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# POST HAZARD MARKET RECOVERY STRATEGY ON CONSUMER PATRONAGE OF BUSH MEAT IN NIGERIA

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**ABSTRACT**: *This study sought to evaluate bush meat markets in the aftermath of epidemic out break of the Ebola in Nigeria. In course of epidemics, governments institute regimes of enlightenment campaigns to stop or minimize the consumption, handling and processing of wild animals whens studies show that major segments of the population of countries like Nigeria are at risk of contracting diseases. Also post epidemic, bush meat consumption drops, thereby giving rise to the need to encourage consumption. The major objective of this research is to empirically study post hazard market recovery strategies on consumer patronage of bush meat in Nigeria. The study was descriptive, using random sampling method to sample 250 respondents in two states of the South-east and South-south regions of Nigeria, applying a five point Likert style questionnaire with 87.3% Cronbach's alpha value. Analyses were done using SPSS version 22. First hypothesis was tested with the aid of Pearsons Chi square test producing a significant result. Binary regression analysis was used to fashion out a model for coordinated marketing effort. Three conclusions were reached, in the event of outbreak of an epidemic, "hazard factors" have to be emphasized in the campaign communication, secondly, countering and removing warnings about consumption will significantly affect consumption in post epidemic period and finally the messages must be clear, credible, and consistent in an effort to impact consumption. Finally, policy reappraisal and modification of present strategies have to be embarked upon to restore normalcy to the market for bush meat.*

**KEYWORDS**; Marketing, Consumption, Bush meat, Epidemics, Market recovery.

## INTRODUCTION

Post hazard recovery is the act or process of returning to normal state after a period of difficulty (Platts, 2017). Hazards are unwelcomed events viral disease outbreak, ecological disaster or other environmental misfortune that threaten the life and general well-being of the society it visited. Whereas world institutions and governments are developing programs to prevent or reduce the occurrences, its prevalence is largely unavoidable hence hazard management includes pre-hazard, during hazard and post hazard activities. One of the notable outbreaks that occurred in the Sub-Sahara Africa including Nigeria is the Ebola Disease which was allegedly linked to unhygienic handling and consumption of bush meat.

Bush meat products are major sources of proteins for human diet and their consumption depends on socio-cultural factors, ethics or religious beliefs or traditions (Font-i-Fornuls and Guerrero, 2014). Nigeria has great potential for 'bush meat' marketing, considering the



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population and the protein requirements of the people. Bush meat is very popular amongst the people of Nigeria. From the north of the country where very large games are available, to the south where there are games as small as rodents such as rats, bats, grass-cutters, deer and even birds. These varieties of meat act as sources of protein and come in the form of whole meals, parts of the meal or simply delicacies enjoyed at leisure. Expectedly, bush meat market was vibrant, and presents lucrative opportunity for all the supply chain participants including the hunters, traders, hoteliers and food vendors. The government agricultural agencies like Agricultural Development Programme (ADP), and world bodies like United Nations Development Programme(UNDP), United States Agency for International Development (USAID) have conducted researches in this area and are also providing assistance to the farmers from the findings of their works.

The outbreak of the dreaded 'Ebola' disease in 2014, which spread from Liberia to all through the West African region including Nigeria, posted a scary askance on the consumption of bush meat. As a strategy for dealing with the hazard, the federal government using its official media advised the consumers of bush meat to abstain and others as well to refrain from hunting, killing, handling, rearing and processing these animals to avoid further spread of the pandemic disease being fought. In October 2014 according to WHO (2014) it officially "declared that Nigeria is free of Ebola virus transmission". Furthermore, WHO (2016) stated that "on March 29th 2016 under the International Health Regulations (IHR) (2005) regarding the Ebola virus disease outbreak in West Africa, that in their own opinion, the Ebola situation in West Africa no longer constitutes a public health emergency concern and the temporary recommendations adopted in response should be terminated."

What roles do the various governments and global organizations play to reinstate the markets for bush meats after these periods of epidemics? The intention of this work is to highlight those strategies that will assist to revert to the status quo ante.

**Statement of the problem**

Epidemics come and will be overcome as a result of the resilience, resourcefulness and ingenuity the human society survives. There will in the future be epidemics no doubt; in like manner we will still count on these human characteristics to survive them (USAID, 2016). In solving these problems associated with epidemics in the past, problems are inadvertently created in other spheres of human endeavours that would not ordinarily and consciously be targeted for disruption or destruction. For example, it is not only as a consequence of diseases that such actions have been taken in the past to ensure the wellbeing of the human race. There have been cases in the past were bans, seizures, and destruction of harmful, unwholesome and outright dangerous foods and drugs have been undertaken. Messages are also passed from the health authorities and medical experts. However, when such threats have been removed the authorities would normally begin a campaign to advice consumers to resume consumption. In the case of epidemics concerning bush meat, no evidence can be found that such a campaign for reversal has been made in the case of the bush meat industry in Nigeria. Luiselli and Dendi (2016) conducted a study that "involved surveying markets twice a month between March and September 2014, found a statistically significant fall in trade for all the main traded types of animals", but no study has confirmed recovery from the fall. No research (known to the researchers) has been done to this effect and this informs the need for this present research work. Therefore, it is necessary to investigate the influence of such epidemics on the demand and consumption of bush meat knowing its importance in developing countries.



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**Objective of study**

The main objective of this paper is to empirically study post hazard market recovery strategy on consumer bush meat patronage in Nigeria. The specific objectives developed for the purposes of this study were:

1) To identify the factors influencing consumers' perception of bush meat in Nigeria
2) To determine the post hazard communication factors that influence consumption of bush meat in Nigeria
3) To determine how significant the messages of health officials and medical experts are in determining perception and consumption of bush meat pre and post epidemics
4) To offer suggestions to the policy makers and health officials as to promotional strategies to be employed to restore customer patronage post epidemics

**Research questions**

To accomplish the objectives of this study the following questions have been advanced;

1) What are the factors influencing consumers' perception of bush meat in Nigeria?
2) What are the factors that significantly determine consumption of bush meat in Nigeria that can be targeted for post hazard communication?
3) How significant are the messages of health officials and medical experts in determining perception and consumption of bush meat pre and post epidemics?
4) Can suggestions be offered to the policy makers and health officials as to promotional strategies to be employed to restore customer patronage post epidemics?

**Research hypotheses**

To answer the research questions and accomplish objectives of this study the following hypotheses have also been advanced;

$Ho_1$ There are no significant factors influencing consumers' perception of bush meat in Nigeria

$Ho_2$ There are no significant factors that determine consumption of bush meat in Nigeria that can be targeted for post hazard communication

$Ho_3$ The messages advanced by the health officials and medical experts has no significant influence on the perception and consumption of bush meat pre and post epidemics

**Scope of study**

Consumers and farmer/hunters will be surveyed. They were from three local government of Anambra State of Nigeria; Awka South, Ogbaru, , and Ekwusigo and three local governments of Edo State Etsako West, Esan Central and Akoko Edo, representing areas where bush meat are commonly sold and they also have urban and rural markets.



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**Significance of the study**

This study is important because of the enormous contribution of bush meat to the economy particularly in the hotel, tourism and the rural economies. In particular, the provision of protein badly needed for the good health and general well-being of the population of Nigeria is of essence. Furthermore, it is important to find out if people got the abstinence message in the first place. The world is worried and wants to know if a situation where there is another outbreak how the message would quickly get to the population in the risk areas to avoid heavy casualties. The bush meat agricultural sector is also a very important source of income to the farming communities that do not rear domestic animals in a large scale. There is a need therefore to find out the effects that these epidemics have and investigate how the messages to the consumer have affected the market for these bush meat to assist in future occurrences.

## REVIEW OF RELATED LITERATURE

The literature review is in three parts to reflect the theoretical, empirical and conceptual framework required for this study.

**Theoretical frame work**

**Consumer behavior**

The major theories of consumer behaviour can be grouped with

(a) economic theories,

(b) psychological theories

(c) psycho-analytical theories and

(d) socio cultural theories.

However according to Bray (2008) a number of approaches have been adopted in studying decision making and the studies by different writers have suggested typological classification which have given rise to five major approaches. The differences between these classification, he states lies in the variables involved in each of these alternate approaches of models of man , which fall with these categories: Economic man; Psychodynamic, Behaviourists, cognitive and humanistic (Bray, 2008). According to Wikipedia (2016) a consumer is defined as someone who acquires goods or services for direct use or ownership rather than for resale or use in production and manufacturing. Rahi (2014) states that many factors, specificities and characteristics influence the individual as a consumer in what he is and in his decision making process, shopping habits, purchasing behavior, the brands he buys or the retailers he goes. The most frequently quoted of all consumer behavior models according to Prasad and Jha (2014) is the Howard-Sheth model of buyer behavior, which was developed in 1969. The model is important because it highlights the importance of inputs to the consumer buying process while suggesting methods in which the consumer puts these variables in order before making a final decision. This model is based on the assumption that the consumer behaves rationally during purchase, process is repeatable and is result of incentives which have their source in the environment (input variables) and it consists of four main groups of variables. ( *CEOpedia, 2016).*



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According to Prasad and Jha (2014), Andreason (1965) proposed one of the earliest models of consumer behavior model. This model recognizes the importance of information in the consumer decision-making process and it further emphasized the importance of consumer attitudes. It however failed to consider attitudes in relation to repeat purchase behavior. While the Nicosia model concentrates on the buying decision for a new product, and concentrates on the business' attempts to communicate with the consumer, and the consumers' inclination to act in a certain manner based on the availability of information. Engel-Kollat-Blackwell model was created to describe the increasing, fast-growing body of knowledge concerning consumer behavior.

Traditional consumer decision models and theories developed in the 1960s and 1970s are still being used to structure research in the field of consumer behavior and provide variety of opportunities for future research. Prasad and Jha (2014) discussed another model Sheth-New Mangross Model of Consumption Values. This model is made up of five consumption values that determine consumer choice behavior. According to this model, there are five consumption values - functional, social, conditional, emotional, and epistemic values - influencing consumer choice behavior and any of which can influence choice by its self or in combination with others

Hawkins, Best and Coney(2001) proposed the following model of consumer behavior which we will adopt for the purposes of this study for its simplicity amongst other reasons:

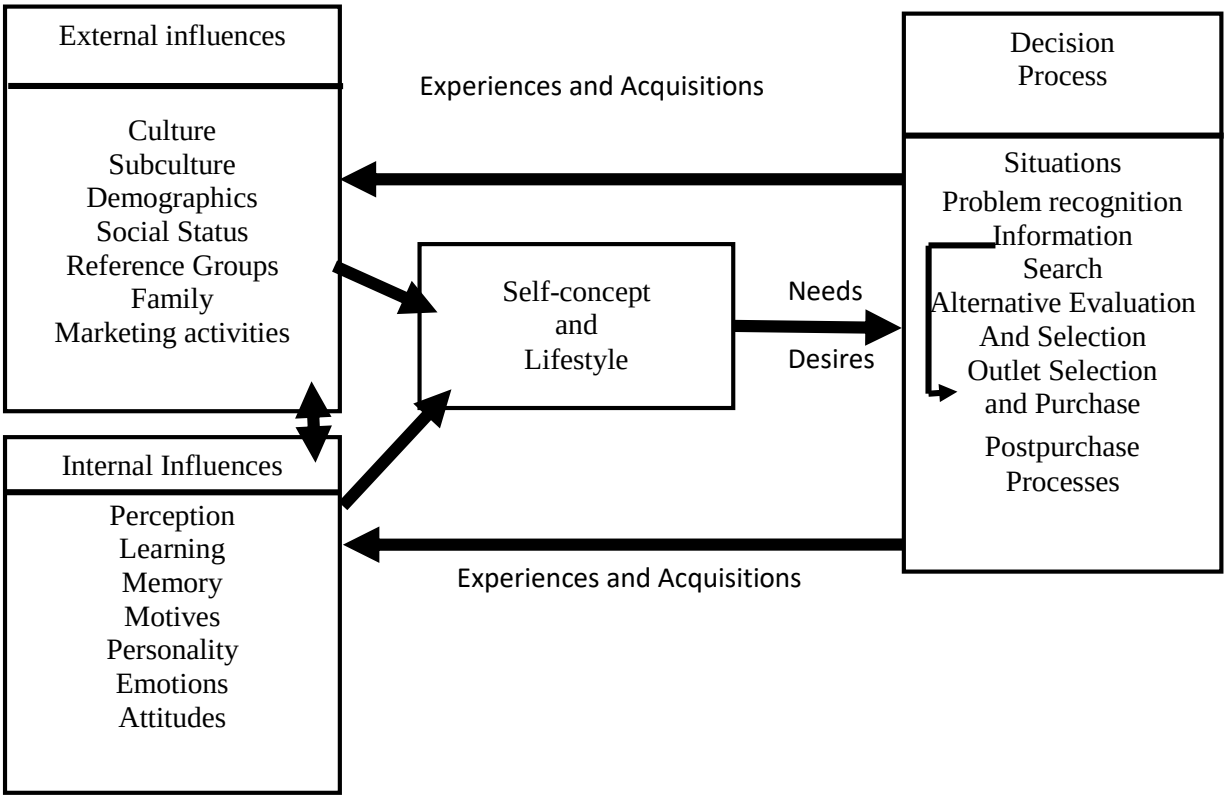


Figure 1: Overall model of consumer behaviour

Source: Hawkins, D. I., Best, R. J. and K. A. Coney (2001) Consumer behavior; building marketing strategy. Boston, McGraw-Hill Higher Education, 26



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Though this is a simplified model it represents the major factors considered in marketing literature we are interested in.

### Factors affecting or determining consumer preferences

According to Burns and Burns this conceptual frame work is one of many different models that researchers can use. However, in terms of the choice of conceptual framework every research work has unique conceptual model(s) of its own which depends wholly on the research objectives. It is recommended by Burns and Burns (2003) that with the knowledge that these variables listed in the model would ordinarily contain dozens of sub-concepts, the researcher should reduce these to a manageable number which can be included in the questionnaire. The model being a structure that puts together various constructs and their relationships can be put to use in bivariate or multivariate analysis.

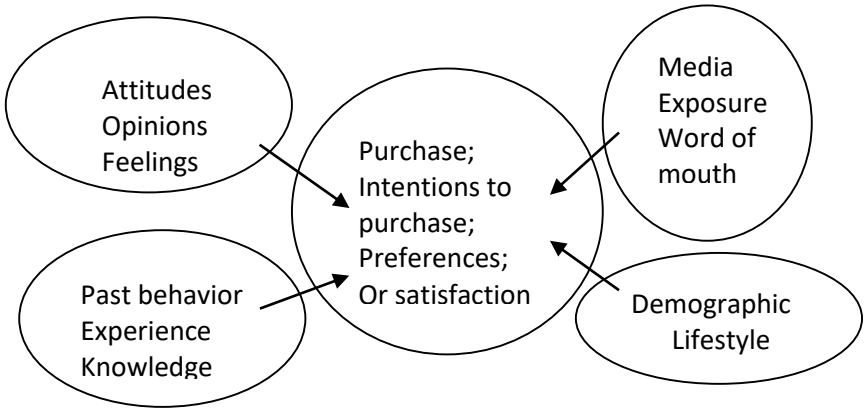


Figure 2: A conceptual model for multiple regression analysis
Sources: Burns, A. C. and Bush, R. F. (2003) Marketing research; online research application, 4th ed. New Jersev. Pearsons Education Inc. 562

## REVIEW OF EMPIRICAL LITERATURE

### Marketing of meat

Consumer buying behavior with respect to meat has exhibited marked and somewhat unexpected changes in recent years (Chavas; Braschler). According to Menkhaus, St. Clair and Hallingbye (1985) most of the early demand studies employed linear or logarithmic formulations of the demand relationships. it is argued by Brosekhan,. and Velayutham (2016) that the study of consumer behaviour is rapidly evolving as researchers recognize and implement new techniques and trans disciplinary perspectives to understand the nature of purchase and consumption behaviour. This wider view attempts to study consumer behaviour in the light of rapidly evolving lifestyles, values, priorities, and social contexts. Font-i-Fornuls and Guerrero, (2014) have posited that several factors influencing the changes in consumer demand for meat include: health concerns, changes in demographic characteristics, the need for convenience, changes in distribution and price. Then Quality, which they defined as consumer acceptance of a food or food product by regular consumers of the product; finally thy postulate that consumer preferences for meat, from a sensory stand point are influenced by



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appearance, tenderness, flavour, and juiciness while Purchase intent or willingness to buy is likewise important in determining preferences.

Then, Menkhaus, St. Clair, and Hallingbye (1985) economists had sought to provide explanations as why marked and somewhat unexpected changes have occurred recently, but the "results forthcoming from traditional least squares demand equations have been ambiguous and inconsistent with theory". However, Clair, and Hallingbye (1985) noted that alternative procedures, which may be more consistent with consumer behavior and the underlying utility theory, appear to hold promise of improved estimates of the parameters involved. Also, the study of Brodie and, Danaher (2000) shows "the existence of widespread prevalence of empirical studies that use a single dominant hypothesis or test a single model or method rather than competing hypotheses." This they said "is of concern because the single dominant hypothesis approach may lack objectivity relative to the inductive and competing hypotheses approaches."

**Marketing of bush-meat globally, in African and in Nigeria**

Bushmeat, i.e., "meat that predominantly comes from wild vertebrates, represents the primary source of protein in forested areas of the tropics" (Fa et al. 2002a, Milner-Gulland and Bennett 2003). "Bush meat hunting is extensive in West and Central Africa as both means of subsistence and sorce of commercial gain" (Cronin, Woloszynek, Morra, Honarvar, Linder Gonder, O'Connor and Hearn, 2015). Morsello. Yagüe, Beltreschi, Van Vliet, Adams, Schor, Quiceno-Mesa, and Cruz (2015) in their "study conducted in Brazil and Colombia highlighted the importance of human beliefs, attitudes, and social norms to the understanding of bush-meat consumption and preference." Mosello et al (2015) also found that among the tested indicators, the strongest predictor was "the importance of bush meat to social relations." Moreover, they stated that "informal social norms, such as the greater importance attributed to taboos, tended to decrease the average number of wild species that a person would eat, whereas attitudes toward the illegality of hunting were less important." Finally they found that the two economic indicators, increased income and wealth, tended to decrease preference for bush-meat and the likelihood of consumption.

This contrasted with a study by Martin (1983) from a study conducted in Southern Nigeria and parts of Plateau and Bauchi States that had an opposite result. He found that as at the 1970s, over 50% of the population ate bush-meat regularly, and that bush-meat was popular with all income-groups. It also contrasted with another study by Brasharesa, et al (2011) which indicated that "as the price of bush-meat rises with its movement from the rural to urban areas, the characteristics of the consumer change as well". "Thus, the 'poor' person's meat in the country becomes the "rich" person's meat in the city." This last study was conducted by Brasharesa, et al (2011) in Ghana, Cameroon, Tanzania, and Madagascar. Wealthier households consume more bush-meat in settlements nearer urban areas, as observed by Brasharesa, et al (2011) and others, but the opposite pattern is observed in more isolated settlements. In respect of the trade in bush meat, from a study conducted by Eniang, Eniang and Akpan (2008) "results show that bush meat trade is increasing at an alarming rate with more hunters and traders, with the goal of making profit. They were able to itemize a large number of animal species involved in the trade." In a related study, where each farmer was asked about the average number of each species harvested per month per annum, Adeola (2011) reported that the grand total estimate provided by wildlife species was 9137kg. Big game accounted for 7510kg (82%), reptiles 1208kg (13%), small games 379kg (4%), , while game birds provided 40kg(1%). According to Kalu and Aiyeloja (2002) marketers as



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against hunters and restaurant operators, were the major source of bush meat to consumers. They further stated that predominance of the marketers over and above other sources was reflective in all the locations /sites in the area under review.

**Epidemics and other health issues**

According to Cronin et al (2015) widespread bush meat hunting represents a severe threat to human populations through "the transmission of Zoonotic pathogens via human contact with infected bush meat as well as the decline and/or loss of a cheap and readily available protein source." Both they say "represent major public health concerns with long-term ramifications." "Zoonotic diseases result in millions of deaths annually, and the economic losses from a single outbreak can amount to tens of billions of dollars" (e.g. SARS) ( Lee and McKibbin 2004; Keusch et al. 2009; World Bank 2012). Prevention "and early control of outbreaks is key to reducing their impact, but there remains a critical need to improve the capacity of developing countries to effectively implement prevention and control activities as demonstrated by the 2014 Ebola virus disease outbreak in West Africa" (USAID, 2016). Factors associated with emergence, re-emergence, and spread of pathogens have been categorized into four broad domains worthy of investigation: "1) genetic and biological factors of pathogens and hosts, such as microbial adaptation and human susceptibility to infection; 2) physical environmental factors (e.g. climate variability and weather); 3) ecological factors (e.g. land-use change); and 4) social, political, and economic factors, including poverty and animal and public health infrastructure" (Bogich et al. 2012; Daszak et al. 2001; Smolinski et al. 2003).

Luiselli and Dendi (2016) in a study that "involved surveying markets twice a month between March and September 2014, found a statistically significant fall in trade for all the main traded types of animals." According to them, "the campaign done over the radio, televisions and newspapers during the 2014 outbreak in Nigeria was largely successful" (Luiselli and Dendi, 2016). According to WHO (2016) the number of reported deaths were 28 for Nigeria as against that reported in Liberia, 3,151 cases unconfirmed number of deaths and Sierra Leon, 3,589 confirmed deaths.

**Conceptual framework**

The following will form the conceptual framework for this study. It is a model that combines Burns and Bush (2003) conceptual model for multiple regression analysis and the Overall Model of Consumer Behaviour of Hawkins, Best, and Coney (2001). The Researcher has taken into cognizance the shortcomings of the models and analysis method as well as the statistical tool used for analysis in reviewed studies. The binary logic regression analysis will be employed and applied to this model.

$$\mathcal{E}\beta_o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \ldots + \beta_n X_n$$

Equation 1

then this translates to

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \ldots + \beta_n X_n + \varepsilon$$

Equation 2



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Where

- Y is the dependent variable,
- $\beta_0$ is the constant the intercept,
- $\beta_1$ through $\beta_n$ are the coefficients of the $X_1$ through $X_n$
- and Ɛ is the Odds, zero if consume and one if do not. (Schüppert, 2016).

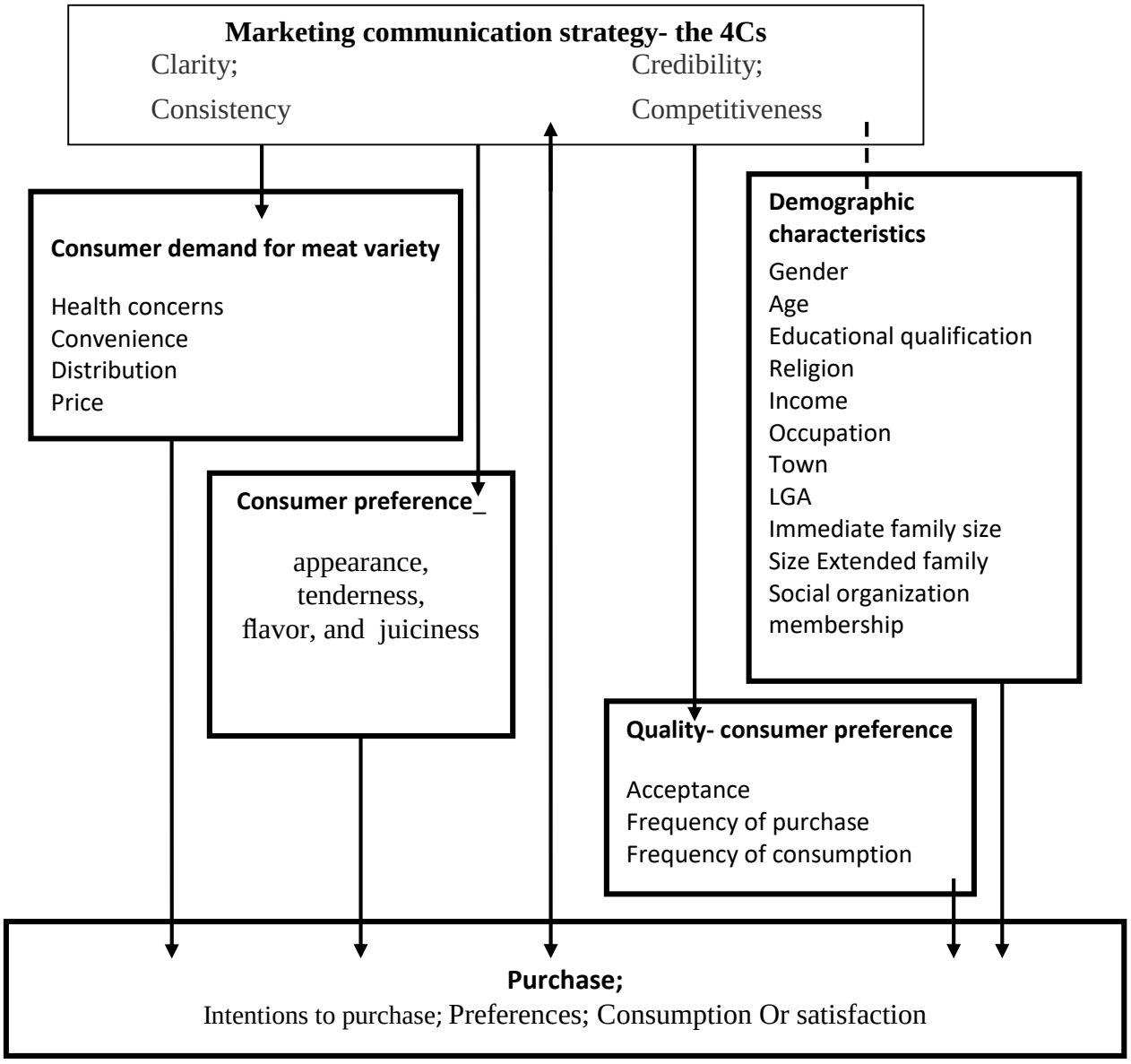


Figure 3 Conceptual frame work; model of consumer preference for bush meat
Source: adapted from Burns, A. C. and R. F. Bush (2003) Marketing research; online research applications, 4th ed. New Jersey, Pearsons Education Inc. 566-567 and Hawkins, D. I., Best, R. J. and K, A. Coney (2001) Consumer behavior; building marketing strategy. Boston, McGraw-Hill Higher Education, 26



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The assumption of linearity has been overcome by the use of this equation. The normality of the distribution is also not a major factor to be considered.

## METHODOLOGY

The research work was a descriptive and exploratory survey study.

### Population of study

This comprised of all the people residing and trading/working in the three local government areas in each of Anambra and Edo state both in South-south and South east regions of Nigeria.

### Sample size

Consumers in six local government areas (LGAs) ; Awka south, Ogbaru, , and Ekwusigo in Anambra State (NPC,2006: population 4.2 million), South East and Edo state(NPC,2006: population 3.2 million)-Etsako West, Esan Central and Akoko Edo LGAs, South- South Nigeria. Using a convenience method of determining sample size a total of two hundred and fifty consumers will be surveyed 125 each for state, each LGA according to alphabetical order 42, 42, 41 with a total of 250randomly was applied..

### Sources of Data

Data was sourced both through primary (survey, and instrument and unstructured interviews) and secondary sources (Libraries at the two universities libraries in Awka and Igbariam, internet, print media and so on.)

**Pilot test** was conducted in intervals and reliability analysis conducted that generated Cronbach's Alpha values for testing of the instruments before the study was conducted. The alpha scores obtained was .873, which was well above the minimum set of .7 for social research (Palant, 2011, Nwaizugbo and Ogbunakwor, 2013) before instrument was administered. The major means of data collection was a structured questionnaire with dichotomous question for the demographic data, while other variables were measured on a Likert scale type ranging from 1(strongly disagree) to 5(strongly agree)( Nwaizugbo and Ogbunakwor, 2013). Paid trained student enumerators were employed and the distribution spanned 3months during the long vacation period which enabled the study achieve a 90% return and valid rate.

### Method of data analysis and presentation.

Data obtained and analyzed were put into tables, in the form of percentages and discussed the hypotheses were tested as follows:

The first hypothesis was tested using Pearson Chi square Test of independence analysis to test at .05 level of significance (reject null if significance calculated is less than .05). The second $Ho_2$: the variables here were put in a binary logistic regression analysis to test for relationship (Reject hypothesis if no variable has calculated significance less than .05). The third hypothesis $Ho_3$: we used knowledge and information variable to test this hypothesis using binary regression analysis for this purpose (Reject hypothesis if no variable has calculated significance less than .05). The fourth hypothesis $Ho_4$: The study used knowledge and



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information variable to test this hypothesis using binary regression analysis for this purpose (Reject hypothesis if no variable has calculated significance less than .05). For the fifth hypothesis $Ho_5$ regression models outputs were used to construct models that could possibly be used if both regressions with the two different dependent variables have no significant variable then null cannot be rejected.

**Presentation and analysis of data**

The researcher issued 250 questionnaires out of which 225 were returned and were found to be usable. The respondents composition is as displayed in table 1 in Appendix A. 115 respondents were located in Anambra State, while 109 were located in Edo State. The sample had 66% of all the respondents as males, while 34% were females. Majority had a family size of between 2 to10 persons in their families. Christians, Muslims and Traditionalist made up the majority of the respondents, out of Theses 222 respondents responded to questions as to whether they consume bush meat and if they had stopped eating bush meat as a result of information received about the hazards posed by diseases found in bush meats. The data are as displayed in table below.

**Table 2: Cross tabulation of location and consumption pattern of respondents**

| | | Location of primary study | | |
|---|---|---|---|---|
| Respondents | | Anambra | Edo | Total |
| Consume bush meat | Yes | 85 | 79 | 164 |
| | No | 29 | 30 | 59 |
| | Total | 114 | 109 | 223 |
| Stopped consumption as a result of information from health officials | Yes | 59 | 35 | 94 |
| | No | 54 | 74 | 128 |
| | Total | 113 | 109 | 222 |

Source: authors survey 2016

A total of 75% of the respondents eat bush meat, however this percentage dropped from this figure to 48% as a result of respondents reducing consumption in Anambra State. In Edo State it was 73%, initially it dropped to 67% in light of information received. The drop in consumption of bush meat Anambra State (27%) was far more pronounced than that of Edo state (6%) of the respondents.

**Table 3: Cross tabulation of respondents' occupation and whether the respondents consume bush-meat**

| | | Respondents occupation | | | | | |
|---|---|---|---|---|---|---|---|
| | | student | casual worker | Trading /technician business | Public servant | Others specify | Total |
| Consumption of bush meat | Yes | 10 | 20 | 26 | 101 | 8 | 165 |
| | No | 9 | 16 | 7 | 22 | 5 | 59 |
| Total | | 19 | 36 | 33 | 123 | 13 | 224 |

Source: authors survey 2016



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The explanation as to why there was this large difference between the response of Anambra and Edo state respondents may be found on inspection of the above table. There were a large number of public servants as 55% as against 45% for all other occupations put together. Out of this 55%, 82% of them consume bush meat. Out of the 123 public servants 83 of them were respondents from Edo State.

**Table 4: Cross tabulation of location, occupation and respondents accepting information to stop eating bush meat**

| Respondents | | location of primary study | | |
|---|---|---|---|---|
| | | Anambra Public servants | Edo Public servants | Total |
| Stopped consumption as a result of information from health officials | Yes | 25 | 30 | 55 |
| | No | 15 | 53 | 68 |
| | Total | 40 | 83 | 123 |

Source: authors survey 2016

Anambra State only 37% of public servant continued to eat while 63% continued in Edo State. This could be said to explain this state of things therefore agreeing with the findings of the study by Brasharesa, et al (2011 ). The other demographic profiles were less differentiated.

**Analysis of consumption, variables affecting it and belonging in our model**

Two dependent variables in two different relationships were provided using our conceptual mapping; these were the status of respondents as consumers or not consumers and the effect of information on consumption of bush meat. Six independent variables were put forward to assist in the execution of this research. These independent variables measured on a five point Likert scale were as follows: (details are in tables 13 and 15 in Appendix B

Consdem- Marketing items that affect demand

Conspref- consumer preference items

Consqua- quality determinants

Conshaz- health hazard information

Preinfo- Government/ WHO information about outbreak of epidemic

Postinfo- government communication Post epidemic

$$Y= \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3\ldots + \beta_nX_n + \varepsilon$$

Where Y is the dependent variable, $\beta_0$ is the constant the intecept, $\beta_1$ through $\beta_n$ are the coefficients of the $X_1$=Consdem through $X_2$ = Conspref; $X_2$ = Consqua; $X_2$ = Conshaz;



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$X_5$ = prefinfo; $X_5$ = Postinfo and Ɛ is the Odds, zero if consume and one if Not. The assumption of linearity has been overcome by the use of this equation as stated earlier and normality is also not a major factor to be considered.

**Test of hypotheses**

**Testing proposition that the perception of consumers to bush meat in Nigeria is not favourable**

A Chi square test of independence was conducted using the data obtained from the Question do you consume bush meat? The rule for the test was if p(significance calculated) is less than .05 then we reject the null hypothesis. Equal opportunity of occurrence was assumed

**Table 5: Test Statistics**

respondents consumption of bush meat

| | |
|---|---|
| Chi-Square | 50.161[a] |
| Df | 1 |
| Asymp. Sig. | .000 |

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 112.0.

Source: authors survey 2016

Form the table the calculated significance of .000 is less than the fixed level of .05 therefore the null hypothesis is rejected and we state that there is favourable preference for bush meat in Nigeria. This result agrees with the finding of Martin (1983).

**For test of hypotheses $H0_2$ through $Ho_5$ binary logistic regression was used.**

Logistic regression was performed to investigate the effects the set of six independent variables of interest in two steps on the two different dependents variables (whether respondents consume bush meat and whether respondents' consumption had been stopped by information from health officials). The researchers' main model with the first dependent variable had a 73.4% accuracy of prediction before the introduction of the six independent variables. The model coefficient from Omnibus test was highly significant with value of .000(P<.05). The Chi square value was 39.25 with 6 degrees of freedom. The Hosmer–Lemeshew Goodness of fit had a significance level of .115 (and a Chi square value of 12.905) which is well over .50 (Palant, 2011: 176), indicating further the goodness of fit. Between 17 to 24% of the variation in this model was explained by these set of variables. From the classification table the overall percentage of 79.0% was obtained showing an increase in the ability of the models to predict the correct categories (i.e. Consume, do not consume). Sensitivity of the model which is the percentage of the people that consume bush-meat has been calculated at 95.5% .See Yes column of classification table. The specificity of the model was 33.3%, that is it predicted people that od not consume bush meat. Also the positive predictive value was 80% which indicated that 80% of the people that eat bush-meat had been predicted by our model. The negative value is 73% that means that the model found accurately that 73% of the respondents were found not to eat bush meat accurately.



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In respect of the second independent variable (whether respondents' consumption had been stopped by information from health officials), the second main model had a 57.3% accuracy of prediction before the introduction of the six independent variables. The model coefficient from Omnibus test was highly significant with value of .003 (P<.05). (Palant, 2011: 175)The Chi square value was 19.510 with 6 degrees of freedom. The Hosmer–Lemeshew Goodness of fit had a significance level of .711 (and a Chi square value of 5.424) which is well over .50 (Palant, 2011: 176), indicating further the goodness of fit. Between 9 to 12% of the variation in this model was explained by these set of variables. From the classification table the overall percentage of 61.5% was obtained showing an increase in the ability of the models to predict the correct categories (i.e. stopped Consumption, did not stop consumption). Sensitivity of the model which is the percentage of the respondents' consumption that stopped eating bush meat as a result of information from health officials has been calculated at 43.7%. See "yes" column of classification table. The specificity of the model was 64.1% that is, it predicted people that had not consume bush meat as a result of information. Also the positive predictive value was 56.3% which indicated that 56.3% of the people that eat bush-meat had been predicted to stop heating by our model. The negative value is 64.1% that means that the model found accurately that 64.1.6% of the respondents were found not to have stopped eating bush meat accurately. The binary regression analysis results are shown in the table below;

**Table 6: Direct regression analysis of first dependent variable (disposition of respondents to consume bush meat) and a set of Six independent variables**

| Item | | Implications |
|---|---|---|
| ■Resulting equation | $Y=3.056-.164X_1+.005X_2-.051X_3-.027X_4+056X_5+ .057X_6$ | Consdem, Consqua, and conshaz have negative relationship(effect) with/on consumption, while conspref, Preinfo, and postinfo have positive relationship/effect with/on consumption so to increase Y one would need to increase the last three while reducing the effects of the former three. |
| ■Significant variable(s) | Consdem= X1 (sign, .000)<br>Believe bush meat is nutritious<br>Convenience of purchase<br>Opportunity to kill<br>Location of purchase<br>Price of bush meat is important and<br>Price is reasonably affordable | These items are important considerations in purchase decisions and consumption. |
| ■Resulting equation if only significant variables are in equation | $Y=3.309-.144X_1$ | |



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| | | |
|---|---|---|
| ■Include pre epidemic warning | $Y=2.190-.160X_1+.057\ X_5$ $X_1$ (.000level of significance) and $X_5$ (.045 level of significance) | Countering and removing warnings about consumption will significantly affect consumption post epidemic |
| ■Include post epidemic encouragement | $Y=2.534-.165X_1+.072\ X_6$ $X_1$ (.000level of significance) and $X_6$ (.044 level of significance) | Including consdem items positively in the message in the post epidemic information campaign will significantly affect the return of consumers that had stopped eating bush meat as a result of the pre epidemic campaign and the epidemic itself. |

Source: authors survey 2016

The results of the second direct regression analysis is as follows:

**Table 7: Direct regression second dependent variable (information and consumption of bush-meat) and a set of six independent variables**

| Item | | Implication |
|---|---|---|
| ■Resulting equation | $Y=4.782-.20X_1+.009X_2-.053X_3-.075X_4-.040X_5+.043X_6$ | Consdem, consqua, conshaz and preinfo have the potential of reducing consumption, while conspref and postinfo would increase consumption |
| ■Significant variable(s) | Conshaz $=X_4$ is very significant (.015)<br>*Health implications of consumption of bush-meat is important<br>*Use of several media of information dissemination is effective<br>*knowledge that Bush meat is a potential disease vector<br>*Government is a major source of information<br>*Consumers are aware of the potential dangers of consumption<br>*Convinced that Ebola and laser fever can be contracted through contact with bush-meat<br>*Information received is that bush meat should not be eaten because it can carry disease | If the goal is to reinforce the pre epidemic warnings then increased information flow that targets consumer with Conshaz items will have significant effects. Otherwise stop the information that highlight conshaz. |
| ■Resulting equation if | $Y=3.828-.098X_4$ | |



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| | | |
|---|---|---|
| only significant variables are in equation | | |
| ■Include pre epidemic warning | Y= 3.983 -.160$X_1$ -.026$X_5$ $X_1$ (.006 level of significance) and $X_5$ (.376 level of significance) | |
| ■Include post epidemic warning | Y=3.602-.099$X_1$ +.014 $X_6$ $X_1$ (.000level of significance) and $X_6$ (.630 level of significance) | In during epidemic period, emphasis on consdem items will not have a significant effect |
| ■Include only pre - information | Y= 2.312-.072X5 (significance level .004) | During epidemics concentration of information to conshaz items will have significant effect |
| ■Include only post edidemic information | Y= .714-.072X6 (significance level .422) | During the epidemic messages other than conshaz items will not change consumption significantly, even the constant is so small that it gone down and become insignificant. |

Source: authors survey 2016

**Test of the proposition that there are no significant factors influencing consumers' perception of bush meat in Nigeria**

To test this hypothesis we need the assistance of Table 6: Direct regression analysis of first dependent variable (disposition of respondents to consume bush meat) and a set of six independent variables. Six independent variables were regressed and only one was found to be significant at .000 which is less than .05. that is Consdem- Marketing items that affect demand. Therefore we reject the null hypothesis and state that there is a significant variable that influences consumers' perception of bush meat in Nigeria.

**Test of the proposition that there are no significant factors that determine consumption of bush meat in Nigeria that can be targeted for post hazard communication**

Here the relevant table is that same Table 6: Direct regression analysis of first dependent variable (disposition of respondents to consume bush meat) and a set of six independent variable. Here we observe that when the variable post epidemic government information that the following results are obtained: $X_1$( Consdem)with a 000level of significance and $X_6$ (Postinfo) with a significance level of .044. It is observed that both of these have significant levels below .05 therefore we reject the null hypothesis and state that there are factors that determine consumption of bush meat in Nigeria that can be targeted for post hazard communication



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**Test of the proposition that no significant suggestions can be advanced to the bush meat industry as promotional strategies to increase the customer patronage after epidemics**

Based on the results of the test of hypothesis Ho3 above we could reject this null hypothesis however to be double sure we introduce the analysis from Table 7: Direct regression second dependent variable(information and consumption of bush-meat) and a set of six independent variables . this is because the result so far introduced are positive. The one from this new table has a significant variable which when the independent variable is put into the model we have a new variable Conshaz $=X_4$ that is very significant .015 being less than .05. This variable is negatively correlated to the new variable that is consumption after information had been given. Therefore we also state that we reject this null hypothesis.

**Test of the proposition that no other significant solutions to problems as may be observed from the study can be proffered.**

The results obtained from the other test of hypotheses have also given grounds for the rejection of this hypothesis because as shall be discussed in the next sections each of the preceding hypotheses do have implications and which will generate significant proposals for solutions of present post hazard period we are in and those to occur in the future.

## DISCUSSIONS OF MAJOR FINDINGS

The survey data and the outcomes of various analysis of this study have given the researchers much insight into the variables that are at play before, during and after epidemics that affect consumption of bush meat in Nigeria. They have also provided the researchers with variables that can be used pre and post epidemics so as to make the implementation of safe and well being programmes of government meaningful, organized, focused and reduce unnecessary negative pressure on the market for bush meat and quickly restore normalcy to the market when epidemics end. Specifically, two variables were found to be significant though one is positively related while the other is negatively related. This is actually a good thing in that while bush meat has the potential of providing highly needed protein source, unfortunately it can come with a devastating “price”. So it can be derived that two main variables form the independent in two equations that make up our model that is demand based factor and the hazard based factor.

The demand based factors would include Believe bush meat is nutritious; convenience of purchase; opportunity to kill; location of purchase, price of bush meat also important , price is reasonably affordable, also Bush meat is cheaper than other types of meat in the market and has the potential of saving a lot of money by consuming bush meat. These result compared with those identified by Font-i-Fornuls and Guerrero, (2014). There were no significant differences in term of demand for bush meat in terms of income groups agreeing with the results of the Martin (1983) study. These demand based items are important considerations in purchase decisions and consumption and therefore could be targeted in messages to the consumers after the epidemic. The hazard based factors would include, Knowledge of health implications of meat consumption is important to household, information is received from many sources about the health implications of eating meat, know that meat can carry disease, information from government announcements that meat can cause sickness have been received in the past, consumers know of what laser fever does to human beings, also know about Ebola disease and



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what it does to human beings. The consumers are also convinced that Ebola can be contacted by eating/handling of bush meat and further convinced that Laser fever can be contacted by eating/handling of bush meat, and they know that they should not eat when they are told not to.

The test of hypotheses have show that Nigeria have a very favourable disposition to eating bush meat, they have reasons why they consume it and these reasons are very significant and yet they also know the danger of eating infected meat.

## CONCLUSIONS AND RECOMMENDATIONS

The researchers are mindful of the potential damage to the economy and the serious danger posed by contact between our people and diseased animals. First, it is of utmost importance that when epidemics break out that our people are immediately sensitized about the danger and its sources. This sensitization should also be done in such a manner that permanent damage should not be done to the bush meat market so that return to normalcy can take place as quickly and smoothly as possible at the end of the epidemic. In the epidemic period, emphasis should be on the hazard factors which has already been seen will have very significant reducing effect on consumption as was evident in the post-epidemic information data on consumption. Hazard factors have to be emphasized in the campaign communication as soon as indications have pointed at an outbreak of a disease.

Secondly, it is also evident from the finding of this study that when epidemics end there is a need to restore the market to normalcy. Countering and removing warnings about consumption will significantly affect consumption post epidemic. Also including the demand based items in communication in the post epidemic information campaign will significantly affect the return of consumers that had stopped eating bush meat as a result of the pre and epidemic campaign. We are familiar with the communication that that countries like Britain, Brazil, Argentina etc (mad cow disease) put up when epidemics end to assist their farmers, therefore we expect no less from our government.

Finally, it is pertinent at this point to state that the specifics of the communication as important as they are if not encoded in such a way that the four Cs of communication are the structure of the encoding may loose their potency. Therefore the message must have clarity, must be perceived as credible, must be consistent with the factors that are being targeted so as to be competitive and do the job of informing on time to stop or start consumption.

Though the researchers have put the focus on government and health official, we are also mindful of the immense contributions of other persons and organisations that have great potentials of assisting in this regard. Philanthropist, profit based firms and organizations not for profit should partake in this endeavour because without people there can be no consumers, no community, no business, no government and no Nigeria.

### Limitation and gap created by this study for future research

We are mindful that we have not brought into this study all possible variables and other methods of treating the data from the survey are possible therefore opportunities abound for other researcher to look specifically in more details the factors that this study has looked at not in-depth. Expansion of the scope from the regions of South East and South-South Nigeria could



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also improve the results. Importantly, there is a need to investigate the rationale behind the overwhelming difference in the reaction of public servants as against other occupation groups

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