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RURAL AGRIBUSINESS-BASED HOUSEHOLD PREFERENCES AND MANAGEMENT OF COMMUNICATION SERVICES IN ABIA STATE, NIGERIA: A HEDONIC APPROACH

***Onwumere J., Chukwu A.U. and Obi V.C.**

Department Of Agribusiness Management

College Of Management Sciences, Michael Okpara University of Agriculture,

Umudike, Umuahia, Abia State, Nigeria

Abstract: *This study on agribusiness-based household preferences and management of communication services in Abia State, Nigeria was analyzed using a hedonic approach. The study tried to identify which mobile communication services impacts most on agribusiness households, and which network provider guarantees better utility to the household users. Thus, 240 agribusiness-based households were selected using multistage sampling technique. Two out of three agribusiness zones in Abia State were selected namely: Aba and Umuahia agricultural zones were selected for the study. The study made use of primary data obtained using a well-structured questionnaire. Descriptive statistics, multivariate tests and Hedonic analysis were used for the data analysis. Results revealed that males (61.67%) dominated as agribusiness-based households' heads in the study area. Majority (26.25%) of households were in the age bracket of 61-70 years who were also engage in agricultural activities being their major activity. The hedonic model revealed that household characteristics such as sex, education, electricity connection to household buildings, ownership of house, and increased household size related positively with household ability to settle call prices charged by the preferred network provider while poor and extremely poor households related negatively with ability to settle call prices as charged on calls per day. The multivariate test showed that Mobile Telecommunication Network (MTN) Limited Communication service impacted most on the welfare of these households than Globalcom (GLO) communication services Nigeria Limited. No meaningful contribution was observed in the case of Airtel communication services. It was recommended that communication service providers in the study area should reduce their call rates to accommodate the poor and extremely poor households in order to increase household preferences and subscriptions.*

Keywords: agribusiness, households, preferences, communication, services

I.0 Introduction

Given its enormous potential for improving household's and societal welfare, the government of Nigeria during the president Obasanjo's administration in 1999 came up with the policy of privatization and commercialization of the communication sector (AigbeaKaen, 2007). This policy of privatization and commercialization of the communication sector decomposed the Nigeria telecommunication firm (NITEL), giving way for private communication firms to spring up and rush into the nation seeing the desire for telecommunication by Nigerian household (CTA, 1997).Communication without doubt is a major driver of an economy. Emerging trends in socio-economic growth shows a high premium and high cost of services as well as variation and inconsistent service of information and communication technology (ICT) to the greater audiences in developing countries such as Nigerians (Aigbeakaen, 1997).

In recent years, following deregulation activities in many developing nations (Reardon et al. 2009) and the lowering of trade barriers in developed ones (World Bank 2008), individual, households and private, market-driven agribusinesses have replaced state-supported entities. There is a wide gap of disparity between the urban and the rural population warranting a bridging. On the demand side, an increasingly urban population worldwide requires food to be delivered farther and farther from the farm; with rising incomes and changing preferences, this population also demands higher levels of food safety, quality, and traceability. Communication system optimization has become a need in agribusiness development which has a consequential effect in households' wellbeing in many developing economies.

As FAO (2005) notes, the information system obviously removes critical barriers that have kept farming households from participating in the commercial agribusiness supply chain. Households need to receive relevant and timely information regard productive activities. They need to keep in touch with other stakeholders their activities in such areas as demand and quality requirements, price and market situation. Further, agribusiness households may need information on agricultural yields, access to finance, and agricultural extension services (FAO 2005).

Eventually the ubiquity of cheap mobile phones (even among smallholders) and reliable Internet connections have proved indeed to be reliable communication sources for various household functions including labour sourcing and provision of labour. To select reliable communication service providers has been a bottleneck case among agribusiness households. It has been observed that agribusiness based households finds it difficult to choose the service provider that will impact most on their welfare and that which will guarantee them a better utility given the varied but similar services provided by these network providers at a relatively high and extortive prices which have almost stampeded savings among the agribusiness households. Following this backdrop, this study investigated the household preferences with respect to management of communication service by MTN, GLO and Airtel mobile network services in Abia State, Nigeria. The specific objectives are first to analyse the determinants of call prices that agribusiness households are willing to pay and secondly, ascertain the effects

2.0 Methodology

This work was carried out in Abia State, Nigeria. Abia State is a state created in 1991 from part of Imo State, the citizens are predominantly Igbos. Abia state lies with approximately latitude $4^0 4^0$ and $6^0 14^0$ North and longitude 7^0 $10^0$and 8^0 East. The state share common boundaries to the north with Ebonyi State, south with Rivers state, the East with cross river and Akwa Ibom State and west with Imo State respectively. State Abia state has 17 Local Government Areas namely: Aba North L.G.A, Aba South L.G.A Arochukwu L.G.A, Isiala Ngwa South L.G.A, Isiukwuato L.G.A, Obingwa L.G.A, Umuahia North, Umuahia South L.G.A, and Umunnochi L.G.A. Eighty percent of the population of Abia State practice Agriculture, mainly Crop production. The State has three agricultural Zones namely; Umuahia, Aba and Ohafia. In these zones, because of the tropical and humid climate agribusiness households are usually involved such activities as crops production like cassava, cocoa, oil palm, maize, palm kernel processing, rearing of sheep, goat, pork, poultry, fishery, rabbit production etc. and also the availability of communication services have helped in boosting of communication in this study area.

A Multistage sampling techniques was used in selecting the respondents. The first stage was a purposive selection of Abia State and the agribusiness zones (Umuahia and Aba Zones). Further, using a simple random sampling technique two local governments areas were selected from each of the agribusiness zones. Also four communities were selected from each local Government, giving a total of 8 (eight) communities from the two selected agricultural zones. Thirty households were selected from each community and 240 households in all were studied. Table 1 revealed the distribution and the spread of data selection.

Table 1: Sample distribution for the study area

Agricultural Zones	**Selected LGA**	**selected community**	**selected households**
Aba	Osisioma Ngwa	Umuojima	30
		Osaka – Ukwu	30
	Isiala Ngwa		
		Ikputu	30
		Ntigha	30
Umuahia	Umuahia South		
		Ubakala	30

		Olokoro	30
	Ikwuano		
		Umudike	30
		Isiala	30
Total			**240**

Source: Survey Data 2012.

The study used primary means of data collection via questionnaire to source the information analyzed in this work. The technique of data analyses included the use of descriptive statistics and an econometric model involving hedonic and multivariate analyses.

The econometric model was estimated in a log-linear form is represented as

$$LNP = Xi\beta_1 + \sum^{n} j\ Wij + \varepsilon i$$

Where

LNP = is the natural logarithm of call price paid per day by households. This is measured by the price per second charged by the selected communication service provider per number of calls per day, and set of *n* dummy variables.

Wi = represent the type of service provider to which the agribusiness household is connected (i.e if government owned communication service: NITEL, or the Global system mobile: GLO, MTN, AIRTEL)

β and φ: are conformable vectors of relevant coefficients to be estimated.

εi is the stochastic variable or residual term or error term.

To model the choice of communication service, agribusiness households "/" is assumed to maximize their profit from communication services "j" (Vij*) as follows:-

$$Vij^* = Zi\alpha j + \sigma ij + Uij$$

Where;

αi is the vector of corresponding parameters to be estimated.

Zi is a vector of agribusiness household characteristics; and each choice is assumed to be affected by the unique latent factor and the coefficient are restricted to be equal to one in order to normalize the scale of choice. The indirect utility Vij* is not directly observed but can be uncovered through observed choices in the form of binary variable.

The variable specification for hedonic model and multivariate test is given below

Table 2 Description of the variables for hedonic model and multivariate test

VARIABLE	DEFINITION
LNP	Natural logarithm of price charged on

	calls per day.
MTN COMM	If the household is accessible to MTN communication (i.e Yes, 0=otherwise)
GLO COMM	If the household is accessible to GLO Communication network (1=yes. 0=otherwise)
AIRTEL COMM	If the household is accessible to Airtel Communication network (1=yes, 0 = otherwise).
HH size	Household Size
EXT POOR	If the household is extremely poor (1=yes, 0=otherwise)
POOR	If the household is poor (1=yes, 0 = otherwise)
EDUC.	Education level of household head
AGE	Age of household head (in years)
SEX	Gender of household head
HRENT	If the household building is rented (1=yes, 0 = otherwise)
HOWNED	If the household building is owned (1=yes, 0 = otherwise)
ELECT	If the household building is connected to electricity (1=yes, 0=otherwise)

The variable specified above are the characteristics of the selected agribusiness–based households that determines their willingness to settle their call prices per day as charged by the preferred network provider. The hedonic model was used to analyze the determinants of calls prices that agribusiness households are willing to expend on calls per day as charged by the preferred network providers. The hedonic model is a value system approach of estimating value of public offered products like communication services. It is done by decomposing the product being studied into its characteristics and estimating value of each characteristic on the product.

The multivariate tests ascertained the effect of communication governance on the welfare of these selected agribusiness households in the study area, using the same variables as specified above.

3.0 Results and discussions

The section is presented following the analyses of the socioeconomic variables of the agribusiness households; determinants of the call prices that households are willing to spend per day as payment to the communication service providers; and

multivariate test analyses on the effect of communication governance on the welfare of agribusiness households.

The socioeconomic characteristic of the households were analyse with respect to gender, age, educational level and household size. They are presented in table 3

Table 3: Distribution of socio-economic characteristics of agribusiness-based households

Socio-Economic characteristics	Variable	Frequency	Percentage (%)
Gender	Female	92	38.33
	Male	148	61.67
	Total	**240**	**100**
Ages	20-30	45	18.75
	31-40	57	23.74
	41-50	36	15.00
	51-60	39	16.25
	61-70	63	26.25
	Total	**240**	**100**
Education Level			
	Primary School Only	96	6.67
	Secondary School only	63	26.25
	Tertiary	69	28.25
	Post-tertiary	74	30.83
	Non	18	7.5
	Total	**240**	**100**
Household Size	1-5	136	56.7
	6-10	61	25.4
	11-15	43	17.9
	Total	**240**	**100**

Source: Survey data 2012

Table 3 revealed that the gender distribution of household heads skewed towards the males (51.67%). An appreciable proportion (26.25%) of agribusiness-based household heads in the age bracket of 61-70 was found in the study area. Also, greater percentage (30.85%) of the agribusiness–based households in the study area are educated up to post –tertiary level while less percentage (7.5%) do not have the formal education. This indicates that majority of these households who have the formal education, will attaché more value to the modern means of communication and also make effort to pass the knowledge to the uneducated households on the use of communication services. Education impacts knowledge and the higher the knowledge, the higher the value attached to the subject matter. High proportions (56.7%) of the households are in the household range of 1-5 household sizes. This depicts that as the households' increase, the need for communication services increases.

Analyses of the determinants of call prices that agribusiness households are willing to pay per day using a hedonic model are presented in table 4

Table 4: Hedonic analysis on the determinants of the call prices that households are willing to spend per day

EFFECT	CO-EFFICIENT	P-VALUE
INTERCEPT	3.517E2a (14.401)	* * *
SEX	1.331E3a (75.641)	* * *
EDUC.	4.135E2a (57.860)	* * *
POOR	3.570E2a (-41.687)	* * *
EXT POOR	3.975EA (-41.687)	* * *
HRENT	3.392E2a	
MTNCOMM	3.782E3a (44.250)	* * *
GLOCOMM	3.880E2a (32.247)	* * *
AIRTELCOMM	6.515E2a (295.674)	* * *
ELECT	4.015E2a (45.757)	* * *
HOWNED	9.371E2b (581.344)	* * *
HHSIZE	4.001E2a (44.340)	* * *
CHI-SQUARE	709.753	

Source: Survey data, 2012

Note*** =significant at 1% risk level

Table 4 shows the determinants of the call prices that agribusiness households are willing to expend per day in the course of utilizing the services of the selected communication service provider. The hedonic model is statistically significant at 1% risk level. Gender (Sex) is statistically significant at 1% risk level and relates positively to the prices agribusiness households are willing to expend on call prices as charged by the preferred communication service(s) per day. This indicates that gender have a strong positive influence on the value attached to these selected communication services and the price paid for certain level of utility by the agribusiness households.

Education is statistically significant at 1% risk level and has a strong influence on the prices that agribusiness households are willing to pay per day on calls as charged by the selected communication service provider. Education means knowledge and information, and the more informed the households are, the greater the value and patronage of the communication service provider that guarantees better utility.

Extreme poverty is statistically significant at 1% risk level but relates negatively with call prices that households are willing to pay and the amount spend on calls per day for the preferred communication service. Extremely poor households earn very little income for their survival and so, have greater value for their survival and with less preference for communication network provider. This shows that extremely poor households although may want to use mobile phones or very few of them use it for communication but the calls prices are serious discouragement.

Preference for MTN, GLo and Airtel Communication services are statistically significant at 1% risk level and positively relate to call prices households are willing to spend on calls per day. This means that as the agribusiness–based household enjoys better utility in terms of reduced prices from the selected communication networks, the more disposed they are to patronize them.

Households with electricity is significant at 1% level and positively related to the call prices households can pay on calls for selected communication service provider per day. This means that if the household is connected to electricity is evidence improved standard of living, thus, there is high tendency for value and willingness to pay for call charges per day higher than the poor households will do for the preferred communication service provider.

Living in owned house (HOWNED) is statistically significant at 1% risk level and positively related to the call prices households can afford to pay per day. This indicates that as the household owns the house they live in, this partly indicate an improve status of living with no rent attached or with imputed rent. Thus, the agribusiness households have added value to demand and are disposed to pay or be able to settle higher call prices per day than their counterpart very poor agribusiness households.

Household size is significant at 1% risk level and positively related to call prices that households are willing to spend on calls per day. This means that as agribusiness household size increases per household, the need for communication increases, so is the willingness to settle amount expended on calls per day as charged by the preferred communication service provider.

Table 5: Multivariate test on the effect of communication governance on the welfare of agribusiness households

Independent Variables	**Dependent Variables**	**Coefficient**	**t-statistics**
Intercept	MTNCOMM	1.244	7.165 ***
	Glocomm	4.096	16.309***
	Airtelcomm	4.217	17.171***
EDUC.	MTNCOMM	2.075	11.834***
	GLOCOMM	0.963	3.834***
	AIRTELCOMM	0.160	0.651
ELECT	MTNCOMM	0523	3.014***
	GLOCOMM	0.002	0.008
	AIRTELCOMM	0.359	1.463
HOWNED	MTNCOMM	1.154	6.649***
	GLOCOMM	0.260	1.034
	AIRTELCOMM	0.003	0.014
HHSIZE	MTNCOMM	0.350	2.013**
	GLOCOMM	0.100	0.397
	AIRTELCOMM	0.052	0.213

SOURCE: Survey data, 2012

Note: *** = Significant at 1% risk level

**= Significant at 5% risk level

Table 5 reveals multivariate test analyses on the effect of communication governance on the welfare of agribusiness households. The result conveyed that there is a positive and high significant (1% risk level) relationship between communication governance and education level of the agribusiness households. There was a significant impact among agribusiness households using MTN and Glo communication services than those ones using Airtel services. Some of these households were found involved in using the services provided by MTN and GLO service providers to boost the operation of their businesses such customer connections, business sourcing, other operations as phone retail services and accessories such as call outlets, rechargeable cards selling and phone repairs. The result implied that returns from this business are translated into other capital for payment of school fees and other educational needs. There is also a positive and significant relationship between using MTN communication network and having electricity in ones house. The relationship is significant at 1% risk level. The implication is that for households involved in business with MTN Communication networks, the return is rewarding to the point of electrifying their houses and business centres.

Further, there is a positive and significant relationship at 1% risk level between house ownership and the use of MTN communication service network. It was observed that some households who are involved in vendor business with MTN communication services own their accommodation than others using Glo and Airtel network providers.

Also, household size related positively and significant at 5% risk level having MTN communication network providers. The implication is that some households with many members have various phone boot outlets. These phone boot outlets are managed by these households and this guarantee quicker return. The result pointed out that majority of the positive and significant contributions came from MTN service providers against Glo and Airtel network providers. The situation must have accounted the reason why there are proponents households patronizing MTN services in the study area.

4.0 Conclusion

This study following the hedonic analysis indicated that gender, education level, electricity connection to household buildings, living in owned houses and household size are significant factors that determine the response agribusiness households to call prices charged by communication service provider. Very poor households were not able to pay for such charges and thus exhibited negative relationship to call prices demanded by the service providers. This situation is not favorable as some of these household are facing limited asses to information needed for social and economic development. The multivariate test showed that MTN communication service impacted most on the welfare of the agribusiness household in the study area than GLO and Airtel service providers. This evident as patronizing MTN communication service providers for one business or the other related positively with such welfare variables as education, ownership of house and electrifying of houses.

Therefore, it was recommended that the network operators invest on network extensions, quality service delivery and product and services outlet infrastructures while also concentrating on price reduction strategies as a way of accommodating the poor and extremely poor households. This if done would boost access to communication and information to all and sundry which would enhance individual and collective welfare.

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