the sample size, N is the population size, 1 is the constant, and e is the level of precision i.e. sampling error (0.05).

Data collected were analyzed using descriptive such as frequency, percentages and mean, while inferential statistics such as regression was used.

RESULTS AND DISCUSSION

Result in Table 1 reveals that most (91.8%) of the respondents were male while 8.2% were female. There is male dominant involvement in rice farming while female involvement is in post-harvest activities such as processing and marketing. Age categories of rice farmers reveals that most (87.4%) of the respondents were between the age range of 21- 50 years while few (7.7%) were above 50 years of age. The mean age of the respondents was 38 years. This implies that respondents were active and young and expected to be ready to adopt new technologies and innovations such as e-wallet. Most (93.2%) of the respondents were married, with mean household size of 10 members, often times the larger the household size, the greater the productivity. The implication of this finding is that more family labour will be readily available and it will reduce the amount spent on hired labours. This findings agree with that of Opara (2010) that a large household size is an obvious advantage in terms of family labour supply. Also, result reveals that most (87.4%) of the respondents had formal education ranged from primary, secondary, tertiary

and Arabic education respectively. The mean years of farming experience was 21 years. This is an indication that the rice farmers are quite experienced in the area sampled and this may enhance the adoption of technologies to improve production and make more profit. This result corroborates that of Ayoola, Dangbegnon, Daudu, Mando, Kuli, Amapu, Adeosun and Ezui (2011) who stated that the higher the experience the better opportunities of having access to quality information and adoption of new innovation. Above half (51.2%) of the respondents reveal they had a farm size ranging from 1 – 4 hectares of land for their rice production in the study area. This is an indication that most of the respondents in the

study area operate on small scale and this will have effect on their level of production. This finding agrees with that of Agumuo (2004) that most farmers in Nigeria operate on small scale. Most (94.7%) of the respondents had no access to credit while few (5.3%) had access to it. Credit is vital in order to boost production capacity. The availability of credit becomes imperative for improving and enhancing income. This means that credit is a catalyst for increased agricultural production and technology adoption. Akudugu, Guo and Dadzie (2012) stressed lack of access to credit make it difficult for farmers to afford technology and innovation.

Table 1: Distribution of respondents according to their socioeconomic characteristic, (n=207)

Variables	Frequency	Percentages	Mean
Sex			
Male	190	91.8	
Female	17	8.2	
Age (years)			
Less than 21	10	4.8	38.1 years
21 – 30	51	24.6	
31 – 40	70	33.8	
41 – 50	60	29.0	
Above 50	16	7.7	
Marital status			
Single	14	6.8	
Married	193	93.2	
Household size			
1 – 5	42	20.3	10.1
6 – 10	97	46.9	
11 – 15	48	23.2	
16 – 20	15	7.2	
Above 20	5	2.4	
Educational level			
No formal education	26	12.6	
Primary education	22	10.6	
Secondary education	93	44.9	
Tertiary education	31	15.0	
Arabic education	35	16.9	
Years of farming experience			
1 -10	45	21.7	21.4 years
11 – 20	93	44.7	
21 – 30	35	16.9	
31 – 40	25	12.1	
>40	9	4.3	
Farm size (ha)			
0.01-1.00	100	48.3	1.61
1.01-2.00	84	40.6	
2.01-3.00	15	7.2	
3.01-4.00	7	3.4	
>4.00	1	0.5	
Access to credit			
Yes	11	5.3	
No	19	94.7	

Sources: Field survey, 2015



Source(s) of information

Source of information on e-wallet programme was based on extension method of disseminating information which is through individual, group and mass media method. Result in Table 2 shows that most (80.7%) of the respondents source information about e-wallet from radio programmes (mass media method) which ranked 1st among the extension method of disseminating information. Above half (58.5%) of the respondents source information on e-wallet programmes from village heads (individual method) which ranked 2nd among the extension method of disseminating information while almost half (49.3%) sourced information about e-wallet from co-operative society (group method) which ranked 3rd among the extension method of disseminating information to farmers. Dissemination of the right information at the

appropriate time among farmers is a key to providing change in agriculture (Asiedu-Darko, 2013). This is essentially promoted through the transfer of information and technologies to farmers in order to increase sustainable agriculture (Van Niekerk, Stroebel, Van Rooyen, Whitfield and Swanepoel, 2011). Researchers (Daudu and Anyanwu 2009; Oladele, 2011; Ota and Shimayohol, 2011 and Oladeji, 2012) observed that farmers can get needed information through different channels; majorly through agricultural extension agents, mass media, folk tales, social networking, and agricultural project administrators like FADAMA officials. This result also corroborates with Tologbonse *et al.* (2010) found out that the most important source of information on agricultural production were radio and television.

Table 2: Distribution of respondents according to sources of information on e-wallet (n = 207)

Variables	Frequency	Percentage	Ranking
Individual methods			
Village head	121	58.5	2 nd
Friend/neighbour	50	24.1	7 th
Relatives	56	27.1	6 th
Extension agents	79	38.2	4 th
Group methods			
Workshop	29	14.0	10 th
Seminar	33	15.9	9 th
Cooperative	102	49.3	3 rd
SPAT	1	0.5	12 th
Mass media			
Radio	167	80.7	1 st
Television	75	36.2	5 th
Telephone	40	19.3	8 th
Newspaper	3	1.4	11 th

Sources: Field survey, 2015*Multiple responses

Perception of rural farmers on usefulness of e-wallet programme

Result in Table 3 reveals the perception on the usefulness of e-wallet programme on rice production in Niger State. Findings indicate that the respondents had a favourable perception towards the usefulness of e-wallet programme in the study area. The mean value result on rice farmers perception towards usefulness of e-wallet reveals that simple/easy process of input redemption (\bar{x} =4.34), very cheap cost of fertiliser acquisition (\bar{x} =4.31), easy access to fertiliser (\bar{x} =4.28), free seed acquisition (\bar{x} =4.28), encourage youths to embrace agriculture (\bar{x} =4.25), direct farmers orientation/grass root orientation (\bar{x} =4.24), functional connectivity affective network connection (\bar{x} =4.17), short distance transportation of inputs acquired (\bar{x} =4.09), effective delivery service (\bar{x} =4.07), effectiveness of coordination

mechanism (\bar{x} =4.06), very close redemption centre (\bar{x} =4.05), subsidised input (\bar{x} =3.95), improve yield/high productivity (\bar{x} =3.95). The subsidised farm inputs of e-wallet programme are delivered directly to farmers through their mobile phones. This enables the government to disseminate valuable information to the rice farmers, thus ensuring farmers' progress (Ezeh, 2013). However this finding is in line with IFPR (2010) report that access to subsidized seeds and fertiliser by smallholder producers through the use of a voucher system transformed the food aid dependent economy of Malawi to an exporter of food. It is believed that if the e-wallet approach is sustained in Nigeria, it will go a long way in transforming the Nigerian economy too. This finding is in agreement with the reports of Adebo (2014); Godson-ibeji, Chikaire and Anyaoha (2016) who established that e-wallet quickened accessibility to improved seed, access to fertiliser, subsidized farm input and renewed confidence in government programmes.

Due to the high favourable remark of the respondents on the perception on the usefulness of e-wallet programme in the selected area, the prospects of e-wallet programme suggest that the scheme will serve as a stimulus for contemporary

economy and enhance rural farmer's participation in subsequent programme in ensuring food security and eradicate poverty. If this policy frame work is well pursued, it will also reduce Nigeria food import bill and increase agricultural export.

Table 3: Perception of rural farmers on usefulness of e-wallet programme (n = 207).

Perception	SA	A	IN	D	SD	Sum	Mean	Remark
Simple/easy process of input redemption	84(420)	112(448)	9(27)	1(2)	1(1)	898	4.34	Favourable
Functional connectivity effective network connection	50(250)	147(558)	7(21)	2(4)	1(1)	864	4.17	Favourable
Effective delivery services	36(180)	157(628)	7(21)	6(12)	1(1)	842	4.07	Favourable
Short distance transportation of inputs acquired	59(295)	124(496)	10(30)	13(26)	1(1)	848	4.09	Favourable
Very cheap cost of fertiliser acquisition	79(395)	118(472)	8(24)	1(2)	1(1)	894	4.31	Favourable
Free seed acquisition	77(385)	119(476)	8(24)	1(1)	1(1)	888	4.29	Favourable
Little or no inputs acquisition cost	3(15)	165(660)	16(48)	22(44)	1(1)	768	3.71	Favourable
Timely delivery of inputs during cropping season	5(25)	145(580)	9(27)	46(92)	2(2)	726	3.50	Favourable
Easy access to fertiliser and seeds	74(370)	122(448)	8(24)	2(4)	1(1)	887	4.28	Favourable
Easy access to extension services	14(70)	14(56)	15(45)	5(10)	159(159)	340	1.64	Unfavourable
Improved yield / high productivity	2(10)	196(784)	7(21)	1(2)	1(1)	818	3.95	Favourable
Encourage of youths to embrace agriculture	74(370)	119(476)	9(27)	2(4)	3(3)	880	4.25	Favourable
Increased interest in farming	5(25)	191(764)	7(21)	2(4)	2(2)	816	3.94	Favourable
Elimination of corruption tendencies of middle-men	72(360)	76(304)	12(36)	2(90)	2(2)	792	3.82	Favourable
Direct farmers orientation/grass root orientation	74(370)	119(476)	7(21)	5(10)	2(2)	879	4.24	Favourable
Wide area of coverage	4(20)	183(732)	16(48)	3(6)	1(1)	807	3.89	Favourable
Subsidize inputs	4(20)	192(768)	9(21)	1(2)	1(1)	818	3.95	Favourable
No problem of fertilizer adulteration	5(25)	120(480)	78(234)	3(6)	1(1)	746	3.60	Favourable

Source: Field survey, 2015

Constraints of using e-wallet in rice production

Table 5 shows constraints faced by rice farmers in the usage of e-wallet in their rice production. The findings showed the mean value of major constraints militating against e-wallet programme in the study area which includes difficulties/no access to extension services (\bar{x} =4.70) ranked 1st among the constraints, element of corrupt tendencies at redemption centres (\bar{x} =4.68) ranked second. However, due to high level of corruption, insincerity and political interruption in the distribution channels, large proportion of these inputs could not reach the farmers (Adebo, 2014). Adesina (2013) pointed out that the old system used in supplying inputs to the farmers was weak, inefficient and fraudulent, hence a large proportion of the farmers could not benefit

from it. He stressed that the inputs meant for the farmers were diverted by political elites to other countries for personal gains. It was also noted that most of the fertilisers supplied were adulterated, thus damaging the environment. Untimely delivery of inputs during cropping season (\bar{x} =4.62) ranked third, complicated input redemption process (\bar{x} =3.89) ranked fourth. This is contrary to the view of IFPR (2010) that the promotion of a dual fertiliser market (subsidised and free-market) has prevented the required response from the private sector in taking over the role played by the public sector. This calls for capacity building of agro dealers in fertiliser acquisition and distribution strategies. Very distant redemption centres (\bar{x} =3.04) ranked fifth among the major constraints facing rice farmers in achieving their goal of maximum



productivity and developed good zeal to the farming enterprises.

Table 4: Constraints of using e-wallet in rice production

Constraints	SA	A	IN	D	SD	Mean	Ranked
Complicated input redemption process	10(50)	178(712)	11(33)	2(4)	6(6)	3.89	4 th
Dysfunctional/ineffective network connectivity	4(20)	6(24)	9(27)	185(310)	3(3)	2.14	10 th
Ineffectiveness of coordination mechanism	3(15)	4(16)	77(231)	121(242)	2(2)	2.44	9 th
Ineffective/untimely delivery of services	2(10)	58(232)	9(21)	137(274)	1(1)	2.62	8 th
Unsatisfactory number of bags of fertiliser per head	14(70)	75(300)	11(33)	103(206)	4(4)	2.96	7 th
Very distant redemption centres	8(40)	95(380)	10(30)	86(172)	8(8)	3.04	5 th
Problem of transportation of inputs acquired	7(35)	92(368)	8(24)	90(180)	10(10)	2.98	6 th
High cost of fertiliser acquisition	2(10)	3(12)	9(27)	182(364)	11(11)	2.04	12 th
Untimely delivery of inputs during cropping season	146(730)	49(196)	8(24)	3(6)	1(1)	4.62	3 rd
Difficulties/no access to extension services	187(935)	3(12)	11(33)	3(6)	3(3)	4.70	1 st
Elements of corrupt tendencies at redemption centres	176(880)	7(28)	16(48)	5(10)	3(3)	4.68	2 nd
Problem of fertiliser adulteration	3(15)	2(8)	2(24)	189(378)	5(5)	2.08	11 th

Source: Field survey, 2015

Assessing the socioeconomic characteristics of the rice farmers and the constraints associated with using e-wallet in rice production.

The ordinary least square (OLS) was used and the result obtained are presented in Table 5. The coefficient of determination (R^2) showed that (55.38%) variation of the effect on the constraints associated with using e-wallet in rice production was explained by the independent variables included in the models. While the remaining (44.62%) was as a result of non-inclusion of some explanatory variables and error in the estimation. Result in Table 5 showed that out of ten independent variables, four were found to have significant influence on the constraints associated with using e-wallet in rice production. These variables: household size (3.62) which was significant at 1% level of probability, education

(0.66) which was significant at 5% level of probability, farm size (13.78) which was significant at 1% level of probability and access to inputs (32.48) which was significant at 10% level of probability were found to have significant influence on the constraints associated with using e-wallet in rice production in the area. The positive coefficient of the household implies that farming household had positive influence on rice production among the respondents. The positive coefficient of education implies that the higher the education the better the farmers' output. Education is very vital because it fast tracks the adoption of innovation and new technology. The positive coefficient of farm size and access to inputs imply that access to adequate farmland and agricultural inputs will positively influence the rice production.

Table 5: Effects of socioeconomic characteristics of rice farmers and the constraints associated with using e-wallet in rice production, n=207

Variables	Coefficients	Standard error	t-value	p-value
Sex	-5.247884	4.019879	-1.31	0.193
Age	-.1597863	.2467158	-0.65	0.518
Hhsize	3.615886	.5333957	6.78	0.000***
Education	.6614678	.3036418	2.18	0.031**
Farming exp	.2150266	.1880175	1.14	0.254

Farm size	13.77984	2.569847	5.36	0.000***
Credit access	-5.362886	7.632219	-0.70	0.483
Cooperative	-16.02133	24.66008	-0.65	0.517
Extension	2.392486	3.539883	0.68	0.500
Input access	32.48216	17.9743	1.81	0.072*
Constant	-33.32146	18.75277	-1.78	0.077

R-squared=0.5538, Adj R-squared =0.5310

F-Ratio = 24.32***** = significant at 1% level of probability, **=significant at 5% level of probability, *=-significant at 10% level of probability

Source: Field survey, 2015

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings, it can be concluded that rice production in Niger State were small-scale farmers enterprise and it was dominated by male. The major source of information on e-wallet was through radio transmission. Also, majority of the respondents had favourable perception on the usefulness of e-wallet in the study area. Furthermore, through the use of e-wallet on rice production farming households were found to be positively influenced in the study area. Moreover, difficulties or lack of access to extension services, corruption among others were the constraints faced by farmers in the usage of e-wallet in the study area.

Based on the findings of this study, it is recommended that:

- i. The E-wallet programme should extend the sources of information so as to reach more farmers in the study area.
- ii. The respondents perception should be strengthen so as to attract other farmers both with the state and outside the state.
- iii. Most of the constraints facing the rice farmers such as difficulties/no access to extension services and element of corrupt at redemption centres should be solved so as to deliver proper and efficient programme to the rice farmers.

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