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DETERMINATION OF ADOPTION RATE OF ELECTRONIC WALLET SYSTEM BY RICE FARMERS IN BENUE AND TARABA STATES, NIGERIA

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Abstract

A survey was conducted in Benue and Taraba States, Nigeria, to determine the adoption rate of electronic wallet system by rice farmers. The population of this study consisted of all rice farmers who adopted electronic wallet system for the purpose of accessing farm inputs in the study area. A sample size of 325 respondents was selected using purposive, snow ball, stratified and simple random sampling techniques. However, 311 copies of questionnaire were retrieved and analyzed. Data for this study were collected mainly from primary source, through the use of a well-structured questionnaire along-side interview technique. The result shows that 73.63% of the respondents were males. The respondents had a mean age of 44.12 years. Over 66.88% of the respondents did not have extension contact and only 30.23% had access to credit. The highest (63.93%) number of adopters of electronic wallet system in Benue State was in 2013, while 44.44% adopted electronic wallet system in 2013 in Taraba State. Result of binary logistic regression shows that some factors were found to exert a significant influence on the rate of adoption of electronic wallet system. It was concluded that socio- economic characteristics generally have influence on the adoption of electronic wallet system. The study recommended that more awareness should be created on the use that electronic wallet system in accessing farm inputs by famers. This will further enhance the adoption of the system.

Key words: Determination, Adoption Rate, Electronic Wallet System, Farmers, Nigeria

Introduction

Although, the Nigerian rice sector has improved significantly in terms of both production and consumption, the production increase is not adequate to match its demand for

consumption (Bamigboye and Kuponiyi, 2010). Consequently, the price of rice has gone beyond the reach of majority of Nigerians (Omofonmwan and Kadiri, 2007). Appropriate farming technologies and systems are therefore, required if rice production is to shift from the subsistence and primordial state in which it is currently being practiced in the country (Banmeke, Fapojuwo and Fakoya, 2010). In 2011, the Federal Government of Nigeria launched a policy document known as Agricultural Transformation Agenda (ATA). The launching of this policy document was expected to be a roadmap in solving fundamental problems associated with the agricultural sector (Adesina, 2012). In July, 2012, the Federal Government introduced the Growth Enhancement Support Scheme (GESS) as a component of the Agricultural Transformation Agenda (ATA). Growth Enhancement Support Scheme (GESS) was designed to deliver government subsidized farm inputs directly to farmers via general system for mobile phones.

The GESS is powered by electronic wallet, an electronic distribution channel which provides an efficient and transparent system for the purchase and distribution of agricultural inputs based on a voucher system (Tiri, Ojoko and Aruwayo, 2014). The scheme guarantees registered farmers electronic wallet vouchers with which they can redeem fertilizers, seeds and other agricultural inputs from agro-dealers at half the cost, the other half being borne by the Federal and State Governments in equal proportions. As a technology, the electronic wallet system was adopted by 4.2 million farmers in 2012 and the number increased to 9.2 million in 2013 (Adesina, 2013). However, the programe has been underperforming due to low level of awareness by the farmers and insufficient fertilizer and seed supply (Adebo, 2014). Abdulahi (2014) also reported that it took a lot of time to complete the registration of a farmer and cost of mobile phones was high. To alleviate the challenge of cost of mobile phones, the Federal Government at inception of electronic wallet system had promised to provide mobile phones to farmers at no cost (Adesina, 2012). The phones have not been supplied as promised. Farmers are still left with the task of purchasing their personal phones (Haruna, Jamilu, Abdullahi and Murtala, 2013). These constraints could limit the adoption of electronic wallet system by rice farmers in Benue and Taraba States. No study had attempted to determine adoption rate of electronic wallet system by rice farmers in Benue and Taraba States. It has therefore, become imperative to fill this research gap.

The broad objective of this study was to determine adoption rate of electronic wallet system by rice farmers in Benue and Taraba States, Nigeria. Specifically, the objectives of this study were to:

1. describe the socio-economic characteristics of rice farmers who adopted electronic

wallet system in Benue and Taraba States;

2. compare the level of respondents' understanding of the content of e-wallet system in Benue and Taraba States;
3. determine the rate of adoption of electronic wallet system by rice farmers in the first four (4) years (2012 to 2015) of the programme;
4. describe the level of rice farmers' access to farm inputs through electronic wallet system in Benue and Taraba States.

The null hypothesis for the study was stated as:

1. Socio- economic characteristics of rice farmers do not influence the rate of adoption of electronic wallet in Benue and Taraba States.

Methodology

Study Area

This study adopted cross sectional survey using a research questionnaire to collect data in Benue and Taraba States, Nigeria. Benue State has a land mass of 34,059 square kilometers and lies between Longitude 7° 47' and 10° 0' East, Latitude 6° 25' and 8° 8' North. The ecology of Benue State supports extensive arable crop and livestock production as well as fruit, palm, grains, legumes, root and tuber production. Hence, the State is acclaimed the 'Food Basket of Nigeria' (Aliegba, 2011). Taraba State lies between latitude 60 30′ and 90 36′ north of the equator and Longitude 90 10′ and 110 50′ east of the Greenwich meridian (Taraba State Ministry of Information, Youth, Sports and Culture, 1999). Taraba State covers an area of 54,473 km^2 and has agriculture as the mainstay of its economy with the production of varieties of cash crops throughout the year (TASG, 2016).

Population and sample size

The population of this study consisted of all rice farmers in Benue and Taraba States who adopted the electronic wallet system for the purpose of accessing farm inputs. A total of three hundred and twenty five respondents were selected as sample size using multistage sampling technique, involving purposive, stratified, snowball and simple random sampling techniques. Data were collected from primary source with the use of a well-structured questionnaire and interview techniques.

Techniques of Data Analysis

Data for this study were analyzed using descriptive statistics, such as frequency, percentages and mean as well as inferential statistic like binary logistic regression. While Frequency, percentages and mean were used to analyze objectives 1, 2, 3 and 4, logistic regression was used to test for the stated hypothesis.

Results and Discussion

Socio- Economic Characteristics of Respondents

Age(years)

Table 1 shows that the mean age of the respondents in Benue State was 43.62 years. In Taraba State, the mean age of respondents was 44.95 years. The pooled mean age was 44.12 years. This result implies that farmers who adopted electronic wallet system in the study area were matured in age and in their active years which indicates their capacity to adopt innovations and to work respectively. Similarly, Ayoola, Dangbegnon, Daudu, Mando, Kudi, Amapu, Adeosun, and Ezui (2011), in their study of socio-economic factors influencing rice production among male and female farmers in Northern Guinea Savanna Nigeria reported that the respondents were young and active in Kaduna and Niger States, Nigeria.

Sex

The pooled result (Table 1) also shows that 73.63% of the respondents were male and 26.37% were female in the study area. The results suggest that as far as farming activities were concerned, both sexes are willing to adopt agricultural innovations for improved productivity. This result confirmed the findings of Okwu and Iorkaa (2011) who reported that, majority of the farmers in Ushongo local government area, Benue State, Nigeria, males.

Rice Farm Size

` The pooled result (Table 1) shows that 48.55% of the respondents cultivated between 2 and 4 hectares. Another 31.52% had a farm size less than 2 hectares, with 12.54% of the respondents having rice farm size of 5-7 hectares. The remaining 6.75% and 0.64% had farm sizes of between 8 and 10 hectares and more than 10 hectares respectively. The pooled mean farm size of the respondents is 2.98 hectares. This confirms a priori expectation that farmers in Benue and Taraba States were small scale farmers. This result confirms the finding of Yuguda, Girei, Dire, and Salihu (2013), who reported that majority of their respondents constituting about 60.90%, had a land holding between 2 and 5 hectares.

Average Annual Income

Data in Table 1 shows that the pooled mean income of Benue and Taraba farmers was N186,598.00. The implication of the result is that, given the right orientation, farmers will be willing and able to at least pay for farm inputs distributed through electronic wallet system, if convinced that it will actually lead to an improvement in their productivity.

Extension Contact

Entries in Table 1(pooled) shows that 66.88% of the respondents did not have extension contact, 33.12% of the respondents had extension contact. This result implies that farmers' access to improved farming technologies is limited. Extension helps to increase agricultural production,

Table 1: Distribution of Respondents Based on Socio-Economic Characteristics (n=311)

	Benue State (n=194)			Taraba State (n=117)			Pooled (n=311)		
Variable	F	%	*x*	F	%	*x*	F	%	*x*
Age (years)			**43.62**			**44.95**			**44.12**
21-30	28	14.42		10	8.55		38	12.21	
31-40	54	27.84		40	34.19		94	30.23	
41-50	58	29.90		37	31.62		95	30.55	
51-60	42	21.65		17	14.53		59	18.97	
>60	12	6.19		13	11.11		25	8.04	
Sub-total (a)	194	100		117	100		311	100	
Sex									
Male	141	72.68		88	75.21		229	73.63	
Female	53	27.32		29	24.79		82	26.37	
Sub-total (b)	194	100		117	100		311	100	
Rice Farm Size(Hect.)			**2.21**			**4.27**			**2.98**
< 2	91	44.33		7	5.98		98	31.52	
2-4	85	41.75		66	56.41		151	48.55	
5-7	11	6.70		28	23.93		39	12.54	
8-10	7	7.22		14	11.97		21	6.75	
>10	0	0.00		2	1.71		2	0.64	
Sub-Total (i)	194	100		117	100		311	100	
Average Annual Income(₦'000.00)			**121,264**			**294,927**			**186,598**
≤ 100	118	60.86		06	5.13		124	39.87	
101-200	49	25.25		32	27.36		81	26.04	
201-300	17	8.76		38	32.46		55	17.68	
301-400	4	2.96		18	15.39		22	7.08	
> 401	6	3.07		23	19.66		29	9.33	
Sub-Total (j)	194	100		117	100		311	100	
Extension Contact									
Yes	84	43.30		19	16.24		103	33.12	
No	110	56.70		98	83.76		208	66.88	
Sub-Total (k)	194	100		117	100		311	100	
Access to credit									
Yes	81	41.75		13	11.11		94	30.23	
No	113	58.25		104	88.89		217	69.77	
Sub-Total (l)	194	100		117	100		311	100	

Source: Field Survey, 2017

most especially when the improved farming techniques, machinery and other inputs introduced to farmers are adopted (Age, Ashi and Unongo, 2010).

Access to Credit

The pooled result shows that, 69.77% of the respondents did not have access to credit while only 30.23% had access to credit. This suggests that most of the farmers do not have farm credit for production. This result agrees with Bolarinwa and Fakoya (2011) that only 37.6% of the farmers secured loan from commercial banks and Nigeria Agricultural and Rural Development bank.

Level of Respondents' Understanding of the Content of E-Wallet System in Benue and Taraba States

Entries in the table (2) show that while the mean score of the level of understanding of electronic wallet for respondents in Benue State was 1.97 (moderate), the mean score of the level of understanding of electronic wallet in Taraba State was 2.38 (high). The pooled mean score of the level of understanding was 2.12, implying that farmers in the two States generally have high understanding of electronic wallet. This result is expected because most (86%) farmers now use mobile phones and are therefore, used to text messages (Bolarinwa and Oyeyinka, 2011). This result is in line with the findings of Gaurall (2009) who assert that the use of mobile phone enables farmers to access information from various sources such as research institutes, inputs dealers, government agencies and agricultural extension officers.

Table2: Rice Farmers' Level of Understanding of Electronic Wallet System i n Benue and Taraba States

(n=311)

Level of Understanding	Benue (n=194) Freq.	%	*Mean*	Taraba (n=117) Freq.	%	*Mean*	Pooled Freq.	%	*Mean*
			1.97			2.38			2.12
HU	99	51.00		93	79.5		192	61.74	
MU	16	39.20		22	18.8		98	31.51	
LU	19	9.8		2	1.7		21	6.75	
Total	194	100.0		117	100.00		311	100.00	
		0							

Source: Field Survey, 2017

Level of understanding of electronic wallet

High understanding (HU) (x . 2-3)

Moderate understanding (MU) (x . 1.50-1.99)

Low understanding (LU) (x =1-1.49)

Adoption Rate of Electronic Wallet System in Benue and Taraba States

Table 3 shows that the highest (63.93%) number of adopters of electronic wallet system in Benue State was in 2013. The highest number (44.44%) also adopted electronic wallet system in 2013 in Taraba State, while 7.53% of respondents adopted the system in 2012 in Benue State, 21.37% adopted the system in 2012 in Taraba State. The entries also show that 12.88% and 5.67% adopted in 2014 and 2015 respectively in Benue State. Similarly, only 15.43% and 9.01% of the respondents adopted the system in 2014 and 2015 respectively in Taraba State. The pooled result shows that the highest (56.59%) number of the respondents adopted electronic wallet system in 2013. This was followed by 18.97% of the respondents who adopted in 2012. Another 15.43% and 9.01% of the respondents adopted in 2014 and 2015 respectively. This result implied that adoption of electronic wallet system among rice farmers in the study area was on the decline. This may be that the government was no longer promoting the scheme.

Table 3: Rate of Adoption of Electronic Wallet system in Benue and Taraba States

(n=311)

	Benue State (n=194)		Taraba State (n=117)		Pooled	
Year of Adoption	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
2012	34	17.53	25	21.37	59	18.97
2013	124	63.92	52	44.44	176	56.59
2014	25	12.88	23	19.66	48	15.43
2015	11	5.67	17	14.53	28	9.01
Total	194	100.00	117	100.00	311	100.00

Source: Field Data, 2017

Level of Rice Farmers' Access to Farm Inputs through Electronic Wallet System

Entries in table 4 show that the mean score of level of access to farm inputs through electronic wallet system in Benue State was 1.93 which implied a moderate level of access for Benue farmers. The mean score of the level of access to farm inputs through electronic Wallet system in Taraba State was 2.36. This implied a high level of access for Taraba State farmers.

The pooled mean score was 2.09 which implied that farmers in the two States generally had high level of access to farm inputs through electronic wallet system. This result agree with the findings of Ajah (2014) where the researcher perceptionally evaluated gender access to farm inputs in Abuja, Nigeria and reported that the mean access to improved crop varieties (2.61) is relatively encouraging.

Table 4: Level of Access to Farm Inputs through Electronic Wallet System
(n=311)

	Benue (n=194)			Taraba (n=117)			Pooled		
Level of Access	Freq.	%	*Mean (x*	Freq.	%	*Mean (x*	Freq.	%	*Mean (x*
			1.93			2.36			2.09
HA	97	50.00		113	96.58		210	67.52	
MA	73	37.63		4	3.42		77	24,76	
LA	24	12.37		0	0.00		24	7.72	
Total	194	100.00		117	100.00		311	100.00	

Source: Field Survey, 2017

Level of access to farm inputs through electronic wallet

High access (HA) (*x* 2-3)
Moderate access (MA) (*x* =1.50-1.99)
Low access (LA) (*x* 1-1.49)

Influence of Socio – economic Characteristics on the Rate of Adoption of Electronic Wallet in Benue and Taraba States

Hypothesis 1. Socio – economic characteristics do not influence the rate of adoption of electronic wallet in Benue and Taraba States. The result (Table 5) of Binary logistic regression shows that the Hosmer and Lemenshow test Chi-square of 4.78 (df =8) was not significant which implied that the model used was not significantly different from the standard model. In addition, the Chi-Square of 55.03 (df=12) for model coefficient indicated that socio-economic characteristics included in the model were significantly related to the rate of adoption among rice farmers in Benue and Taraba States. Hence the null hypothesis was rejected. The result shows that membership of cooperative and rice farm size were significant at 1%, while household size, extension contact and access to credit were significant at 5%. Finally, farming experience was significant at 10%. These factors were found to exert a significant influence on the rate of adoption of electronic wallet system. Specifically, the coefficient of membership of cooperatives was negative and significant (-1.126). This implies that farmers belonging to cooperative groups were more likely not to adopt agricultural technologies than their non-cooperative counterparts. This is against a priori expectation. The result could be that, the cooperatives have failed in their responsibility of educating their members on the existence of electronic wallet system. However, this agrees with findings of (Ayoola, 2012), where the researcher studied the socio-economic determinants of the adoption of yam minisett technology in the Middle Belt region of Nigeria and reported that membership of farmers' organization was negative and significant at 5 percent level. The coefficient of household size was positive and significant (0.109), implying that a unit increase in household size increases the probability of high rate of adoption. Obaniyi, Fabiyi, Adewole, Iyilade and Onikoyi (2012) also found out that household size (β= 0.037) had positive

relationship with participation levels of farmers in capacity building programmes in Kwara State, Nigeria. Similarly, the coefficient of farm experience was positive and significant (0.042), implying that a unit increase in farm experience increases the probability of high rate of adoption. This collaborates the findings of Ayoola, Dangbegnon, Daudu, Mando, Kudi, Amapu, Adeosun and Ezui (2011) that experience of male and female farmers in Northern Guinea Savanna Nigeria was a significant (t=1.675) variable that greatly influenced rice productivity in the study area. The result also shows a significance but negative (-0.223) influence between size of farm and adoption rate. Both extension contact (0.881) and access to credit (1.054) showed positive and significant influence on the adoption of electronic wallet system. This implies that as extension contact and access to credit increases, likelihood of high rate of adoption also increases. This confirms priori expectation, the finding of Tijjani, Bakari, Usman and Adebayo (2016) that the probability of rice farmers adopting agricultural technologies increases by 19.2% as extension contact increases by a unit. Darko (2015) also reported that a unit increase in credit access will result in 1.4849 increases in the log-odds of adoption of cocoa research innovation, holding other variables constant.

Conclusion and Recommendations

Conclusion

The study was designed to determine adoption rate of electronic wallet system among rice farmers in Benue and Taraba States, Nigeria. The result showed that a higher percentage of the respondents were active and mature. Also majority of the respondents were male who were married, even though majority had no access to credit and extension contact. Against a priori expectation, majority of the respondents had high level of understanding of electronic wallet system just as majority adopted the system in 2013 (second year of implementation). Majority of the respondents also had high access to farm inputs through electronic wallet system. The study finally revealed that, adoption rate of electronic wallet system had decline in Benue and Taraba States between 2013 and 2015.

Recommendations

Based on the findings of this research, the following recommendations were made:

i. More awareness should be created by the government on the existence of electronic wallet system. This will improve the adoption of the system among farmers in the study area.

ii. More redemption centres should be established to enhance ease of accessibility of farm inputs by the farmers.

iii. Higher quantities of farm inputs should be allocated to farmers through the electronic wallet system. The farmers are willing and able to buy higher quantities.

Table5: Binary Logistic Regression of the Influence of Socio– economic Characteristics on the Rate of Adoption of Electronic Wallet in Benue and Taraba States

Socio-economic characteristics	B	S.E.	Wald	Df	Sig.	Exp(B)
Age	-0.025	0.021	1.386	1	0.239	.975
Sex	0.105	0.339	0.096	1	0.757	1.111
Marital status	0.074	0.583	0.016	1	0.899	1.076
Years of education	-0.020	0.046	0.188	1	0.664	.980
Membership of cooperative	-1.126	0.427	6.953*	1	0.008	.324
Household size	0.109	0.052	4.378**	1	0.036	1.116
Farm experience	0.042	0.024	2.923***	1	0.087	1.043
Primary occupation	0.504	0.347	2.104	1	0.147	1.655
Rice farm size	0-.223	0.090	6.099*	1	0.014	.800
Average annual income	0.000	0.000	0.002	1	0.962	1.000
Extension contact	0.881	0.377	5.470**	1	0.019	2.413
Access to credit	1.054	0.467	5.088**	1	0.024	2.870
Constant	1.531	1.084	1.993	1	0.158	4.623
Chi-square	55.031(df= 12)				0.000	
Hosmer and Lemeshow Test	4.778 (df=8)				.781	
Nagelkerke R^2	.242					

Source: Field Survey, 2017

*Statistically significant at 1% level of significance

**Statistically significant at 5% level of significance

***Statistically significant at 10% level of significance

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